CTU

CZECH TECHNICAL
UNIVERSITY
IN PRAGUE

ANNUAL REPORT ON ACTIVITIES 2022

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Prague, May 2023

Annual Report on Activities of CTU in Prague for 2022
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Rector‘s opening speech

Dear readers,

„At last!" - one would like to exclaim with excitement that we have already lived 2022 without covid and without restrictions on personal, live communication, work and social gatherings. Unfortunately, however, the year 2022 was marked by another catastrophe, also with global impact, namely the war triggered by Russia in Ukraine.

This conflict is still not over, and people seem to have begun to get used to the fact that an insidious war is raging not far from us, in which even completely innocent civilians are dying. But we must not forget. The CTU in Prague immediately expressed its support for the Ukrainians by flying a yellow and blue flag at the Rector's Office and at some faculties, but it did not stop at just moral support.

Help against aggression

Our school also provided financial aid as well as material aid, which we had transported to Ukraine. Last but not least, we then stepped back from academic cooperation with Russian institutions, compiled a list of so-called critical study programmes that should not be studied by Russian students, and set up a separate website with summary information for students and prospective students from Ukraine. We also accommodated Ukrainian refugees in our dormitories and I must say that when we prepared a Christmas gathering for them in the Strahov Canteen and gave them gifts purchased by CTU staff, it was an extremely powerful experience. All these people, especially the mothers with children, would be sitting by their own Christmas trees in their homes if Russia had not decided to go to war. I express my support for Ukraine also now, but it is also appropriate to thank the students and employees of all constituent parts of CTU for their efforts and help.

Defence is necessary

The conflict was linked to a global, or at least Europe-wide, increase in energy prices. The CTU dealt with it very well too, I hope I can immodestly say. We made the necessary savings, adjusted the heating system to correspond with teaching, for example, and came out of the whole situation without any deep losses. I could not even imagine that at first.

I would also like to mention here that last year CTU in Prague deepened its scientific and research cooperation with the Army of the Czech Republic and the North Atlantic Alliance. It is our duty to defend freedom, democracy and, of course, human lives. That is why we are working with both militaries on defence and life-saving systems.

CTU as the guarantor of culture

I have already mentioned that last year we were able to start meeting again without covid restrictions. One of the first events was a charity concert for Ukraine held in March at Bethlehem Chapel. Especially in the summer, the Bethlehem Chapel, or rather the Bethlehem Beseda grounds, came alive with concerts, including outdoor concerts, when musical performances alternated with film screenings in the courtyard as part of the Bethlehem Biograph. The fact that the CTU purchased the Jaroslav Fragner Architectural Gallery in 2020 contributed to the consolidation of the Bethlehem Beseda; last year we selected its new director and I am looking forward to the gallery activities as well. This is how I imagine fulfilling the third role and the overlap of the university's activities into the field of art and culture.

A good team brings success

At the end of April, the inauguration of six Deans, four new and two elected for the second time, and myself as Rector elected for a second term at the end of 2021, also took place in Bethlehem Chapel. I am happy to say that the wish I expressed at the inauguration has been fulfilled. Together we form a team that has constructive discussions over various topics, but is always aware of the necessary unity in (re)presenting CTU to the external and internal world. Together we strive to develop teaching, research and to spread the reputation of CTU in the Czech Republic and worldwide.

This is also linked to our success in the prestigious QS World University Ranking: for the first time, we have been ranked among the top 400 universities in the world (ranked 378th out of more than 2,600 ranked schools), continuing our trend of ever-improving status. We were also the only Czech university to improve its position.

Our success is not „only" as a major educational institution, but also as a scientific and research institution. It would be unfair

to list here only some of our successful projects - and there is not space for all of them, so I recommend reading the following pages.

All successful and prestigious activities are, of course, based on people. Not only on excellent research and academic minds, but also on a whole team of non-scientific workers.

The management of the school and all the units are constantly trying to make sure that everyone has the best conditions for their work and that anyone can ask for improvements. In this context, I would like to remind you that CTU is also the recipient of the prestigious HR Award, and I hope that we will defend it in the future.

School, the foundation of life

Last year, our students again had a slightly greater choice of study programmes; the number of accredited bachelor, master and doctoral programmes exceeded three hundred, and the number of programmes taught in English also increased. Our faculties and the school as a whole are establishing partnerships with other universities around the world. Cooperation in the EuroTeQ alliance, of which CTU has been a member since 2020, is also developing successfully. The alliance of prestigious technical universities represents an interesting and beneficial opportunity for students, researchers and staff to participate in a project that aims to raise the quality of higher education to a higher level. Other members of the EuroTeQ group are the Technical University of Munich, Technical University of Denmark, Technical University of Eindhoven, École Polytechnique - L'X, Tallinn University of Technology, École polytechnique fédérale de Lausanne and Technion Israel Institute of Technology.

The number of our students from abroad is also increasing. We continue the trend of educating and teaching top professionals capable of standing up to the global competition. The employment rate of our graduates exceeds 99%.

However, we often start their preparation even before they are accepted to us. Every year it is evident that students come from secondary schools with different levels of especially mathematical knowledge, and it is necessary to compensate for the enormous difference at the beginning and prepare them for a demanding study based primarily on mathematical sciences. All faculties provide various tools and courses to help secondary school students adapt to the university environment as quickly and painlessly as possible.

We also strive to take care of students in extra-curricular areas; we provide counselling services in a wide range of areas while they are in school, and we have an organization for students with any disability. Our Student Union is one of the largest in Europe, with 11,000 members and 26 interest clubs based on interest or on dormitories.

I'm going to dwell on the dormitories because the decision to raise the price of dormitory accommodation in 2022 has caused resentment among students. However, it was a step we had to take; we actually increased the price after ten years. Over those ten years, inflation has been 23% in total, and we have increased the price of dormitory accommodation by 16%, and that was at a really turbulent time. I firmly believe that our students have understood that. Indeed, the occupancy rate of our halls of residence, with a capacity of over 7000 beds, suggests so. With the care of a proper manager, we will of course invest the money in the modernisation the dormitories.

However, it is not only those who have come to us after secondary school study. CTU also offers a wide range of educational activities within the framework of lifelong learning, LLL, and the University of the Third Age, U3A. In this case, too, given the focus of the university, attention is paid to technical disciplines, which are increasingly reflected in the social sciences in an interdisciplinary manner.

For people, the University of the Third Age often means not only the possibility of obtaining a university degree, but also the possibility of being part of the academic world in general, which was denied to them by the communist regime during their youth and active studying years. But also in general the possibility of meaningful encounters, especially after two years of covid quarantines. I thank all the faculties, whose programmes are detailed in the annual report, for a truly rich offering.

I must also mention Nursery School and Primary School Lvíčata, of which CTU is the founder, and which is in great demand. It has already started the school year in 2022 in expanded new premises.

Technology as sport

I will keep our sports activities for last, of which we offer several dozen (in 2022, for example, we invested in a new archery range at the Podolí Dormitory). Among the CTU athletes are enthusiastic amateurs and true champions, such as kayaker Vít Přindiš, who won gold at the 2022 World Championship. And just as we host not only scientific conferences, but also social events, we prepare traditional sporting events, such as Rector's Day, when the whole university participates in sports - last year the greatest interest was in dragon boat races at our boatyard in Malá Chuchle. And under the auspices of the Rector, the Run on 17 November is also held.

Why did I save sports for last? Because what is important in sports is also important in the world of our university: not only excellent technique and not only the desire to be the best, but also the sense of fair play, helping the weaker, the art of not only competing but also cooperating. I sincerely hope that when you look at the Annual Report of the Czech Technical University in Prague, you will think that the entire team of our school is doing well.

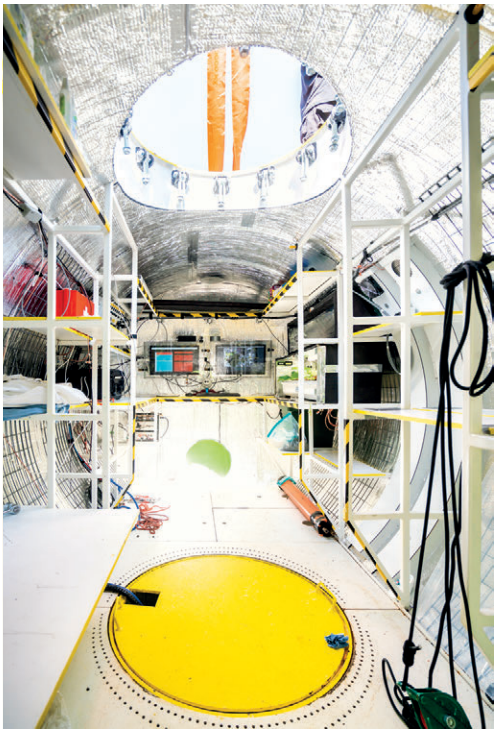
doc. RNDr. Vojtěch Petráček, CSc.
Rector of the CTU in Prague

"It was a shock. Instead of relief that the coronavirus was finally receding and we were beginning to live normally, to meet each other for work and friendship, at the end of February came an even greater disaster than the dreaded covid-19: the attack of Russian troops on Ukraine. Expressions of support for the suffering country, condemnation of the brutal action against the independent state, and above all the search for more and more ways to help not only Ukrainian students but also those who had to flee the country as a result of the rampage of weapons, it all resonated through all parts of the university."

We are with you, we are together
Concert for the support of people in the conflict area in Ukraine took place 9 March in Bethlehem Chapel.

Stories of 2022


HYDRONAUT
H03 MOTHERSHIP

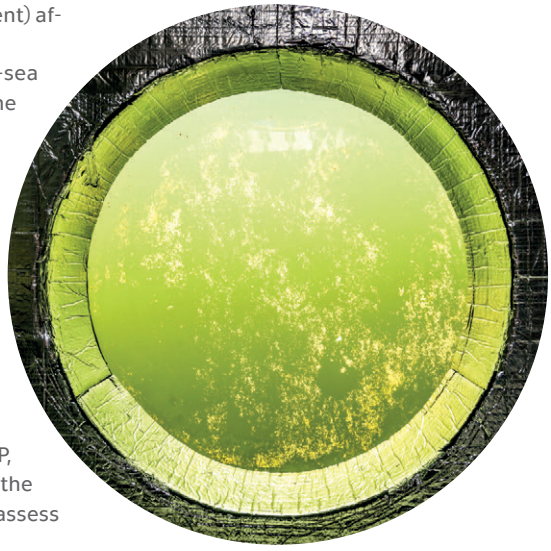


Underwater as in space

The unique research project Hydronaut, whose aim is to build facilities for training crews for isolated, spatially restricted and extreme environments, involves specialists from CTU. Such environments include, among others, space ships and bases.

As part of the project, which has been included in the European Space Agency's business incubator in 2020, researchers from the Faculty of Mechanical Engineering are focusing on the design and construction of a device for online monitoring of the state of the atmosphere inside the habitat and the treatment of very high relative humidity causing strong condensation of water vapour. Their colleagues from the Faculty of Biomedical Engineering are investigating how prolonged stay underwater (or in a similar isolated environment) affects the human body.

In 2022, a nine-day mission was carried out in the Jesenny quarry, when the deep-sea laboratory was submerged at a depth of ten metres. A three-man crew performed the tasks of the scientific mission, as well as a three-man crew was in the surface section the entire time.

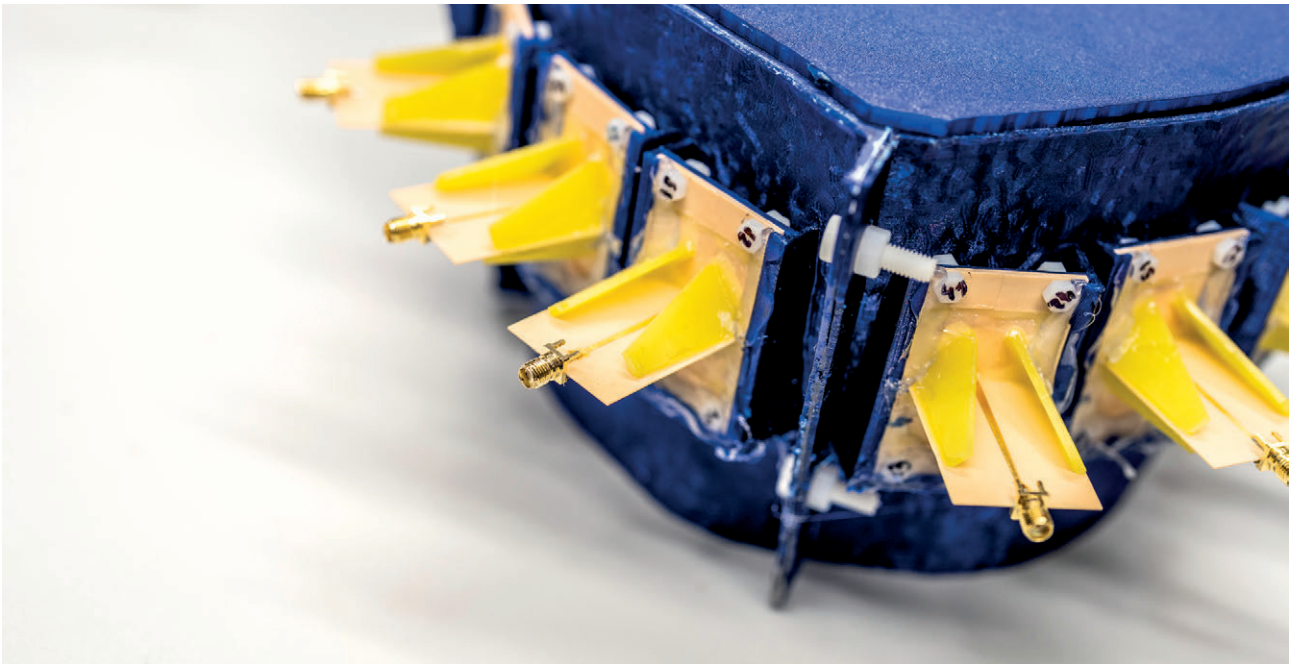


The participation of the Biomechanics and Assistive Technology team of FBME consists in the development of technologies for recording and processing physiological and biomechanical data. In close cooperation with the Department of Fluid Mechanics and Thermodynamics of the Faculty of Mechanical Engineering of the Czech Technical University and the Department of Psychology of the Faculty of Arts of Palacký University in Olomouc, biomechanics from the CTU have developed a complex system for measuring the mental and physical state of people. The cooperation is, among others, covered by the TA ČR project. In 2022, DIANA III Mission, which is implemented by the main investigator, the Faculty of Mechanical Engineering of CTU and the Department of Psychology of the Faculty of Arts of UP, could take place. The system being developed at FBME allows, first of all, to estimate the emotional state and concentration of the crew members, as well as to continuously assess their physical condition.

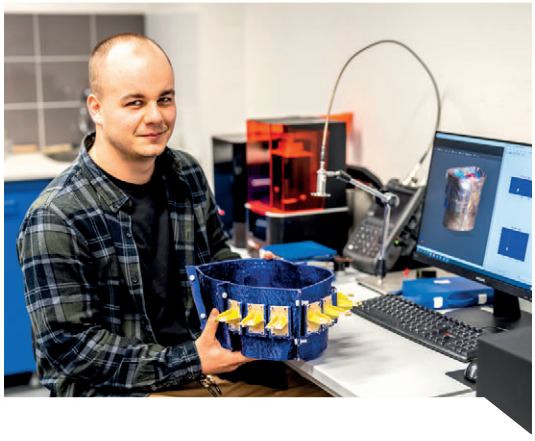
The training system consists, analogous to a space mission, of three parts: a deep laboratory (the laboratory landing module called DeepLab), a surface control station (the orbital station, called the MotherShip), and a control tower (the control centre). The data measured in the underwater laboratory are transmitted in 24/7 availability to a server that stores them in time series form in a database, determines cognitive load in real time, and provides a number of physiological and technical parameters (e.g. heart and respiratory rates, battery technical status, unit temperature, etc.).

Last year's nine-day mission preliminarily showed that crew training (i.e. experience) has a greater effect on ECG changes than the extreme environment itself. Those in the surface module were found to have greater ECG changes (corresponding to a given cognitive load) than those in the deep module, due to the better training of its crew. At the same time, a higher resting heart rate during the working day is shown for all its members and generally greater changes in the ECG for persons fulfilling a leadership role in the crew. These findings can be used in crew training screening and preselection. In the case of regular examination of the stability of the centre of gravity during standing, a slight improvement in stability was observed, i.e. after the mission the crew showed less change in the position of the centre of gravity during standing than before the mission. This may indicate a well-chosen method of regular physical exercise which, with the use of measurements by the proposed stability platforms, can be personalised.

Building facilities for training crews for isolated, space-constrained and extreme environments is the goal of the unique scientific project Hydronaut, in which the Faculty of Biomedical Engineering and the Faculty of Mechanical Engineering of CTU participate. Such environments include, among others, spacecraft and bases.



A student to be proud of



All of us have met someone in our lives who has stuck in our minds and who we value for their qualities or for what they have accomplished along the way. It is even more gratifying when the person who motivates others with their story is someone who is just beginning their professional career.

This is exactly the case with Bc. Jakub Kollár, who after successfully graduating from the Gymnasium Ladislav Novomestský in Senica decided to study at the Faculty of Biomedical Engineering of the Czech Technical University and who in 2022 completed his Bachelor's degree in Biomedical Engineering and was among the top five in his year.

His passion for the field is evidenced, among other things, by the exceptionally high level of his bachelor thesis „System for catheter navigation in RFA liver ablation". For the quality of his work and the difficulty of the topic he was awarded an „A" (excellent) and the maximum number of points, i.e. 100. For evaluation and comparison of the results Jakub Kollár proposed an evaluation method for the accuracy of catheter position detection. The result of his work is a unique functional prototype, which is the first in the world to use radar technology to monitor catheter position in the liver. Along with this, he also designed and implemented a phantom human body torso using 3D printing to validate the experimental system.

Jakub Kollár presented his results at the student scientific conference Instruments and methods for biology and medicine. He achieved a significant success with co-authors from the scientific team of Bio-Electromagnetism, when he published, as first author, the results of his bachelor thesis in the article „Microwave Catheter Navigation System for the Radiofrequency Liver Ablation" in the prestigious journal Cancers (according to WOS, the journal's impact factor is 6.56 and the journal belongs to the first quartile in the field of Oncology).

In 2022, he received the Minister of Education, Youth and Sports Award for Outstanding Students and Graduates for his undergraduate work and exemplary approach to his studies.

Jakub is currently continuing his studies in the master's programme in Biomedical Engineering at FBME. He works in the Bio-Electromagnetism team, especially with doc. Ondřej Fišer, to improve the original radar system to be able to determine not only the position of the inserted ablation catheter in 3D space, but also to continuously monitor the progress of the ablation. After completing his master's degree, he plans to continue working on a similarly interesting problem in the same team for his PhD studies.

Jakub's professional story is just beginning, but we will undoubtedly hear more about him in the future.

TEPLATOR: affordable solution for emission-free heating given the green light

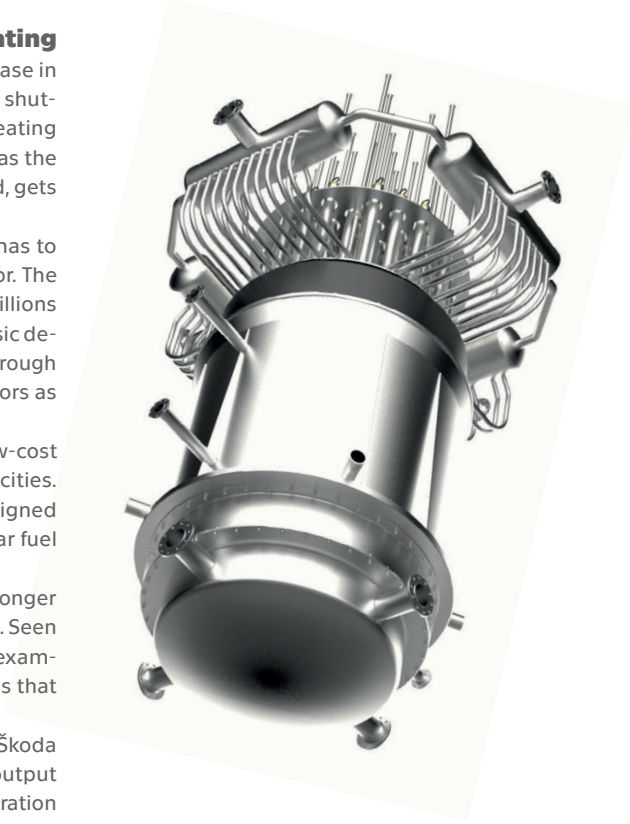
The year 2022 brought turbulence in the Czech energy and heating sector. Russia's war in Ukraine and the associated gas shortage and sharp increase in gas prices, together with long-term European plans for decarbonisation and the shut-down of coal-fired power plants, have given rise to innovative solutions for the heating industry from CIIRC CTU and the University of West Bohemia in Pilsen. TEPLATOR, as the small nuclear reactor, whose father of ideas is Prof. Radek Škoda, has been named, gets the green light in 2022. And for several reasons.

First of all, TEPLATOR, which still exists in the form of a conceptual design and has to obtain a licence to be put into practice, has managed to attract a private investor. The Czech group Invest & Property Consulting has committed to invest hundreds of millions of crowns in the project to create detailed project documentation, the so-called basic design, which is a prerequisite for the licensing procedure. Another important breakthrough is the support of the Czech government, which has accepted small nuclear reactors as a possible low-emission source of Czech energy.

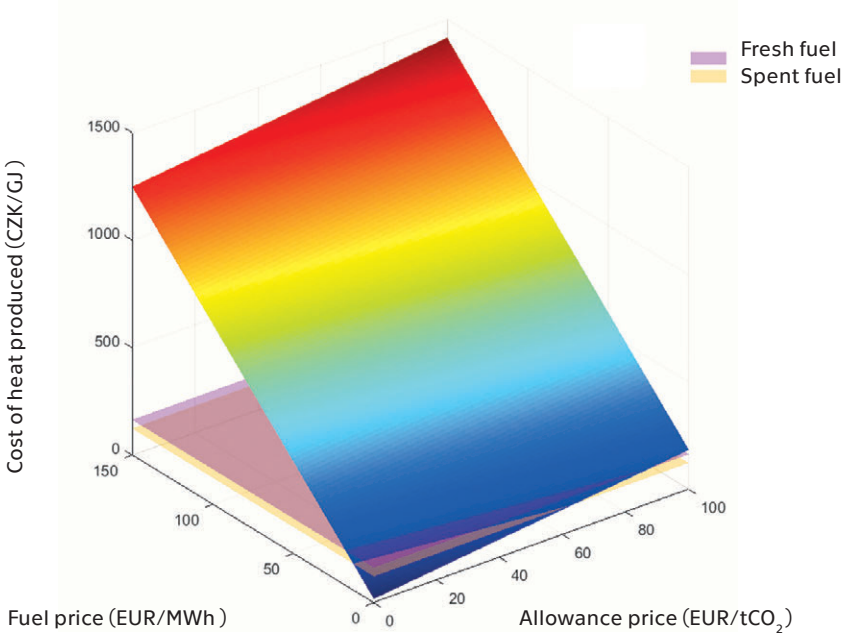
TEPLATOR is a reliable district heating solution that can provide carbon-free and low-cost heat, taking advantage of the district heating networks already in place in many cities. It is a simple, low-temperature, low-pressure nuclear reactor under 200 MW designed exclusively for heating purposes, which can use either low-enriched fresh nuclear fuel or already irradiated fuel cells from existing nuclear power plants.

Irradiated fuel, which nuclear power plants can process about five percent of, is no longer suitable for current reactors. TEPLATOR can recycle and reuse these fuel assemblies. Seen through the popular concept of the circular economy, TEPLATOR is one of the few examples in the energy sector that allows power plants to generate heat from fuel cells that otherwise only bring costs to their owners.

„The Teplator is a big pressure cooker that connects to the energy storage," Radek Škoda describes the device. The entire reactor measures roughly 6 times 6 metres. Its output can be scaled from 50 to 200 MWt. The first TEPLATOR, which will serve as a demonstration unit, is designed with a thermal output of up to 50 MW, and even the full version of the TEPLATOR in the future has an output temperature of up to 180 °C.



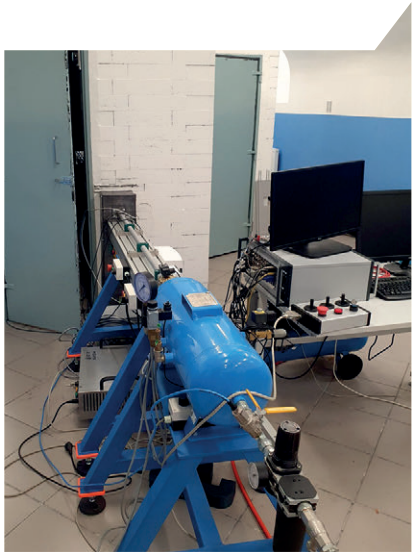
Costs of heat production from gas-fired heating plant / TEPLATOR (50 MW)



DynLab laboratory - Impact testing with fast X-ray imaging

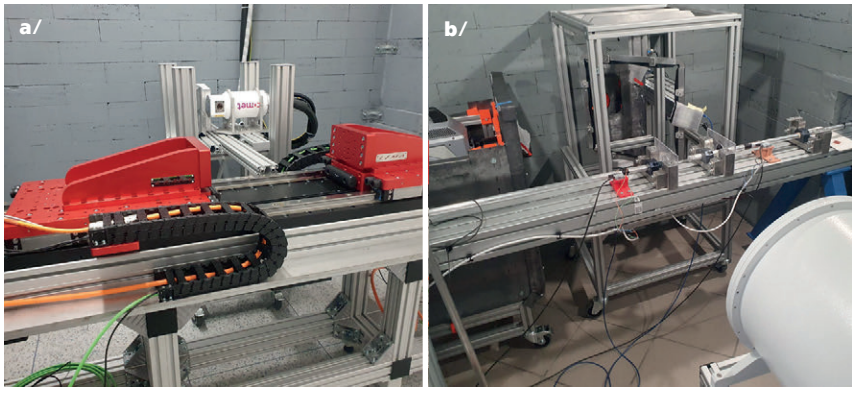
In the prestigious JUNIOR STAR project call of the Grant Agency of the Czech Republic starting in 2022, Tomáš Fíla's project entitled „Impact dynamics using fast X-ray radiography and a flash X-ray source" submitted on behalf of the Faculty of Transportation Sciences of the Czech Technical University was supported. The project is being carried out between 2022 and 2026 and its main theme is the use of very fast X-ray imaging performed during dynamic shock experiments. The project team consists of Tomáš Fíla and PhD students Jan Šleichrt, Jan Falta and Nela Krčmářová.
For the purpose of performing impact experiments, the DynLab laboratory, established in 2015 at the Department of Mechanics and Materials of the Faculty of Transportation Sciences CTU, is equipped with specialized equipment of its own design, including an air cannon, a split Hopkinson pressure bar and a linear motor-based loading device. These are used for testing materials in extreme conditions representing, for example, impact tests of vehicles or penetration of materials by projectiles. In the project, these devices are combined with powerful X-ray sources, which will allow the progress of experiments, with typical durations ranging from a few tens of microseconds to a few hundred milliseconds, to be monitored directly in the laboratory. This will make it possible to analyse the processes inside the materials during the experiments and thus understand their behaviour and the evolution of internal damage. The knowledge gained can be used to design better materials for a given application, e.g. for use in deformation zones of vehicles, for ballistic protection, and also for numerical modelling.
In 2022, the main task of the research team was to combine a flash X-ray source system with an air cannon and a split Hopkinson pressure bar. A flash X-ray is a device that generates extremely intense and extremely short flashes of X-rays, and the variant in the DynLab laboratory makes it possible to take four images with an exposure time of 20 nanoseconds with a minimum interval of one microsecond with the help of a scintillation panel and a high-speed camera. This system is designed to perform experiments of maximum duration of hundreds of microseconds with impact velocities of tens to hundreds of meters per second. Another challenge was to create a completely new facility equipped with a powerful stationary X-ray machine for continuous X-ray imaging of slower impact experiments with a load cell driven by linear motors. This set-up will allow experiments of durations on the order of units to hundreds of milliseconds with impact velocities up to 8 m/s and X-ray projections of up to several thousand frames per second. The X-ray facilities are currently being approved by the State Office for Nuclear Safety to allow safe operation.

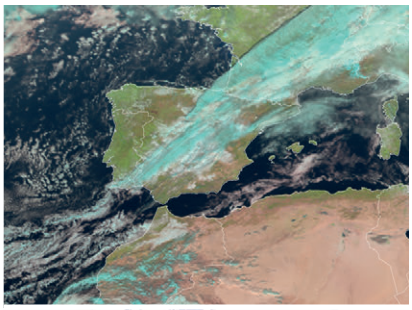
Bunker with an air cannon and a flash X-ray source.

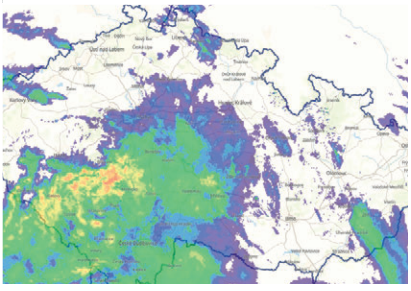


a/ Powerful stationary X-ray machine and self-designed loading device with linear motors - system for X-ray imaging of impact experiments at impact velocities up to 8 m/s. In the background a wall of special heavy shielding blocks.

b/ The air cannon muzzle inside the shielded bunker - a split Hopkinson pressure bar together with a flash X-ray (white cylinder), a scintillation panel with mirror and a high-speed camera.







The most accurate weather forecast and modelling of exoplanet atmospheres

Two victories at the prestigious international conference NeurIPS 2022 (Neural Information Processing Systems) were scored by experts in artificial intelligence from the Faculty of Information Technology CTU. They won the Weather4cast competition for the most accurate weather forecast, such as extreme precipitation in places without meteorological radars. The second Ariel Machine Learning Data Challenge was aimed at modelling the atmospheres of exoplanets, i.e. planets outside our solar system. The machine learning conference in New Orleans was attended by 10,000 artificial intelligence experts from around the world.

By winning the Weather4cast, the faculty team capitalized on its research collaboration with Meteopress in improving AI algorithms for weather forecasting. By combining the knowledge of scientists and students from the faculty and experts from Meteopress, we are now able to forecast the weather very accurately tens of minutes in advance. The winning team consisting of Bc. Jiří Pihrt, Bc. Rudolf Raevskiy, Mgr. Petr Šimánek and Ing. Matej Choma had to predict the rainfall as accurately as possible based on satellite data.

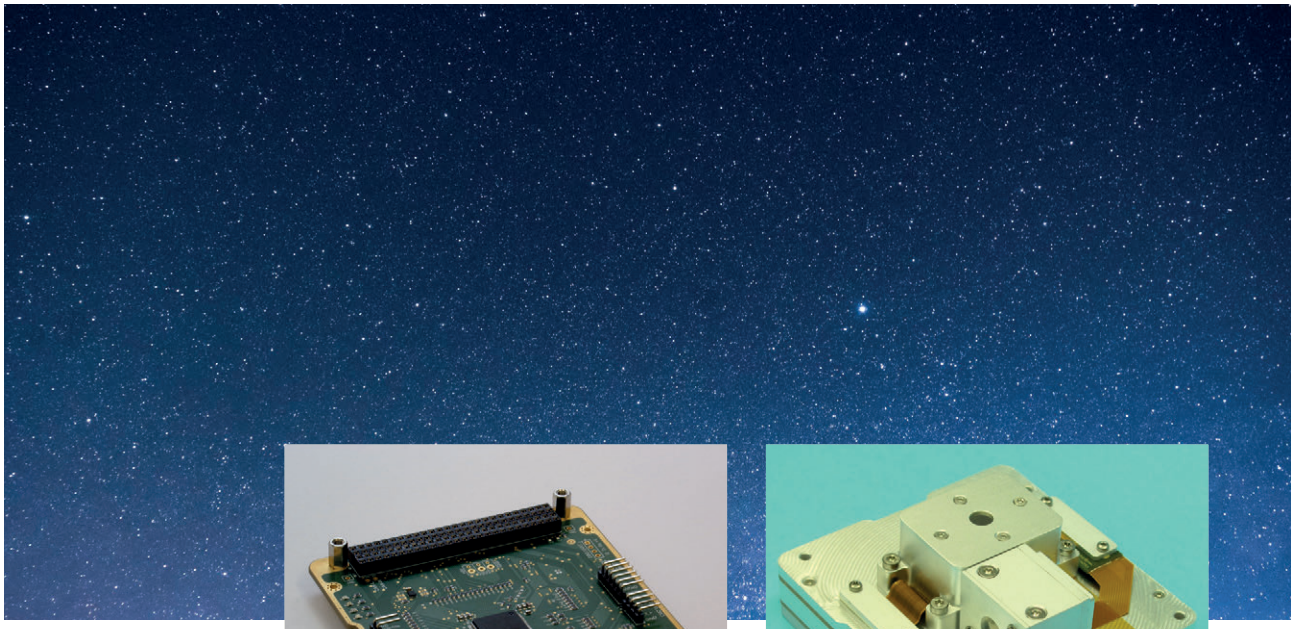
„The aim of the competition was to predict extreme thunderstorms or rainfall up to eight hours in advance over every square kilometre so that one would be able to tell if it was going to rain or not. This was quite difficult because we only had satellite data as input. Simply put, we had to know from a photo of clouds where it was going to rain in eight hours," says Mgr. Petr Šimánek and adds: „We approached the difficult task by using deep neural networks that combined knowledge from the fields of cloud image prediction, transformation of satellite images into radar images, precipitation prediction and conversion of radar images to higher resolution."

The second big success at the NeurIPS 2022 conference is the victory of Ing. Ondřej Podsztavek in the Ariel Machine Learning Data Challenge focused on modelling exoplanet atmospheres. The aim of the project was to design the most efficient method for detecting the temperature of the atmospheres of these planets and the amount of gases in them. To solve the challenge, Ondřej used his experience from long-term research cooperation in the field of neural networks with RNDr. Petr Škoda, CSc., from the Astronomical Institute of the CAS and FIT CTU and Prof. Ing. Pavel Tvrdík, CSc., from the Department of Computer Systems of FIT CTU.

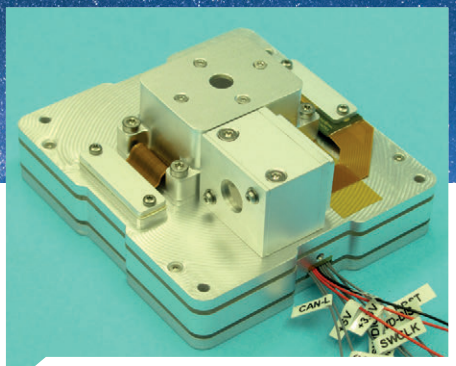
The Romanesque bridge in the grounds of the Vyšehrad National Cultural Monument

During the reign of Vratislav I, Vyšehrad, now a National Cultural Monument, became the center of political power and also served as the residence of the monarch. The Romanesque bridge dating back to the end of the 11th century is an important historical object and is situated on the territory of the former royal acropolis. It was built as a link between the princely and royal precincts and the Romanesque Basilica of St. Peter and Paul, and at the same time it was probably part of the fortifications of the Přemyslov Palace. The Klokner Institute of the CTU and the Vyšehrad National Cultural Monument concluded a memorandum of cooperation at the end of 2021, based on which diagnostics of the reinforced concrete ceiling structure above the Romanesque bridge, diagnostics of the Romanesque bridge made of stone masonry and measurements of dynamic effects of traffic were carried out in 2022. The above-mentioned reinforced concrete structure, which dates back to 1930s, is the de facto bridge that carries traffic along Štulcova Street. By measuring the dynamic effects of traffic, it has been shown that, when all traffic regulations are complied with, in particular the speed and weight of vehicles, car traffic does not have a destructive effect on the structure of the Romanesque bridge. A wide range of knowledge about the condition of the structures and the degradation and corrosion influences was obtained in the framework of the diagnostic work, which then formed the basis, in particular, for the determination of the load capacity of the reinforced concrete floor structure and for the structural analysis of the arch of the Romanesque bridge. This showed that in the long term the vault was structurally unstable and therefore its condition was assessed as unsatisfactory to disastrous. The determined normal load capacity of the reinforced concrete floor structure is 16 t.

Based on the results of the diagnostic work and static analyses, recommendations and measures were formulated to ensure the maximum extension of the bridge's service life in a sensitive manner. The most fundamental of these is to seal the broken opening in the arch, to fill in the masonry in the arch breach and to pour over it suitable inert material. These measures will ensure its structural stability. In order to minimise the moisture load, it was recommended to implement relieving underground drainage and protection of the perimeter masonry surrounding the Romanesque bridge area against ground moisture. Due to the poor condition of the reinforced concrete floor structure, it was recommended to build a new structure over the Romanesque bridge area. Further measures were proposed to stabilise the internal microclimate of the area in which the Romanesque bridge is located, based on long-term monitoring.



Detector core with SpacePix2 monolithic pixel detector



SXRM detector

Detectors in orbit

A number of commercial devices are already capable of detecting ionizing radiation and radiation in normal terrestrial conditions. However, scientists from the Faculty of Nuclear Sciences and Physical Engineering at CTU in collaboration with esc Aerospace have developed detectors to study space weather and ionising radiation in orbit. What's more, their research doesn't just stay at home in the lab, it has also made its way into space. The unique 2SD particle detector was carried into orbit by SpaceX's Falcon 9 rocket from Cape Canaveral, USA.

„This is the second generation of our detector. The first one was launched into orbit by a Russian Soyuz rocket in 2019. The second detector does a bit more than that, because in addition to measuring the number of particles and identifying them individually, it can also determine their direction of flight and their energy. The device also includes another detector for detecting photons of so-called soft X-rays," adds Michal Marčišovský, head of the Center for Applied Physics and Advanced Detection Systems (CAPADS) laboratory, which is developing the components.

Our detectors help protect space infrastructure and human crew from cosmic rays. By detecting dangerous levels of radiation early on, which could damage equipment or endanger astronauts, measures can be taken to limit the risks - for example, a satellite can be rotated to expose its most protected part to radiation, or sensitive equipment can be turned off for a given time.

The SXRM detector is based on the revolutionary SpacePix2 monolithic pixel detector developed by FNSPE. It is designed to operate in various Earth orbit environments for at least 15 years. Its small size and low power requirements allow it to be easily placed on almost any satellite. The more devices in orbit that can monitor the space environment, the more accurately it will be possible to model its evolution.

In addition to the current ones, the SXM detector will be launched into orbit to measure the flow of soft X-ray photons, which are most often emitted during solar eruptions. These eruptions can cause so-called solar storms, which have the potential to damage not only sensitive electronic equipment in orbit but also, in a major event, entire power grids on the Earth's surface. Our detectors could thus protect not only equipment in space but also terrestrial infrastructure in the future.

Life between the world of technology and psychology

When last year the Masaryk Institute of Advanced Studies celebrated its 30th birthday, the Rector of CTU doc. Vojtěch Petráček, CSc., awarded doc. PhDr. Dana Dobrovská, CSc., with the CTU Gold Medal for her lifelong work and significant contributions to the development of CTU. Although Associate Professor Dobrovská graduated in psychology at the Faculty of Arts of Charles University and habilitated at Palacký University in Olomouc, her academic life is continuously connected with the Czech Technical University in Prague, where she has been working since 1973, i.e. for an incredible 50 years. Throughout her working career she has strived to connect the world of technology with the world of humanities and social disciplines, the environment of machines and devices with the spiritual and social life of people who create, operate or use these machines. She manages to reconcile and contrast the clarity and exactness of technical thinking with the fragility and vulnerability of human mental processes. The human being is at the center of her attention, she always strives for the maximum development of each student in her teaching activities, she can advise and encourage.

Her world is not only the environment of a technical university, but also opera, fine arts and history. To her range of knowledge let's add five foreign languages she studied at a time when contact with the outside world was very limited. Her sense of humour, kindness and understanding of others were always among the essential traits of her character, which were appreciated by her colleagues not only in difficult times.

Dana Dobrovská first worked at the Research Institute of Engineering Studies at the CTU as an assistant professor, then she stood at the birth of the Masaryk Institute of Advanced Studies, where she still works today. For twenty years she headed the Department of Engineering Pedagogy and has long been involved in the International Society for Engineering Pedagogy IGIP, where she held, among other things, the prestigious position of President of the International Monitoring Committee; later in 2011, she received a long service award from this society. She has also contributed significantly to bringing the Czech „engineering pedagogy" into the international environment and earning its prestige there. At CTU, she was primarily devoted to the education of future teachers of technical subjects with the conviction that it is important to prepare teachers who will introduce new generations into the world of technology who are not only well-prepared, but also enthusiastic and creative.

CTU team won the European competition EuroTeQ Collider

The EuroTeQ project, funded by the European Commission, allows students to choose courses offered by partner universities and join international cooperation teams. They then apply for a call and develop a project to address it.
60 students at CTU have entered the EuroTeQ Collider competition. The jury selected three student teams to represent CTU at the final EuroTeQaThon 2022 in Munich. Prokop Pučejdl and Edoardo Tasini, students from the Faculty of Mechanical Engineering, together with Danila Lisitskii from FNSPE, presented their project A New Life for Waste Heat, which responded to the challenge submitted by GasNet. They surprised the jury of the European final of EuroTeQaThon with their unique solution of using waste heat in the reduction station of a gas pipeline to generate electricity. In the three-member team, P. Pučejdl dealt mainly with the technical solution and calculations, E. Tasini worked on the economics and environmental benefits, and D. Lisitskii was mainly responsible for the final presentation and the creation of the animated diagram. After a thorough study of the assignment from GasNet, the students came up with the idea of applying the Organic Rankine cycle, which, unlike conventional water vapour cycles, uses organic substances as the working medium. For the competition, they proposed an innovative way to use waste heat to generate electricity and thus make full use of the energy-reducing capacity of reduction stations all year round. They started from the observation that the cogeneration unit, which preheats the gas before expansion, is not used in summer. Therefore, they proposed to recover the waste heat in another turbine put into circulation, which will be able to operate even during the summer months, when the total gas consumption is low and the amount of waste heat is not sufficient to be efficiently used for electricity cogeneration. However, this will be possible with the low boiling point temperature of the proposed organic medium.
The CTU team in Munich won in a strong competition of teams from technical universities from Denmark, France, Estonia, the Netherlands and Germany. The prize included an invitation to the European Parliament. On 19 and 20 January 2023, they presented their project in Brussels and then discussed it with representatives of the European Commission, who have an agenda of education, environment and the use of alternative energy sources.

Interactive installation Forum Robotum attracted 24 000 visitors to Signal Festival

On 13-16 October 2022, the tenth edition of the Signal Festival, the largest cultural event in the Czech Republic with an attendance of half a million people, took place in Prague at several venues. For the first time ever, a part of the CTU, namely the Faculty of Electrical Engineering, took part in the festival. Its Forum Robotum installation was seen by an incredible 24,000 people of all ages during the four days of attendance, making it one of the largest popularisation activities of the CTU in recent years. It is clear that the shared future of humans and robots is a topic that moves society!

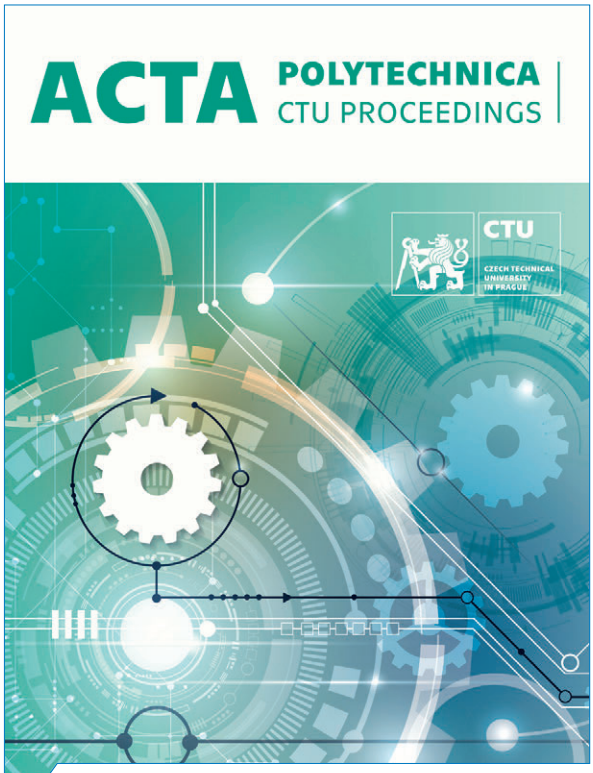
What could visitors experience? A team of scientists, students and an external designer turned the campus courtyard on Charles Square into a robotic zoo. Four types of research robots paraded around elevated platforms and showed what they could do. For the purpose of the installation, the robots were augmented with LED exoskeletons whose colourful transformation was used to interact with visitors. The luminous organs resembled the shape of insect trunks, buds, peacock tails or butterfly wings. And it was no coincidence! In fact, the anatomy and movement of some robots (e.g. the six-legged spider or the robotic dog) are derived from real animals, and so these elements also found inspiration in nature.

The biggest challenge for the team was to integrate all parts of the installation into one working unit. In addition to the robots themselves, this consisted of electromagnetic sensors, microcontrollers, several wireless modules, light control, lidar and data analysis to mediate the interaction between humans and robots.

„Today's technologies are really very complex. What appears at first glance to be a simple thing has many different systems, buses and protocols in the background. Connecting them was key to creating such an installation - yet it is an invisible and often challenging job for researchers," says Jiří Zemánek, curator of the installation from the Department of Control Engineering, of the daunting task. But the hard work has clearly paid off. „I also really enjoyed the atmosphere of the installation, which some visitors described as being from another world," he adds.

And besides the light, the FEE exposition brought sound! Everyone has probably seen a robot at some point, whether it was a simple toy, an industrial machine or an experimental system for research. But have you ever heard what such a robot sounds like? It's not exactly common! So the authors of the exhibition decided to convert the electromagnetic fields of robots into a soundtrack using a guitar pickup. This was then harmonised, so that the whole space was filled with magical music reminiscent of the soundtrack from sci-fi movies. The sensors were attached directly to the robot dogs SPOTs, which emitted dark tones when they moved.

The talented doctoral student Vojtěch Leischner from the Department of Computer Graphics and Interaction is behind this complex audio experience. The actual movement of the robots was then controlled by student operators using wireless controllers specially commissioned for the installation by Ing. Tomáš Rouček from the Department of Computer Science and Ing. Bedřich Himmel from the Department of Cybernetics.



Acta Polytechnica

One of the main activities of the editorial office of the CTU Central Library is publishing the journal Acta Polytechnica. It underwent a significant change in 2022, after 61 years the paper version was discontinued and only the electronic version is published anymore.

We know that the magazine is well known not only within the CTU, but we will allow ourselves to introduce it here briefly because we know that repetition is the mother of wisdom.

Acta Polytechnica has been published since 1961. It is a peer-reviewed journal that publishes original scientific contributions by an international community of authors from a wide range of engineering, mathematics and physics disciplines. It is currently in „Diamond Open Access" mode, which means no charge to readers and authors. Important decisions are approved by the internal Editorial Board, which is composed of representatives of CTU faculties. The journal also has an external Editorial Board of experts, whose important task is its promotion and presentation. In 2022, these members were renewed based on their interest, while two new members were added, one from the Czech Republic and the other from Sweden, extending the journal's direct reach to the Scandinavian peninsula.

Last year was also successful in that Acta Polytechnica repeatedly moved up in the renowned databases in which it is indexed - in Web of Science in the ESCI edition it is in Q3, the Scimago Journal Rank is 0.26, in Scopus the CiteScore for 2022 is 1.6. The journal is also indexed in the Inspec, DOAJ and EBSCO Discovery Service databases.

The aim of the editorial office is to spread awareness of the journal and the published articles and thus increase their impact in scientific circles. Therefore, the social media profiles - Facebook, Twitter and LinkedIn - have also been updated. Information about forthcoming issues, forthcoming articles and other news from the editorial office is regularly posted here.

The journal is published together with the Acta Polytechnica CTU Proceedings series. In 2022, a major challenge, in addition to the standard proceedings of various periodically recurring conferences organized or co-organized by CTU, was the publication of two proceedings of major international conferences. The proceedings series are also included in the Scopus database and selected issues are sent to the WoS (CPCI) database for evaluation.

National Building Sustainability Certification SBToolCZ

Since 2011, the University Centre for Energy Efficient Buildings and the Faculty of Civil Engineering of CTU in cooperation with the certification companies Technical and Test Institute of Construction Prague and the Building Research Institute have been operating, managing and developing the national methodology for assessing the sustainability of buildings SBToolCZ.

In 2022, a new, updated version of the methodology was published to reflect the current legislative, environmental and social situation. It is a powerful tool for designing sustainable buildings. Compared to foreign certification methodologies, SBToolCZ is fully adapted to the conditions in the Czech Republic. It respects local climatic, construction and legislative conditions and also requires lower processing costs. The credible certificate that results from the assessment increases the market value of buildings and directly reduces their operating costs through its requirements. For contracting authorities, it provides conclusive evidence of the consideration of environmental and social aspects as required by Act No 134/2016 on public procurement.

The current certification methodology was developed after a thorough review of earlier versions. In particular, the aim was to unify the criteria evaluation procedures across building typologies - office, residential, single-family and school buildings. In addition, a methodology for the assessment of tertiary education buildings (e.g. universities, etc.) was published in 2022. SBToolCZ covers both the design phase and completed building as well as now also the renovation phase. The methodology is freely available online on the sbtool.cz website.

According to the representative of the national platform, Prof. Petr Hájek from the Faculty of Civil Engineering and the University Centre for Energy Efficient Buildings of the CTU, the development also included the digitalization of the assessment with the possibility of importing data from the digital building model (BIM) and their automatic processing in an online application.

The SBToolCZ certification was applied during the comprehensive reconstruction of the building of the Secondary Vocational School - Vocational Training Centre and Gymnasium in Prague-Hrdlořezy, which was transformed into a modern, ecological, sustainable and energy self-sufficient building thanks to the use of a number of innovative technologies from the CTU. Its design was awarded the SBToolCZ gold certificate. The quality of the reconstruction of the school in Českobrodská Street was also confirmed by the victory of this project in the Adapterra Awards competition in the Built-up Areas category.

During 2022, the methodology was used to assess the design quality of several other buildings. One of these upcoming projects is the planned comprehensive reconstruction of Building B of the Faculty of Civil Engineering of the CTU. SBToolCZ is applied here to set requirements for balancing the environmental, socio-cultural and economic qualities of the renovation design.

(Photo: ECOTEN)

(Photo: ECOTEN)

Beirut success

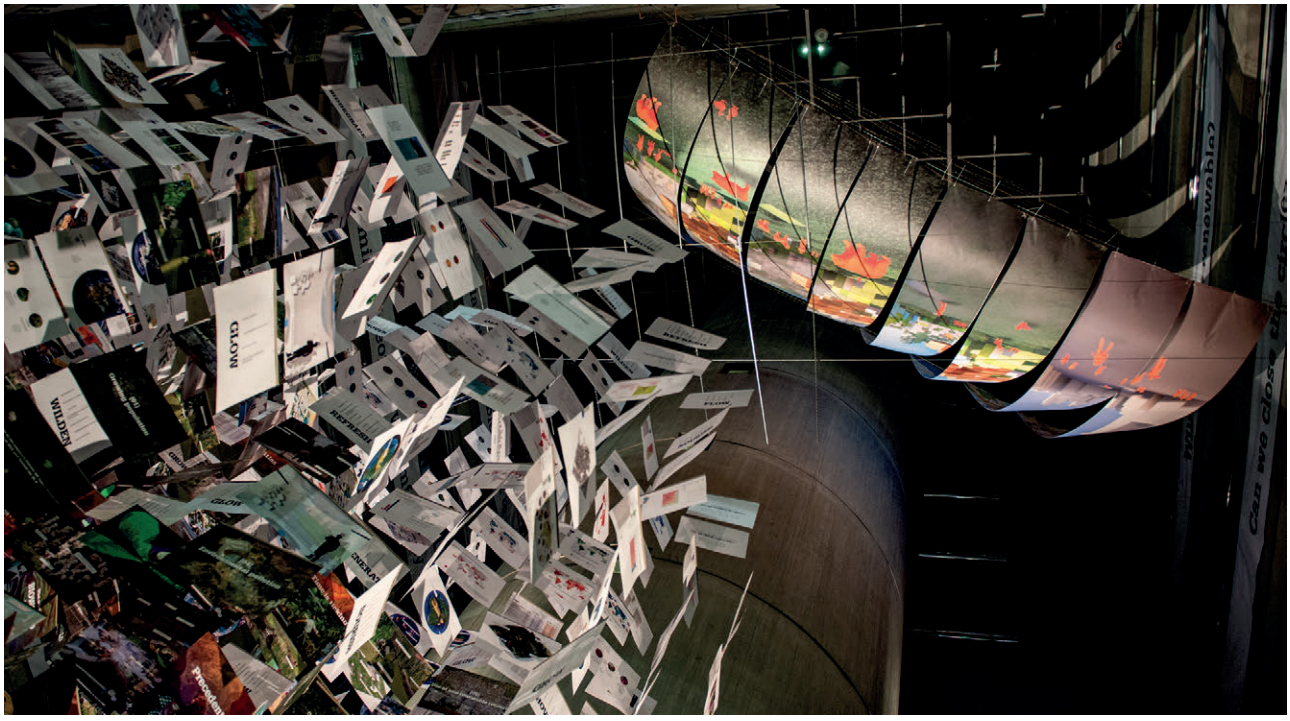
Růžena Mašková, Jakub Tomašík and Adam Rössler, at the time of the competition students of the master's degree programme in Architecture and Building Sciences at the Faculty of Civil Engineering CTU, won second place in the prestigious international architectural competition INSPIRELI BEIRUT PORT RENEWAL COMPETITION. They were able to compete in a competition of 249 projects from 43 countries. At the same time, they also won the first prize in the Urban Design category of the main section of the INSPIRELI AWARDS competition. They were also awarded in the Lumion Prize category.

The student team in the offer of the faculty's architecture studio was attracted by the theme of the restoration of the port of Beirut as a possibility for a pre-diploma thesis. „At the same time, we found the help of Beirut in the form of proposals for possible uses of the port destroyed by the massive explosion of 2020 meaningful," says Růžena Mašková. Together they came up with an urban concept, then divided the area into three parts and gradually connected them. „But we consulted each other all the time, then we fine-tuned the details and made everything look as unified as possible," says Jakub Tomašík.

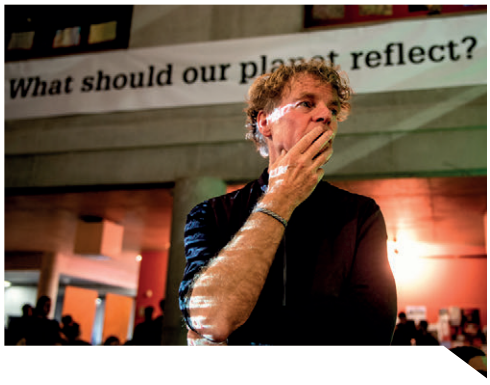
The students worked on the project in the studio first as a pre-diploma project, and then, as part of their diploma theses, each of the objects or blocks of the design was solved. During the first part, their work was led by doc. Ing. arch. Luboš Knytl together with Ing. arch. Petr Ledl, Ph.D., from the Department of Architecture at the Faculty of Civil Engineering CTU. They then worked on their diploma theses under the supervision of doc. Knytl.

The students faced a difficult task of defining themselves against the status quo. The port is located on very lucrative land and at the same time it is cut off from the rest of the city by a busy motorway and a fault in the terrain. The students' goal was to overcome these barriers and annex the area back to the city. They chose to address the design with levitating platforms growing through the high-rise development.

According to Karel Smejkal, president and co-founder of INSPIRELI AWARDS, the jury was impressed by the complexity of the design by students from the Faculty of Civil Engineering of the Czech Technical University, as well as the clear vision of how to work with the site. The students also impressed the jury with the high quality of the architectural elements and the unprecedented scope of the project. The winning designs were offered free of charge to the Beirut municipality to help rebuild the destroyed port and to provide ideas on how to incorporate more public spaces into the port area.



Project with a visionary



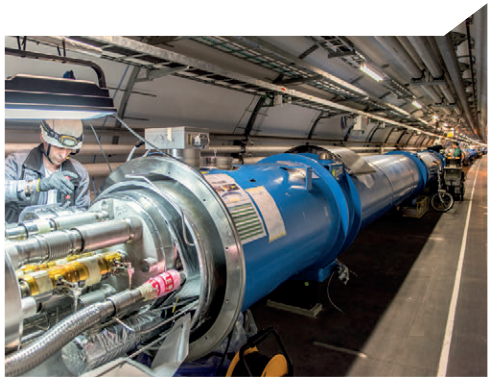
To bring internationally renowned personalities, current topics and new teaching methods to the faculty. The visiting professor studio was one of the first steps taken by the new Dean of the Faculty of Architecture, Dalibor Hlaváček, and the first to accept this role was the Dutch architect, urban planner and visionary Winy Maas.

Winy Maas, professor at Delft University of Technology, combines practice with research. He is the founder of The Why Factory, a think tank that explores the development of future cities, and MVRDV studio, an award-winning studio for its innovative approach to the architecture of buildings, cities and landscapes. In the winter semester, under his guidance, students explored the most pressing global issues of our time and their impact on urban life. „Collaborating with Winy Maas was both a challenge and an amazing opportunity. It was months of hard group work that tested our ingenuity, openness and ability to coordinate. We had to change the way we think in order to come up with innovative ideas, to be able to dream," Barbora Strnadová, a student in the master's programme, described her work in the studio.

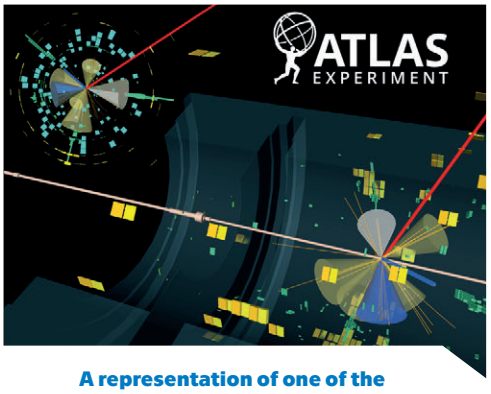
The students covered a wide range of topics from local urban food production to the complete self-sufficiency of metropolises, exploring, for example, ways to make cities light up only when they need to. „We analysed the impact of humans on nature, but also the potential of natural materials. We proposed a series of design solutions to compensate for the overuse of the Earth's resources and created a bio-world where people can live in symbiosis with nature," add another students, Lucie Řeháková and Magdaléna Pourová. Studio assistant Šimon Knettig, a graduate of our faculty, describes the work on the project: „We started intensively and after the first two weeks we hung huge posters with sometimes controversial questions in the faculty atrium." What might future cities whose infrastructure is replaced by biological components look like? And how to reconcile in perfect harmony modern design with flourishing flora and fauna? Answers to the most audacious questions about urban planning and the environment were offered by the Biotopia exhibition, which took place in January 2022 at the Faculty's premises.

In the summer semester, The Why Factory's research focused directly on the Czech Republic. Five schools of architecture, TU Delft, college ARCHIP, the faculties of architecture of the Czech Technical University in Prague, the Brno University of Technology and the Technical University in Liberec, came together to explore the Czech Republic and propose concrete solutions and visions for it.

Ten years since the discovery of the Higgs boson



LHC accelerator magnets. The bundle of charged particles is held inside the accelerator tube by 8,400 magnets, 3,444 of which are superconducting. (Photo: CERN)

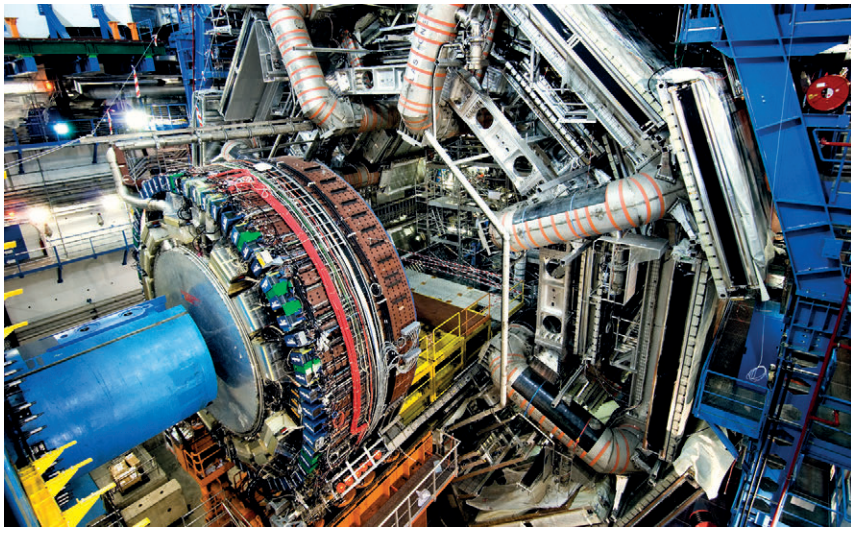


A representation of one of the events that may constitute the manifestation of a Higgs boson created together with two top quarks. The figure shows the particles detected in the ATLAS detector that were produced by the decay of the top quarks and the Higgs boson: the blue line represents the electron, the red the muon, the grey cone the decay products of the tau lepton, the blue cone the hadrons produced in the direction of flight of the b-quark and the four yellow cones another shower of hadrons produced in the direction of flight of the light quarks. The green and yellow squares indicate the energy deposited in the electromagnetic and hadron calorimeter of the ATLAS detector.

One of the greatest achievements of 20th century physics is the so-called Standard Model of elementary particles, which describes what the elementary building blocks are and how they interact with each other. The largest current accelerator, the Large Hadron Collider, which is used to test its predictions, was built at CERN in Switzerland. The largest experiment at this gigantic facility, with a circumference of 27 km, is ATLAS, which registers a huge amount of information every second. Several thousand TB of data are produced annually for further analysis. In the past, the employees of the Institute of Experimental and Applied Physics of the CTU participated in the construction of their own detector (among other things, they secured large contracts for Czech companies) and, after its launch, also in its operation and in the analysis of the measured data.

An example can be the analysis focusing on the properties of the Higgs boson, which according to the Standard Model is responsible for the non-zero mass of massive elementary particles, is the last particle predicted by the model and was first observed in the ATLAS and CMS experiments in 2012. Thus, 2022 marks ten years since its discovery. An article about its properties found in the aforementioned experiments was published in the journal Nature last year.

The IEAP attracts the attention of young staff from abroad, including PhD students who then study at universities in the Czech Republic. One of the examples is Babar Ali, a researcher from Pakistan, who in 2019 successfully defended his dissertation „Search for the Higgs boson in the Standard Model produced associatively with a pair of top quarks in multi-lepton final states $\sqrt{s}$=13 TeV in the ATLAS detector" at Department of Dosimetry and Application of Ionizing Radiation FNSPE CTU (thesis supervisors I. Štekl and A. Sopczak, both from IEAP). B. Ali managed to make a significant contribution to the above-mentioned publication, where the results of our other researchers were also published. His research focused on detected events in which the Higgs boson occurs together with so-called top quarks, the heaviest known elementary particles. They also have a number of other extreme properties, so theorists predict that effects beyond the Standard Model could be observed in processes where they occur. The publication concludes that all the properties of the new particle observed a decade ago at the LHC are remarkably consistent with the predictions of the Standard Model. Nevertheless, other properties remain to be accurately measured. The Higgs boson will continue to be the focus of the IEAP's staff and this may contribute to unexpected surprises in this field.



View of the 25 m high ATLAS detector cylinder during its construction. In the left part of the picture, around the detector axis, you can see the blue cylinder of the neutron shielding, which was designed and manufactured by the IEAP. (Photo: CERN)

We have a world champion!

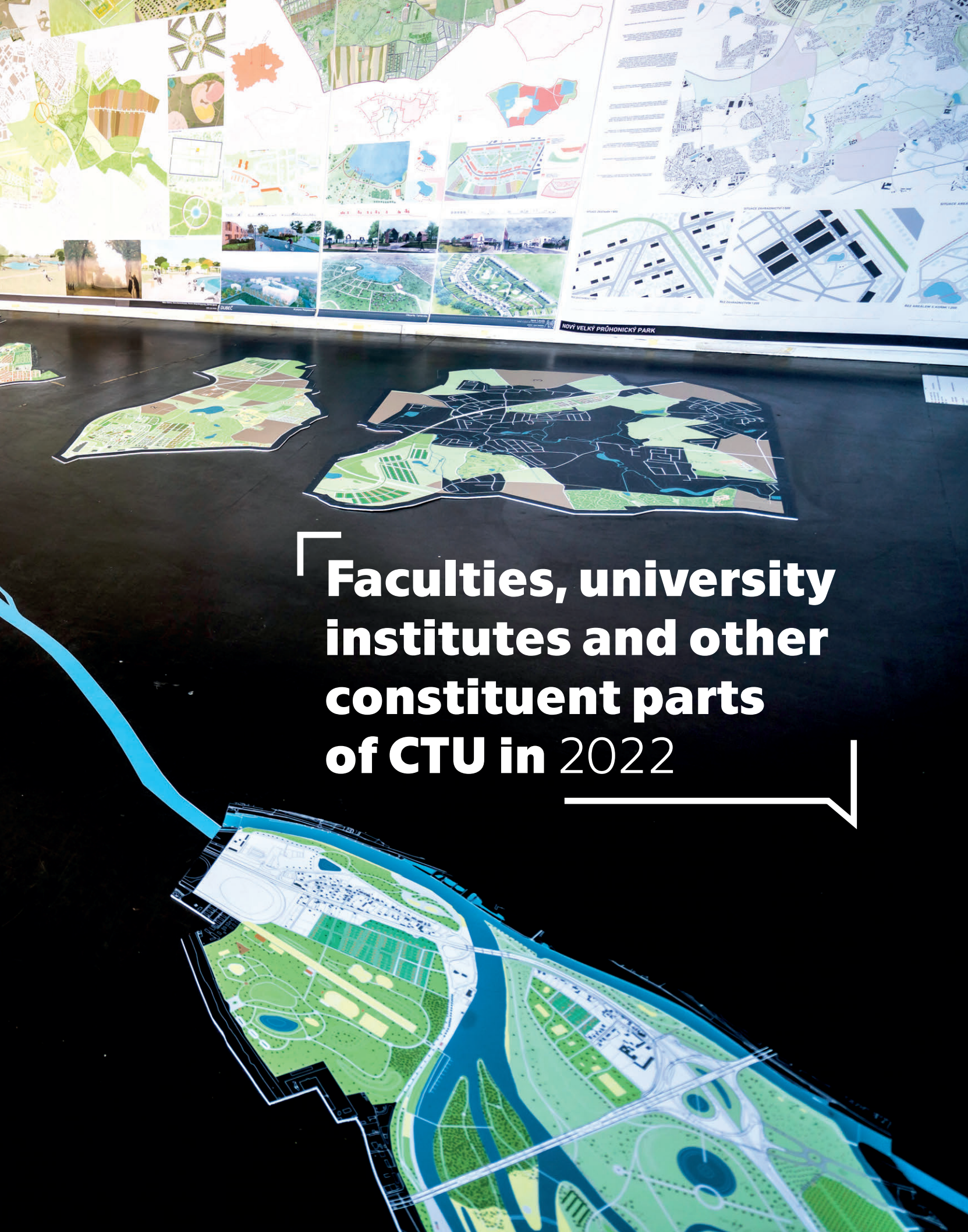
Many prestigious international victories in various student or scientific competitions almost naturally belong to Prague technical university. Students or young scientists win prizes in competitions in artificial intelligence, programming, drones and many other fields. However, it is also famous - albeit only sporadically - for its visible achievements in sport. A clear star in this regard is kayaker Vít Přindiš, a third-year master's student at the Masaryk Institute of Advanced Studies of the Czech Technical University, who became world champion in July 2022. After several European titles in water slalom (including a continental title in extreme slalom), he achieved his first world title (K1 category) last year in Augsburg.

The successful sportsman has been associated with CTU for many years. Prior to his current studies in the master's programme Project Management of Innovation at the MIAS, he spent ten years at the Faculty of Biomedical Engineering. He graduated from the Bachelor of Biomedical Technology programme, then obtained his engineering degree in the Systems Integration of Processes in Healthcare programme. This was followed by a PhD study, which he had to quit after four years. „During my studies, I also started to collect my first sporting successes. It was really challenging at times. It was exhausting to study full time and train 100 percent, but it was worth it. I also embarked on my doctoral studies, but there I was no longer able to give it as much energy and gradually lost touch with the school. I was doing well in sport, but I felt I needed to get my head busy again, refresh and add to my knowledge, and also prepare myself a bit for the transition from professional sport to working life. That's why I decided to study for a master's degree at the Masaryk Institute of Advanced Studies," says the world champion, multiple European champion, Olympic Games participant and Czech national team pillar. He also has another triumph: he was the first Czech kayaker in history to win the overall World Cup (2017).

Ing. Vít Přindiš, five-time CTU Sportsman of the Year, together with the Rector doc. Vojtěch Petráček. (Photo: Jiří Mrhal)

The CTU appreciates excellent sporting results, and therefore great representation. In the competition for the best athlete of the university, Vít Přindiš has already taken first place five times, three times he was silver... In the year 2022 he won before the second Bc. Martina Satková (a water slalom racer who also competes on wild water) and third Antonia Galušková (also a water slalom racer). The fourth place went to a student with achievements in a different sport field than „water", namely athlete Bc. Vít Hlaváč. In the poll organized by the Institute of Physical Education and Sport of the CTU, Vít Přindiš is clearly the most frequently awarded student. And how does he explain the fact that there are so many water slalom racers among university students, either students or graduates of prestigious universities? „Actually I don't even know, it wasn't like that before and I'm really happy about it now. For example, off the top of my head I can't think of many representatives in the under-23 category who have not studied at university," says the slalom racer, who was introduced to „water" at the age of five by his father, who was also a successful representative and Olympian in this sport. Did he enjoy this discipline, which is after all very physically demanding, right from a young age? „I enjoyed it and I am still enjoying it to this day, which is why I stayed with it for so long. It's a constant work with the element, trying to understand it and use it to your advantage at the right moment. I have one advantage that I always highlight. My parents never pushed me into water slalom. They gave my brothers and I a variety of activities to choose from and it was up to us which path we took. I stayed with the water."

Kayaker Vít Přindiš during the winning race at the 2022 World Championships in Augsburg, Germany. (Photo: Ivana Roháčková)



Faculties, university institutes and other constituent parts of CTU in 2022

FACULTY OF CIVIL ENGINEERING

Faculty of Civil Engineering is a school with more than three hundred years of tradition, which, while maintaining the solid foundations of the engineering craft, responds to the trends of modern society. With the successful accreditation of our master's degree programmes in 2022, we have completed a multi-year process of adjusting our studies, and we look forward to seeing whether the number of applicants will grow. Modern teaching methods, adequate research facilities and a stable team of teachers composed of respected experts are the main pillars that enable the training of qualified professionals.

Construction is a creative industry - it combines theory and practice. It requires creative thinking and operational solutions to unique problems. The Faculty is among the European leaders in both basic and applied research. We have well-equipped laboratories in the field of building structures and materials, water engineering, a unique workplace is the underground laboratory Štola Josef, we have our own observatory and interesting architectural studios. We try to use these facilities to educate students, train new scientists and implement research projects.

Our partners are major construction companies that offer students excursions, internships or work experience and support their foreign study stays under the Erasmus programme or bilateral agreements. They value the combination of a solid theoretical foundation, professional knowledge and creative skills in our students and graduates.

I am delighted that the Faculty has become a place of activity for many personalities from many fields. I am convinced that the guarantee of its future development is based on the experience of the older ones, the enthusiasm of the younger ones and the cooperation of academic staff and students.

Prof. Ing. Jiří Máca, CSc.
Dean of the Faculty of Civil Engineering, CTU

Study Programmes

Building Sciences are a specific area of education that cannot function well without the interconnection of teaching and practice, which is why we continue to introduce BIM and VR into teaching. In 2022, the cooperation with Virtuplex was successfully implemented, and students of the Architecture and Civil Engineering programme were able to experience the design method directly in virtual reality. By the end of 2022, eleven master's degree programmes were accredited, in which the admission procedure was also announced directly. The Faculty places great emphasis on the involvement of experts from practice in teaching. Cooperation with professional chambers and partner organisations has been developed, student competitions at local and international level, internships for students, workshops, excursions and lectures by practitioners have been prepared.

Projects

Scientific, research and development activities are one of the key activities of the Faculty. In the long term, excellent results have been achieved in this area, both in basic research and applied research. Research teams are involved in a number of projects of GA CR, TA CR and other grant systems. The Faculty has a long tradition of cooperation with commercial entities in the form of contract and applied research within the projects of TA CR or other providers. Last but not least, it also offers a wide range of services of authorized laboratories and expert services. External collaborations with other universities, institutes of the CAS, departmental institutes, companies and foreign institutions are also important. Funding of scientific research activities is mainly based on domestic grants and projects. The faculty actively supports young scientists, awards grants within the framework of the Initiation Fund for their stabilization at the workplace, establishing international contacts and preparing competitive international projects.

International cooperation

The priority is cooperation with more than a hundred foreign universities and selected prestigious institutions from all over the world, which takes place mainly in the form of study stays of students and academic staff. The Erasmus+ programme is dominant. There are a number of possibilities of trips, the majority of which are in Europe, we also have quality representatives in the "joint degree" and "double degree" programmes. However, we are lagging behind in the number of visiting teachers, partly hampered by the scale and format of teaching (we do not normally have block teaching) and the quality of accommodation; the near-term aim is to encourage and popularise this type of international activity. There is a growing interest and number of international students, especially in doctoral programmes. The aim for the next

period is to convert the Erasmus+ agenda into an EWP (Erasmus without papers), to define the form of a "Welcome Centre" in cooperation with the Rector's Office and to attract more international students and staff.

Awards

Ing. Marek Tyburec, Ph.D., from the Department of Mechanics received a special award from the IT4Innovations jury as part of the prestigious Joseph Fourier Award. The topic of his research is modular-topological optimization in the field of materials engineering. Ing. Martin Vonka, Ph.D., and Mgr. Michal Horáček from the Department of Architectural Engineering, who are working on the topic of factory chimneys as an endangered type of cultural heritage and trying to bring it to the awareness of the general public, were awarded the Patrimonium pro futuro award in the category of Presentation and Popularization for their work. The prize is awarded by the National Heritage Institute.

Important events and happenings

The beginning of the year 2022 was still marked by restrictions related to the pandemic covid-19. Two open days for applicants were organised, the first one in January was held online using a web application and with a live broadcast from the Faculty, the second one in November was organised by contact. On May 21-22, the Faculty joined the Open House Praha project. Regular events included Concrete Week, the Student Scientific and Professional Activities Competition SVOČ, the 20th Summer School of Building Services Engineering, the international architectural competition INSPIRELI AWARDS and others. In May, the Spring Concert was held, which had to be cancelled in December 2021 - violin virtuoso Václav Hudeček and pianist Lukáš Klánský performed. Technical Thursdays were already held by contact in the Faculty Reading Room, but students could also watch them filmed on YouTube and the Faculty's social networks. In the winter semester, internships were held for high school students. The project Builders at Heart continued with a series of other talks featuring interesting projects of academics and achievements of students. The faculty closed the year with a Christmas concert, awards were presented to Faculty personalities, and Aneta Langerová performed.

Third role of the faculty

Within the framework of local development, the Faculty actively cooperates with regional authorities both within the framework of direct cooperation and operational programmes (OP VVV Prague growth pole). Cooperation in the region of Kladno and Buštěhrad through active involvement in UCEEB is also important. The Faculty is also active commercially. It offers the services of an accredited laboratory and tries to commercialise protected intellectual property by selling licenses to patents and utility models. It has set up a programme of cooperation with construction companies in the form of different levels of partnership, which creates space for two-way feedback between the needs of the faculty and practice, leading to improved teaching and graduates' employment in the labour market.

Prof. Ing. Jaroslav Pacovský, CSc., from the Centre for Experimental Geotechnics is the initiator of the creation of a unique European workplace in an abandoned mine. Today, thanks to his efforts, research projects in many fields are being carried out at URC Josef, especially those related to research on materials for the disposal of radioactive waste in a deep repository. The workplace also serves for practical teaching of students not only of the Faculty of Civil Engineering but also of other universities.

Doc. Ing. arch. Lenka Popelová, Ph.D., from the Department of Architecture is engaged in professional and educational publishing and educational activities in the field of history and theory of architecture of the second half of the 20th century and industrial heritage.
She is the co-author of a number of books. In addition to her lecturing activities, she co-organizes exhibitions, interdisciplinary conferences, runs a doctoral study programme in Industrial Heritage and is currently conducting NAKI III research on industrial heritage.
She is a member of ČNK ICOMOS.

FACULTY OF MECHANICAL ENGINEERING

Throughout its history, the Faculty of Mechanical Engineering of CTU has been able to adapt to the development of science, the development of technology and the needs of society, and has often been the initiator of changes that have contributed to the progress of Czech industry. This is a commitment for us and we strive to continue this tradition. The Faculty of Mechanical Engineering is unique in many technical areas. We have testing facilities for aircraft engines and collaborate in their development, as well as in the development of innovative machine tools. We also develop international cooperation and our staff have made significant contributions, for example, to the invention of a device that extracts water from dry desert air.

We provide students with a first-class technical education and prepare them for the challenges of the 21st century. We follow machine development trends and apply current technological trends and knowledge from robotics, automation, additive manufacturing and process control to our teaching. In cooperation with industrial partners, we develop more efficient machines, production technologies and energy sources. The great interest in cooperation used to lead to a preference for applied research, but now we are also trying to focus on fundamental research topics. At the same time, we want to strike a better balance between scientific publications and high added-value results applied in practice, thereby contributing to the competitiveness of our companies in global markets. The Czech Republic is one of the twenty most industrially advanced countries and we strive to ensure that this remains the case.

doc. Ing. Miroslav Španiel, CSc.
Dean of the Faculty
of Mechanical Engineering, CTU

Study Programmes

In February 2022, our Faculty received accreditation for two new bachelor's programmes, Mechanical Engineering and Engineering, which are no longer based only on the distinctive level of examinations from a total of 14 key subjects, but also on the choice of theoretical basis, with the possibility of direct continuation in the follow-up master's studies, which offers a discipline-oriented programme with two basic specialisations - Mechanical Engineering and General Engineering.

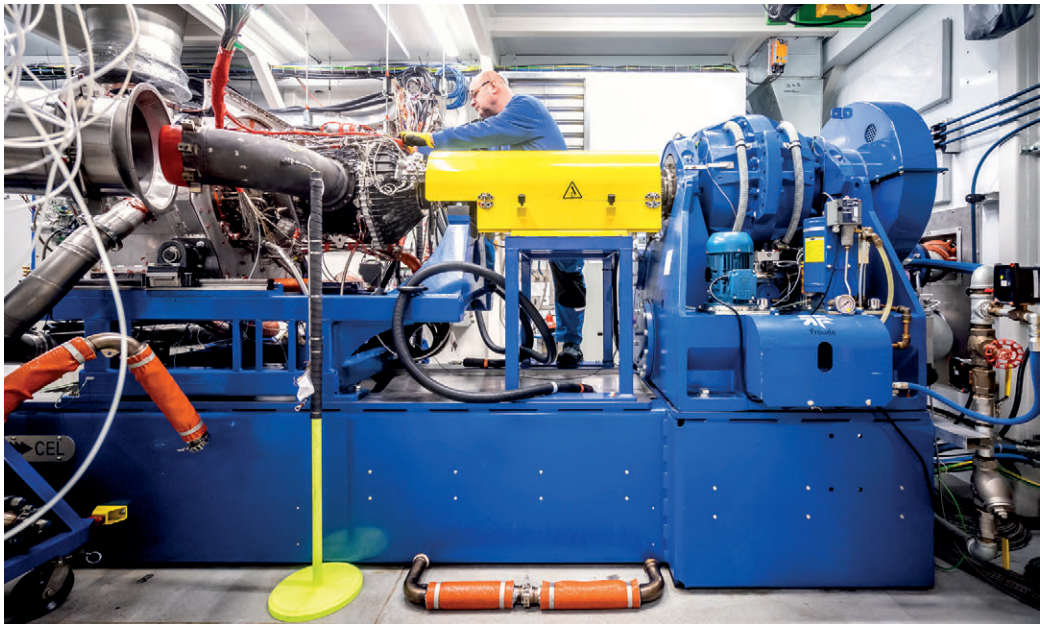
Within the institutional accreditation of CTU, FME was designated as a guarantor for the fields of education 27 - Engineering, Technology and Materials and 7 – Power Engineering. At the beginning of 2022, a new follow-up master's programme in Aeronautics and Astronautics was prepared and accredited.

The application sphere has been involved in the preparation of the Faculty's study programmes, especially in the context of meetings at the Scientific Council of FME CTU. Each of the areas of education, or specialisations, has a representative from the application sphere on the Council. Representatives of industry are invited to participate in the teaching, especially in the follow-up master's studies, and participate in the implementation of selected specialised lectures.

Projects

Within NCK Strojírenství, one of the leading achievements is the development of a unique superstructure environment of the CNC system TOScontrol. The system also includes new results focusing on strategies for using digital twin machines and processes to optimize NC machining. Challenging cases of 5ax machining of blades or compliant parts have also been solved. The leading results of the strategic research project "DMS Mechanical Manufacturing Technology and Precision Engineering" include, for example, the original strategy for optimizing the feed distribution and optimizing the spindle speed in thin-blade machining for the elimination of oscillations and higher productivity, the use of high-pressure cooling for machining difficult-to-machine materials, and the new original strategy for spline interpolation of NC path control.

As part of its involvement in the prestigious EU innovation community EIT Manufacturing, a series of training courses have been developed for industrial partners to introduce them to the trends in the concepts of smart manufacturing, digitalization and flexible automation. Cooperation with a consortium of companies for the construction of a Czech robotic arm for space - within the ESA CZARM project - is also continuing.



Sustainable Aviation Fuel (SAF) testing at CTU test facilities

Testing of a glazed liquid photovoltaic-thermal collector

CNC system TOS control for machine tools from TOS Vansdorf

International cooperation

An example of excellent collaborative research with international reach and excellent results is the cooperation with GE Aviation, the world's largest manufacturer of aircraft engines. The plan of joint research activities is documented by the ongoing concretization of the contract for testing of the synthetic sustainable fuel SAF.
Since 2002, the Centre for Sustainable Mobility Vehicles has been an official partner of Gamma Technologies, the world leader in simulations of vehicle drive units. The results of the cooperation have been reflected in the activities and work for the Formula 1 team. Based on the long-standing cooperation, an office of Gamma Technologies was established in Prague in 2022, which, among other things, will enable the employment of PhD students and postdoctoral students of FME CTU.
The Faculty prepared and implemented the extension of the POSTDOCI project, launched under the CTU Future Fund at all its institutes in 2022. Five positions were co-financed from this fund, the remaining ones are fully covered by the Faculty. In selecting all supported postdoc positions, emphasis was placed on the quality of the mentor and the contribution of the topic to the development of the department internationally.

Awards, other important events and happenings

In the 24th edition of the Werner von Siemens Prize, the third prize went to Ing. Martin Hodek for his diploma thesis "Optimization of a photovoltaic system for household needs". The best dissertation on Smart Infrastructure and Energy was awarded to Ing. Nikola Pokorný with his thesis "Glazed liquid photovoltaic-thermal collector".
The CTU Space Research student team in the Actinspace hackathon created a solution for the challenge "Space debris - The solution includes technical-economic feasibility study" and placed 2nd in the national round.

The European competition EuroTeQaThon 2022 was won in Munich by the team of P. Pučejdl and E. Tasini from FME and D. Lisitski from FNSPE, with the project "A New Life for Waste Heat".
An international success was the S.A.W.E.R. system, which is the result of the scientific research skills of scientists from UCEEB and the Faculty of Mechanical Engineering of CTU. At the World EXPO exhibition in Dubai, it won the award for the best innovation and later also the SDGs 2022 award of the Association of Social Responsibility of the Czech Republic, which promotes the implementation of the UN Sustainable Development Goals.

The third role of the faculty

In the context of the consequences of the war in Ukraine, the Institute of Languages of the Faculty of Mechanical Engineering of the CTU offered professional help to refugees from Ukraine. In agreement with the Rector's Office of the CTU, its teachers organized free courses for them, which were held during the holidays. They taught the students who started studying at our Faculty during the first semester and continue teaching them Czech in the next academic year as well.
The project "Wrapping of forest tree planting material with the new PostCont system" was solved in cooperation of scientists from the Institute of Construction and Machine Parts of FME and Faculty of Forestry and Wood Sciences of CZU. The aim was to develop and build a functional prototype of a device for semi-automated wrapping of the root system of tree seedlings with substrate in a protective container, which saves some manual work and protects seedlings from drying out during storage and planting.

Doc. Ing. Tomáš Matuška, Ph.D., works at UCEEB CTU and at the Institute of Environmental Technology, Faculty of Mechanical Engineering. He is engaged in research of solar thermal technology, heat pumps and systems using renewable energy sources. He led the development of the S.A.W.E.R. technology for extracting water from the air in a desert environment for the Dubai EXPO and is also the originator of international patents related to this technology.

Prof. Ing. Jan Macek, DrSc., FEng., teaches at the Department of Automotive, Combustion Engine and Railway Engineering of FME and works at the FME Centre of Vehicles for Sustainable Mobility. He is the author of hundreds of professional materials and twenty patents. At MSV 2022 in Brno, he received the Gold Medal for creative technical work and achievements in innovation.
His research focuses on energy and environmental aspects of transport.

Prof. Ing. Jan Hošek, Ph.D., worked at the Institute of Thermomechanics of the CAS and in 2002 he joined the Institute of Instrumentation and Control Engineering of FME, where he has been the Head of the Department of Precision Mechanics and Optics since 2005. Since 2007, he has been a Team Leader for CTU in the international OSQAR project at CERN. In addition to his interest in instrument design, he is also interested in the technology of manufacturing small size systems, especially microsystems.

FACULTY OF ELECTRICAL ENGINEERING

Two years on from the significant impact of the coronavirus pandemic, 2022 marked a return to full-time teaching without restrictions. Thanks to this, the activities through which FEE presents itself to the public - popularization events, trips to schools or, on the contrary, class excursions to our laboratories - could be fully resumed. The first participation of our faculty in the SIGNAL Festival became a symbol of the return to normal life. During four October evenings, 24,000 visitors viewed the interactive exhibition Forum Robotum in the premises on Charles Square. The robot showcase has thus become probably the most visited event in the history of the Faculty of Electrical Engineering and a confirmation that the common future of technology and people is a topic that moves society.

The quality of our researchers and teachers is best reflected in the fact that the Faculty of Electrical Engineering has long maintained a high level of student teaching and research, which is also reflected in our international ranking. According to recognised rankings, the FEE has long been the highest ranked electrical engineering faculty in the Czech Republic. And what makes us extremely happy is that for the second year in a row our computer science and cybernetics faculty also holds the highest position in the country.

We continue to work to raise this level in the fiercely competitive environment of contemporary international science, to the benefit of our students, who can get involved in cutting-edge research projects unusually early, often at bachelor's degree level. This is made possible by the fact that we have only eight students per lecturer. In such a ratio, everyone can be treated on a truly individual basis, because the researchers have time to devote to them and develop their skills and talents.

Prof. Mgr. Petr Páta, Ph.D.
Dean of the Faculty of Electrical Engineering, CTU

Study Programmes

In 2022, 3027 students from 36 countries were enrolled for full-time studies, in addition to students coming from abroad for short-term study stays, most of them from France, Spain, Germany (Erasmus+ programme) and also from Taiwan, USA, Mexico and South Korea. Our graduates receive the highest level of education in electrical and computer engineering, electronics, communication technology, automatic control, cybernetics, robotics, computer engineering and power engineering. As a result, they are in demand on the job market and can compete internationally.

Projects

The international team led by the Advanced Materials Group at the Department of Control Engineering has achieved great scientific success. The team took advantage of the unique properties of so-called two-dimensional materials and measured the lowest coefficient of friction to date - one millionth. With such low friction, it would theoretically be possible to move an object weighing 1,000 tonnes with just one hand. The work was published in the prestigious journal Nature Materials in January 2022.

Robotic drones developed by the Multirobotic Systems group from FEE CUT helped conservationists in the restoration of St. Maurice Church in Olomouc. The advantage of these devices is that they can document from different angles places that are not accessible by other conventional means, for example from platforms or scaffolding. In the future, the experts want to design them so that they can be operated also by people without a technical background. A team of experts from FEL CTU developed the drones in the Dronument project, which also involved the Ministry of Culture and the National Heritage Institute.

In 2022, the faculty also announced its involvement in the development of the largest Czech space probe LVICE2. A number of domestic scientific institutions and companies are collaborating on the lunar probe project. An expert team from FEL CTU should develop a magnetometer that would help to investigate, for example, the properties of solar wind plasma. The mission is scheduled to launch in 2027 - if the production of the probe gets the green light during 2023.

A team of experts from the Department of Telecommunication Technology has also successfully developed a new solution for measuring mobile networks. A group consisting of Dr. Zbyněk Kocur, Dr. Ondřej Vondrouš, Ing. Ondřej Votava and Dr. Jiří Hájek worked for four years on the preparation of F-Tester® 4drive-box. The device is already used by the Czech Telecommunications Office and the telecommunications company Cetin. The team also won the Rector's Award for 2021 for its development and application.

International cooperation

Dr. Jakub Mareček from the Centre for Artificial Intelligence at FEE CTU coordinates the international project AutoFair, which aims to design explainable and transparent artificial intelligence algorithms. An eight-member consortium, including scientific capacities from Imperial College London, the Technion Institute of Technology in Israel and the National and Kapodistrian Universities of Athens, is collaborating on the project, which received support of CZK 95 million from the Horizon Europe programme in 2022. The project also envisages the involvement of technology companies.

Dr. Robert Pěnička

Dr. Jakub Mareček

Student racing team eForce Prague Formula

Awards with transnational reach

The student racing team eForce Prague Formula operating at FEL CTU had an exceptionally successful season in 2022. It jumped from 48th to 17th place in the world ranking of 279 university teams and is the ninth best in Europe. The team also presented its unmanned eForce formula in the winter in the Czech Republic's pavilion at the EXPO 2020 world exhibition in Dubai.

The IT SPY 2022 competition evaluating the best diploma theses in computer science in the Czech Republic and Slovakia was won by Ing. Jiří Ulrich, a graduate of the Open Informatics study programme at FEE CTU. He won with his thesis in which he designed and implemented an open and accessible WhyCode system for determining the positions of moving objects.

In 2022, the Faculty also received two JUNIOR STAR grants awarded by the Grant Agency of the Czech Republic to projects that are expected to have a significant impact on science on a global scale. In the coming years, the grant will help Dr. Robert Pěnička from the Department of Cybernetics to research methods for controlling and planning the flight of autonomous drones in unknown environments with obstacles. The radiation of extremely intense electromagnetic pulses, called EMP, which occurs in high energy density plasmas, is being studied by another recipient of this grant, Dr. Jakub Cikhardt from the Department of Physics.

Dr. Jakub Cikhardt

Drone in the church Stará Voda

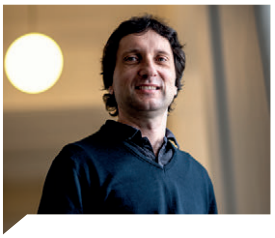
Significant events

The year 2022 will also be associated in the history of FEE with a diversity survey that was conducted among staff and students. The Faculty received feedback from which further steps will be taken. While technology may appear neutral, it is backed by people who bring their experience, knowledge and social factors to it. In collaboration with commercial partners, we have decided to strive to create an environment that is friendly and welcoming to anyone whose starting conditions may not be the same as the majority. In doing so, we believe we will encourage diverse and innovative ideas, attract new talents and motivate existing quality staff.

Personalities of the Year 2022

Dr. Michal Novotný, Dr. Tereza Tykalová and doc. Jan Rusz

The method of automatic video analysis of facial movements developed by a team from the Faculty of Electrical Engineering and neurologists of First Faculty of Medicine of Charles University can detect Parkinson's disease in the early stages of the disease. The method uses twelve biometric indicators describing movements of the forehead, root of the nose, eyebrows, eyes, cheeks, mouth and jaw. On behalf of FEL CTU, doc. Jan Rusz, Dr. Michal Novotný and Dr. Tereza Tykalová from the Department of Circuit Theory collaborated on the project. A paper on the method was published in September 2022 by the prestigious scientific journal Digital Medicine. Rusz's team also received the Rector's Award in 2022 for their earlier high quality publication of a paper in this research area.



FACULTY OF NUCLEAR SCIENCES AND PHYSICAL ENGINEERING

The year 2022 has brought us many opportunities and successes, but also worries, for example, in connection with the attack on Ukraine, and when I took over the Faculty in the role of dean at the beginning of the year, I had no idea what was ahead of us.

Right at the beginning of the year, the second satellite with detectors from our faculty entered the Earth's orbit to monitor so-called space weather and ionizing radiation. The detector will help answer the question of how to protect space infrastructure and human crew from cosmic radiation.

We are also finishing work on the school's second nuclear reactor VR-2, which will be operational in the first half of 2023. This will allow us to expand our scientific scope and teaching capabilities. This is important not only for our students, but also in view of the need to maintain the diversity of electricity sources in the country and to ensure our energy self-sufficiency.

In addition to teaching and research in the field of fission reactors, we are also involved in nuclear fusion. The new PlasmaLab@CTU, which was inaugurated on 17 February 2022 and is part of the global PlasmaLab network, will significantly expand the possibilities of study and scientific investigation of fusion and research opportunities.

We are also active in the field of quantum technologies - we are involved in the European DigiQ project, which brings together 24 universities. In cooperation with other faculties, we have also prepared a new master's degree programme in Quantum Informatics.

In addition to the science and education of our students, we do not neglect our efforts to communicate with high school students. We were pleased, of course, with the growing number of applications, but especially with the increase in the number of students. We will do everything we can to ensure that this interest does not decline.

doc. Ing. Václav Čuba, Ph.D.
Dean of the Faculty of Nuclear Sciences and Physical Engineering, CTU

Study Programmes

The Faculty provides 12 bachelor's and 16 master's programmes. It offers to doctoral students nine programmes in mathematics, physics, chemistry and IT with an overlap into medicine. It has also opened full-time teaching at the undergraduate level for the first time for self-paying students in English.

In cooperation with FIT, FEE and FME, we have prepared a new master's degree programme in Quantum Informatics aimed at the latest trends in computer science. Quantum Communication and Cryptography Labs and a Quantum Computing Lab will also be built to ensure teaching. Teaching will be conducted in both Czech and English.

Projects

In March 2022, the faculty received permission from the State Office for Nuclear Safety to build the VR-2 nuclear reactor. The project of preparation, construction and commissioning of the facility is managed by the Department of Nuclear Reactors. In addition to faculty resources, it also uses cooperation with departments of other faculties of CTU. The cooperation with the Department of Concrete and Masonry Structures from the Faculty of Civil Engineering enabled the determination of the requirements for concrete structures and their technical design. The knowledge of the staff of the Department of Mechanics and the Department of Geotechnics of the Faculty of Civil Engineering was used in the investigation of the subsoil and subsequent analysis.The department provides teaching for its own students, but also for students from universities around the world, or employees of various companies and organizations, both domestic and foreign. For example, regular training of firefighters takes place here. From 2020, thanks to the cooperation with the IAEA, the reactor hall is equipped with the Internet Reactor Laboratory system to offer online teaching. During the pandemic, the system was first tested by FNSPE students and today it is regularly used for teaching foreign students - for example from the USA, Great Britain, Tunisia and other countries.

International cooperation

The Faculty has extensive international cooperation with more than 100 foreign partners in the academic and private sectors. As a result of the Ukrainian crisis, we were forced to terminate our cooperation with the JINR laboratory and other partners from the Russian Federation. On the other hand, we managed to sign an official cooperation between CTU and FAIR infrastructure, where our students and employees can now travel for fully paid short-term internships.

Awards with transnational reach

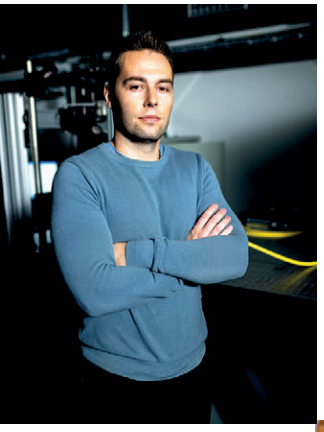
For the use of mathematical modelling in electrocardiology (ECG), Niels van der Meer was awarded the Learned Society Prize for university students. His research demonstrates the combination of several disciplines, namely medicine, mathematics and IT.

On 19 May 2022, two of our graduates won the prestigious Werner von Siemens Dissertation Prize. The first prize went to Petr Hauschwitz for his thesis entitled Large-scale functionalization of surfaces using laser-created micro- and nanostructures. The third place went to Roman Lavička for his work Ultra-peripheral collisions at ALICE experiment.

From the international final of the EuroTeQaThon competition, which took place on 23-25 November at the Technical University of Munich, a team consisting of CTU students - one of them was Danila Lisitskii from our Faculty - brought home the gold medal. Together with Prokop Pučejdl and Edoardo Tasini from the Faculty of Mechanical Engineering, they proposed optimising electricity production in natural gas pressure reduction stations by using an innovative cycle in which waste heat from the cogeneration (CHP) units is used to generate electricity.

Significant events

Among the new professors, who were handed over their appointment decrees by the Minister of Education Vladimír Balaš in the Grand Hall of the Karolinum on 19 December 2022, were also four employees of our Faculty, namely Prof. doc. Ing. Irena Kratochvílová, Ph.D., for the field of Physical and Materials Engineering, Prof. RNDr. Jan Mlynář, Ph.D., for the field of Applied Physics, Prof. Ing. Ivan Richter, Dr., for the field of Applied Physics and Prof. Ing. Hanuš Seiner, Ph.D., DSc., for the field of Physical and Materials Engineering.



Dr. Petr Hauschwitz

Dr. Karel Tesař

Our scientists also took home a number of prizes. Medals of CTU 1st degree were awarded by the Rector of the University to Prof. Igor Jex and doc. Jan Siegl. Prof. Jan John and Prof. Jiří Kunz were awarded silver medals of the FNSPE. The bronze medal of FNSPE was awarded to Prof. Pavel Šťovíček. For all of the awardees, the medals are a thank you for their long-term contribution to the development of science and pedagogy at our Faculty with a significant international overlap. Karel Tesař, a PhD student at the Department of Materials, received the Stanislav Hanzl Award, which he received on the occasion of the International Student Day on 17 November.

The European Commission awarded the first prize in the Nuclear Innovation Prize in the category of reactor system safety to the MultiProtectFuel project led by Martin Ševeček from the Department of Nuclear Reactors. This project focuses on nuclear fuel innovation for currently operating reactors. These are already being tested in commercial reactors and their introduction has been newly included by the European Commission as a condition for the sustainability of nuclear energy within the taxonomy.

The third role of the faculty

Like other institutions, the Faculty has provided support to students affected by the Ukrainian crisis. It supported those who had only obtained the B1 certificate and made their studies possible. It is certainly worth mentioning the Christmas in Jaderka, which was open to everyone, regardless of nationality or religion, an event that shows that the Faculty has not only a scientific but also a human side. It was a joint Christmas Eve organized by David Kramár and active students in the Atrium in Břehová on December 24 at 5 pm.

The Faculty has also been involved in the popularization of science and technology across society for a long time. We participate in the Festival of Science, Science Fair, Colours of Ostrava, we are part of the World of Technology and others. We organise specialised courses for primary and high school pupils, as well as U3A and professional courses in the field of medical applications and radiation protection. Our scientists travel all over the country to give talks.

Personality of the Year 2022

Ing. Monika Kučeráková, Ph.D., is one of the most experienced crystallographers in the Czech Republic. Since 2012 she has been working at the Institute of Physics of the CAS in the Department of Structural Analysis. She has solved hundreds of crystal structures and contributed to the development of Jana2020 program, a world-renowned crystallographic computing system that helps solve complicated structures of substances. Her research is a source of information and inspiration for environmental scientists, geologists and engineers.

FACULTY OF ARCHITECTURE

Faculty of Architecture of the Czech Technical University in Prague is the oldest and most prestigious institution providing education in architecture in the Czech Republic. The year 2022 was a year of changes, successes, but also sadness at the Faculty.

As of 1 February, I replaced Prof. Ing. arch. Ladislav Lábus, Hon. FAIA, who had successfully led the Faculty for two terms. The new management has initiated steps to transform the Faculty, which they committed to in their election programme. We have introduced a permanent Visiting Professor Studio, which aims to bring internationally renowned personalities, current topics and new teaching methods to the Faculty. Dutch architect and urban planner Winy Maas was the first to accept this role. We have opened three new studios under the direction of René Šulc, Jan Jakub Tesař and Tomáš Zmek. We have also started to work towards the establishment of a joint double degree programme in cooperation with the Italian Politecnico di Milano. We were the first at CTU to announce a selection procedure for the position of ombudsperson, whose work will create a space for dialogue and confidential assistance in matters of ethics and culture in the study and working environment.

We have all been affected by the Russian invasion of Ukraine. We have been working hard to help Ukrainian students and their families, and we have announced an emergency admission procedure for Ukrainian students. In March, another sad news came. Alena Šrámková, a leading representative of the Czech architectural scene, emeritus professor FA CTU, left the Czech architectural scene at the age of 92. She connected her teaching career with our Faculty, influenced generations of architects and was the author of our new building.

doc. Ing. arch. Dalibor Hlaváček, Ph.D.
Dean of the Faculty of Architecture, CTU

Study Programmes

With 1500 students, our faculty is the largest school of architecture in the Czech Republic. It is responsible for shaping the future shape of our professions. It places great emphasis on the connection between theoretical and studio teaching. It focuses on the development of interdisciplinary cooperation offered by the potential of three programmes under one roof, the study of architecture and urbanism, landscape architecture and design. In 2021, students completed the first year of the newly opened consecutive three-year master's programme in Architecture, Urbanism and Landscape Architecture, offering a full-fledged education recognised for the practice of the profession in all three authorising disciplines of the Czech Chamber of Architects.

Projects

The team of the Institute of Theory and History of Architecture led by Prof. Petr Vorlík completed a five-year project Architecture of the 1980s in the Czech Republic, which focused on mapping the architecture of the period, its theoretical background, specific projects and recording the current state of buildings from the 1980s. The project produced a total of five publications: 1) (a)type (2019) focuses on selected symptomatic phenomena and buildings at the end of normalisation; 2) unbuilt (2020) describes unrealised, utopian and provocative contemporary visions; 3) interviews (2020) capture the memories of selected actors, 4) improvisation (2021) highlights the emergence of extraordinary architecture through the creative circumvention and bending of period pitfalls, 5) ambition (2022) traces the escape from the projected everydayness of the 1980s.

The series is complemented by the website architecture80.cz, where it is possible to find full versions of the books and individual creators and buildings on an interactive map. The project Architecture of the 1980s in the Czech Republic - Specificity, Identity and Parallel Reflections on the Background of Normalisation was supported by the NAKI II Programme for Applied Research and Development of National and Cultural Identity.

International cooperation

In the field of international cooperation, 2022 was a busy year. The November Talks lecture series with the subtitle Future(s): Time for Change featured guest speakers Professor Winy Maas, French urban planner Alice Cabaret, American-British architect Karen Cook and MIT professor Carlo Ratti. As part of the Athens programme, we ran two workshops on exploring the city using the tools of urban analysis and privately owned urban public space. Ten student teams from five European schools of architecture worked on conceptual visions for the development of Strahov Stadium as part of The Future of Strahov Hill project. The Public Drawing Workshop, led by Japanese architect Momoyo Kaijima (Bow-Wow studio), explored how people's behaviour changes across the centuries in public spaces, with the collaboration of the Institute of Urbanism of the FA CTU and ETH Zurich.

Awards

Tomáš Efler's team (Tomáš Efler, Václav Girsa, Miloslav Hanzl, Jana Strnadová and Jaroslav Svěrek) won the Grand Prix of Architects in the Reconstruction category for the restoration of the gloriette at the Děčín castle and also won the Patrimonium pro futuro competition. Tomáš Efler deals with the restoration of historical buildings and he also guides his students to a sensitive approach to heritage.

A total of five of our graduates won awards in the 23rd year of the Diplomas competi-

Hearts made from clips in support of Ukraine

UDesign workshop for Ukrainian children

tion announced by the Czech Chamber of Architects. The second place went to Anna Laubová for her work Densification of the development behind the Church of St. Nicholas, Velké Meziříčí (head of the work Zdeněk Rothbauer), the third place went to David Foud for the project of the headquarters of the Institute of the Memory of the Nation ÚBOČ. 34 (head of the work Tomáš Hradečný), special prizes went to Jakub Kuchař, Kristýna Mastná and Klára Pavelková.

Two design graduates from the Fišer-Nezpěváková studio were successful in international competitions, Michal Zmek awarded in the Graduation Projects showcase and Anna Zatloukalová nominated for the Green Concept Award. The Jaroš-Bednář studio's exposition at the Designblok international competition show was a success, winning the award for the best school presentation.

All awards went to our students in the Central Group competition on the theme of the new building of the Vltava Philharmonic: the winner Matěj Štěpánek, second place Matouš Pluhař, Martin Holman, Ondřej Pecháček and Jonáš Staníček and third place Max Fleischmann and Ondřej Fiedler.

Faculty design-build projects were successful. The prize of the Foundation for the Development of Architecture and Civil Engineering in the Building of the Year 2022 Award was awarded to the project Three high seeds by the Hlaváček-Čeněk studio. A set of footbridges and shelters (a collaboration between the Institute of Design II and the KRNAP Management) was awarded the Krkonoše Architecture Award as a Public Investor's Achievement.

Significant events

Immediately after the outbreak of the war in Ukraine, the Faculty became involved in aid. Design students organized a benefit sale and auction of artworks. Ievgenia Gubkina, an architectural historian from Kharkiv, came to give a lecture on the situation in Ukraine in terms of heritage conservation, and Alex Bykov, a Kiev architect, photographer and curator, gave three lectures in support of Ukrainian artists and scientists. Throughout the summer, workshops organised by UDesign were also held in the Faculty building to help Ukrainian children integrate into their new environment through creative activities.

Public Drawing Workshop

Personalities of the Year 2022

New professors Miroslav Cikán, Martin Pospíšil and professor Hana Seho are the personalities of the year.

Prof. Ing. arch. Hana Seho

Prof. Ing. arch. Miroslav Cikán

Prof. Dr. Ing. Martin Pospíšil, Ph.D.

MgA. Jitka Aslan, designer, doctoral student at the Institute of Design and this year's winner of the Stanislav Hanzl Award. She was awarded the prize for her active participation in the running of the institute and faculty-wide activities, organization of workshops and lecture series, grant and publication activities.

FACULTY OF TRANSPORTATION SCIENCES

The year 2022 was marked by the military conflict in Ukraine, which subsequently triggered a sharp increase in energy prices and significant inflation. The unprecedented aggression of the Russian Federation has thus affected everyone's lives and, in the context of the aftermath of two years of living with covid-19, one would expect society to be unable to cope with further dramatic events. The opposite has been true and I am proud of how we have dealt with the situation. The entire CTU, individual faculties, as well as the staff and students themselves, were actively involved in helping our Ukrainian friends. The naturalness with which the involvement of Ukrainian students and academics in our faculty environment was carried out, together with the assistance implemented, filled me with hope for a better future for all of us. Despite the difficult economic situation in which the Faculty found itself in in 2022, we prioritized the quality of our results over quantity and focused on working with doctoral students who are the scientific future of the Faculty, including, for example, in the form of new direct support through the Industrial Scholarship. We have worked intensively to expand our master's Smart Cities dual degree programme with additional disciplines as well as with doctoral studies. However, I still consider the perception of students and employees as the most valuable part of the Faculty to be absolutely essential. I want to continue to focus on their personal growth and creating a welcoming faculty environment. This is the beginning of a long journey together towards further qualitative shift, which we will only be able to achieve by working together, whether you are a student, employee or partner outside of CTU. I look forward to this collaboration.

Prof. Ing. Ondřej Přibyl, Ph.D.,
Dean of the Faculty
of Transportation Sciences, CTU

Study Programmes

In 2022, the Faculty of Transportation Sciences successfully obtained accredi-tation for new specialisations of the study programme. Thanks to them, the professional block of bachelor's studies was completed, where students choose a specialisation within one programme. At the same time, a study programme related to aircraft maintenance was accredited. At the moment, the faculty offers four bachelor programmes for study, of which one is later divided into four professional specialisations, focusing on transport and intelligent systems, logistics and air transport. This model is followed by a master's study. Thanks to the new institutional accreditation, the Faculty, as the guarantor of the Transportation education area, is therefore ready to offer quality education and the possibility of cooperation between the individual units of CTU.

Projects

The prestigious project GA ČR JUNIOR STAR was launched by Ing. Tomáš Fíla, Ph.D., and the operation of fast X-ray imaging in the dynamic laboratory was launched. Also, a group of projects from the OP RDE calls aimed at developing infrastructure to support study programmes and excellent research were completed. The modernisation of the research infrastructure has considerably increased the possibilities of obtaining prestigious grants, addressing advanced research topics and increased the attractiveness of the workplace in the eyes of researchers from abroad, thus improving the level of internationalisation. In the field of aviation, in cooperation with the Air Traffic Control of the Czech Republic, the concept of integration of unmanned systems into the airspace of the Czech Republic (FUTURE) is being solved within TA ČR, with a positive impact on society thanks to ensuring their safe and organised operation

International cooperation

One of the first steps of the new dean, Professor Ondřej Přibyl, was the signing of an exclusive cooperation agreement with the leading European university Technische Universitat Berlin, DAI-Laboratory in the field of smart and autonomous mobility. Within the framework of the international scientific symposium SCSP 2022, a memorandum of cooperation was also signed with another major European university - Technische Universität Dresden, specifically with Fakultät Verkehrswissenschaften "Friedrich List". The dean of the Faculty together with the Minister for Science, Research and Innovation Mgr. Helena Langšádlová and representatives of the Czech Embassy visited the MobilEye workplace in Israel. The Prague Innovation Centre for Advanced Technologies and Research signed a Memorandum of Understanding with MobilEye in Jerusalem. Its aim is to cooperate on the development of an autonomous bus and its integration into the city's traffic management.

Awards

In the prestigious competition Czech Transport Construction, Technology and Innovation, our students won a number of prizes. Namely, Aneta Matysková for her work "Concept of parking study in the Vrchlabí city" and Matěj Šilhán for his work "Study of the bypass of the Frýdlant city". Professor Jaroslav Vlček Prize was awarded to the students Ing. Petr Had, Ing. Jan Vébr, Ing. Kateřina Pithartová and Ing. Dominik Ptáček. However, the Faculty of Transportation Sciences can also boast elite athletes; in the poll for the best CTU athlete, Antonia Galušková, Markéta Jirmanová and Kristián Fišl were in the top twenty. The Czech team at the opening ceremony of the World University Winter Games in Lake Placid was led by downhill skier Bc. Tomáš Klinský.

Significant events and happenings

Traditionally, the most important event of the Faculty is the international Smart Cities Symposium Prague. After two years of the online version, it was again organized in a contact form in the premises of the Minorite Monastery, with participants from eleven countries. The contrast of the historical premises with the modern scientific approach to the solution of sustainable mobility and other topics related to transport, telematics and logistics gave the whole event a unique hallmark. The symposium was traditionally held under the auspices of the Mayor of Prague Zdeněk Hřib and the Minister of Industry and Trade Jozef Síkela. This year's event focused on the habits and behaviour of people not only in the use but also in the choice of transport. Once again, posts dealing with changes in the context of the global pandemic covid-19 were included, but a significant part of them were those focused on the development and ap-

plication of new tools and methods for creating sustainable transport infrastructure and quality of life in cities.

The third role of the faculty

The incoming dean, Prof. Ondřej Přibyl, established a new advisory body - the Industrial Council, which consists of more than 20 prominent personalities from the field of transport. Its purpose is to ensure the preparation of our graduates in accordance with the current needs of the labour market, but also to deepen cooperation with our partners in the field of transport, logistics and telematics. Furthermore, it has created a new targeted support for students of doctoral study programmes in the form of the Industrial Scholarship, where a commercial partner can assign a topic for a dissertation and subsequently provide targeted support to a student selected by the partner during its preparation.

Personalities of the Year 2022

Doc. Ing. Bc. Vladimír Socha, Ph.D.

He founded and leads the Laboratory of Human Factor and Automation in Aviation, where his main scientific research activities take place. He has successfully participated and is participating in several projects, especially TA CR. All of them have been implemented as applied research of the university in cooperation with aviation organizations such as airports or flight training providers. He is the author of almost a hundred scientific publications, supervisor of several doctoral students, he organizes the international scientific conference New Trends in Civil Aviation and cooperates with several domestic and foreign universities, especially in the field of human-machine interface in aviation.

Ing. Kateřina Pithartová, MSc.

She is a first-year graduate of the dual degree programme in Smart Cities, which the Faculty offers in collaboration with the University of Texas at El Paso. Her thesis focused on the border crossing between El Paso (USA) and Ciudad Juarez (Mexico). Based on the results of her thesis, she was offered a fellowship at UTEP, where she is currently continuing her research as part of her doctoral studies.

FACULTY OF BIOMEDICAL ENGINEERING

The year 2022 was a successful year for FBME CTU. Interest in the Faculty continues to grow and the number of applicants exceeds our possibilities.
It is very gratifying that thanks to the students, publications in prestigious journals were also created. An example is the significant success achieved by a graduate of the bachelor's programme Biomedical Technology and a student of the follow-up master's programme Biomedical Engineering Bc. Jakub Kollár, who, with co-authors from the Bio-Electromagnetism team, published the results of his bachelor thesis as the first author in the prestigious journal Cancers. In his paper, he discussed the development of an innovative navigation system for RF liver ablation based on UWB radar. Jakub also subsequently received the Prize of the Minister of Education, Youth and Sports.
FBME was also represented during the announcement of the winners of the 3rd national Transfera Technology Day event with an innovative technology for respiratory therapy. In a competition of eleven finalists, out of a total of twenty-eight submitted projects, the team, represented by MUDr. Markéta Janatová and Ing. Radim Kliment, Ph.D., placed 5th. The participation of the CTU team was fully supported by Monika Dobiášová, PhD, and her team from the CTU InQbay incubator. In 2022, for the first time ever, successful alumni were awarded with the Alumni Awards.
Collaboration with all partners across all disciplines also continued. The Faculty is represented in many important projects. We must not forget the recruitment to the bone marrow donor registry, which took place on 10 March 2022 in Kladno with a result of 261 new donors, making it the most successful event of this kind in our history. At the same time, our students regularly donate blood at the Kladno hospital.

Prof. MUDr. Jozef Rosina, Ph.D., MBA
Dean of the Faculty of Biomedical Engineering, CTU

Study Programmes

In 2022, the Faculty received an extension of accreditation for the follow-up master's degree programme in Civil Emergency Planning and for the doctoral degree programme in Civil Emergency Preparedness from the National Accreditation Bureau. It has also submitted an application for extension of the current accreditation to include teaching in a foreign language, i.e. English, for the doctoral programme in Assistive Technology.

Projects

In 2022, the faculty tackled 118 inter-disciplinary projects, 22 of which were newly acquired. Among the important ones with international overlap is the MEYS EXCELES programme, which under the leadership of Mgr. Radim Krupička, Ph.D., and under the auspices of the St. Anne's University Hospital in Brno, eleven institutions from all over the Czech Republic, including our Faculty, are cooperating with the aim of introducing methods for the analysis of kinesiological and neurophysiological data. There is also a project of TA CR from the TREND programme called Smart Mobility for children with disabilities under the leadership of doc. Ing. Patrik Kutílek, MSc., Ph.D., and two projects of the Ministry of the Interior of the Czech Republic (IMPAKT 1) - Monitoring the location of members of the IRS forces even during intervention in large buildings using AI elements, where the Faculty is a co-researcher, and Modular multisensory professional clothing to manage risk, to protect the health and safety of IRS members using AI methods under the leadership of doc. Ing. Pavel Smrčka, Ph.D., and Ing. Jan Mužík, Ph.D.

International cooperation

On 14-17 September 2022, the 18th STAFF/MALT SYMPOSIUM, an international meeting focused on myocardial ischemia and related imaging technologies and ECG, was held for the first time in the Czech Republic. The organizer was Mgr. Ksenia Sedova, Ph.D., who has been regularly representing the faculty at these meetings since 2016. A total of 46 participants from 14 countries attended the symposium.
As part of a two-year project, the Faculty, with the support of the Czech Development Agency and under the leadership of Prof. Ing. Karel Roubík, Ph.D., has completed the introduction of the field of biomedical engineering at universities in Cambodia, initiated by the Ministry of Health there. This included the creation of laboratory tasks at the Cambodian University of Health Science, which was given laboratory equipment, instruments and study literature, and students were also trained, including printing on a 3D printer. Subsequently, a visit of future Cambodian teachers to the Czech Republic took place, who visited not only the laboratories at the Faculty, but also medical technology departments, especially in hospitals and polyclinics in the Czech Republic.

Awards

On 25 May 2022, the Subcommittee of the Economic Committee for Aviation and Space Programme of the Chamber of Deputies of the Parliament of the Czech Republic awarded doc. MUDr. Miloš Sokol, Ph.D., MBA, LLM, for his lifetime work as an aviation physician and for his activity in solving aviation accidents. Doc. Sokol is the foremost expert of the Army of the Czech Republic in the field of forensic medicine and a recognized expert in forensic and aviation medicine for aviation accident investigation. Doc. Ing. Lenka Lhotská, CSc., received in Singapore, at the IUPESM World Congress, the honorary award "Fellowship" for her outstanding contribution to the international development of the field. The Czech Literary Fund Foundation and the Talent Foundation of Josef, Marie and Zdeňka Hlávkas awarded Prof. Mudr. Ivan Dylevský, DrSc., for his publication Clinical Kinesiology and Pathokinesiology, Vol. I and II, with the Josef Hlávka Award for original book work in the field of scientific and professional literature published in the Czech Republic. The award ceremony took place on 29 August 2022 at the castle in Lužany. Bc. Ksenia Kulakova won the second place in the final of the SHE

Award competition, held in Brno on 24 November 2022, for the best bachelor's thesis of female graduates of technical disciplines. This nominated her for the WE Local conference in Barcelona, where she presented her current research topic to an audience of academics and industry representatives.

Other important events and happenings

Doc. David Vrba and his team from the Bio-electromagnetism research team collaborated with doctors from the General University Hospital in Prague and the 3rd Medical Faculty of Charles University to verify the accuracy of transcranial magnetic stimulation targeting in patients suffering from orofacial pain. The results of this collaboration are published in the prestigious journal IEEE Transactions on Neural Systems and Rehabilitation Engineering. Doc. Fišer and his team developed a new UWB antenna for microwave imaging in collaboration with FEE CTU. The design, optimization, implementation and testing of the antenna were published in the prestigious impact journal IEEE Transaction on Antennas and Propagation.

The third role of the faculty

The students and staff of the faculty once again proved that they can be very reliable and empathetic partners in many activities. Student Tereza Kuklová trained the Družec Volunteer Fire Brigade Unit in first aid in emergencies. Together with another student, Zlata Svatošová, they visited the Kindergarten Kladno to explain to the children in an engaging way what first aid is. The Czech HTA group presented their work at the 2nd Summit of the Healthcare Journal on the Economics of healthcare. In September, we welcomed staff from ČSZT-SÚKL to the Faculty for a professional excursion to the Faculty's laboratories, and in May, pupils from Kladno 6 Primary School also visited the laboratories. At the request of the Prague school Gymnasium Arabská, students of the Faculty of Medical Rescue and Civil Emergency Planning programmes trained pupils from 1st to 3rd grades in first aid. In April, the future paramedics donated blood together at the Kladno Regional Hospital.

Personalities of the Year 2022

Over its 17-year history, the Faculty has had a number of exceptional alumni who have achieved significant success in their professional lives, engaged as volunteers, or positively impacted public life. This was one of the reasons for the announcement of the CTU FBME Alumni Awards. From very high quality nominations, the committee selected the first ever awarded alumni, namely Ing. Markéta Icha Kubánková, Ph.D., and Jan Rieger, M.Sc. The awards were presented on October 20, 2022 at the Bethlehem Chapel on the occasion of the graduation ceremony.
At the meeting of the Scientific Council of the CTU on 22 November 2022 in the Bethlehem Chapel, Prof. MUDr. Blanka Průnová, DrSc., and Prof. MUDr. Pavel Kučera, Ph.D., were appointed emeritus professors at the proposal of the Scientific Council of the Faculty.

Ing. Markéta Icha Kubánková, Ph.D., and Jan Rieger, M.Sc.

FACULTY OF INFORMATION TECHNOLOGY

Year 2022 was a successful year for us in all areas. I am very pleased that FIT was the most requested faculty of CTU for the second year already, and that interest in studying here has increased significantly again. Almost a quarter of all applicants to study at CTU are applying to FIT, which makes us sincerely happy, and at the same time we are aware of our responsibility for the quality of teaching. That is why we continuously update it according to the latest trends and requirements and monitor its evaluation by our students, so that we continue to be synonymous with excellence in IT education and science. The interest of applicants is confirmed by the award "Most visited faculty on the portal VysokeSkoly.cz" in the category of Technology and Informatics for the year 2021/2022.

Last year we also opened additional laboratories and supported the establishment of a new research group. These development activities contribute to teaching and scientific research, enable the link between theory and practice, and open up new opportunities for projects and interdisciplinary cooperation.

We greatly appreciate all the successes at home and abroad. I would mention, for example, the two victories won by our AI experts in competitions held in the framework of the prestigious international conference NeurIPS 2022 in New Orleans.

Studying at FIT is not just about programming or software, but about the broad interdisciplinary skills that are essential today. We cover all areas of computer science and offer a flexible and individual teaching approach, with opportunities to collaborate on real-world projects that connect computer science to a wide range of application areas. In the coming year, we will continue to develop the Faculty at all levels to continue to produce excellent IT professionals who will be able to succeed in practice or cutting-edge science.

doc. RNDr. Ing. Marcel Jiřina, Ph.D.
Dean of the Faculty
of Information Technology, CTU

Study Programmes

FIT offers bachelor, master and doctoral studies in the Informatics programme. Students can choose from ten bachelor's and nine master's specializations. The education offered covers all areas of computer science from information security, management informatics, computer graphics to artificial intelligence. In addition, FIT offers a double degree programme in cooperation with the University of Antwerp. Doctoral students can also complete a doctorate realized in cooperation with the company (the so-called Industrial PhD). The Faculty constantly emphasizes quality teaching, which is regularly updated according to the latest trends and ensures the link between theory and practice.

Projects

Scientific and research activities are among the key priorities of FIT. We have long-term cooperation with companies (e.g. ŠKODA Auto, Profinit or Deloitte) and foreign universities (e.g. University of Southern California or Ben Gurion University in Israel). Important international projects in which the Faculty participates include the European Commission-funded ELIXIR project on data planning and management. Faculty scientists are also investigating exoplanets in collaboration with the Astronomical Institute of CAS. Another important project is the collaboration with Meteopress, where research is being conducted on the use of neural networks for weather forecasting. Research on methods of protection against cyber threats is focused on the project Analysis of encrypted traffic using network flows. In 2022, researchers successfully completed projects on research on programming languages Evolving Language Ecosystems (ELE) and Big Code. Research projects are also conducted as part of the student programme Research Summer at FIT. The results of these projects are often presented at conferences and used in practice.

International cooperation

The Faculty has a long-term goal to focus on science and research and to link its knowledge and experience with major foreign universities and research organizations. FIT collaborates with the Netherlands in an international infrastructure for life sciences data called ELIXIR. The output is the Data Stewardship Wizard tool, which is also recommended by the European Commission. Other collaborations are with the Austrian institute RICAM in the project Pa-radoxically Moving Graph Realisations and with the Austrian Vienna University of Technology in the projects Structural Approach for Diversity of Stable Solutions and Streamlining the Application of FAIR Principles in Research Data Management. Joint projects are also underway with the University of Antwerp. In addition to research activities, the Faculty cooperates with foreign universities in the framework of student mobility.

Awards with transnational reach

The prestigious international conference on artificial intelligence NeurIPS 2022 was won by Mgr. Petr Šimánek who won the competition for the most accurate weather forecast and Ing. Ondřej Podsztavek for the best exoplanet atmosphere modelling.

Student Bc. Roman Bushuiev received the Via Chimica Prize for 2022 for his bachelor thesis Prediction of terpene biosynthesis using machine learning, which he worked on in collaboration with the Institute of Organic Chemistry and Biochemistry of the CAS.

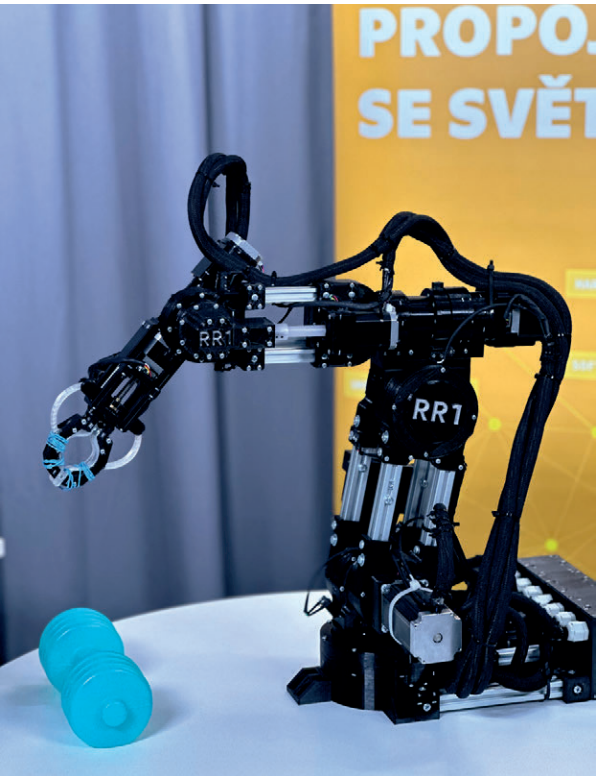
Student Ondřej Cach became world champion in Excel in the MOS World Championship. Out of one million students who entered, he reached the finals and became a two-time Microsoft Office World Champion.

Significant events

FIT has opened a new Laboratory of Robotic Agents under the leadership of Prof. Pavel Surynek. An unusual event was the AI jazz concert, which musicians

Bc. Roman Bushuiev received the Via Chimica 2022 Award for his bachelor thesis

Winning the competition for the most accurate weather forecast at the international conference NeurIPS 2022



Real Robot One (RR1) 6+1 axis robotic arm from Robotic Agent Lab

played according to the notes generated by artificial intelligence. The Faculty organized or co-organized several important conferences - international symposia DDECS and CPM, international research meeting PESW and conference Technology in Society. FIT also hosted lectures by world experts in cryptography Joan Daemen and Lejla Batina. Highlights included the FIT and FA team's participation in the finals of the multinational EuroTeQaThon competition. Also worth mentioning is the signing of the Memorandum of Cooperation in the Demand and Supply Ukraine 2022 project.

The third role of the faculty

The Faculty contributes to the dissemination of scientific knowledge among laymen and experts and participates in social events through its projects. In 2022, the Faculty continued to publish the "Ones and Zeros" podcast with the aim of bringing the latest information technologies to the general public. FIT also had its programme at the Researcher's Night or ScienceFest. Prof. Surynek made it to the finals in the Český Vševěd competition for the best science popularizer. The results of student research are often used in practice, for example, monitoring vegetation in high voltage areas with drones, insulin administration with pens made from 3D printing, a training aid for volleyball or a device to make drones visible in flight. Within CTU, FIT participates in the prg.ai initiative, which supports cutting-edge science and research in the field of artificial intelligence.

Personalities of the Year 2022

Prof. RNDr. Pavel Surynek, Ph.D., is an expert in artificial intelligence in robotics and head of the Robotic Agent Laboratory (RoboAgeLab). He invents new algorithms for warehouse automation, focuses on heuristic search, evidence, multi-agent systems and robotics problem solving. Together with international universities, he conducts research on scheduling that coordinates the collaboration of many robotic agents. In 2022, he made it to the finals of the Český Vševěd 2022 competition, where he presented his scientific work in a popularizing way. Computerworld magazine selected him as the TOP IT personality for 2022.

Doc. Ing. Robert Pergl, Ph.D., is an expert in conceptual modelling and its application in software engineering. He deals with FAIR data and projects in this area. He is the founder and head of the Centre for Conceptual Modeling and Implementation (CCMi) at the Department of Software Engineering at FIT, which focuses on research, development and application of methods and tools for ontology engineering, business engineering, software engineering and data management. Doc. Pergl is the CTU representative on the ELIXIR National Infrastructure Node Committee, where he coordinates the development and application of the Data Stewardship Wizard data planning tool and the OpenPonk conceptual modeling platform.

MASARYK INSTITUTE OF ADVANCED STUDIES

We entered the year 2022 with the hope that we would finally have a period of ordinary academic joys and worries, and on top of that, the 30th anniversary of the founding of the Masaryk Institute of Advanced Studies. The age of three decades is already worth remembering and celebrating, the adolescence of uncertainty and searching is becoming a thing of the past, and a creative and fruitful phase arrived. It would be a shame not to take advantage of this optimal time, and so of course, in addition to the celebrations, we prepared a series of events to demonstrate the inventiveness and creative environment. In an international setting, we implemented the first edition of the International Project Workshop course in cooperation with the University of Lille, and we also organised the Partner Companies Fair. The cooperation with practice was best documented by the Hyundai Day event at the CTU, where the Institute provided workshops on automotive issues with a focus on electromobility.
In early 2022, we expected life to return to normal as the pandemic subsided. Unfortunately, this was not the case. In late February, Russia invaded Ukraine and the world changed. For the Masaryk Institute of Advanced Studies, this meant the need to engage in effective refugee assistance, especially among university students, where we were involved in teaching Czech language as part of the CTU activities. At the same time, two colleagues prepared, organized and taught Czech language courses free of charge in the dormitories where mainly mothers with small children were accommodated. And perhaps this small episode showed that the world, the CTU and the Masaryk Institute of Advanced Studies maintain basic human values even in difficult times.

Prof. PhDr. Vladimíra Dvořáková, CSc.
Director of the Masaryk Institute
of Advanced Studies, CTU

Study Programmes

The granting of accreditation for the Teaching of Practical Education and Vocational Training programme in 2021 has become an encouragement and impulse for further development of the "teaching". We have prepared and started to implement a project within the framework of the National Renewal Plan, which creates the prerequisites for deepening the teaching of pedagogy at CTU within the individual faculties (teaching of mathematics, physics, chemistry, informatics, civil engineering, mechanical and electrical engineering subjects), where the MIAS, under the expert leadership of doc. Ing. David Vaněček, Ph.D., would provide the pedagogical, psychological and didactic part of teaching. This means further strengthening of synergy within the capacities of CTU and also an effort to fulfil the social role of universities. The significant shortage and age structure of teachers in these subjects reduce the quality of their teaching in secondary schools and thus the quality of the staff in technical and natural science fields or entering students at universities. In the fall of 2022, the MIAS submitted an application to the National Accreditation Office to extend the accreditation of the existing economics programs, the bachelor programme Economics and Management and the follow-up master programme Innovation Project Management. We have conceived the preparation of the re-accreditation as an opportunity to strengthen the modern character of the programme capable of responding to current economic and social challenges, including greater involvement of practitioners in teaching, deepening cooperation with companies and professional associations, and the inclusion of professional practice in the curriculum of the study programme.

Internationalisation

High-quality language training, an integral part of education in our country, is undeniably very important in today's globalised world, but social competences that strengthen the ability to move in an international environment cannot be neglected. This requires both knowledge and practical experience, which is best acquired at a young age. Students acquire this knowledge already at undergraduate level, where courses are offered that take into account psychological and social issues when working in international teams as well as cultural practices when dealing with foreign partners. Practical experience in English is then gained by meeting international students from ERASMUS or the EuroTeQ consortium of six technical universities, or directly through a semester stay abroad or participation in other programmes (e.g. Athens). In 2022, we prepared one more specific experience for the students - the International Project Workshop, a course prepared in collaboration with the University of Lille, with the participation of companies with the international presence - Cofidis, Linet, Decathlon, L'Oréal, Komerční banka or HoppyGo, which prepared tasks for the students to solve. The semester course started with a week in Prague, where student teams were formed, companies were presented, which at the same time enabled a tour and also management lectures were held. This was followed by a period of online communication within the team and with the support of the tutors from among teachers. Finally, the students presented their results to the international expert jury in Lille. Certainly an experience not to be forgotten, but also an important item on a professional CV, especially if the student is interested in working in the management of international companies in the future. And of course internationalization also includes an international environment among teachers, where we are trying to increase the number of foreign teachers (not only from Slovakia).

Projects

The increase of projects, especially in the field of applied research, was one of the basic strategies of the Masaryk Institute of Advanced Studies in 2022. We focused on the preparation of those within the Technology Agency of the Czech Republic. A total of five proposals were submitted, which will be evaluated in 2023, both in the field of economics and teaching. At the same time, in the field of didactics, we were involved in the preparation of an Erasmus+ project with four other foreign participants. During the year, we addressed the project Evaluation of the piloting of a middle management support article in education, involving

the issue of management in educational innovation, which appropriately links the pedagogical and research activities of the MIAS in both management and teaching. We also participated in another international project, funded by Norway Grants, which emphasises the important issue of innovation and the introduction of new technologies (especially digi-talisation). Technological and economic transformations must also be perceived in terms of ethical and social dimensions, only in this way can science, research and development bring positive impulses for the development of society. And for the first time in the Institute's history, a "postdoc" came to the Institute, who quickly became involved in didactic research and also significantly in EuroTeQ activities with an emphasis on improving the quality and didactic level of higher education.

Awards and other significant activities

Many of the events mentioned here commemorated the 30th anniversary of the founding of the Masaryk Institute of Advanced Studies. In April, this anniversary was given a social dimension by a festive evening where some reminiscing was done, but above all, living in the present and looking to the future. Important personalities who were associated with our Institute were remembered and appreciated, especially the former director, Prof. Ing. Vladimír Kučera, DrSc., dr. h. c., who worked at the Institute in 2007-2015, and the Rector, doc. RNDr. Vojtěch Petráček, CSc., presented the Medal of the CTU for lifetime work at the MIAS to doc. PhDr. Dana Dobrovská, CSc. The individual points of the programme were connected by musical inserts and exceptional students appeared on the stage. The floorball team, which represents MIAS very successfully, appeared in new jerseys, other successful athletes also presented themselves. World champion Vít Přindiš invited his long-time friend Daniel Stach, known mainly from the Czech TV show Hyde Park Civilization, to the stage. Daniel Stach focused his excellent performance on the promotion of science. The link between sport, study and science certainly works and let us wish the Masaryk Institute of Advanced Studies in the years to come that it continues to work. After all, the fact that the first three places among the award-winning athletes for the entire CTU in 2022 were taken by athletes from our Institute confirms that the environment of MIAS is conducive to all talents.

KLOKNER INSTITUTE

Dear colleagues,
I am glad that, despite the complexity of the times, I can evaluate the past period as very successful for the Klokner Institute. For this I am very grateful to all the staff of the Institute. In addition to scientific research and teaching, the work of our employees is intensively connected with practice and partners. Our activities are of irreplaceable importance in expert and research operations in construction and related fields. They are increasingly becoming multidisciplinary and also include the fields of chemistry, engineering, power engineering, informatics and digitalisation.
A wide portfolio of grant projects was also being resolved in 2022. For example, the Libeň Bridge 1922-2022 was published thanks to these grants. Research on robotic fabrication of building elements and structures is being developed very intensively. The Institute continued to participate in the university-wide project of the OP RDE for international mobility of employees of research organizations.
As part of our cooperation with the practice, we have successfully participated in many tenders, resulting in a number of agreements with key partners from the public and also private sphere. Expert activities also continued within the scope of the concluded framework agreements, e.g. the agreement with the Road and Motorway Directorate for inspections and diagnostics of bridges and load tests or the framework agreement concluded with the Technical Road Administration of the Capital City of Prague for diagnostics and extraordinary inspections of bridges.
Effective cooperation was established with the institution of the National Cultural Monument Vyšehrad in the preservation of cultural heritage in the Vyšehrad area, including the remains of the old Romanesque bridge from the 11th century.

prof.. Ing. Jiří Kolísko, Ph.D.
Director of the Klokner Institute, CTU

Study Programmes

Graduates of the master's degree programme can continue their further education at the Klokner Institute in two doctoral study programmes: Materials Science, Diagnostics and Structural Reliability in Construction and Civil Engineering, which includes the fields of Theory of Structures and Non-metallic Materials Science. The latter is accredited until the end of 2024 and is currently no longer able to accept new students. In the programme Materials Science, Diagnostics and Structural Reliability in Construction, students are introduced to new developments in the fields of concrete technology, rehabilitation of concrete and masonry structures, production and testing of building materials and diagnostics of building structures. The study programmes also train experts in the verification of the reliability of new and existing building structures, the determination of models of normal and extreme loads and their effects, experimental analysis of structures, risk assessment of technical systems and pre-normative research. A doctoral seminar was held in the last quarter of 2022, where students presented their academic and practical achievements.

Projects

In 2022, three scientific projects were launched - one by the Ministry of Transport of the Czech Republic (TRANSPORT 2020+) and two standard projects funded by the GA CR. In one of the awarded GA CR projects, an employee of the Klokner Institute acts as the main applicant, in the other project the Faculty of Civil Engineering CTU is the main applicant. At the same time, projects from previous periods continued to be implemented. Students of the KI also actively participated in the Student Grant Competition, where two projects were supported. The first part of postdoctoral mobility of foreign staff was implemented within the internal grant calls.

International cooperation

In 2022, Klokner Institute staff served as members of editorial boards of prestigious professional journals (International Journal of Safety and Security Engineering, Structural Concrete - the Official journal of the fib, International Journal of Heritage Architecture, 'Advanced Materials Research') and in committees of a number of international conferences. Together with the University of Stellenbosch, South Africa, KI organized the International Probabilistic Workshop IPW 2022 .
Klokner Institute staff also participated in international research on materials engineering and structural reliability (RILEM, IABSE, fib, WTA, JCSS). They have collaborated with prestigious research institutions (JRC Ispra, Politecnico di Torino, Torroja Institute, TNO Delft, TU Ghent, The University of Coimbra: Polo II, University of Stellenbosch) and major industrial partners (LafargeHolcim Research & Development, France).

Awards with transnational reach

Last year, the Klokner Institute won an award in the Footbridge Awards competition from the Madrid Architects' Association Headquarters (COAM) for the footbridge over the Dřetovický brook, which is located in Vrapice near Kladno. It was already awarded by the Czech Chamber of Architects in 2019. The Klokner Institute was involved in the structural design of the footbridge, the material technology and the production of the unique thin-walled prefabricated material from UHPC. The footbridge was then cast by company KŠ Prefa.

Significant events

After a longer break caused by the covid-19 pandemic, a Christmas concert was organised for industry and university partners and friends of the Institute.
At the beginning of 2022, thanks to a memorandum of cooperation, a partnership was established with the Vyšehrad National Cultural Monument.
The Institute's employees were also active in the media, and it is worth mentioning the TV appearances of the director Prof. Kolísko on the issue of the Barrandov Bridge repairs, 3D printing and the anniversary of the 1997 floods. We also participated in the creation of several books - Libeň Bridge 1922-2022 (main author:

Petr Tej) or Methods for ensuring the sustainability of steel bridge structures of industrial cultural heritage (co-author: doc. Ing. Miroslav Sýkora, Ph.D.).

The third role of the institute

The range of activities of the Klokner Institute and its staff is very wide. In addition to science, we have also been involved in expert, innovative, pedagogical, forensic and standardization activities. In 2022, the Institute produced 178 protocols on tests performed within the Experimental Department, 264 expert reports, 919 Accredited Testing Laboratory reports and 48 expert opinions.

The Klokner Institute also cooperated with a number of partners (the Railway Administration, the Road and Motorway Directorate of the Czech Republic, the Waterways Directorate of the Czech Republic, TSK Prague a. s., the Vyšehrad National Cultural Monument, etc.).

As part of its innovation activities, the Klokner Institute and its commercial partners had three scientific results protected in the form of a utility model in 2022. In total, the Klokner Institute holds 37 valid decisions on the protection of intellectual property, of which one is a European patent and eight within the Czech Republic, as well as 23 utility and two industrial designs.

Klokner Institute staff were also involved in standardization activities within the European Committee for Standardization (CEN) and the International Organization for Standardization (ISO).

Personality of the Year 2022

Ing. David Čítek, Ph.D.

Among the many personalities who deserve to be brought to the fore, we mention Ing. David Čítek, Ph.D., who in 2021 successfully completed the doctoral study programme Science of Non-metallic Materials and Building Materials. His dissertation on "Experimental analysis of UHPC cohesion and reinforcement" was awarded the "Outstanding Dissertation" by the Czech Concrete Society in 2022. Within the Klokner Institute, Ing. David Čítek, Ph.D holds the position of Head of the Concrete Technology Laboratory, focuses on the diagnosis of bridge structures, is actively involved in grant activities as principal investigator, and is a member of the organizing board of the fib Young Member Group and TG 2.5 Bond in Concrete. Thanks to his activities, the Klokner Institute is collaborating with the French research centre LafargeHolcim Research & Development on the testing and development of high strength cement composites

CZECH INSTITUTE OF INFORMATICS, ROBOTICS AND CYBERNETICS

The year 2022 brought many changes: instead of the much-needed calm after the coronavirus pandemic, there came an economic, energy and social crisis, largely caused by the war in Ukraine. Technology has no choice but to continue doing what it does best: delivering smart and necessary solutions. The supply of heat in the Czech Republic (and thus the replacement of Russian gas) could be solved with the help of small modular reactors. The concept of the new device, TEPLATOR, which can use nuclear waste, was developed by scientists from the CIIRC CTU and the Faculty of Electrical Engineering University of West Bohemia in Pilsen, headed by Prof. Radek Škoda, they had it patented, and in 2022 a major investor was secured, thanks to whom the detailed project documentation necessary to put it into practice will be created.

The CIIRC continued its strong collaboration and support to industry in 2022, led by the already established National Industry 4.0 Centre and the RICAIP Centre of Excellence, which is developing a unique Testbed for Industry 4.0. A new National Centre for Construction 4.0 has also been established with the main objective of creating an ecosystem for innovation and technological transformation of the construction industry.

We also welcomed a number of distinguished guests from the Czech Republic and abroad: the German Federal Vice-Chancellor and Minister for Economic Affairs and Climate Action Robert Habeck, the European Commission Executive Vice President Frans Timmermans, who debated with students about Green Europe, and the Slovenian Minister for Digitalisation Emilia Stojmenova Duh.

We also had the opportunity to present the Institute's activities and discuss the needs of science, the state and industry with the Minister for Science, Research and Innovation Helena Langšádlová or the Deputy Prime Minister for Digitalisation and Minister of Regional Development Ivan Bartoš.

Mgr. Ondřej Velek, Ph.D., Director,
Prof. Ing. Vladimír Mařík, DrSc., dr. h. c.
Scientific Director of the Czech Institute of Informatics, Robotics and Cybernetics, CTU

Education of doctoral students

In recent years, a number of CIIRC CTU employees were involved in the education of students in doctoral study programmes, supervising nearly 100 doctoral students at various faculties and universities in the Czech Republic and abroad.

Projects

CIIRC CTU has long been successful in obtaining large-scale European and national projects thanks to a clear strategy and vision. In 2022, for example, the European Digital Innovation Hub- EDIH CTU, supported by the European Commission and the Ministry of Industry and Trade of the Czech Republic, was successfully acquired for CTU. This will focus on supporting companies and public administrations in the field of artificial intelligence and machine learning.

In total, 62 national and 41 European projects were addressed at the CIIRC in 2022.

International cooperation

From its inception, the CIIRC was conceived as a workplace open to collaboration with anyone as long as it promised to contribute to knowledge or practice. It tries to combine excellence with usefulness, it involves various CTU departments in projects, it also connects with research organisations within the Czech Republic and is linked to international networks of research institutes in Europe, it has also created specific tools for cooperation with industrial practice. The Institute is gradually being built as a sophisticated AI ecosystem, i.e. a complex system of scientific collaborations, projects, financial resources and know-how transfers to practice, making CIIRC a top workplace, which, among other things, has earned the designation of an excellent part of CTU from the international evaluation committee.

The EU is also aware of the specific position of AI and has established six virtual European centres of excellence in this field of expertise in the last two years. CIIRC has - thanks to its results - become part of four of them - ELISE, TAILOR, VISION and euROBIN.

The CIIRC has achieved international prestige thanks to its results also on the basis of the operation of a large-scale testbed for intelligent manufacturing, which it built in cooperation with the Faculty of Mechanical Engineering as part of the European RICAIP project. This is an investment of almost EUR 50 million, which is shared with CIIRC and FME by CEITEC BUT in Brno, DFKI and ZEMA, both in Saarbrucken.

In addition to these networking activities, the CIIRC is home to the Central European offices of CLAIRE and ELLIS, two of the most prominent professional organisations in the field of artificial intelligence and machine learning in Europe. CIIRC also represents the Czech Republic in the international associations IDSA and Gaia-X.

Awards with transnational reach

The paper "Learning to Solve Hard Minimal Problems" by co-authors Petr Hrubý (ETH Zurich), Timothy Duff (University of Washington), Anton Leykin (Georgia Institute of Technology) and Tomáš Pajdl (CIIRC CTU) won the Best Paper Award at the IEEE/CVF CVPR 2022 (Conference on Computer Vision and Pattern Recognition). CVPR is one of the most prestigious scientific conferences in the field of computer vision, along with ICCV and ECCV.

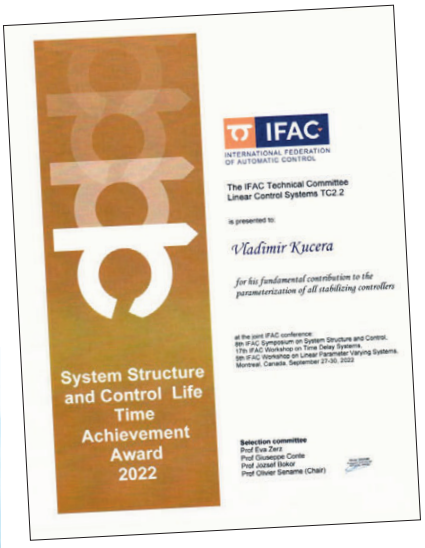
At the joint conference SSSC - TDS - LPVS of the International Federation of Automatic Control (IFAC), which took place in Montreal, Canada, on 27-30 September 2022, the IFAC System Structure and Control Life Time Achievement Award 2022 was awarded to Prof. Ing. Vladimír Kučera, DrSc., dr. h. c.

Scientific Director of CIIRC CTU Prof. Ing. Vladimír Mařík, DrSc., dr. h. c., has achieved the status of IEEE "Life Fellow" in 2022, recognizing outstanding lifetime achievements of selected IEEE members. Professor Mařík is recognized by the IEEE as a technical leader in the field of application of cybernetics to industry.

Significant events

On 9-12 October 2022, the annual conference of IEEE SMC - International Conference on Systems, Man, and Cybernetics - organized by CIIRC CTU took place in Prague. It addressed technological innovation and engineering excellence in the areas of cybernetics, systems, human-machine interaction, artificial intelligence, and machine learning.

Eighty robotics and industrial artificial intelligence research and industry experts



from both sides of the Atlantic discussed the future of industry in terms of scientific and technological development at a US-EU workshop. The event was organised in close collaboration with two globally renowned personalities, Prof. Růžena Bajcsy from UC Berkeley and Prof. Wolfgang Wahlster from DFKI.

The Czech-French workshop "CZ-FR-AI", which took place on 12-13 September 2022, enabled a meeting of leading Czech and French researchers, developers and entrepreneurs focused on strategically important areas of artificial intelligence. It was the result of several years of effort by an international team composed of representatives of the Ministry of Foreign Affairs of the Czech Republic, the French Embassy in Prague, CIIRC CTU and the French Institute Inria.

After two and a half years of construction, a unique experimental laboratory, the largest of its kind in Central and Eastern Europe, was inaugurated on 28 April 2022 at the CIIRC CTU. Testbed for Industry 4.0 is a research infrastructure being built at CTU thanks to more than one billion investment of EU and Czech funds within the RICAIP centre.

The third role of the institute

In addition to broad outreach activities, such as involvement in the Open House Festival, the Researcher's Night and other events for the general public, the Institute's focus in 2022 was on supporting war-affected Ukraine. Scientists from CIIRC CTU initiated a plan for Ukraine's reconstruction with the help of a smart application using artificial intelligence to link demand with supply. The project, which is supported by the Business Club Ukraine led by the Ministry of Industry and Trade of the Czech Republic, also involves FIT CTU and CzechTrade.

Personalities of the Year 2022

CIIRC has long been successful in attracting prominent personalities of Czech and international science. According to the ninth edition of the Guide2Research ranking, four out of the top ten computer scientists in the Czech Republic work at CIIRC CTU.

Josef Šivic (No. 2 in the ranking) deals with the development of intelligent systems that can automatically understand complex visual inputs and learn, like a human, from just a few examples.

The subject of Tomáš Pajdla's studies (ranked No. 4) is artificial intelligence - in particular image, structure from motion, iterative reconstruction or 3D reconstruction.

Tomáš Mikolov (ranked No. 7) focused his research on general artificial intelligence and topics such as unsupervised learning, spontaneous evolution of complex systems, diversity in evolutionary algorithms, and the growth of complexity in various computational systems.

Torsten Sattler's (ranked No. 10) main research interest is 3D computer vision with a focus on 3D reconstruction and visual localization.

Josef Šivic

Tomáš Pajdla

Tomáš Mikolov

Torsten Sattler

UNIVERSITY CENTRE FOR ENERGY EFFICIENT BUILDINGS

The year 2022 was not easy and its beginning meant many unknowns for all of us, connected with the war conflict in Ukraine and the resulting energy crisis. Nevertheless, we have achieved several successes that I would like to mention.

As in previous years, CTU UCEEB attracted the most attention thanks to its S.A.W.E.R. technology, which won the Best Innovation Award at the World Expo 2020 in Dubai. The expert committee of the prestigious American magazine Exhibitor also awarded it second place among the exhibitions of 192 nations. It received the SDGs Award from the Corporate Social Responsibility Association in the Innovation, Technology and Energy category. Several companies have already expressed interest, so we are confident that we will soon be able to commercialize the device with international patents.

Another success was the Envilop lightweight envelope, which was applied in the renovation of the building of the COPTH Secondary School in Českobrodská Street in Prague. The project won the "Built-up areas" category in the Adapterra Awards competition and won two more awards in the Building of the Year 2022 competition. In addition, the building design received a gold certificate of the SBToolCZ methodology, in the development of which we participate.

The Water in the City methodology was very well received. Although it is free to download in electronic form, there was strong interest in its printed version. On the Hithit platform, we managed to raise a substantial amount for a second, expanded edition. In addition, in cooperation with the City of Prague, we published the Methodology for Adapting School Buildings to Climate Change in Prague.

The international RESINDUSTRY project on the use of renewable energy sources in industry, in which CTU UCEEB is the coordinator, was evaluated by the Interreg Europe programme as one of the most successful in the EU.

Ing. Robert Jára, Ph.D.
Director of the University Centre of Energy Efficient Buildings, CTU

Study Programmes

Within CTU UCEEB there are no study programmes, but we participate in teaching at individual faculties, which allows us to transfer knowledge from applied research to their study programmes.

Projects

In 2022, we addressed more than 83 grant projects and 166 contract research orders. Among the most significant completed was the four-year international CAMEB National Centre of Competence project, which was motivated by the scarcity of non-renewable natural resources (material and energy) and the associated impact on construction.

Although there is currently a trend towards massive savings in the operating energy of buildings, the material and energy intensity of construction is increasing rapidly. This is why the National Competence Centre was created, bringing together partners whose knowledge has enabled them to find better ways of using resources in construction. A final meeting was held in November 2022, where the individual sub-project teams presented the results of four years of research and development.

International cooperation

In 2022, we addressed 18 major international projects. We successfully completed the implementation phase of three projects under the Interreg Europe programme: RESINDUSTRY, FINERPOL and LC DISTRICTS. In the first one, which aimed to promote interest in the installation of renewable energy sources in industry using subsidy titles from EU funds, we had a coordinating role. Thanks to the cooperation with the Ministry of Industry and Trade, the number of applications for RES subsidies was increased and some of their parameters and conditions were adjusted. In September, the project moved into its second, monitoring phase, mapping the impact of the recommendations and proposed changes.

This is the second time we participated in the FINERPOL project, which was completed in September and aimed at supporting the introduction of new and improvement of existing financial instruments for energy efficiency projects in public buildings. LC DISTRICTS has improved regional development programs in the renovation and construction of energy efficient buildings, district heating and other urban renewal methods that reduce CO2 emissions.

Awards

We took part in the international Solar Decathlon competition in Wuppertal, where we won 3rd place in the Comfort category. The sustainable, low-energy construction of the competition building took place on our experimental site in Buštěhrad, where the Firstlife team built a demonstration of superstructures for the student dormitory Větrník in Prague.

The Czech Association of Energy Sector Employers awarded the Silver Medal of Prof. Vladimír List for merit for the development of the Czech energy sector to the head of our research team of the Laboratory of Organic Rankine Cycles, Ing. Jakub Maščuch, Ph.D.

The municipality of Mikolajice won the award from the Smart Cities 2022 competition. With its project Smart Ecological Municipal Energy including a pellet cogeneration unit, in which we participated, it won in the category Project for a municipality up to 10,000 inhabitants. The submitted solutions were evaluated by the expert jury of the competition, which consisted of 29 experts in the field of Smart City.

Ing. Jakub Maščuch, Ph.D.

Solar Decathlon

Other important events and happenings

We lectured not only about our innovative projects at the all-day accompanying program called UCEEB Forum, which took place during the Aquatherm Prague 2022 trade fair. The aim was to familiarize the participants with the process of technology development in our laboratories and their subsequent application in the real environment, but also to introduce them to BSE system diagnostics and their implementation in buildings.

As part of Prague's exposition at Smart City Expo 2022 in Barcelona, we presented our smart technologies in the field of urban innovation to partners from all over the world. We also met our international partners from SPARCS, CrAFt, NEB-STAR, PLURAL and other projects. We discussed smart solutions in urban environments with a number of global experts.

In October 2022, it was exactly ten years since the laying of the foundation stone of our building in Buštěhrad, which was completed and opened in 2014. It was also here that the Scientific Council, composed of renowned experts from foreign universities and research institutions, met in June. Its aim was an independent evaluation of the UCEEB's activities to date, combined with a discussion on further development and possibilities for future international cooperation.

Our first internal annual conference took place at Masaryk Dormitory in Prague. Representatives of the research teams presented innovative outputs of their projects, 25 lectures were given on projects across six disciplines. The central theme was energy flexibility in all its forms, from hydrogen to electric energy storage and Carnot batteries to smart control algorithms. Traditionally, the topic of sustainable construction was also present. We presented the SBToolCZ certification tool in its new online form and projects dealing with sustainable municipal development.

The third role of the centre

Our other activities include support in the development and change of standards in cooperation with the Czech Agency for Standardization, especially in the field of multi-storey wooden buildings. We participated in the preparation of the Green Savings subsidy programme for the Ministry of the Environment of the Czech Republic. We provide specialized seminars for the professional public and train both designers and implementation companies. We systematically promote sustainable construction at national and international level.

Personality of the Year 2022

Ing. Nikola Pokorný, Ph.D., is primarily engaged in testing, modelling and development of new renewable heat sources. For his dissertation, entitled Glazed Liquid Photovoltaic-Heat Collector, he was awarded the Werner von Siemens Prize in the category Best Thesis on Smart Infrastructure and Energy. In recent years, he has been increasingly working not only on the issue of renewable energy in district heating, but also on projects aimed at developing specific devices for recovering water from the air in desert environment. Together with his colleagues, he developed and successfully tested the MAGDA (Mobile Autonomous wAter Generator from Desert Air) device for producing water from air in extremely dry and hot environments. The motivation to pursue this concept was to put a S.A.W.E.R. type device, developed for EXPO 2020, on the back of a car, making it easier and faster to transport and thus making this technology more accessible. MAGDA can be used not only as an emergency source of drinking water in arid areas, but also during natural disasters or armed conflicts.

INSTITUTE OF EXPERIMENTAL AND APPLIED PHYSICS

IEAP acts as CTU's base for research in particle and nuclear physics. It is here that detector technologies for fundamental physics and satellite experiments and precision imaging are developed. In connection with the involvement in experiments in underground laboratories, the Institute develops technologies used in low-background experiments focused on neutrino physics and the search for dark matter in space. In connection with fundamental experiments, the relevant theoretical physics disciplines are also developed at the IEAP. Through an attractive scientific programme, we are succeeding in attracting talented young foreign researchers to science and research in the Czech Republic (their share in the Institute exceeds one third of the scientific staff).

doc. Ing. Ivan Štekl, CSc.
Director of the Institute
of Experimental
and Applied Physics, CTU

Educational activities

Although the Institute does not have its own study programme, it is active in the field of education. Last year, it focused on supervising the professional work of students from other faculties of CTU and other universities in the Czech Republic and abroad. It also acted as a training centre for two foreign students sent to CTU by IAESTE. The internship of the winners of the national round of the Physics Olympiad took place here. We took part in the organization of the Particle Prague event, in which interested secondary school students at IEAP worked on laboratory tasks with pixel detectors. Three of our staff members acted as lecturers for courses on the operation of Medipix pixel detectors held at the IEEE NPSS School of Application of Radiation Instrumentation in Dakar (Senegal) and ICISE School for Medical Physics 2022 in Quy Nhon (Vietnam). As a part of lifelong learning, teacher training in the accredited program of the Ministry of Education and Science „Progressive Detection Methods in Teaching Subatomic and Particle Physics at Primary and Secondary Schools" took place and we organized courses on Secrets of the Microworld and Laws of the Microworld for the University of the Third Age.

Projects

In autumn 2022, we completed our largest project „Engineering Applications of Microworld Physics", which was already in its fifth year under the OP RDE Excellence in Research programme and covered most of the Institute's research activities. As co-investigators, we have been involved in the preparation of several OP RDE JAK projects, which, if accepted, should partially replace the successfully completed one.

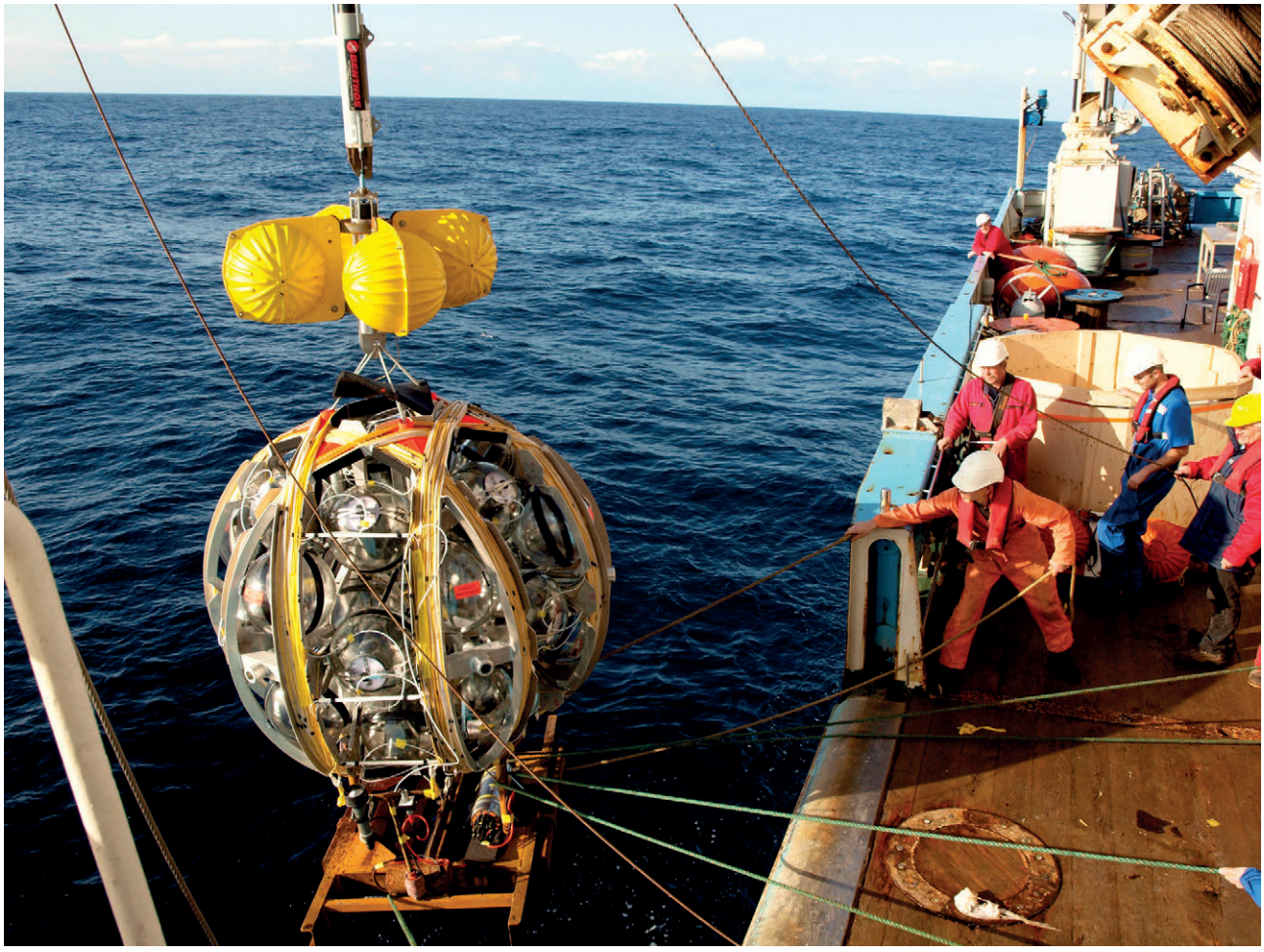
One of the most successful areas of the Institute's activities is the application of detection technologies in space. Three more projects have been added to the two already running projects from space agency ESA to develop the HardPix radiation detector and place it on the Lunar Gateway Station. IEAP is leading one of ESA's prestigious projects to study a Czech scientific ambition mission, which plans to send a Czech satellite with a magnetic spectrograph and HardPix detectors into deep space beyond the Earth's magnetic field. Furthermore, the Institute collaborated on a study of suitable equipment for ESA's lunar rover, which is expected to deliver a neutron spectrometer to search for water on the Moon. IEAP has also been awarded a contract by the UK Met Office to monitor space weather in Earth orbit. As part of this mission, the HardPix detector is expected to launch into space on a D-Orbit satellite in the summer of 2023.

International cooperation

Almost all of the Institute's activities were carried out within the framework of broad international cooperation, especially with the CERN research institute and the underground laboratories LSM (France) and SNOLAB (Canada). At CERN, our Institute has been active for a long time in the ATLAS experiment at the LHC accelerator - it participated in its construction, running and also in data analysis. I would like to mention a major achievement of our staff - the publication of the results of their work in the journal Nature (details are given in the introductory part of the Annual Report).

Last year, our institute was invited to participate in the KM3NeT experiment, which is part of ESFRI, the European Strategy Forum on Research Infrastructures. Its aim is to build a giant neutrino telescope to detect neutrinos coming to us from space. Several cubic kilometres of water in the Mediterranean Sea will be used as the detection medium.

The development and applications of semiconductor pixel detectors were carried out in the framework of the international Medipix collaboration (CERN), activities focused on satellites and space missions were carried out in cooperation with the European Space Agency (ESA) and the Japanese Space Agency (JAXA).



Installation of optical modules in the waters of the Mediterranean Sea. These will be part of the KM3NeT giant neutrino detector, which is used to register the interaction of cosmic neutrinos with seawater.

Awards

IEAP employee Yuta Orikasa received the Outstanding Paper Award from the Physical Society of Japan in 2022 for his publication in the field of theoretical particle physics.

Other important events and happenings

In 2022, the Institute celebrated its 20th anniversary. On this occasion, an Open Day of IEAP was held at the Bethlehem Palace, followed by a celebration at the Hrzán Palace.

The Institute has long been active in the field of theoretical neutrino and nuclear physics. Last year it organized the regular international conference MEDEX'22 (Matrix Elements for the Double beta decay EXperiments), focused on neutrino physics and dark matter.

The Institute and the war in Ukraine

Due to the Russian aggression in Ukraine, the Czech Republic withdrew from the international Joint Institute for Nuclear Research in Dubno. Therefore, our scientific activities in relation to this institution are gradually being curtailed. In this context, the Institute is supporting a Ukrainian doctoral student from the JINR who is studying theoretical astrophysics at the Silesian University in Opava. Just after the war started, a former employee of the JINR approached our Institute and signed a protest against the war. The ranks of the Institute's staff were thus enriched by a top expert in experimental nuclear and neutrino physics with many years of experience from the prestigious University College London.

INSTITUTE OF PHYSICAL EDUCATION AND SPORT

Physical education and leisure and sports activities are seen as an integral part of university life. They link physical and intellectual education on campus, develop students' physical skills, broaden their knowledge of active lifestyles and help combat civilizational diseases and negative social phenomena. In the past year, the efforts of the IPES were also aimed at maintaining and improving the quality of the physical education and sport system as a basic prerequisite for its further development at CTU.

After two covid years, the activities of the IPES could again be successfully developed in all forms, i.e. in teaching physical education, providing other sports activities for students and employees, organizing winter and summer training courses and providing sports representation of CTU in sports competitions of universities, including at the international level.

The increase in the number of students in regular physical education are evidence of the increased interest in sports activities and confirm for us the right direction of the teaching. Interest has also increased in winter and summer training courses as well as the opportunity to represent the university. Students have been successful in university competitions not only at home but also abroad. Cooperation with university sports clubs has also been successful.

Thanks to the understanding of the university administration, it was possible to maintain the school's sports facilities in good condition and to modernize their equipment.

It can therefore be concluded that 2022 was a year of stability and further development of the Institute's activities.

doc. PaedDr. Jiří Drnek, CSc.
Director of the Institute of Physical Education and Sport, CTU

Teaching PE and sports

Regular teaching of physical education and sports for students of the CTU is the main mission of the Institute. Students can choose from a wide range of up to fifty different sports activities in which they can improve during their studies. We emphasize the quality of teaching and the importance of regular exercise, physical and mental balance of students.

We also offer methodological videos on the Institute's website, which are used both for teaching with the possibility of creating training plans and for the individual needs of students. In 2022, videos of tennis, circuit training, self-defence and MTB riding techniques were created as part of the internal IP 2022 competition.

Offer of courses

In 2022, we offered students to participate in eight winter ski and snowboard courses and specialized courses for the paramedic field with a total participation of 344 students. We were cautious when planning the courses due to the unclear situation around the pandemic, but we were still able to include foreign courses (Austria and Slovakia) and these were again among the most attractive.

In the summer period, the Institute organized 36 courses with 917 students participating. As in previous years, the offer of these activities is very varied and is updated every year according to the interest of the participants. In 2022, courses were organised focusing on archery, self-defence, yoga, water tourism, windsurfing, volleyball, beach volleyball, cycling (road and mountain bikes), horse riding, golf, tennis, hiking, etc.

A great benefit for students are the familiarisation courses organised in cooperation with the faculties. Thanks to them, the participants have the opportunity to get to know their future classmates better, to get acquainted with the offer that the school provides in the field of sports and physical activities, but also to receive from the management of the faculties and senior colleagues the necessary information for a successful entry to study at CTU. The courses have been positively evaluated by students for a long time.

„Amateur" sports

Physical education classes are supplemented by a wide range of one-off sporting events, such as the Rector's Sports Day, cycling trips, Cross Campus and smaller tournaments and matches.

The sports offer at the CTU is significantly expanded by the activities of the university physical education units VSK CTU and VŠTJ Technika Praha. In their clubs, the physical education units offer a very varied mosaic of sports and physical leisure activities and cooperate with the institute in organising major sporting events such as the 17 November Run.

Every year there is also a semester-long teaching of seniors within the University of the Third Age in two groups of thirty people.

Representation

In cooperation with the faculties, the Institute also provides sports representation of the school at university championships in the Czech Republic and at international sports events. In the past year, CTU students were successful not only in competitions within the Czech Republic, but also gained significant sporting successes abroad. Among the most important domestic successes were the second place overall at the Czech Academic Championships in indoor athletics and the excellent results of our athletes at the Czech Academic Games held in České Budějovice. CTU took sixth place in the competition of universities and won a total of 39 medals, including 12 gold.

Last year's sporting successes were crowned in November by participation in the 6th World InterUniversity Championships in Barcelona, where the CTU team won in a competition of 64 universities from 25 countries. In individual sports our footballers, futsal players and mixed team of swimmers won gold medals, basketball players were silver and bronze medals

were won by the volleyball team and mixed teams of badminton and table tennis players.

Proof of CTU's appreciation of outstanding student representatives are the regularly awarded exceptional scholarships for successful representation of the school, which are awarded by the deans of individual faculties on the proposal of the Institute's management. The culmination of these awards is the annual competition for the best CTU athlete under the auspices of the Rector. In 2022, the first place was taken by water slalom player Ing. Vít Přindiš, student of the 3rd year of the master's programme at the Masaryk Institute of Advanced Studies of CTU. Last year he

was a great success at the World Water Slalom Championships in Augsburg, where he became the world champion in the individual race.

Under the auspices of the MEYS and in cooperation with VSC Victoria we are involved in the UNIS project for top athletes studying at the CTU. The project creates conditions at the university for combining sports and study career. In 2022, 27 top athletes were included in the project.

University leagues

CTU actively participated in the newly established competitions of universities, university leagues organized by CUSA, in six team sports. Our school is represented in all university leagues by nine teams of men and women - in basketball (men, women), floorball (men, women), volleyball (men, women), futsal (men), football (men) and in the hockey league, where we are represented by the Engineers Prague team consisting of players from CTU, CZU and VŠE.

Computing and Information Centre

The Computing and Information Centre plays the role of a central IT operator for the faculties, institutes and other parts of CTU. With 83 employees, we operate a wide range of services for both students and university employees.

We hold ISO 9001 (quality management QMS), 20 000 (service management) and 27 001 (information security management) certificates for the management, operation and development of information systems.

For users, only specific applications and functionalities related to study, science and research, and licensing or support for day-to-day administration in the field of personnel and economics are often visible. However, much of the infrastructure is hidden in the background, yet is actually used all the time. Backbone networks, servers, identity services (authentication and authorization), ID card and ID badge issuance, access and access control are all but a fraction of the services provided.

In 2022, projects were the main source of funding for development activities and outputs. We implemented, or co-implemented, nine strategic management support programme projects, two central development projects and a DKRVO project.

Within the framework of electronic exchanges we cooperate with workplaces in the Czech Republic and Europe. An example is the eSign project, which started in 2021 and is intended to ensure the exchange of electronically signed documents between universities within the EU with the support of Mobility. In 2022, we continued our work and prepared the deployment of this application into production operation, including a signpost for users.

Due to changes in laws related to digitization, we have devoted considerable effort to the preparation and architecture of systems using electronic signing, validation and long-term storage.

As part of the expansion of electronic circulations in CTU administrative processes, we have successfully deployed AEDO system modules at selected CTU units.

We dealt with the integration of the telephone system into the university infrastructure. Based on user requests, we created an application that adds caller ID from the UserMap system to the caller's number. We also built the basis for intelligent call routing based on the caller's number.

As part of eduroam's monitoring and security, we have deployed a new RadMon application that makes it easy to get an overview of the network and various statistics, and to monitor the performance load or, for example, to resolve collisions in case of misconfiguration.

In UserMap, we have put into operation email management, new pass data transfer to GTS and many other new features. In CARD2 we focused on programming work, finalizing the database structure and the legal system for external and internal users.

In KOS application, we have made progress in optimising internal processes. We have modified the generation of PDF documents from KOS in a way that meets the conditions for long-term archiving of documents and we have technologically tested the key steps required for digitizing processes.

The agenda for calculating quantified criteria for the habilitation procedure or the procedure for appointment as a professor has been significantly supplemented in the V3S application. Thus, both points from the KOS database for teaching activities (theses, doctoral students) and the calculation of points for the management of scientific research projects from the EZOP database are now included.

For all newly adopted projects of the national programmes, a closer link between the EOP application (project registration) and iFIS (automatic procurement) was put into operation. For projects accepted for funding by the provider, this functionality allows to significantly speed up the process of setting up these projects at CTU and subsequently drawing them from the beginning of the solution.

Of course, there are many more projects and activities, for all of them we can name at least the implementation of the infrastructure for Bethlehem Palace - connecting the site to the CTU network with a direct optical link and putting into operation structured cabling for the operation of the CTU Rectorate, increasing the reliability of the network by connecting a new redundant backbone box in Dejvice or increasing security by deploying a monitoring system for wifi connection.

CTU Archive

In 2022, the CTU Archive celebrated 60 years of its modern existence. Josef Petřík, professor of geodesy, came up with the idea of creating it from the original registry of documents and student registers in the 1930s. However, due to the Second World War, the permanent position of archivist was not filled until 1962 by Dr. Václav Lomič. The task of the archive was both administrative work, the so-called pre-archival care, and historical work, writing the historical development of the CTU. These original tasks have gradually been expanded to include those brought about by modern times. In addition to the shredding and archiving of traditional written documents, the Archive is beginning to focus on archiving digital documents in the long-term repository of the National Digital Archive. It is also preparing to apply the latest organizational schemes using the ProArchive application, which enables, among other things, remote access to inventories of recorded archival files. With the help of a specialised book scanner, the systematic digitisation of student records has begun.

The Archive is also involved in the activities of professional associations. Its employees are members of e.g. the association What will be left of us? Within the Czech Archival Society, they sit on the committees of the Specialist Group of Specialised Archives and the Specialist Group of University and Scientific Archives. They also successfully build contacts with colleagues from related foreign archives, especially German, Austrian, Polish and Slovak archives.

In January, the adaptation of the former heating plant of the university dormitories in Strahov into a modern archive building started. These new premises are not only planned as a mere depository, but also as a meeting place for various events not only for CTU staff and students, but also for the wider public.

CTU Central Library

Supporting and monitoring the latest trends in the fields of professional publishing and new forms of scientific communication were among the Library's strategic activities in 2022. It provides information support to students and the academic community of CTU throughout the entire cycle of their studies and scientific work, from information support for individual disciplines to support for publishing results - standards of professional publishing, storage, access and dissemination of scientific outputs.

We also follow the global developments in the field of Open Access and Open Science, including FAIR data and the issue of „predatory publishers". We have created an Open Science portal for authors and researchers of CTU projects (openscience.cvut.cz) to find in one place the necessary information about projects, conditions of funding providers, Open Access, research data and conditions for storing the results of publishing and scientific work, including links to educational events, set services and available tools. Using the three steps „Think - Check - Publish" the author can make sure that he/she has chosen the right journal, book, publisher to publish his/her work.

The portal also covers copyright issues in basic terms. It describes the area of publication and data repositories, such as Zenodo, where researchers can deposit their papers, datasets and research software.

Last year, a project was focused on new trends in education (online learning and also so-called blended learning) and their support by libraries, involving 21 university libraries from the Czech Republic, including CTU CL. The conclusions and recommendations from this project will be implemented into the information support of studies and services after evaluating their suitability for our users and taking into account the conditions of the CTU.

CTU Publishing House

Fortunately, the year 2022 was no longer marked by the coronavirus pandemic and measures to protect against the spread of the disease and other complications (including increasing problems for printers with paper supply). Even so, its effects were partly felt in the university's publishing activities. The trend of making teaching literature available digitally and minimizing print publishing ventures by faculties and units is visible. There has also been a significant increase in the cost of printing in 2022. The need for savings in view of the worsening financial situation mainly due to increased energy costs, inflation, etc. has also been felt in the publishing sector at the university.

Over the last ten years, a quarter of a million copies have been published under the CTU banner - the overall "numerical" trend is downward due to digitization and other changes; not only the number of published titles is decreasing, but especially the number of copies of individual titles (expensive printing is a major contributor to this). Publishing is moving to the online space.

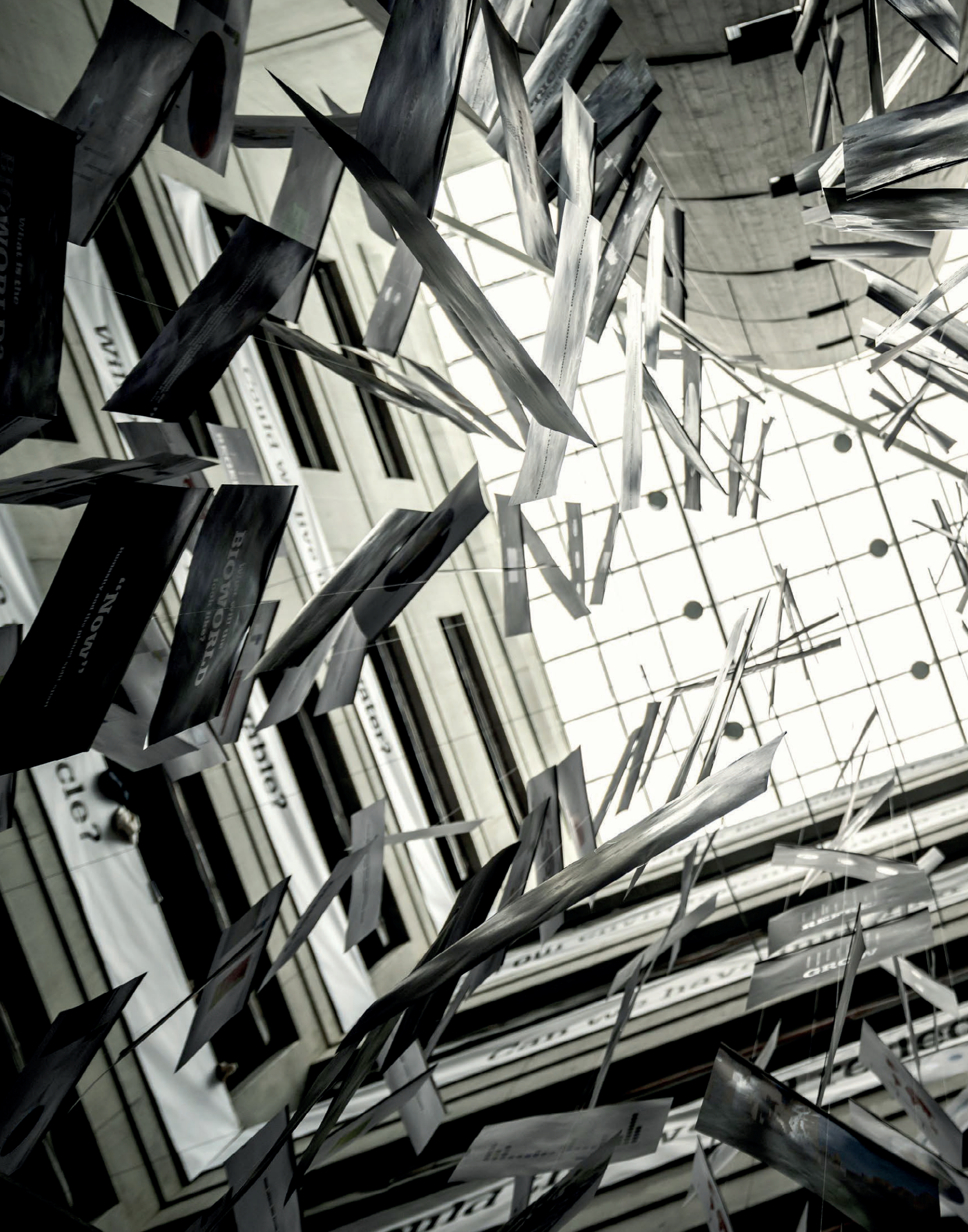
Despite the difficult conditions, the Publishing House has managed to meet all its objectives and be a professional base for the university in 2022. The Publishing House published a total of 32 titles within the CTU editorial series, which is five more than in the previous year. The positive trend continues in the first months of this year, so it is expected that the total number of publications will be higher in 2023. Notable publishing ventures that have required greater editorial attention and involvement, both in terms of scope and quality of editorial, graphic and printing work, include the university textbook doc. Beňo entitled Aircraft. Another title of the edition prepared by the authors from the Faculty of Architecture, this time dedicated to theatre, was very successful (doc. Stýblo and Prof. Soukenka: Theatre: Space and Action). In addition, the Publishing House is involved in the preparation of other publications issued under the CTU banner, such as the CTU Annual Report, proceedings, catalogues, PR publications, etc. In 2022, 185 of these publications were published, 124 of them electronically (online) and 5 on CD/DVD.

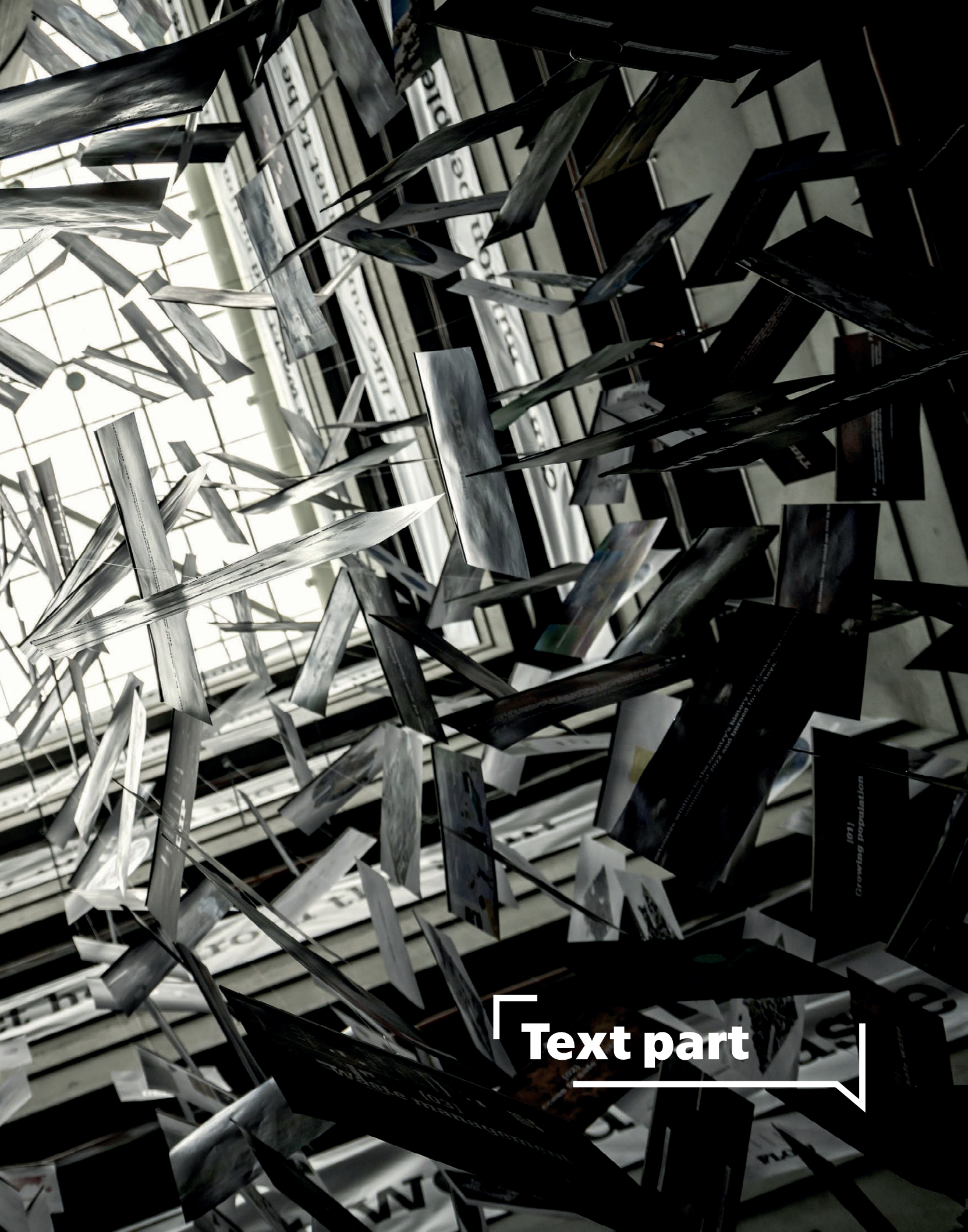
Another successful publishing venture was the second supplemented edition of the publication Honorary Holders of a Doctorate of the Czech Technical University in Prague by Prof. Ivo Kraus and Dr. Vladimíra Kučerová. The book, which presents more than 170 prominent personalities who have received honorary doctorate diplomas of the Czech Technical University of Prague from 1905 to the present, was "baptized" on 8 December 2022 by the Rector of CTU doc. Vojtěch Petráček.

Service Facilities Administration

The Service Facilities Administration CTU provides accommodation and catering for students, employees and commercial clients. It provides complete catering and congress services in its own facilities, manages outdoor sports grounds belonging to individual dormitories and leases non-residential premises to business persons.
The CTU dormitories are among the largest in the Czech Republic and are located in several locations in Prague: Hlávka campus in Prague 2, Podolí campus in Prague 4 and Strahov campus and Orlík, Bubenečská, Sinkuleho, Dejvická and Masarykova dormitories in Prague 6. In addition to accommodation facilities, the campuses of the dormitories also include canteens, sports fields and interest rooms. In total, they have a capacity of approximately 7,400 beds and offer accommodation in single, double, triple and quadruple rooms. Some of them have their own bathroom and kitchenette. They accommodate not only students, graduates and applicants from CTU, but in case of free capacity they are also able to satisfy applicants for accommodation from other universities. Thanks to long-standing cooperation, student representatives participate in the creation of leisure facilities (hobby rooms, sports activities, and support for social events).
An additional accommodation activity of the dormitories is the sale of vacant capacity in the form of hostels to the general public. In addition to student accommodation, SFA also offers commercial accommodation. Its capacity is around 220 beds - Novoměstský hotel***, hotel Masarykova kolej*** and hostel Strahov.
Meals are provided in the CTU canteens, which are located near the dormitories and classrooms. SFA operates three canteens in Prague – Strahov Canteen, Student House Canteen and Technical Canteen, two food counters - Horská and Karlovo náměstí, Megabufet, MIAS bistro, Academic Restaurant and Archicafe. Another canteen is located in the Kokos building in Kladno. Catering is provided to students and employees of the CTU as well as to the public.
In addition to regular repairs of dormitory and canteen buildings, planned investment projects are being implemented. During 2022, the total reconstruction of Bubeneč Dormitory was still underway, which will bring an increased quality of accommodation and offer adequate facilities for students.
The new accommodation will be of the cell type - two adjacent rooms will form a double cell. They will be separated from the corridor by a hallway, which will contain the necessary facilities. Each double room will have its own bathroom, toilet and a small kitchenette with a built-in fridge. The total capacity will be 203 rooms - 187 double rooms, 14 single rooms and two rooms for people with reduced mobility, i.e. 390 beds in total. Access to the building and the rooms will be keyless, by chip or personal card. There will also be a new gym and two study rooms. The student club will move to new premises. The anticipated date of the dormitory's commissioning is the beginning of the winter semester of the academic year 2023/2024. In addition, due to the planned revitalisation of Strahov Dormitories, we have started the renovation of the model rooms.

In 2022, the Bubeneč Dormitory was completely reconstructed, which will bring an increased quality of accommodation and offer adequate facilities for students. The new accommodation will be of the cellular type - two adjacent rooms will form a double cell. The total capacity will be 203 rooms - 187 double rooms, 14 single rooms and two rooms for people with reduced mobility, i.e. a total of 390 beds.





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1 Basic information about the university

CZECH TECHNICAL UNIVERSITY IN PRAGUE
Registered address:
Jugoslávských partyzánů 1580/3
160 00 Praha 6 - Dejvice

The Czech Technical University in Prague (hereinafter referred to as CTU) is a public university-type higher education institution established under Act No. 111/1998 Coll., on Higher Education. The function of the statutory body is performed by law by the Rector of the CTU, doc. RNDr. Vojtěch Petráček, CSc.
CTU is composed of eight faculties, six university institutes, special purpose facilities, including CTU Rector's Office, and other constituent parts. The organisational chart, the composition of decision-making bodies, the representation of the University in the representation of Czech universities and other data about the University are presented in the **Table Annex to the Annual Report, Section 1.**

Mission

The long-term maintenance of internationally recognised and competitive excellence in education, science, technology, innovation and application contributing to the improvement of the quality of social life.

Vision

CTU strengthens its place at the forefront of technical universities in the Czech Republic and its position as an internationally recognized research university developing the talent and abilities of students as well as academics and other staff. It contributes to increasing technological literacy, advancing technical knowledge, promoting digital skills and innovation, and engaging in societal challenges, thus striving to become one of the world leaders in education, science and research.

Strategic objectives

CTU will continue to fulfil its mission, vision and strategic goals through participation in major international projects, cooperation with renowned Czech and foreign scientific teams and external partners, including industrial partners, as well as through the implementation of development projects within the institutional plan, the centralized development programme or within the fund of school-wide activities in accordance with relevant government strategies. It emphasises the transfer of knowledge from the scientific environment to the application sphere. CTU confirms its excellence not only nationally but also internationally, interdisciplinary with the participation of all faculties, university institutes and constituent units.

It demonstrates that its mission, vision and strategic objectives are relevant to the dynamically changing needs of a global society. It clearly confirms its ability to compete, to offer unique solutions and to respond without hesitation to change in both the approach to education and the use of science, technology and innovation to improve the quality of social life.

CHANGES TO INTERNAL REGULATIONS

In 2022, CTU made several changes to the university's internal regulations. The changes made were of an organisational and financial nature.

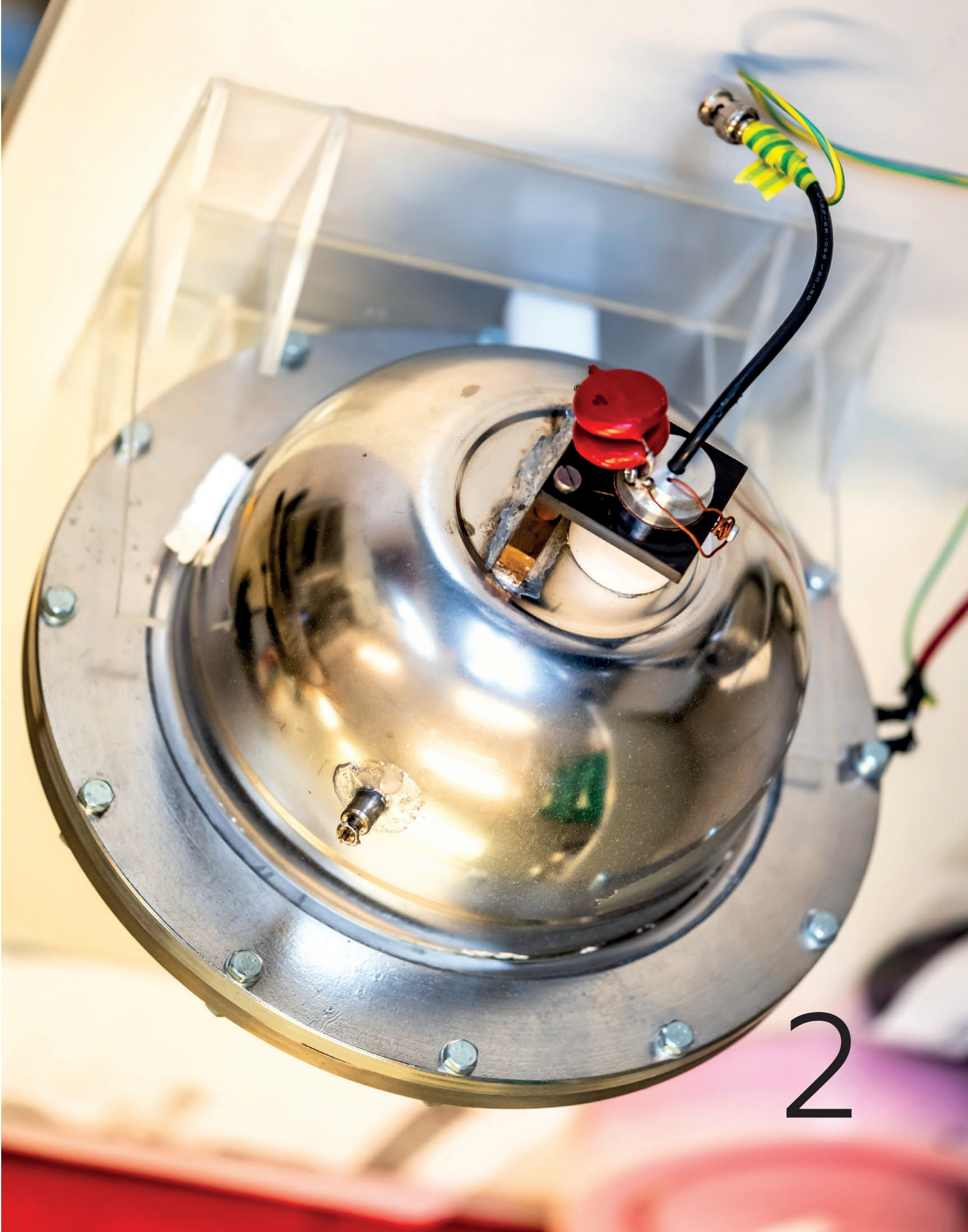
With effect from 11 January 2022, the Rules of Procedure of the CTU Scientific Council postpone the possibility of convening and voting by electronic means until the end of 2023.

On 22 April 2022, amendments to the Rules of the Quality Assurance System for Educational, Creative and Related Activities came into force, specifically Article 5 regarding the division of responsibilities in quality assurance of educational activities was amended. On the same date, an amendment to Article 20 of the Regulations of the Habilitation and Appointment to Professor Procedure of the CTU regarding the possibility of remote voting came into effect, and the Regulations of the Quality Assessment of Study Programmes in Article 5 regarding the division of responsibilities in quality assurance came into effect on the same date.

The new CTU Code of Ethics was approved on 23 February 2022 and became effective on 7 May 2022, on the same date minor changes to the CTU Statute become effective.

The Study and Examination Regulations have been amended (VI. amendments) with effect from 23 April 2022. The application for institutional accreditation and related changes in doctoral studies, respectively the activities of the disciplinary councils and the newly adopted regulation „Evaluation of the Quality of CTU Study Programmes" have been taken into account. The next, VII. amendments to the CTU Study and Examination Regulations, which reflected the beginning of the war in Ukraine and the introduction of sanctions regulations, took effect on 27 September 2022. The last, VIII. amendments to the CTU Study and Examination Regulations concern doctoral studies and took effect on 29 October 2022.

In 2022, the CTU provided information in accordance with Act No. 106/1999 Coll. in response to five requests, no decision was issued on the refusal of a request or an appeal was filed against the decision.



doc. Dr. Ing. Gabriela Achtenová
Vice-Rector for Bachelor
and Master Studies

„The year 2022 will forever be remembered as the year of the beginning of Russia's horrific aggression in Ukraine. The biggest wave of migration since World War II was unleashed in Europe. From the university's point of view, it became a year of unity. Everyone put their „hand to work" in helping Ukrainian refugees. I thank everyone for their precious unity."

2 Study programmes, other educational activities

Among the many activities we can mention the following: MIAS programmed the entry form; CIPS transformed its premises and, thanks to the empathy of its staff, became a helper and a gateway to CTU accepting Ukrainian refugees - those interested in studying at CTU. The faculties and MIAS opened more than ten intensive Czech language courses that ran from March to September 2022. Students taught each other regardless of which faculty the Ukrainian refugees were enrolled in. If one faculty lacked the space to teach, another offered its space. Maksym Dreval led a Czech-English-Ukrainian mathematics seminar in preparation for the entrance exams. As a result, nearly 160 Ukrainian refugees became students of accredited study programmes at the CTU in the academic year 2022/2023. Through their diligence and perseverance, most of them made it through the winter semester even at the faculties with the most difficult study content. A big thank you goes not only to the „linguists" who devoted their efforts and holiday time to teaching Czech, but to all those who participated and who were not mentioned in the thank-you list.

An important milestone was the obtaining of institutional accreditation, which enabled the introduction of a new process of recognition of prior study in the admissions procedure. Although it could only be launched in mid-July, over 400 applicants from all countries took advantage of this option.

ACCREDITED STUDY PROGRAMMES

In 2022, CTU implemented accredited bachelor, master and doctoral study programmes in accordance with the study plans mainly in the Czech language, selected programmes in English were available not only for foreign but also for Czech students. Within the double degree programmes, specialisations in French or German are also offered. An overview of accredited study programmes is published on the CTU website. Faculties and institutes of higher education present their study programmes during open days. We perceive that internationalisation is very important in today's world and therefore we support it with a greater emphasis on bilingualism, we also manage to provide quality services for international students. Bilingualism is promoted, for example, through the website, but also through dedicated Study at CTU or Study in Prague projects. The needs of students with disabilities are also taken into account. Support for girls, future students of technical fields, plays an important role at CTU. The long-standing project Girls, beware! aims to encourage young women to take up technical education.

The admission procedure for all types of studies, i.e. bachelor, master and doctoral, is conducted in accordance with the Statute of the CTU in Prague. To increase the success rate, the faculties offer various types of preparatory courses to applicants. Study programmes are designed so that students as early as the first year are involved in research projects and cooperation with industry, where they have the opportunity to gain experience with international partners. Thanks to the state-of-the-art laboratories and testing facilities, students have the opportunity to orient themselves to the application sphere very early on, and some achieve honours already during their undergraduate studies.

The monitored data show that in 2022, CTU was running a total of 322 accredited study programmes, including 83 bachelor, 100 master and 139 doctoral programmes, both full-time and combined. Compared to 2021, the number of programmes increased from 315 to 322, of which 74 were foreign-language programmes. In 2022, a total of 17,316 students studied at CTU, of which 5,409 were women and 2,972 were foreigners, which is not a significant decrease compared to 2021. It can be concluded that in terms of longer-term development, the number of students at CTU is continuously decreasing, but the number of those from abroad is increasing. Over the last five years, women have accounted for almost a third of the total number of students at CTU. Detailed statistical data from the faculties and institutes of higher education are presented in the Table Appendix, Section 2. An overview of the current accredited study programmes of individual faculties and institutes of higher education is provided on the CTU website.

COOPERATION WITH THE APPLICATION SPHERE

With its study programmes, CTU responds promptly to the development of social challenges in all areas of its activities.

Support for the orientation towards the application sphere is already taking place at CTU in the framework of the involvement of first-year students in research projects and cooperation with industrial partners, both national and international. In order to support cooperation with the application sphere, individual faculties and university institutes nominate external

workers from practice to committees assessing bachelor's or master's theses and involve them in teaching. Most qualification theses are written according to the requirements of practice together with external experts. In specific examples, the application sphere is involved in the design and implementation of study programmes, assists in the assignment of thesis topics or is involved in consultancy activities in project management. The interconnection of teaching and practice is a very important evaluation criterion when studying at the CTU; the requirements of practice are transferred into the topics of qualification papers in accordance with the trend in the given field. In this way, students get acquainted with modern methods and approaches, increase their chances on the labour market and expand their employment opportunities after graduation. Individual faculties and university institutes approach the integration of practice into teaching individually and on the basis of subject specifics.

LIFELONG LEARNING, UNIVERSITY OF THE THIRD AGE, FURTHER EDUCATION

CTU also offers a wide range of lifelong learning activities and the University of the Third Age, U3A. Technical disciplines are given a lot of attention here as they are increasingly reflected in the social sciences. The further education offered by CTU is aimed at the employees themselves in the context of upskilling in career-oriented and preparatory courses. Lectures and courses are also aimed at interested members of the public. Vocationally oriented courses broaden the possibilities of a person's economic activities. Preparatory courses for university studies enable participants to broaden or consolidate their knowledge, especially in mathematics, physics and descriptive geometry, while foreign participants have the opportunity to obtain the necessary certificates for subsequent studies in the Czech language in language courses. The offer of courses within the framework of CVT provided by faculties and higher education institutes is published on the czv.cvut.cz portal and also on the websites of individual constituent parts.

The University of the Third Age is a specific, interest-oriented type of lifelong learning with the aim of personal development of the individual, not the acquisition of a university degree. The basic mission of U3A is to make university knowledge, knowledge and skills in the field of technical and natural sciences, history, culture, etc. available to people of post-productive age. It is aimed at people who are entitled to a retirement pension and have reached the age of 60. Graduates of U3A courses and programmes are issued with a certificate by the CTU in Prague, which is handed over after the end of the academic year at a festive assembly in Bethlehem Chapel. An overview of U3A courses is also published on the czv.cvut.cz website.

Within the framework of professional development of employees, the University focuses mainly on training programmes that address real situations in practice with the aim of improving qualifications.

Further education is also focused on the younger generation, within the University Primary School and the Lvíčata Kindergarten. Given the uniqueness of this education system, it is given its own space within the chapter on the Third Role.

The faculties and university institutes are involved in LLL according to their field of specialization.

The Faculty of Electrical Engineering presents itself to the general public through a number of popularization activities, the biggest tradition being Physics Thursdays. This is a regular series of lectures and seminars organized by the Department of Physics not only for its academic community but also for the wider public. The popularity of this cycle, which reached its six hundredth episode at the end of 2022, is evidenced by the viewership on the FEE CTU YouTube channel: the number of views of individual lectures is not exceptional in the tens of thousands, but we can also find lectures that have been seen by more than a hundred thousand people interested in technology. Physics Thursdays as a long-established brand is thus one of the most visible activities within the whole university.

The Faculty of Information Technology held open days on 13 January and 12 November 2022. There was also an open day for doctoral candidates (Ph.D.O.D.). Another traditional event was the Design Sprint Summer School, where students learned about the principles of prototyping and testing. The IT Summer School in cooperation with Czechitas was designed for secondary school students. For its students, the faculty organized every semester a career fair and a technology conference COFIT. Research events and conferences included the Prague Embedded Systems Workshop aimed at presenting the results of students in doctoral programmes and the international symposium Combinatorial Pattern Matching. The faculty organized the first annual Technology in Society Conference. Its students were also able to participate in the annual summer student research support programme - Research Summer at FIT (VýLeT). The opening of the new Robotic Agent Laboratory was also a major event in 2022.

The Faculty of Civil Engineering prepared a number of lectures by experts from practice and other professional departments, conferences, exhibitions, workshops, seminars and student competitions. For example, the second year of the Concrete Week event was held, when a unique bench was created in front of the faculty, or the Ignition 2022 conference, and the competitions Hall of the Year Junior for secondary school students and Hall of the Year Academic for university students were held. The faculty actively participated in the events Lesamáj, Open House Prague, ScienceFest, Researcher's Night and Summer School of Building Services Engineering. Three large-scale exhibitions were held in its atrium - „The Vltava River - Changes in the Historical Landscape", „Maintenance and Restoration of Cultural Heritage Buildings and Their Economic Aspects" and „Technical Monuments of the Elbe-Vltava Waterway". The faculty also organised a number of exhibitions in the FCE Gallery.

The Faculty of Nuclear and Physical Engineering, as part of the Czech Presidency of the EU Council, hosted the European Union Conference on the Use of Nuclear Energy for Hydrogen Production on 11 October 2022. The conference, co-organised by the Ministry of Industry and Trade of the Czech Republic (MIT)

and the Czech Hydrogen Technology Platform (HYTEP), presented the current situation in this field in Europe and the USA. The faculty also implemented online courses for secondary school teachers, after completing which participants received a DVPP certificate (continuing education of teaching staff). The Mathematics for Life event is organised by the faculty in cooperation with the Faculty of Education of Charles University.

The Faculty of Transportation Sciences was able to re-establish its Children's Transport Academy thanks to the lifting of pandemic measures. This very popular suburban camp is aimed at introducing children to transport issues in an effort to spark their interest in this very important field for the future of us all.

Students of the Faculty of Biomedical Engineering, study programme Security and Public Protection completed a training course at the 15th Engineer Regiment of the Czech Army in Bechyně. The challenging and interesting course included familiarization with the tasks and equipment of the Army of the Czech Republic in the field of civilian crisis management, demonstrations of equipment, work of military pyrotechnicians and training in self-defence, military climbing and obstacle course. The training contributed to a better understanding of the tasks, capabilities and capacities of the Army of the Czech Republic for civilian and military crisis management. Students of FBME security study programmes regularly participate in professional training courses in the field of civil protection and crisis management. Practically oriented courses for them in 2022 were eruditely prepared by professional partners, namely: ZZS Kladno, HZS Airport Praha, CBRN unit AČR Hostivice – Bře, SÚRO Praha, SÚJCHBO Kamenná u Příbrami, HZS Zbiroh a DP Praha (as part of a demonstration of the subway protection system). At the request of the Gymnasium Arabská Praha, students of the FBME programmes Medical Rescue and Civil Emergency Planning prepared a course on protection of people in emergencies for students of the 1st to 3rd grades, which included first aid. A team consisting of experts from the Department of Biomedical Engineering FBME CTU headed by Prof. Ing. Karel Roubík, Ph.D., with the support of the Czech Development Agency, is completing a two-year project aimed at introducing a new field of study in biomedical engineering in Cambodia, initiated by the Cambodian Ministry of Health. Students of the medical paramedic course were preparing to increase their competences in driving motor vehicles with the right of way in non-standard conditions at the polygon in Hradec Králové. After completing the course, the participants received a certificate. However, the more important outcome is the acquired skills, which the graduates can apply in practice and, thanks to this, manage a possible crisis situation without harm to health. In the first half of February, two two-day kinesiotaping training sessions were held for students of the Physiotherapy study programme at FBME. In May and June, FBME organized the first workshops of the MDR Certification series - Experience of MDR Certification by Ella-cs, s.r.o., and Experience with NB3EC International, a.s. From March to June 2022, FBME organized a series of professional seminars within the framework of lifelong learning at the CTU in cooperation with the Association of Manufacturers and Suppliers of Medical Devices, the Czech Society of Biomedical Engineering and Medical Informatics of the Czech Society of Medical Engineering ČLS JEP and the Czech Society for Medical Technology. It was a lecture series of experts in the field of quality systems, conformity assessment and creation of technical documentation of medical devices focused on systematic training in internal audits in meeting the requirements of EU Regulation 2017/745. During January 2022, employees of the Faculty of Biomedical Engineering participated in a LLL course entitled 3D printing for medical applications, organized by the Department of Clinical Engineering of IPVZ Prague, which is based at FBME in Kladno. The course was held in the premises which are also a training facility of IPVZ on the basis of a mutual agreement between FBME and IPVZ.

At the Masaryk Institute of Advanced Studies, for example, language courses for employees and the public, Czech language courses for foreign students and a specialisation course for coaches were implemented. English language courses were offered for primary and secondary school teachers, especially a supplementary didactic course, and a newly prepared course, Studies for Educational Advisers. In order to support the integration of foreign workers at the CTU, MIAS also implemented Czech language courses.

The Masaryk Institute of Advanced Studies, the Faculty of Mechanical Engineering, the Faculty of Transportation Sciences, the Faculty of Nuclear Sciences and Physical Engineering, the Faculty of Biomedical Engineering and the Faculty of Architecture were the most involved in the admission preparation courses. The Masaryk Institute of Advanced Studies was particularly involved in career courses. The Masaryk Institute of Advanced Studies, the Faculty of Mechanical Engineering and the Faculty of Nuclear Science and Physical Engineering again offered professional courses.

Most units participated in the U3A courses, namely the Masaryk Institute of Advanced Studies, the Faculty of Architecture, the Faculty of Biomedical Engineering, the Faculty of Civil Engineering, the Faculty of Nuclear Science and Physical Engineering, the Faculty of Electrical Engineering and the Faculty of Information Technology, as well as the Institute of Experimental and Applied Physics and the Institute of Physical Education and Sport.

In 2022, a total of 535 lifelong learning courses were implemented at the CTU, with a total of 4,193 participants, which is almost twice as many as in 2021. Most of them were oriented towards the performance of a profession, in the fields of information and communication technologies (242 courses) and arts and humanities (124 courses). There was interest from participants in courses specialising in arts and humanities, but also in science, mathematics, statistics, technology, manufacturing and construction. A total of 1 389 participants took these courses. The increasing interest in these courses may indicate that this is a significant shift in the quality of the education offered.

3

3 Students

MEASURES TO REDUCE ACADEMIC FAILURE

In 2022, teaching returned to the normal (contact) mode. The issue of academic failure was again given considerable attention. However, CTU has coped with these changes very well, as can be seen, among other things, from the results of the university-wide student survey. The overall academic failure rate has slightly decreased from 30.6 % to 30.0 % compared to 2021. The Faculty of Information Technology has seen a significant decrease, with a 5.7% drop in academic failure. The Faculty of Electrical Engineering has also seen a significant decrease, with a 4.7 %drop. In contrast, the Faculties of Civil Engineering, Mechanical Engineering and Nuclear Science and Physical Engineering have increased the rate, while the Faculty of Transportation Sciences has kept it approximately the same. A detailed analysis of the data and information on the structure of students in different disciplines and degrees, together with the scholarships distributed, is presented in the **Table Annex, Section 3.**

Every year it is evident that students come from secondary schools with different levels of mathematical knowledge and it is necessary to compensate for the huge difference at the beginning and prepare them for a demanding study based primarily on mathematical sciences. The Faculty of Information Technology has organized a regular Faculty Informatics Correspondence Seminar (FICS) for secondary school students. Upon successful completion of the FICS, a candidate can be admitted without an entrance exam. To facilitate the study at FIT, the faculty organizes a Preparatory Course in Mathematics for the first grade students. The Faculty of Civil Engineering offers preparatory courses in mathematics, the opportunity to take a „mock" mathematics admission test, and a preparatory course in drawing for applicants to the Architecture and Civil Engineering programme; first-year students can take advantage of intensive levelling courses.

The Faculty of Electrical Engineering also strives to adapt secondary school students to the demanding conditions of university studies by organising preparatory courses for the entrance examinations in mathematics and physics. The Embedded Technology Club is designed especially for students from secondary schools who want to broaden their horizons in the field of electronics. Introductions to practical electronics, programming, mathematics and physics are provided for already admitted candidates. The FEE also successfully tries to combine electronics and computer science with experiential pedagogy in the FEE Camp, where high school students develop their skills during a week-long summer stay on the banks of the Orlická Reservoir.

In 2022, the Faculty of Biomedical Engineering organised a week-long course for prospective first-year undergraduate students of BioŠrot 2022, which included an introduction to mathematics, biology, physics and chemistry. For students of Physiotherapy, a training course PhysioTmel 2022 aimed at presenting anatomy teaching and improving physical fitness was organised. In addition to these two courses, a regular introductory course for Paramedic students was also implemented to introduce them to the study at the Faculty, the content of their future work and the work of the IRS forces. The week-long stay also allowed them to get to know each other and lay the foundations for building a solid team. The Faculty of Transportation Sciences prepared courses aimed at reviewing secondary school mathematics and physics, preparing for university teaching and getting to know the teachers.

The Faculty of Nuclear Sciences and Physical Engineering has long offered its students the opportunity to take preparatory courses in mathematics and physics for matriculation and entrance examinations. In addition, all freshmen participate in Preparation Week, where the basics of mathematics and physics are discussed to balance their initial knowledge from various secondary schools.

Faculties and units try to eliminate academic failure during the first months of study. It is quite standard to offer, for example, elective courses, the so-called repetitoria, designed for the repetition of learned material or individual consultations with teachers and study advisors. Refresher courses in other professional subjects are commonplace. Different forms of already functioning or newly applied online mentoring have proved successful, involving both teachers and more experienced students. The teaching evaluation survey is an important tool for obtaining feedback from students and identifying problem areas.

In 2022, the Faculty of Mechanical Engineering used the outdated „two-speed" access system (accreditation of the B2341 Mechanical Engineering programme ends on 31 December 2024, no new students are admitted from 2021). The Faculty of Mechanical Engineering has obtained new accreditations for three- and four-year Bachelor's degree programmes, where the four-year study will no longer be primarily based on lower, beta level examinations. Managed monitoring of student performance based on a long-term data base has been significantly more successful in reducing student failure. Essentially, this involves

the use of ‚artificial intelligence' that can predict students ‚at risk' based on their performance in each week of the exam period or credit week. A profile of the failing student is established by internal quality management methods and tailored help is offered to the student based on knowledge of their behaviour from the credit week to about three quarters of the exam period. The students thus identified are offered targeted assistance in setting up a timetable for the remainder of the exam period, when a suitable strategy for meeting their study obligations can still be used to meet them according to the Study and Examination Regulations and progress to the summer term. Predicting the risk of failure in studies and informing the at-risk student in time to offer advice and assistance (without lowering the level) leads to success in most cases. However, compared to 2021, there has been a significant decrease in those seeking advice and assistance. Of the approximately 40 ‚at risk' students identified, only approximately 25% of those approached took up the offer of help. Even so, this targeted way of checking for academic failure leads to an increased likelihood of passing the critical first year and means about 15-20 new engineers per year.

The Masaryk Institute of Advanced Studies uses the LMS Moodle application, in which electronic courses are available, including a variety of study guides, texts, worksheets, didactic tests, discussions, methodological guides, instructional videos, etc. The KOS information system is used to monitor the level of academic failure within individual years, semesters and courses, which is evaluated throughout the study, including indicators relating to the percentage of successful completion of studies. These statistical summaries are used in particular by the programme guarantors and the coordinator for student affairs, who regularly evaluate the failure rate and propose measures, such as specific adjustments to course content and didactic approaches to teaching.

The Faculty of Nuclear Sciences and Physical Engineering offers students in their first year the opportunity to enrol in courses such as Mathematical Minimum 1 and 2, which complement the mathematical and physical fundamentals. In addition, the faculty has a Tutors' Association which provides free tutoring to all students. Tutors are recruited from among the senior students and work under the guidance of the Vice Dean for Education.

FINAL DECISIONS ON ANNULMENT

During the year 2022, no final decision was issued at the CTU in Prague on the invalidation of the state examination, its components or the defence of a dissertation, or appointment as an associate professor pursuant to § 47c, § 47f and § 47g, or pursuant to § 74a, § 74d and § 74e of Act No. 111/1998 Coll., on Higher Education.

MEASURES TO LIMIT THE PROLONGATION OF STUDIES

The return to contact teaching was key for the faculties and units. The maximum capacity for tutorials was reduced so that practitioners could give more individual attention to students. Further refinement of the Study and Examination Regulations took place during 2022. At FBME, so-called Citation Thursdays were also implemented, mainly for final year students, offering consultations on citations, citation management and copyright.

The Masaryk Institute of Advanced Studies has focused on recommending model study plans, and has also strengthened information and guidelines for writing qualifying papers.

The Faculty of Biomedical Engineering, within the framework of the international project ITEM, Innovative Teaching Education in Mathematics, which ended on October 31, 2022 and within the framework of which real examples from the practice of biomedical technicians and engineers were prepared according to the method of RNDr. Eva Feuerstein, Ph.D., verified the use of interactive visualization of mathematical solutions in the Matlab Web App Server environment. These examples with visualizations have already been used in teaching. It was statistically proven that the new approach, i.e. using the solution of given problems in pairs with the constant possibility of teacher's assistance and at their own pace, is beneficial for the students and they achieve better results than before its introduction. In addition to learning outcomes, motivation to get a better result has also increased.

Another motivational tool for limiting the extension of studies is the assessment of fees for exceeding the standard period of study increased by one year in accordance with the CTU Statute.

FOUNDATIONS, GRANTS, SCHOLARSHIP PROGRAMMES

The scholarship is a motivational element that supports particularly talented or otherwise outstanding students at CTU. The support is directed towards participation in study stays abroad and at faculty events, as well as a reward for an excellent bachelor or master thesis, or for the best studio projects. Of course, the scholarship programme can also be used in difficult social situations in order to successfully complete the studies. Each faculty approaches the use of scholarship programmes differently, but always in accordance with the CTU Scholarship Regulations. In addition to the traditional rewards mentioned above, many of them have also proceeded to support successful secondary school students or the best first grade students for excellent presentation of the field or faculty, which overall contributes to the good reputation of CTU. There is also the „Gifted Students" scholarship, which targets bachelor and master students who are involved in research projects and co-author research publications or participate in (inter)national competitions.

INFORMATION AND ADVISORY SERVICES FOR STUDENTS

Information and counselling services are provided through the CTU Centre for Information and Counselling Services, the CTU Career Centre and the ELSA Support Centre for Students with Special Needs. They are used by all faculties, with an emphasis on continuous improvement of the professional qualifica-

tions of the staff of these centres and the quality of the services provided in accordance with the individual needs of students. The aim of the Information and Counselling Service is to act as a low-threshold facility for CTU students, applicants for study and the general public. To be a friendly place, open to all, helping, with an emphasis on the individual and their individuality. To foster a quality relationship between the student and the university and to co-create the conditions for successful studies and professional and personal life. The Centre for Information and Counselling Services also organises thematic seminars and lectures to promote study skills and for the personal development of students. There are also workshops (music, art or drama) aimed at fostering the creativity of technically inclined students.

CENTRE FOR INFORMATION AND COUNSELLING SERVICES OF CTU (CIPS)

The Centre for Information and Counselling Services of the CTU supports students to be successful in their studies as well as in their professional and personal life. Already at the time of enrolment, it focuses on first-year students, and individual care is provided to anyone who has any problems entering the university. Everyone receives the information that at the centre they will find support and help in solving problems that occur not only in the academic and social adaptation to the new environment, but also in the course of further studies.

CTU students have the opportunity to take advantage of individual academic, psychological, socio-legal and spiritual counselling with special emphasis on dealing with situations of academic risk. Throughout the academic year, the centre organises events with the intention of providing students with the opportunity to acquire the necessary competences for their academic, professional and personal life. During the semester, seminars, lectures and workshops are organised to promote study skills and creativity, and for personal development.

Other forms of counselling are also offered to students: coaching, speech counselling, financial counselling, psychological counselling for international students, support for female students at CTU, group work and seminars for doctoral students.

The efforts of the centre are aimed primarily at creating an environment for CTU students that minimizes the obstacles they encounter during their studies and that affect the number of those who drop out of their studies prematurely and unnecessarily. CIPS has a particular focus on working with students who have problems with procrastination and computer dependency. The centre cooperates intensively with the ELSA Support Centre for Students with Special Needs and with the study departments of individual faculties and higher education institutes. It provides its services in both face-to-face and online formats.

CTU CAREER CENTRE

CTU in Prague is a certain insurance for its graduates for future employment, thanks to its unique position and perception by companies and future employers. All faculties or university institutes cooperate with the private sector to the best of their abilities, and therefore graduates have the opportunity to join the workforce immediately after graduation. At the same time, the CTU, through its Career Centre, provides services for the personal development of students and their preparation for future professional success. In this respect, there is a personal counselling centre where it is possible to prepare for a job interview with psychological diagnostics.

Of course, the services provided include advice on how to prepare a quality CV together with a cover letter. An important service is career counselling, which can analyse weaknesses and strengths along with the appropriate work style and effectiveness and recommend a direction.

In general, the centre helps students to know themselves and to be able to apply their strengths in what they do. It introduces them to the workings of the labour market and helps them to increase their attractiveness to employers, whether by improving their self-presentation or by gaining work experience. It also teaches them to think entrepreneurially and helps them to explore whether a career in science, business or as an employee is more suitable for them. It complements subject-specific knowledge with today's much-needed soft skills, especially communication skills and other skills that are needed in life. It also helps to find solutions to career, study or personal problems, transmits the right contacts and motivates students to solve the situation. The services of the Career Centre can be used not only by CTU students, but also by graduates up to three years after graduation, and now also newly by CTU employees. The centre uses various methods of coaching, mentoring and personal testing. Last but not least, the centre participates in fairs and student events, maintains Facebook and a website where it advertises job positions and informs about its services. It also represents student services at open days. For its successful functioning, cooperation with companies and maintaining awareness of the development and needs of the labour market as well as regular training of its staff is essential.

SUPPORT FOR STUDENTS WITH SPECIAL NEEDS

Students with physical, visual and hearing impairments, specific learning disabilities including ADHD (attention deficit hyperactivity disorder), autism spectrum disorder and other difficulties (chronic illness, psychological disorder or disease, impaired speech and other communication skills, etc.) are served by the ELSA Support Centre for Students with Special Needs as a department of the Department for Education and Student Affairs of the Rector's Office of the CTU. The service of the centre, which by its nature goes beyond the scope of professional counselling, was provided in accordance with the valid document of MEYS which defines the general conditions for the provision of studies for students with specific needs and contains a methodological standard for their implementation. A complementary document was the methodological instruction of the Vice-Rector for Studies on the support of students with specific needs at CTU. Modifications of study conditions are carried out in close cooperation with faculties and institutes of CTU mainly through direct work of lecturers, contact persons and study department officers. Through the ELSA Support Centre for Students with Special Needs, cooperation is already implemented during the entrance

examinations. When filling in the electronic application form, applicants with special needs have the opportunity to request adjustments to the entrance examinations and study conditions due to their disability. Teachers at faculties and institutes of higher education are regularly informed about students with special needs who are registered at the ELSA Centre and are provided with instructions on how to communicate and work with such students.

In 2022, there were 363 students with special needs registered at CTU. Due to the high increase in their number, there was a need to expand the staffing of services. These students are offered the opportunity to secure study literature in accessible form, to use the ELSA Centre's digitisation and library services, visualisation and note-taking services as well as sign language interpretation including simultaneous transcription. Personal and study assistance also plays a very important role, together with technical services consisting in lending special technologies and aids. In the ATELION Assistive Technology Studio, a specialised workplace of the ELSA Centre, technical facilities for students with visual impairments have been extended.

The services offered by the centre include functional diagnostics, diagnosis of specific learning disabilities and related regimes such as modification of the course of teaching and examinations, together with individual teaching and time compensation. The centre's staff also attended to students who, as a result of the war in Ukraine, required the implementation of support measures related to their deteriorated physical and psychological condition.

The centre's staff, together with freelancers, implemented a series of seminars designed to support study strategies, find motivation to study, overcome procrastination or master challenging subjects such as mathematics or English. The centre's services are also aimed at incoming international students.

New in 2022 were two events for students with special needs. The first one, the ELSA study boost, was for newly entering first year students who received information within two days about the ELSA Centre and the support system itself. In addition, there were three blocks of lectures on mental health, time-management and working with texts. The second event was Picnic with Elsa, an informal meeting of students registered at the ELSA Centre and their counsellors. The students shared tips with each other on how to manage their studies mentally well, what helps them in their studies and what not to forget while studying.

The ELSA Centre together with the CTU Career Centre created the Extra Career Programme - a career counselling programme for students with specific needs at CTU. It focuses on orientation of students with specific needs on the labour market, the importance of self-knowledge and career targeting, opportunities to inform employers about specific needs, strengthening strengths and communicating one's own needs.

To raise awareness of the services of the ELSA Centre among CTU students and staff, its staff recently participated in a first-year orientation course and several open days. As a result, many students with special needs were able to make contact.

The ELSA Centre has created new promotional and information materials reflecting its services. In addition to roll-ups or posters, these include study planners to help students with time-management and bookmarks for books „Look out, script!" . Contributions to the general awareness campaign to improve mental health are the new online manual The Undergraduate Mental Health Handbook, the information leaflets „5 Steps to Mental Wellbeing for Undergraduates" or awareness leaflets on crisis management, which were distributed to all CTU units.

SUPPORT FOR EXCEPTIONALLY GIFTED STUDENTS

Excellence is one of the goals that move the entire university to a high level in the perception of society. CTU in Prague is aware of the necessity to support exceptionally gifted students who in the future may be part of excellent scientific teams not only in the Czech Republic but also internationally (the project „Gifted Students" was mentioned in the chapter Scholarships). The actual support and search for such students starts already in secondary schools, in the form of excursions, visits and discussions with students of secondary vocational schools. Internships for secondary school students at specific faculties have also been successful projects. The Faculty of Architecture, for example, is making contact with gifted secondary school students in the form of educational workshops on architecture and its study.

In 2022, students of the Faculty of Transportation Sciences participated in the prestigious Transport Construction of the Year competition, where the main student competition was won by Ing. Matěj Šilhán with his study of the Frýdlant bypass. This competition is highly valued by practitioners and students apply for it with their diploma theses. The final theses are also awarded at the Faculty of Transportation Sciences by the prize of Prof. Ing. Jaroslav Vlček, DrSc., in three stages. It has also organised the 14th annual Dean's Prize of the FTS, a competition for secondary school students with a transport theme, whereby the awarded students are allowed to be admitted to the FTS without an entrance examination.

The Faculty of Biomedical Engineering held open days for the public, as well as for faculty schools and other interested students from primary and secondary schools. The Masaryk Institute of Advanced Studies regularly organises open days, but also cooperates with secondary schools in the preparation of future teachers, where projects are also addressed, the outputs of which increase the attractiveness, competitiveness, or material and technical equipment of secondary technical schools. Several lectures have also been held in secondary schools, both in person and online.

Talented students from the Faculty of Architecture have the opportunity to participate, for example, in the research activities of individual departments as student researchers and are sent on foreign stays. The Faculty of Architecture has long been cooperating with important foreign architectural offices and prestigious European studios.

Every year, the Faculty of Information Technology announces a summer student research programme - Research Summer (VýLeT), which financially supports talented bachelor and master students and enables them to engage in scientific research activities at the Faculty and leads them to independent scientific work and publishing.

The Faculty of Nuclear Science and Physical Engineering has been a long-term partner of secondary school competitions and Olympiads and supports successful students who graduate in the first semester and meet the rules for the award of an extraordinary scholarship with a one-off amount of CZK 10-15,000 depending on the type of secondary school competition they have attended.

SUPPORT FOR STUDENTS IN DIFFICULT LIFE SITUATIONS

CTU in Prague is attended by over 17,000 students who go through many life circumstances in the course of their studies and need to be helped. The faculties take an individual approach to dealing with each student. At the same time, it is possible to use the services of CIPS and ELSA centres, offered to students of all CTU units.

To overcome socio-economic disadvantages, social or special-purpose scholarships are awarded on the basis of an application and the provision of appropriate documents proving a difficult living situation. Students with socio-economic disadvantages are also identified on the basis of individual work by study officers or coordinators with whom they address their specific needs. In addition to financial assistance, the possibility of, for example, curriculum adjustments or other forms of benefits are used.

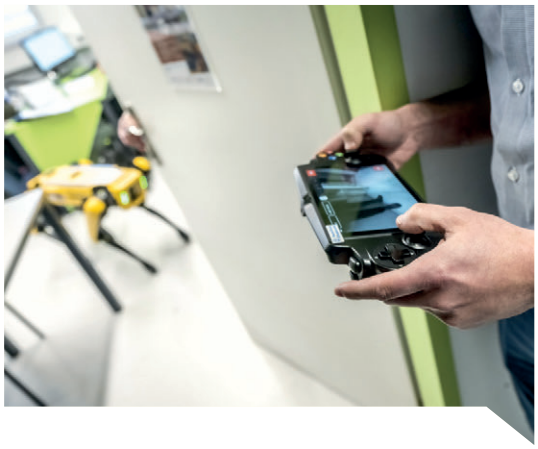
After the Russian invasion of Ukraine, the centre organised interviews with students-refugees who were interested in studying at the CTU in Prague. In addition to providing support, adapting to the new environment and choosing a suitable study placement, they were also provided with other counselling services according to their current needs. A total of 400 student-applicants from Ukraine benefited from these services and a large number of questions were answered.

Of course, the centre continued to focus on the current students of the CTU in Prague, whose lives were also touched by the war in Ukraine.

SUPPORT FOR STUDENTS IN THEIR ROLE AS PARENTS

The role of a parent is no doubt very important and needs to be taken care of. The role of the student's parent is multiplied and it is also up to the university what conditions it prepares for those who have entered this role in the course of their studies or who have already started the university as a parent. Already in previous years a modification of the Study and Examination Regulations has been applied in practice, under which the maximum duration of studies and the time limit for fulfilling study obligations for student-parents have been extended. Other measures are also being taken by CTU units, such as modification of studies, counselling on the development of an individual study plan, taking into account interruptions of studies in terms of adjustments, and deduction of the recognised period of parenthood from the total period of study. The CTU in Prague is the founder of the University Primary School and Kindergarten Lvíčata, which enables CTU students and employees to place their children there. The school focuses mainly on technical and natural sciences. They are part of the university, they are involved in its life.

In addition, the Dean of the Faculty of Electrical Engineering, for example, awarded students in the role of parents a Christmas scholarship for the second year in a row. The contribution for one child is CZK 10,000 as a thank you for their active contribution to the education of the new generation.



4 Graduates

COOPERATION WITH GRADUATES

It is customary for individual faculties and institutes to hold social and professional events to maintain relationships with alumni. The Klokner Institute holds an annual Christmas concert. The Faculty of Information Technology regularly organises a meeting of alumni in February and November, who are very happy to get together informally and share their work experience. The constituent parts continued to maintain regular communication with their alumni, e.g. the Faculty of Architecture sends out an e-newsletter and systematically strives to present alumni, and thus the CTU brand, in the media. The Faculty of Civil Engineering communicates with its graduates via social networks, and other units use similar tools. Many of its alumni are also registered for the Faculty of Electrical Engineering's monthly newsletter. Moreover, the faculty managed to organise an alumni meeting under the banner of the Elektra Club again in October 2022 after a covid break.

The Faculty of Transportation Sciences and the Klokner Institute, for example, benefit from the direct involvement of alumni, who maintain contacts, among other things, by serving on state final examination committees. Graduates become opponents of final theses, evaluators and supervisors of student projects or lecturers in professional courses and practical exercises.

Through communication with its graduates, the Faculty of Biomedical Engineering receives valuable comments on the content of studies, according to which it adjusts the curricula and course outlines in the framework of the newly prepared accreditations. Many graduates, especially of specific disciplines such as optics and optometry, participate as experts in various professional conferences.

In 2022, FBME prepared the Alumni Awards competition, which was presented for the first time to outstanding alumni of the faculty. From very high quality nominations, the committee, consisting of teachers, students and external experts of FBME, selected the first awarded alumni: Ing. Markéta Icha Kubánková, Ph.D., and Jan Rieger, MSc. The awards were presented to them on 20 October 2022 in Bethlehem Chapel on the occasion of the graduation ceremony of the follow-up master's degree programme in Biomedical Engineering.

On 21 October 2022, the academic staff, employees and students of the Department of Health and Population Protection FBME organized XII. year of the student scientific conference Aspects of the work of the helping professions - AWHP 2022. This year was rich in interesting lectures on the work of the IRS and also the helping professions, fourteen of which were presented in three blocks.

The CTU Career Centre helps to maintain contacts with graduates and to promote some of their successful projects. This cooperation is important for retrospective evaluation of the success of studies, mapping of employment and feedback from employers. An overview of the number of graduates is included in the **Table Annex, Section 4**.

MONITORING EMPLOYMENT AND EMPLOYABILITY OF GRADUATES

Employability of CTU students is a very important feedback for the university about the quality of studies and its interconnection with practice. It is also important for applicants who assess their interest in studying with an evaluation of their subsequent employability on the market. Employability is primarily supported by the CTU Career Centre and the database of advertised jobs, temporary jobs and internships suitable for students and recent graduates, which is maintained and regularly updated on the website www.kariernicentrum.cz. The traditional Mentoring programme is another way of supporting students' employability, thanks to which they gain practical experience in their field and establish further cooperation. In this programme, we work closely with CTU alumni who act as mentors for selected students. The centre also facilitates thesis topics commissioned by companies. Another way of supporting employability is through personnel counselling centres, where students can obtain information about the labour market directly from personnel specialists from technical companies.

Generally speaking, the employment rate of graduates has been high in the long term, as confirmed by surveys of individual faculties by employers, who are particularly satisfied with their good technical knowledge. The Faculty of Information Technology regularly ranks at the top of rankings that compare the success of graduates in transitioning into practice.

At all CTU constituent parts it is said that a weak point is the systematic acquisition of feedback from employers. A newly introduced measure is the so-called Study Programme Councils, where one of the members is always a representative from the employers of students of a given study programme.

COOPERATION WITH EMPLOYERS

Most of the graduates are employed in the field they studied and their employment is very good.

CTU in Prague is closely linked to highly specialised areas, where experts from practice often work closely with faculties. Mutual recognition comes already during studies, when students and future employers have the opportunity to meet at professional seminars or during specific projects, in which both academia and the private sector are involved. External experts are members of examination and expert committees of state final exams or during the organisation of student conferences at the faculties and institutes of CTU. They also act as consultants for bachelor, diploma and dissertation theses, or even as their direct commissioners.

Students also gain practical skills and knowledge during compulsory work experience. Employers and professional organisations are also involved in the process of improving the content of study programmes and consultations in the preparation of study programme re-accreditations, such as at the Faculty of Biomedical Engineering. In addition, employers are very interested in graduates, a video spot was also filmed with BTL Medical technologies s. r. o., where the director Ing. Tomáš Drbal and former FBME graduates describe the current needs, but also the strengths and quality of FBME graduates.

Other important forms of cooperation between faculties and employers also include cooperation between the academic and application spheres on the assignment of the topics of bachelor, diploma, and even dissertation theses, often accompanied by a job offer for the author of the assigned work. This is an established practice of the Faculty of Architecture or the Klokner Institute (cooperation with ČEZ, a. s., ŘSD ČR, etc.).

The Faculty of Civil Engineering offers companies in the field a contractual form of cooperation. A very successful activity is the so-called Technical Thursdays, focused on current topics in the field of construction, prepared in cooperation with representatives of companies and experts from the ranks of academics. The faculty is still involved in the Koordinuj.cz project, which organises the so-called Arenas, professional meetings of selected companies and interested students.

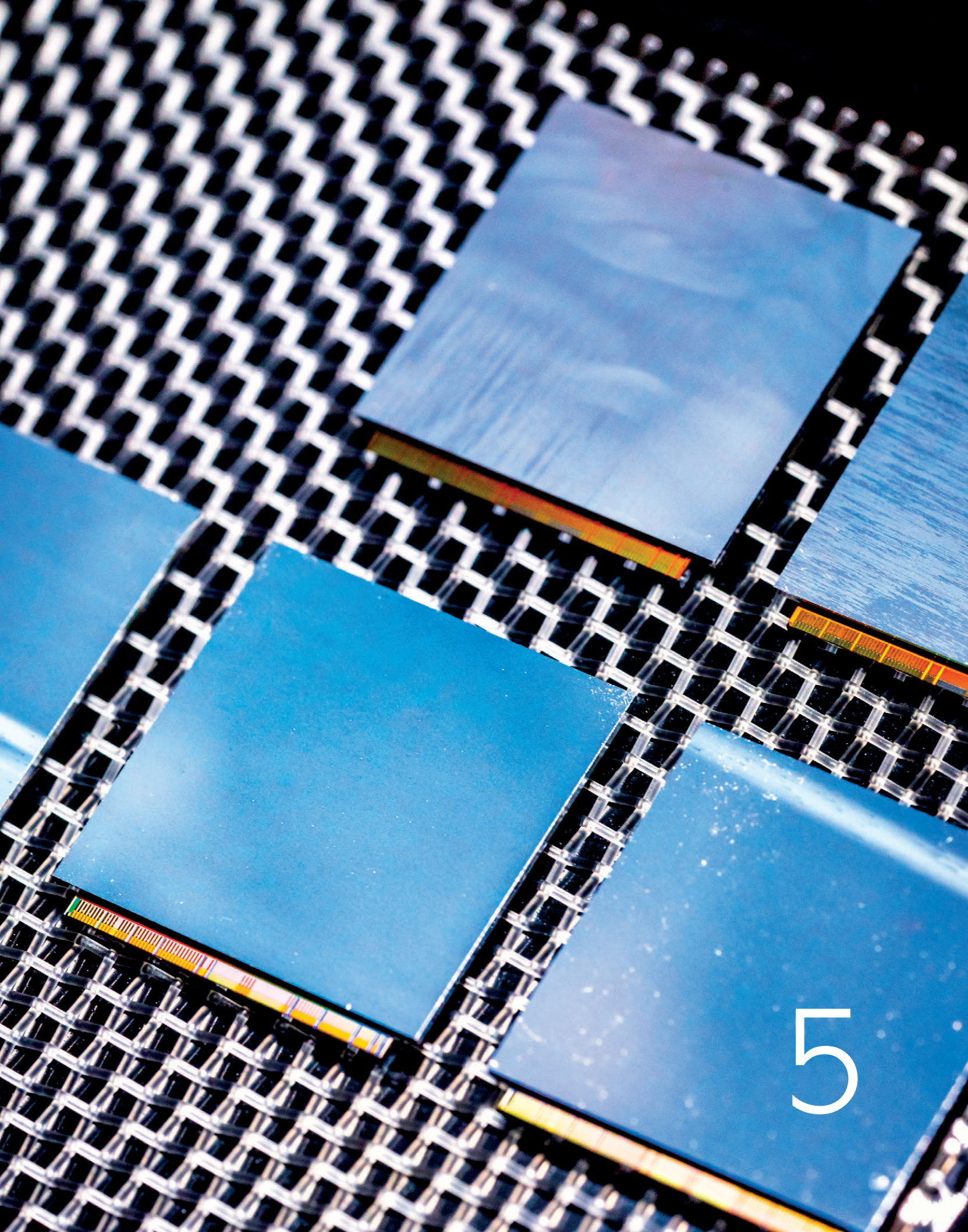
At the Faculty of Transportation Sciences, cooperation with potential employers of graduates is one of the key points. The main tool for this connection is the Career Day, which in 2022 took place on 6 April, where 30 companies presented themselves to students with specific offers of cooperation during their studies or permanent employment after successful completion of FTS study programmes. At the same time, with the arrival of the new dean, Prof. Ondřej Přibyl, the existing form of cooperation was expanded by a new advisory body of the dean - the Industrial Council, which consists of more than 20 personalities from major companies and institutions. A new form of direct support for doctoral studies is the Industrial Scholarship.

The Faculty of Information Technology offers employers an established FIT Partner/FIT Sponsor programme, which allows them to influence the focus of students and thus directly participate in the formation of graduates. The traditional COFIT Career Fair, where students can connect with companies, browse collaborative offers and participate in workshops with sponsors, was held on October 11, once again in person.

The Faculty of Mechanical Engineering and the Faculty of Electrical Engineering have come to the attention of companies by organizing Career Days. The two-day event, which included an accompanying professional programme, took place on 20 and 21 April 2022 at the premises of both faculties in Dejvice. Their aim was to enable direct contact of nearly five and a half thousand students of both faculties with employers of various sizes, ranging from giants of Czech industry to small progressive start-ups.

The Masaryk Institute of Advanced Studies successfully cooperates with 15 faculties over a long period of time. A pilot compulsory elective internship course was added to the Economics and Management study programme, which has already been used by dozens of students. At the same time, the companies and institutions where students go for internships were invited to the Partner Companies Fair, which was of great interest to students.

Students of the Faculty of Nuclear Sciences and Physical Engineering can apply for the ESCO trainee program thanks to the long-term partnership with CEZ Group, and in summer they participate in the Summer University at Temelín NPP or Dukovany NPP. In addition, the Student Union at the FNSPE CTU in Prague once again organized a career fair Catch Me at Jaderka, which is of great interest to both companies - exhibitors and students. As a novelty, the faculty included the Startup Project among the elective courses, which motivates and supports students to start their own business. The course is taught in cooperation with Presto Ventures and other partners from the commercial sphere. One of the outcomes in 2022 was the launch of the Million for Startups competition to support new startups by our master's students or recent graduates.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5 Interest in studies

ENTRANCE EXAMS

The entrance exams at the CTU in Prague are organized annually by individual faculties, which use their pedagogical background to set up a system of verification of the candidate's knowledge and subsequent evaluation. A total of 14,166 applications were submitted for admission to the bachelor's degree in 2022, and 7,477 applicants were admitted. 2 856 applicants were admitted to the follow-up master's degree. The total number of students finally admitted in 2022 was 10 568, including doctoral studies, of which 10 333 for bachelor's and master's degrees. The 2022 figures show a slight increase compared to 2021. A more detailed analysis of the data is included in the **Table Appendix, Section 5**.

Entrance examinations to the bachelor's degree of most faculties are aimed at verifying the ability to solve problems in the range of secondary school mathematics independently. All faculties and the Masaryk Institute of Advanced Studies prepare their own tests and their experts compile them specifically according to their own needs to test the abilities of future students in particular areas. Most of the admission tests are single-round, the exception being the Faculty of Architecture, whose two-round admission procedure consists of a talent test in the first round (art exam, spatial imagination test) and the second round consists of tests in general overview and general study prerequisites.

After the „covid" admission of applicants without entrance exams, the Faculty of Mechanical Engineering has returned to its own entrance exams in mathematics in 2022, corresponding to the standard matriculation exam, as well as to selection exams corresponding to a higher level, the so-called Mathematics+. At the Faculty of Transportation Sciences, candidates who have passed the common (state) part of the matriculation examination do not take the written examination. The final score is determined on the basis of the results of the matriculation examination, taking into account the pass mark in the subjects of mathematics and physics. The written examination in mathematics and English was taken only by candidates in the Professional Pilot course.

At the Faculty of Biomedical Engineering, the entrance examinations for the academic year 2022/2023 were conducted in the form of written tests. They were provided by own resources, both for bachelor's and master's degree programmes. The tests were in the areas of mathematics, biology, physics, chemistry and computer science, according to the programme of study.

The Masaryk Institute of Advanced Studies has a written entrance exam that is provided by its own resources and evaluated thanks to a license from Acrea - Remark Office OMR, which it owns.

Overall, we can summarize that in the case of the master's programme, entrance examinations are conducted in different forms, according to the priorities of individual faculties. Most use different tests, the form of which varies according to the focus of the study. Another option used is oral interviews. At the Faculty of Architecture, for example, the admission procedure is conducted in two rounds, with a portfolio assessment in the first round followed by an oral interview. The Faculty of Nuclear Sciences and Physical Engineering, which waives the entrance examination for all applicants for bachelor's studies, tests knowledge of mathematics and professional subjects according to the chosen study programme in the follow-up master's studies.

COOPERATION WITH SECONDARY SCHOOLS

The cooperation between CTU and secondary schools is constantly improving and expanding. Participation of the units in national and international fairs and the use of various communication platforms, including new media, is a matter of course.

In 2022, the Faculty of Civil Engineering continued its cooperation with secondary schools - the Secondary Technical School of Construction in Dušní and the Secondary Technical School in Duchcov. It also has a very good concept of presentation on social media - it manages FB pages and several FB groups, Instagram, YouTube and, within the CTU platform, a LinkedIn account. The website Srdcem stavaři (Builders at heart) presents interesting moments from projects, studies, experiments, etc. in the form of videos and podcasts and thus contributes to the popularization of professional and scientific research activities. In addition, the faculty operates the portal stavarna.online, which hosted online open days.

The first year of the Technology Olympiad, organized by the Faculty of Electrical Engineering, took place. The winner was the Kosora team from the Gymnasium Mnichovo Hradiště. Out of 1,161 students from gymnasiums and vocational secondary schools across the Czech Republic, 71 secondary school students competed in teams of up to three. The Technology Olympiad aims to contribute to a better understanding of the trends that drive the world today and to inspire their study.

At the beginning of May, the FEE CTU Robocompetition for the 2nd grade of primary schools and the corresponding classes of multi-year grammar schools took place in three days. A total of 85 teams from all over the Czech Republic participated. The best competed in a live television superfinal, won by a team of students from Wichterle Gymnasium in Ostrava-Poruba. In November, four rounds of the Robocompetition for secondary school teams took place. The top 35 groups qualified for the final in December. The same day was also the final of the 10th Electrotechnical Olympiad, which was won by Marek Hanus from the Secondary School of Electrical Engineering and Informatics in Rožnov pod Radhoštěm. The Faculty of Electrical Engineering also prepared events for secondary school teachers. In February and September, LEGO experts showed them tips on how to diversify their teaching with advanced building blocks in a LEGO seminar. In early December, the faculty organised a three-day autumn school of physics with a packed programme. The event was attended by teachers from the 12 faculty schools as well as from a number of other schools in the country.

In 2022, the StreTech conference, which the Faculty of Mechanical Engineering organizes together with secondary schools, was held again after a two-year „covid" break. At this conference, secondary school students present their work in front of the teachers and students of CTU, and they were also invited to the „Taste Engineering" event, which took place at the Faculty of Mechanical Engineering on 22 and 23 June 2022. During the conference, they could experience university teaching in the lecture hall, see the laboratories and try out the accommodation in the student dormitories. This event was followed in November 2022 by a seminar on „Perspectives on Modern Mechanical Engineering", for secondary school mathematics and physics teachers. During lectures and laboratory tours, teachers were able to learn about the latest findings in science and technology that they can apply in their teaching work.

For the ninth time, CTU participated in the Researcher's Night. The event is a regular destination for many secondary school students who are thinking about the direction their studies should take. Visitors were able to learn about interesting projects prepared by the university and take a look at the premises that are not open to the public during normal operation.

On the occasion of the Day of Girls and Women in Science (11 February), the Faculty of Electrical Engineering and the Faculty of Nuclear Sciences and Physical Engineering organised the event Become a Woman Scientist for a Day, which was attended by 80 female secondary school students. The female scientists presented their work in laboratories, workshops and lectures.

The Faculty of Transportation Sciences has launched a new web portal www.rozhybejbudoucnost.cz, which is dedicated to bringing the study at the faculty closer to secondary school students. This new dynamic tool for study applicants has seen high traffic from the first days and together with the newly built social media promotion, we have already seen an increase in new applicants during the second round of applications for study. The entire campaign is based primarily on demonstrations of employability in practice after graduating in transport, logistics and telecommunications. Combined with a number of other promotional events, such as open days, the Science Festival and the Researcher's Night, the Faculty of Transportation Sciences has been making itself known to prospective applicants since primary school.

The Faculty of Biomedical Engineering, which also cooperates with primary schools (in 2022, it organised several excursions with practical demonstrations, some of which focused on physics), organised open days on 28 January and 21 November for those interested in studying, especially from secondary schools. Students were able to see the laboratories and unique faculty facilities, and during the January date, they were also able to view the „Students in the Time of Covid" photo exhibit, which featured stories of FBME students who helped during the pandemic. On 21 January, a special open day was prepared for students of the E. Beneš Gymnasium in Kladno.

In 2022, the Gymnasium Jaroslav Vrchlický, Klatovy, became a faculty school of FBME. On 26 January, FBME prepared a full-day program for grammar school students with experiments in nine laboratories of the faculty. At the request of the Gymnasium Arabská Praha, students of the Medical Paramedic and Civil Emergency Planning programmes prepared a course on human protection in emergencies for pupils of the 1st to 3rd grades, which included first aid.)

At the PLNOC 2022 event (7-8 October 2022), a lecture night in Pilsen, students of the Paramedicine study programme were invited to give lectures to secondary school students. This was the third year of the event, which is organized by the Gymnasium Pilsen at Mikulášské náměstí. Our students prepared a first aid workshop for the visitors. Those interested could try how to react properly to unexpected serious acute conditions (e.g. circulatory arrest, stopping massive bleeding). Students of higher years of Gymnasium Pilsen were introduced to the study programs of our faculty and answered questions about studying and student life at CTU.

The Faculty of Information Technology hosted the Design Sprint summer school. The Czechitas IT Summer School offered girls aged 14-19 the opportunity to learn the basics of IT technology and visit the faculty's laboratories. Open days were held in person and included lectures on undergraduate studies and admissions. These could be watched live from the stream or back from the recording. The 9th edition of the FIKS competition - the FIT Information Correspondence Seminar - was also held, the successful solvers of which were admitted to the faculty without entrance exams. There is a long-term cooperation with the Arabská Gymnasium, which is one of the first secondary schools in the Czech Republic to offer the field of programming/informatics.

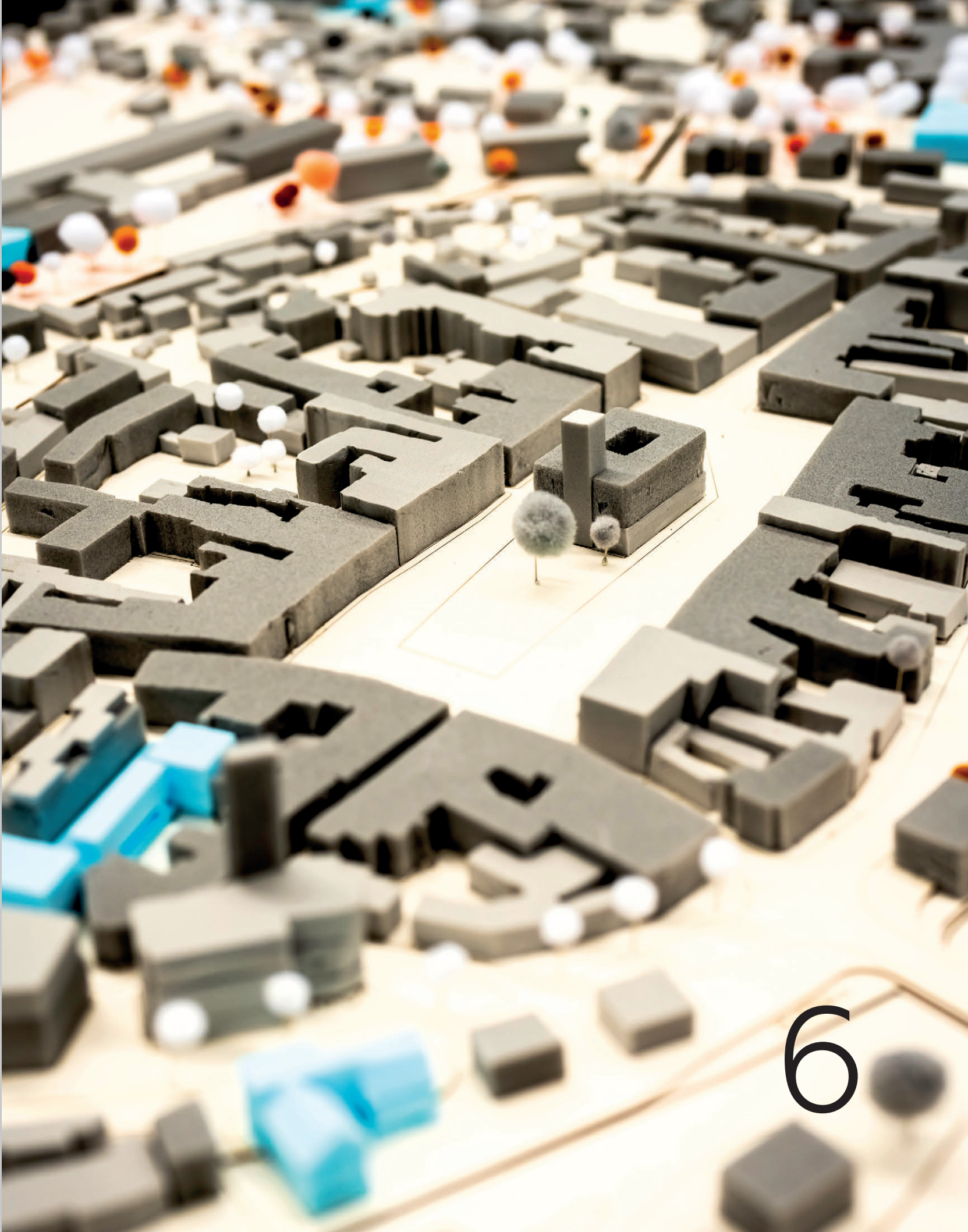
The Masaryk Institute of Advanced Studies continued its cooperation with secondary schools, especially in connection with the preparation of future teachers. At the same time, it implemented a number of lifelong learning courses for secondary school teachers, traditionally in language and newly focused on educational counselling. Specialist lectures were also given in secondary schools, and teachers from the Masaryk Institute of Advanced Studies assisted in consulting in secondary school vocational activities.

The Faculty of Nuclear Sciences and Physical Engineering has offered an online educational programme for schools on

the issue of radioactivity called The Sparrow Flies to Schools. More than 160 schools participated in ten dates, and in addition to the broadcast itself, educational material and a test of acquired knowledge were created and freely available to secondary school teachers. The Technical Club was then held at the detached office in Děčín and was attended by 77 pupils from 12 secondary schools, three primary schools and even one kindergarten. In addition, the faculty once again opened its premises to interested secondary school students as part of the Day at Jaderka. Students toured a number of departments and facilities where they could work if they chose one of the programs offered by the faculty. As every year, the GOLEM tokamak and the newly built PlasmaLab@CTU attracted great interest.

In July, the 6th year of the Children's University took place. For one week, the participants got acquainted with interesting departments of individual faculties and also the CTU Central Library. About 250 children from 1st-8th grades of primary schools participated. The university was concluded with a „graduation" in Bethlehem Chapel.

In July, the Rector's Office of the CTU in Prague organized an experiential suburban camp for children from families of Ukrainian students and CTU staff under the name Science for Children. The camp was held with the support of the Rector doc. RNDr. Vojtěch Petráček, CSc., and the management of faculties and units of CTU, under the auspices of the Vice-Rector for International Relations Prof. Ing. Oldřich Starý, CSc. The event was attended by 31 children aged 8-14 years.



6

Ing. Veronika Kramaříková, MBA
Vice-Rector for Development
and Strategy, from 6 November 2022
temporarily appointed Bursar

„Without quality academics staff and employees it would not be impossible to function and there would be nothing to develop. Therefore, CTU supports the development of human resources by creating appropriate conditions for professional growth and for work itself. "

6 Employees

The total number of CTU employees has slightly decreased over the last three years (from 4 177 employees in 2020 to 4 109 in 2022). The number of academic and other staff has decreased, but the number of scientific and professional staff has increased. The percentage of female employees in 2022 has increased slightly in all three listed categories.

CAREER SYSTEM AND MOTIVATIONAL TOOLS FOR ACADEMIC STAFF

The clearly stated principles enshrined in the CTU Code of Ethics are respected throughout the university and are strongly reflected in the area of human resources management. Within the Career System, the quality of teaching and creative activities is continuously improved and evaluated according to European standards with an emphasis on the requirement of excellence and international competitiveness. The Career System regulates the relationship of employees to CTU, defines the content of job positions, qualification requirements of academic staff and the framework of professional career, including expected milestones for CTU staff and job applicants in terms of their expected career growth and motivation. It defines the principles of equal access, transparency and reviewability of major employment decisions in relation to the career progression of staff and sets out the basic principles enabling successful reconciliation of professional and personal life. The Career System has been supplemented by the Code of Ethics approved by the Academic Senate of CTU.

The structure of academic, scientific and other staff, including the distribution among the individual units of CTU, can be read from the data in the **Table Appendix, Section 6**.

DEVELOPING THE PEDAGOGICAL SKILLS OF ACADEMIC STAFF

Pedagogical skills are an integral part of the development of the entire university. Most often, support is given to young and novice teachers who do not have such experience and who need to acquire the basic knowledge, pillars and practices to transfer knowledge towards students. The Masaryk Institute of Advanced Studies is a key provider of courses and offerings for all CTU units. Some faculties themselves recommend that their staff complete a minimum of one semester of pedagogical and psychological studies. In 2022, for the first time, CTU teachers could participate in pedagogical courses offered by partner universities within the EuroTeQ alliance. For the development of academic staff, the CTU Central Library, in turn, organises under the auspices of the HR Award project, e.g. semester e-courses on Information for Science and Research, a series of thematic lectures Doctoral Days (not only for doctoral students), seminars on industrial law, standards, etc. Courses on scientific article writing and publishing were organised at the National Library of Technology in cooperation with the CTU. Most faculties also maintain communication between the course supervisor and the teacher for the sake of quality and teaching methodology.

In 2022, a large portion of the institutional development project funds have been set aside for academic staff development. At the same time, a survey of staff interest in self-development courses was conducted. University-wide assessment by students also contributes to improving the quality of teaching, providing feedback to their lecturers.

The faculties support the participation of their employees in educational courses.

GENDER EQUALITY PLAN, SEXUAL AND GENDER-BASED HARASSMENT

CTU is a technical university where the proportion of women is still low in relation to men. The number of women among employees and students is increasing, thanks to the high activity of individual faculties and the positive presentation of successful women in their respective fields. Women are represented in the leadership of departments and faculties, and are successful in habilitation and appointment procedures. Gender equality at CTU is based on the nature of ethical behaviour and adherence to the values of the university. The difference in the composition of students is not significant, the ratio of gender representation is approximately the same. The university management is also balanced - four of its nine members are women. According to the Rector of the CTU, this parity is also favourably reflected in the management of the university.

Gender equality in research and innovation is a priority for the European Research Area. The European Commission's Strategy for Gender Equality 2020-2025 sets out a vision, policy objectives and actions to make concrete progress on gender equality in Europe and to achieve the Sustainable Development Goals.

The main methodologist not only for gender equality is the Rector's Office of the CTU, which has a specially trained person for this issue. Discrimination would be investigated directly by the senior managers of the unit and, if necessary, dealt with by law enforcement authorities.

In 2022, CTU joined the development project Social Security at Czech Universities in the Context of Academic Ethics, which addressed topics and implemented activities to meet the goals of the CTU Gender Equality Plan. During the year, an equal opportunities audit was carried out, the target group was employees and students of doctoral study programmes. Seminars and workshops were held to raise awareness of equal opportunities issues in the university environment and how to integrate the gender dimension into science and research. An architectural study including a description of the material equipment of a place for parents with children „Baby point" in the spirit of universal design was created within the project. The topic of work-life balance was also the focus of a moderated discussion on how the university environment and the conditions of grant providers can properly motivate and help early career researchers to develop their careers. Members of the Gender Equality Team working group, representing faculties, units and institutions of CTU in Prague, actively participated in the implementation of the events.

Prof. Ing. Oldřich Starý, CSc.
Vice-Rector for International Relations

„Internationalization is not just a goal. Above all, it is a proven way to continue to increase the prestige of CTU and its position among renowned universities at home and in the world."

7 Internationalisation

SUPPORT FOR STUDENT PARTICIPATION IN MOBILITY PROGRAMMES ABROAD

Support for students in this area is based on the CTU Strategic Plan 2021+, specifically on the priority „Increasing the quality and success rate of studies", has the character of financial support and is implemented in several ways, primarily through Erasmus+ programmes, the school-wide project „Student Mobility", the ATHENS programme and several others, also focused on student mobility.

Erasmus+ programme

The most important programme of international cooperation and a tool to support the mobility of CTU students and employees in 2022 was again Erasmus+. This programme of the European Union allows institutions to exchange students of all levels of study for the purpose of study or work placement and foreign stays of employees for the purpose of teaching placement on the basis of concluded mutual agreements. Non-academic staff have the opportunity to broaden their knowledge within their fields of study through training abroad, shadowing colleagues at foreign institutions or participating in workshops. Within the Erasmus+ programme, CTU has 636 valid inter-institutional agreements with 327 European universities with a total capacity of 1,431 places for outgoing students and 1,427 places for incoming students.

In the academic year 2021/2022, CTU sent students and staff abroad under all types of Erasmus+ mobility, 740 applications were submitted and a total of 386 students were nominated. 325 students at all levels of study of individual faculties and the Masaryk Institute of Advanced Studies gained experience in preparation for studying abroad.

Most of the trips were to Spain (44), Germany (36), Finland (27) and Portugal (21). The Faculty of Architecture (65), the Faculty of Civil Engineering (56), the Faculty of Mechanical Engineering (42) and the Faculty of Electrical Engineering (38) sent the largest number of students on study stays. Only two physical and two virtual trips took place within the framework of staff mobility.

In May, the first graduates passed the state final exams and defended their diploma theses within the dual degree programme Smart Cities at the partner university of the Faculty of Transportation Sciences of CTU UTEP (University of Texas of El Paso) in the USA.

CTU used all allocated funds from EU sources, including EUR 661 680 for student mobility, EUR 23 648 for staff mobility and EUR 101 180 for mobility organisation. In the academic year 2021/2022, 386 students were admitted to CTU under the Erasmus+ programme, mostly from France (136), Spain (90) and Germany (39). The largest number of incoming students was registered at the Faculty of Mechanical Engineering (98), Faculty of Civil Engineering (84), Faculty of Electrical Engineering (69), Faculty of Information Technology (57) and Faculty of Architecture (44).

In 2022, the gradual increase in mobility continued, approaching the values before year 2020. According to the data available so far, the numbers for outgoing students are at 74.6 per cent and for incoming students at 80.0 per cent, compared to the 2019/2020 academic year. However, the final data will only be included in the 2022/2023 statistics.

Student Mobility Project

The annually recurring project builds on the long-established model of sending students to foreign partner universities in accordance with bilateral agreements on student exchanges, mostly with non-European institutions. Its content is the selection of students across CTU, including language tests, for one and two-semester study stays at foreign universities, the allocation of scholarships, the organization of their stay and the final evaluation of the obtained study results. It applies to students of all faculties, including those going on a „double degree" programme. The project is formally school-wide, coordinated by the Department of International Relations of the Rectorate of the CTU, however, the benefits are transferred to students of all participating faculties and departments of the CTU.

In 2022, 112 students travelled for a total of 468 student-months and 142 students arrived for a total of 710 student-months. The most interesting countries for outgoing students are South Korea (8 universities, 22 students), Taiwan (4 universities, 15 students) and the USA (4 universities, 15 students). The other countries are Canada (10), Australia (8), Singapore (8) and Japan (7). A total of 10 students went to study for a double degree at partner universities in Germany, France, the USA and Taiwan.

The largest number of students on exchange programmes came from Taiwan (31), South Korea (22), Canada (20), Mexico (15), USA (13), Singapore (8), Argentina (6) and in smaller numbers also from Hong Kong (5), India (3), Australia (3), Thailand (2),

Chile (3), Colombia (3), Peru (1), Brazil (1), Costa Rica (1), Japan (1), Malaysia (1), China (1) and Russia (1).

The number of outgoing students is gradually increasing. The summer semester 2022 was still affected by the covid situation in several countries (Taiwan, Japan) which still could not accept exchange students. In the winter semester, all partner destinations were already accepting students, but some still had to fulfil quarantine conditions upon arrival, which was reflected in the cost of departure. However, we were able to cover these costs for the students.

The allocated funds, which totalled EUR 11.5 million in 2022, were used for scholarships for outgoing students and extra costs related to the ongoing pandemic restrictions.

ATHENS programme

During the week of 12-18 November 2022, CTU organised eleven intensive week-long courses within the Athens programme, attended by 192 international students from leading European technical universities. The courses were held at the faculties of mechanical engineering, electrical engineering, nuclear sciences and physical engineering, architecture, transport sciences and information technology.

59% of the participating students came from France, 7% from Portugal, 6% from Spain, 5% from Italy, as well as students from Belgium, Poland, Austria and Turkey arrived. Around 4 000 students participate in the programme each year. Of course, CTU students also have the opportunity to participate in the Athens programme and go to partner universities.

SUPPORT FOR INTERNATIONAL MOBILITY OF ACADEMIC AND NON-ACADEMIC STAFF

Foreign trips of academic and administrative staff have been a common part of the life of departments, faculties and other workplaces for at least three decades. These usually include participation in scientific conferences, various internships, research stays or work in international project teams, associations and associations. The vast majority of these international mobilities are covered by decentralised project or regular operating funds of individual CTU units.

At the central level, mobility of academic and administrative staff for lecturing activities is mainly offered under the Erasmus+ programme. The number of teaching staff visits is not very high, as young university teachers in particular are busy with lectures in their departments and research work. Limited travel opportunities for most of 2022 have also had a negative impact on the numbers of teacher visits.

CTU supports short-term trips of students, doctoral students and postdocs abroad, especially participation in selected international scientific conferences. The prerequisite is an active contribution to the event and other activities in the interest of CTU, especially the preparation of new projects or future contractual bilateral cooperation, presentation of the university, etc. This category also includes trips of successful scientific and sports teams.

In 2022, a total of 67 student mobilities were financially supported in this area, including participants in a number of international sports games and professional competitions, with a total financial volume of 384 thousand CZK. The supported mobilities also includes study stays within joint study programmes. Among the most used agreements are those with partner institutions in Germany, France, USA and Taiwan.

Another tool to support teacher visits is the school-wide IP project „Staff Mobility", which aims to send selected young teachers and researchers, especially from the Ph.D. and „post-doc" categories, to partner universities, especially those outside Europe, who can have a significant positive impact on further deepening cooperation with these institutions. Limited financial resources prevent more such mobilities.

The year 2022, even if only in the first months, was again negatively affected by limited travel opportunities, which was reflected in the mobility not only of students but also of all types of academic and non-academic staff. However, there has been a gradual turn for the better.

Table 7.2 and a comparison with the corresponding figures for 2021 shows that there has been a slight increase in all types of mobility monitored, both in the categories of outgoing and incoming students and teachers (overall for CTU). The numbers are starting to approach the figures for 2019.

The number of international students as of 31 December 2022 increased by 4.7 per cent to 3,802 compared to 3,643 in 2021. In 2022, travel restrictions of several months were still in place for a number of destinations that primarily host international events of all types. However, the return to standard living conditions was reflected in a slight increase in the number of international trips by teaching, research and administrative staff compared to 2021. On a positive note, the online communication options did not stop work on international projects and the significant reduction in reciprocal visits did not have a negative impact on ongoing projects.

INTEGRATION OF FOREIGN MEMBERS OF THE ACADEMIC COMMUNITY INTO UNIVERSITY LIFE

The deepening of the internationalisation of university life and the increase in the quality of the educational process is also significantly influenced by the presence of foreign staff at individual faculties. On the basis of existing cooperation agreements with foreign partner institutions and according to the requirements of the faculties, foreign teachers are continuously approached and invited to lecture stays within the standard teaching at CTU for bachelor, master and doctoral study programmes. Financial support for these lecture stays is provided through the IP project „Staff Mobility", which has been a standard part of the activities for further deepening the internationalisation of life at CTU for eight years. The project is based on the priority of the CTU's long-term plan - „Increasing the number of foreign teachers", the main part of which is focused on the organization of the arrival of foreign teachers, their stay at CTU and the payment of reasonable living expenses.

This project represents the beginning of permanent presence of foreign teachers in teaching in selected disciplines of the educational process at CTU. This will increase the attractiveness of teaching at CTU and may also mean increased interest of self-paying students in studying at individual faculties and thus the possibility of obtaining additional financial resources.

INTEGRATION AND EXPERIENCE WITH VIRTUAL AND COMBINED STUDENT AND STAFF MOBILITY

Virtual and combined mobility is slowly becoming part of the everyday life of CTU students and academic staff and contributes to the overall internationalisation of the university. The project, supported by a grant from the centralised development programme of the Ministry of Education, Youth and Sports, which aims to introduce, develop and maintain virtual and combined mobility at Czech universities, contributes to their introduction and development for the second year. CTU is a partner of this project, which has so far been beneficial not only in terms of setting up internal processes for virtual and combined mobility, but also the possibility of using a broad platform for sharing and exchanging valuable experiences.

Virtual and short-term combined mobility is also significantly supported by the EuroTeQ project (see Chapter 10 for details). A Course Catalogue is also available for those interested in virtual study at the partner universities involved in this project. In the catalogue, they can select the specific courses they are interested in. In 2022, 272 „virtual outgoing „ students of CTU used this option. The highest numbers of outgoing students were from the Faculty of Electrical Engineering and the Faculty of Information Technology. 181 foreign students participated in courses offered at CTU faculties. The highest numbers of students were from the Faculty of Electrical Engineering, the Faculty of Information Technology, the Faculty of Nuclear Sciences and Physical Engineering and the Masaryk Institute of Advanced Studies.

After the initial mistrust, CTU has received positive feedback from both students and academic staff who have tried virtual or combined mobility.

ACTIVITIES STRENGTHENING I NTERNATIONALISATION, INVOLVEMENT IN INTERNATIONAL PROJECTS

All activities in the area of internationalisation are based on the priorities of the Strategic Plan 2021+. The following overview summarises the implementation of the individual tasks. The network of international partners with whom CTU has concluded bilateral cooperation agreements continues to expand. Currently, cooperation in the area of student exchanges is underway with 117 universities from the top five hundred of the world's top-ranked universities according to the QS World University Rankings 2022. For cooperation in science and research, agreements have been concluded with 59 universities of this recognised quality ranking of higher education institutions. In 2022, the CTU concluded 12 new contracts with foreign universities, two of which are again among the top 500 in the world according to the QS World University Rankings 2021. With six others, extensions of existing cooperation contracts were signed, usually for another five years.

Following the gradual lifting of travel restrictions throughout most of 2022, the number of foreign students at individual faculties of CTU has increased from 3,643 in 2021 to 3,802 in 2022, an increase of 4.7 percent year-on-year. The share of foreign students, in 2022 from 99 countries from all continents, in the total number of CTU students is 22.16 percent, which is higher than the national average. However, the surprisingly favourable development of the number of foreign students can also be viewed from another angle. The decline in the number of incoming Erasmus+ students, the reduction in the number of exchange students from partner universities and the decline in the group of self-payers was offset by an increase in foreign students in Czech study programmes, especially citizens of the large countries of the former Soviet Union, Vietnam and Slovakia. These students mostly attended various Czech language courses starting in 2021, successfully completed them in May and June 2022 and subsequently succeeded in the entrance exams to the CTU. Their total number in 2022 was 2,742, representing 72.1 per cent of the total number of foreign students.

The best international students of all types of study programmes can be supported by an exceptional scholarship from extra-budgetary sources. In 2022, 42 students received this scholarship with a total amount of CZK 670,000.

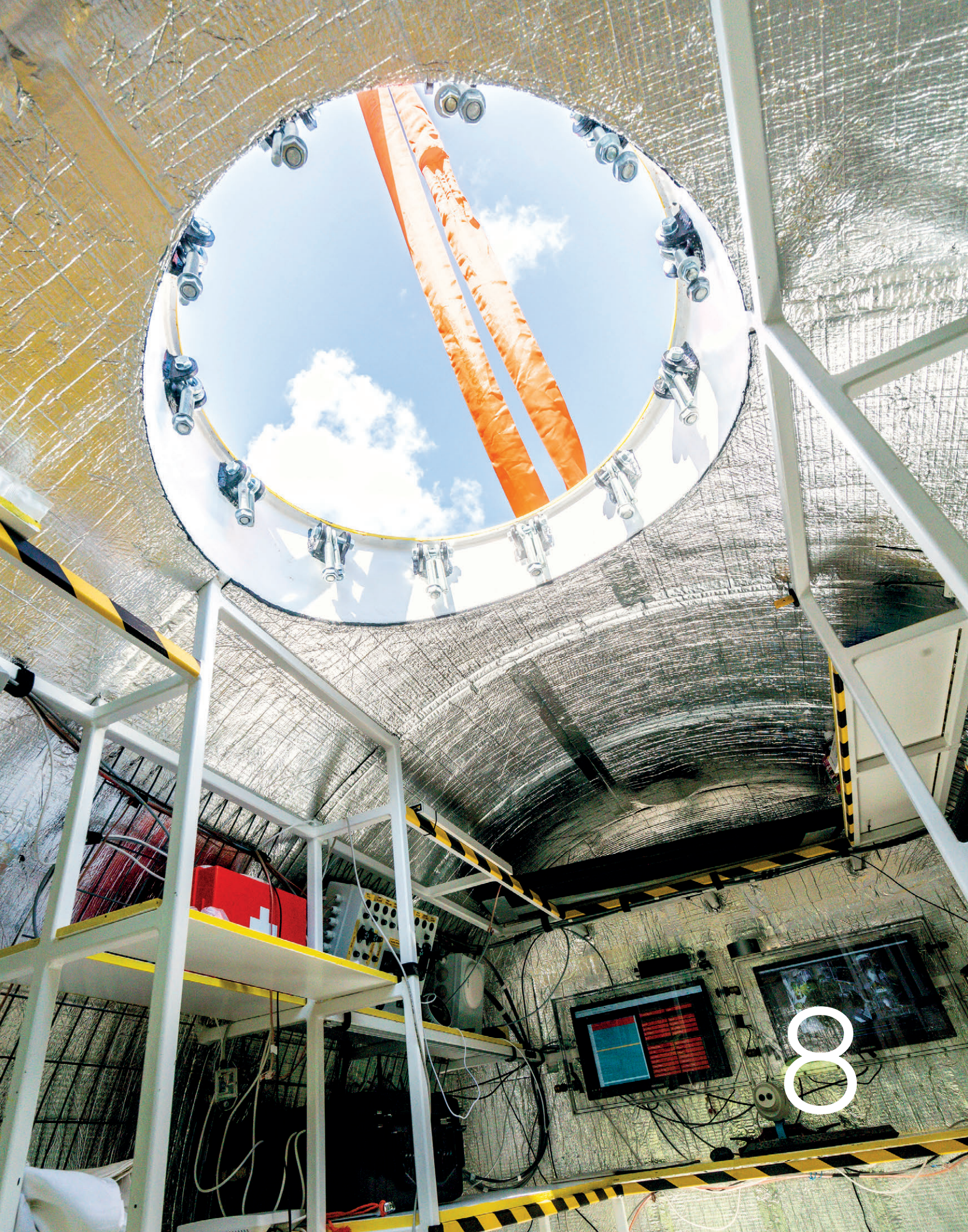
CTU faculties have a total of 25 valid contracts for double degree programmes. The eleven best students from these programmes were supported with scholarships in the total amount of CZK 220,000.

In 2022, 365 self-pay students studied at CTU, which is only a slight decrease from the 381 in 2021. This is clearly due to the persistent deterioration of travel conditions in 2021 (when the application process for students starting in 2022 began), the uncertain outlook for 2022, along with the lengthy visa process at Czech embassies. Especially for applicants from non-European countries, this meant considerable obstacles and many students aborted the application procedures. It is to be hoped that the improvements in travel from 2022 will also be reflected in the influx of international self-pay students, of which there were 621 in 2019, the highest ever achieved in the history of the process.

The regular participation of CTU representatives at large, annually organized international education fairs contributes to the deepening of existing inter-university cooperation and the establishment of new contacts. The staff of the Department of International Relations participated in the most important conferences at least in the form of online presentations. Also in 2022, two „Orientation Weeks" for incoming international students were held, organized by members of the International Student Club with the organizational and financial support of the Department of International Relations of the Rector's Office. The „Orientation Week" is an important tool to help the school's newly arriving international students and is already taken for granted at CTU. Fortunately, it was possible to organise both events in the standard face-to-face format, which is much more efficient than the online version organised in 2020-2021. This has

also had a positive impact on the overall number of international students at CTU. Most of the admitted applicants were able to arrive safely in Prague and adapt to the new conditions in time.

In cooperation with the International Student Club, two dozen language courses and several dozen extracurricular cultural, social and educational events were offered to international students. International students have the opportunity to participate in at least one student event per week each year, which significantly contributes to the popularization of the CTU campus as a pleasant place for study and extracurricular activities. Thanks to these activities, Prague has long been one of the world's top „international student-friendly" cities. The year 2022 was a year of a turn for the better in this area as well. The volunteers from the International Student Club deserve a huge appreciation for being able to maintain a positive mood in the international community on campus even in the new conditions.



Prof. Ing. Zbyněk Škvor, CSc.
Vice-Rector for Science,
Creative Activities and PhD Studies

„CTU is a research university whose academic staff is involved in many national and international research projects. It focuses mainly on research in the fields of artificial intelligence, informatics, cybernetics, civil, mechanical, electrical and nuclear engineering. The research portfolio also includes the fields of architecture and biomedical engineering. CTU reflects the current demands of interdisciplinary collaboration in research and teaching and is a recipient of the European Commission's Human Resources Excellence in Research Award. We are really proud of this award, which promotes a stimulating and supportive working environment for CTU researchers."

8 Research, development, artistic and other creative activities

MEASURES TO STRENGTHEN THE INTEGRATION OF CREATIVE AND EDUCATIONAL ACTIVITIES

The vision of CTU in Prague is to hold its place among the „top" technical universities in the Czech Republic, but also to strengthen its position internationally as a recognized research institution that supports and develops the talents and abilities of students and academic and other staff. Therefore, the area of research, development, artistic and other creative activities is the basis for all faculties and higher education institutes of CTU and the results of mutual cooperation directly influence educational activities. The interconnection of scientific and educational activities occurs already at the level of undergraduate studies, and significantly at the level of doctoral or master's studies. Students are regularly involved in research at the CTU and are guided so that new personalities are continuously developed in the field of science. Most study programmes include courses focusing on scientific and creative activities. The professional growth of the scientific and teaching staff and supervisors is also supported. The prerequisite for doctoral studies is involvement in successful prestigious project teams, as well as opportunities for foreign stays in the context of scientific activities. Part-time employment in scientific projects or obtaining a special-purpose scholarship are also financial motivations. In 2022, authors from CTU most often collaborated with the Czech Academy of Sciences and its individual institutes, e.g. physics, nuclear physics, plasma physics or physiology, as well as the Motol University Hospital, the General University Hospital in Prague or the Central Military Hospital in Prague, as well as the Institute of Clinical and Experimental Medicine or the National Institute of Mental Health. Significant were also the collaborations with Charles University, VŠCHT in Prague or Technical University in Ostrava, which resulted in 123 published documents. Analytical data concerning research, development, artistic and other creative activities are presented in the **Tabular Appendix, Section 8**.

For the implementation of theoretical and experimental research, an important support tool for PhD students is, for example, the Student Grant Competition (SGC), which is announced once a year in two areas. The first is the support of grant projects in the fields of architecture and urban planning, architecture and construction engineering, civil engineering, geodesy and cartography, mechanical engineering, technology in transportation and telecommunications, logistics, computer science, electrical and computer engineering, engineering informatics, applications of natural sciences, biomedical and clinical technology, economics and management, quantitative methods in economics and history of technology. In 2022, 361 projects were supported in the amount of CZK 109 252 000. The second area is projects aimed at organising student scientific conferences, of which 56 were held in 2022.

INVOLVEMENT OF STUDENTS OF BACHELOR'S, MASTER'S AND FOLLOW-UP STUDY PROGRAMMES IN CREATIVE ACTIVITIES

Faculties and university institutes approach the creative activities of students individually, based on their research needs. An important element here is also feedback, not only from students but also from external partners. The results of the creative activities are used by the students in the preparation of their seminar, bachelor, diploma and dissertation theses. The themes of the qualification theses are related to current issues in the field and reflect contemporary important social issues and needs. Students also participate in faculty research teams to solve partial tasks in the projects of the Student Grant Competition, Security Research, GA CR, TA CR and other international programmes.

For the implementation of scientific research projects, students have well-equipped laboratories where they can use the latest technologies. The participation of doctoral students, as well as master's and bachelor's students, is very beneficial for research. As part of compulsory student projects, internships in industry are also encouraged, for example at the Faculty of Mechanical Engineering as part of the two-year international Master of Automotive Engineering programme, which is popular with both students and future employers. Students on this programme have the opportunity to split their studies between two European technical universities.

The category of student involvement in creative activities includes the participation of the Faculty of Electrical Engineering in the tenth edition of the Signal Festival. The Forum Robo-

tum installation was created under the curatorial supervision of Dr. Jiří Zemánek from the Department of Control Engineering with the contribution of students mainly from the computer science and cybernetics disciplines. During four evenings in October, it was viewed by an incredible 24,000 spectators of all ages on the campus at Charles Square. This event has thus become one of the largest popularization activities of the faculty in recent years.

The fourteenth formula of the CTU CarTech team - FS.14, is exceptional in that for the first time the combustion engine is supplemented by an electric drive, making the formula one of the world's first hybrid cars to race and finish in the international Formula Student competition.

From 30 January to 13 February 2022 at EXPO 2020 in Dubai, our students presented the unmanned form of the eForce team, which was assembled by students of the Faculty of Electrical Engineering. In addition, Team eForce experienced a very successful racing season in 2022, with its piloted electric formula winning races in Switzerland and the Czech Republic, for example, and the team's autonomous formula also proving that it is capable of racing at the highest level.

In January 2022, the Faculty of Electrical Engineering inaugurated NANOLAB, a laboratory for research and teaching of nanoelectric technologies. It combines several unique technologies into one unit. Its capabilities will benefit both researchers from the Department of Microelectronics and students, who will gain hands-on experience with high-tech devices used in the semiconductor industry.

The Faculty of Mechanical Engineering also has other student teams that participate in international competitions or support the promotion of technology in secondary schools and among the general public - CTU Space Research for building rockets and space technologies (https://spaceresearch.cvut.cz/), Chicken Wings CTU for building model aircraft (https://www.facebook.com/chickenwingsCTU/) and Cenelín/Fúzelín (https://www.cenelin.org/) for creating a model of a virtual nuclear power plant and tokamak.

Gifted and skilful students can join projects announced and supported by individual institutes from the second semester onwards, which aim to include them in their scientific research activities. For the topics of these projects, a separate portal has been set up on the website of the Faculty of Mechanical Engineering to facilitate orientation in their offer: https://fs.cvut.cz/projekty-studenti/.

The Faculty of Architecture has a successful „learning by doing" teaching method, which primarily strengthens the connection between creative and educational activities. Some of the bachelor and diploma theses are commissioned as variant solutions of real public buildings, the design of which was originally created in the studios of the lecturers. This approach is very welcome by the students, as a realistic result is evident, which increases overall motivation. Collaboration with the public and private sector is also ongoing. Students not only gain new knowledge, but also become familiar with the latest methods and technologies in the implementation of their own designs. Semester and final theses in the Design study programme are based on specific assignments from such renowned companies as RWE, Sapeli, Technistone, Galavito, Tesla, Meva, Meopta, Viadrus or Lasvit, as well as state institutions such as the Krkonoše National Park Management.

The Faculty of Biomedical Engineering has around 100 active projects from various providers each year, involving both undergraduate and postgraduate students. Students are also involved in research on respiration, gas exchange and the probability of survival of a person buried in avalanche snow. Their activities have contributed to the validation of perlite as a material that can replace snow in experiments aimed at studying gas exchange of the buried. Furthermore, it will allow for simple, cheap and year-round testing of avalanche protection equipment (e.g. snow snorkels and other breathing devices). Students also contributed to the creation of illustrative applications in the Matlab App Designer environment for teaching mathematics based on the PBL or PBOL approach within the framework of the international ITEM project.

The Faculty of Electrical Engineering and the Faculty of Nuclear Science and Physical Engineering provide first-class education within their study programmes, which are closely linked to research activities. Semester projects and theses are usually part of a specific research or development project in which students and academic staff collaborate. The thesis topics, not only at these faculties, are formulated with regard to current problems in the field and thus reflect issues addressed in the research and development activities of academic staff. Students are also involved in custom research projects, measurements, testing and expert consultations, especially for medical institutions and for companies producing and distributing medical technology. A consortium of 24 universities, including the Faculty of Nuclear Sciences and Physical Engineering, has now received funding of 215 million crowns for the DigiQ project. Its main objective is to create professionally and technically well-resourced training programmes in quantum technologies at the participating universities. It was officially launched in autumn 2022 and is spread over four years. Among other things, it will offer students their own DigiQ diploma.

The Faculty of Transportation Sciences has long applied project-oriented teaching, which also involves external experts from the field of road, rail and air transport and information and telecommunication superstructure. Individual departments cooperate with partners from the application sphere in solving research and practical tasks. Talented students are involved in professional and scientific research activities, either as auxiliary researchers or through their direct participation in projects, grants and experiments. Through such oriented teaching, student projects lead to cooperation with a number of employers such as PUDIS a. s., the Railway Administration, the coordinator of public transport in the Liberec Region KORID LK, spol. s r.o., ROPID or the Institute of Planning and Development of the Capital City of Prague.

The team of bachelor degree students regularly participates in the international student transport engineering project seminar Middle European Planning Seminar, which is held alternately in the Czech Republic, Austria and Hungary. Here, international teams solve selected transport engineering problems of the host city.

Students are also involved in applied research through laboratories and specialized teams. They can also meet, for example, in the Faculty of Information Technology's Research Summer programme, where they work with their mentors on joint projects that lead to scientific papers. A very important tool is the faculty portal Cooperation with Industry, through which students have the opportunity to get involved in solving specific problems assigned by partners from practice, both within the framework of regular educational activities (e.g. in the form of term papers) and outside of it.

The university institutes of CTU, such as the Klokner Institute, involve the researchers of the research projects directly in teaching and allow the participation of bachelor, master and doctoral students.

Students of bachelor's and master's programmes of other faculties can participate in research at the CIIRC CTU in many projects, for example in the Department of Industrial Informatics, Robotics and Machine Perception or in the Testbed for Industry 4.0 - RICAIP. Prestigious projects and the opportunity to work with cutting-edge technologies of the future are attractive opportunities for carrying out your own thesis or project collaboration. Students have long been involved in the development of autonomous formulas of decimal size in the F1Tenth competition or successfully participate in Amazon's Alexa Prize in Conversational Artificial Intelligence.

SPECIAL PURPOSE FUNDING OF RESEARCH, DEVELOPMENT AND INNOVATION

In 2022, CTU had at its disposal a total amount of special-purpose funds obtained from the state budget for research, development and innovation of CZK 1 925 776. Of this, CZK 1 660 591 was fully used to address grants and projects directly. The remaining part was transferred to co-researchers or contractors in accordance with the conditions of the projects and the relevant contracts. The share of projects implemented directly at CTU exceeded 86 percent. This fact confirms that CTU is able to implement many projects both independently and in cooperation with other expert teams.

SUPPORT FOR DOCTORAL STUDENTS AND WORKERS ON POST-DOCTORAL POSITIONS

The first and basic way of supporting doctoral students from the CTU is to offer quality dissertation topics provided by supervisors who are not only experts in the field, but also personalities willing and able to guide doctoral students along the path of science, including their first publications in quality journals.

The quality of the working environment was enhanced by the European Commission's HR Excellence in Research Award, which is associated with a commitment to the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. In February 2021, the Rector's Order No. 2/2021 Recommended Practices for the Recruitment of Academic and Scientific Staff and in the Organisation of Selection Procedures for Senior Staff of the CTU came into force, which aims to reflect the best recommendations from the practice of world universities. In 2022, a draft amendment to the CTU Selection Procedure Regulations was prepared on the basis of this guideline. In the context of the directive, a new RJOBS application was also launched in 2022 to facilitate the publication of advertisements on Euraxess and on the CTU's official notice board, both in Czech and English. In this way too, CTU targets top-quality researchers and scientists. Within the framework of the HR Award project, a Methodology for the Evaluation of Creative Workers was further prepared in 2021, and a separate evaluation was launched in 2022 at all units. Furthermore, the Action Plan, the OTMR Strategy and the GEP Gender Equality Plan were updated. A number of webinars, training sessions and seminars were organised for PhD students and research and administrative staff on the above documents. Interim assessment was successfully conducted, and CTU has defended the HR Award until 2024. The CTU library prepares regular Doctoral Days for doctoral students, postdocs and other early career researchers as part of mentoring.

One of the important strategic goals of CTU is to support internationalisation in the field of science, which is implemented for example by obtaining individual grants such as ERC or Marie Skłodowska-Curie Actions of the European Commission. The selection of foreign partners and the way of cooperation with them usually grows directly from the activities, professional needs and interests of specific departments and staff. Taking into account the size and heterogeneity of CTU, it is planned to support and strengthen strategic areas corresponding to upcoming large projects from structural funds in the future, both at central and faculty level. These include, for example, the strategic projects Industrial Technology Centre, Innovative Centre for Transport Technologies, Aerospace Technologies in the Czech Republic, Light Technologies for 21st Century Energetics - LIGHTEN, Research Centre for Artificial Intelligence and Machine Learning - AIML or AI European Centre of Excellence. CTU's participation in the European Universities Initiative network is also key. To ensure foreign stays of PhD students, primarily special-purpose support programmes from external sources such as Erasmus+ are used. Funds are also obtained from EU operational programmes, programmes to support international cooperation, from the Czech Republic's participation in international organisations and from grant projects, including the popular and widely used internal Student Grant Competition. At the same time, the establishment and development of joint doctoral study programmes in the form of joint/double/multiple degrees with professionally close international institutions is also supported.

In 2022, emphasis was also placed on supporting the university's information infrastructure, such as the use of the ANLUPA application, which helps all those seeking sources of funding for their research, experimental development and innovation projects, including international ones. In its digital development plans, CTU supports the principle of Open Access publication of preprints, e.g. by using the university's D-Space repository or departmental repositories within arXiv.org.

The individual faculties and institutes of CTU strive to create suitable conditions for promising young pedagogical and scientific workers as postdoctoral fellows. One of the most common forms is their direct involvement in scientific research projects in a number of national and international programmes, as well as in the already mentioned Student Grant Competition and mobility programmes. Other tools are also available to improve the conditions for postdoc positions, for example, the Faculty of Civil Engineering uses its own Initiation Fund to support and stabilize promising young researchers up to ten years after obtaining their Ph.D. degree and to encourage their activity in seeking to engage in international projects and establish international cooperation. Doctoral students also become active members of research teams and participate in domestic and international basic, applied and contract research projects. Their scientific research work is also supported by the Student Grant Competition, funded by funds earmarked for specific research. Since 2022, systematic support for postdoc positions has been initiated at the Faculty of Mechanical Engineering to deepen international cooperation in scientific research projects and to strengthen the publication performance of individual departments.

At the Faculty of Mechanical Engineering, this support was addressed to all institutes and departments, with five positions co-financed by the CTU Future Fund and the remaining positions fully funded by the Faculty of Mechanical Engineering. In the selection of all supported postdoctoral positions, emphasis was placed on the quality of the mentor, the contribution of the topic to the development of the department on an international scale, and the requirements of the applicants were based on the conditions of the support programme from the CTU Future Fund.

At the Faculty of Information Technology, full-time doctoral students can receive direct financial support. The Dean of the Faculty of Electrical Engineering awards one-off special-purpose scholarships for exceptional results of creative or pedagogical activities or to support the study of foreigners in the Czech Republic. This faculty also cooperates very closely with institutes of the Czech Academy of Sciences, resulting in the creation of several joint accredited courses for doctoral students. There is also active cooperation with other institutes (e.g. medical faculties and university hospitals) where doctoral students have the opportunity to carry out experimental activities.

Also in the Faculty of Biomedical Engineering, outstanding students have the opportunity to receive financial support from funds earmarked for specific research. The faculty's incentive guidelines were also updated in 2022 to incentivize all undergraduate and graduate students, in addition to staff, postdoctoral fellows, and doctoral students, to achieve exceptional results, especially in publishing. Several such students have already received this support.

Across CTU, the activities of scientific and pedagogical staff are also supported by an internal competition of development projects.

A unique platform for the support and development of young talents is the eClub, which is led by Jan Šedivý at the Czech Institute of Informatics, Robotics and Cybernetics CTU and from which the start-up AIquistAI emerged. The main goal of the club is to support innovative ideas of students and help them to put their business plans into practice. Their work is supported by a scholarship from the CTU Media Lab Foundation, which involves partner industrial companies such as Certicon, Seznam.cz, Cybex, etc., which sponsor this scientific incubator. The CIIRC also educates doctoral students and postdocs by organizing lectures by top experts in various fields.

Across CTU, deepening professional relations at the level of the state administration and with the industrial sector plays a very important role.

COLLABORATION WITH THE APPLICATION SPHERE IN THE CREATION AND TRANSFER OF INNOVATIONS, TECHNOLOGIES AND THEIR COMMERCIALIZATION

The study programmes at CTU in Prague are strongly focused on preparing students for their future careers in the sectors they have chosen and in which they are studying. According to their focus, the faculties are very closely linked with experts from the application sphere who participate in the formulation of interesting tasks rewarded by industrial partners. In order to cooperate with the manufacturing sector, the faculties use their own transfer departments, which are also a contact point for dealing with potential commercialisation for both students and employees. For most faculties or higher education institutes, the focus is on exploiting innovation potential for industry. The partners are involved in innovation brainstorming sessions where ideas for new products or applications are sought and defined and, ultimately, subsequent collaborations are established. The Faculties of Civil Engineering, Mechanical Engineering, Electrical Engineering, Transportation Sciences and Information Technology cooperate most often with industrial partners, while the Faculty of Nuclear Sciences and Physical Engineering or the Faculty of Architecture cooperate most often with public administration or state enterprises, such as ČEZ, a. s. The Faculty of Biomedical Engineering involves important practitioners in the scientific council and at the same time, compulsory professional practice of students is an important part of the cooperation. All faculties, the Masaryk Institute of Advanced Studies and the Klokner Institute invite external experts from the application sphere to their accredited study programmes and some of them take on the role of supervisors in doctoral studies. It is common across CTU to develop and deepen cooperation with industrial partners in the framework of contractual activities, testing and expert opinions.

CTU considers the protection of intellectual property and technology transfer to be very important. That is why the InQBay patent centre and incubator have been operating for many years. In September 2021, a limited liability company CTU Tech was established and the UniLion project was launched in 2022 as a technology transfer tool (see more in Chapter 13).

Total income from the transfer of knowledge and research results into practice reached CZK 338,076,000 in 2022, mainly from contract research, consulting and advisory services. This is again an increase compared to 2021.

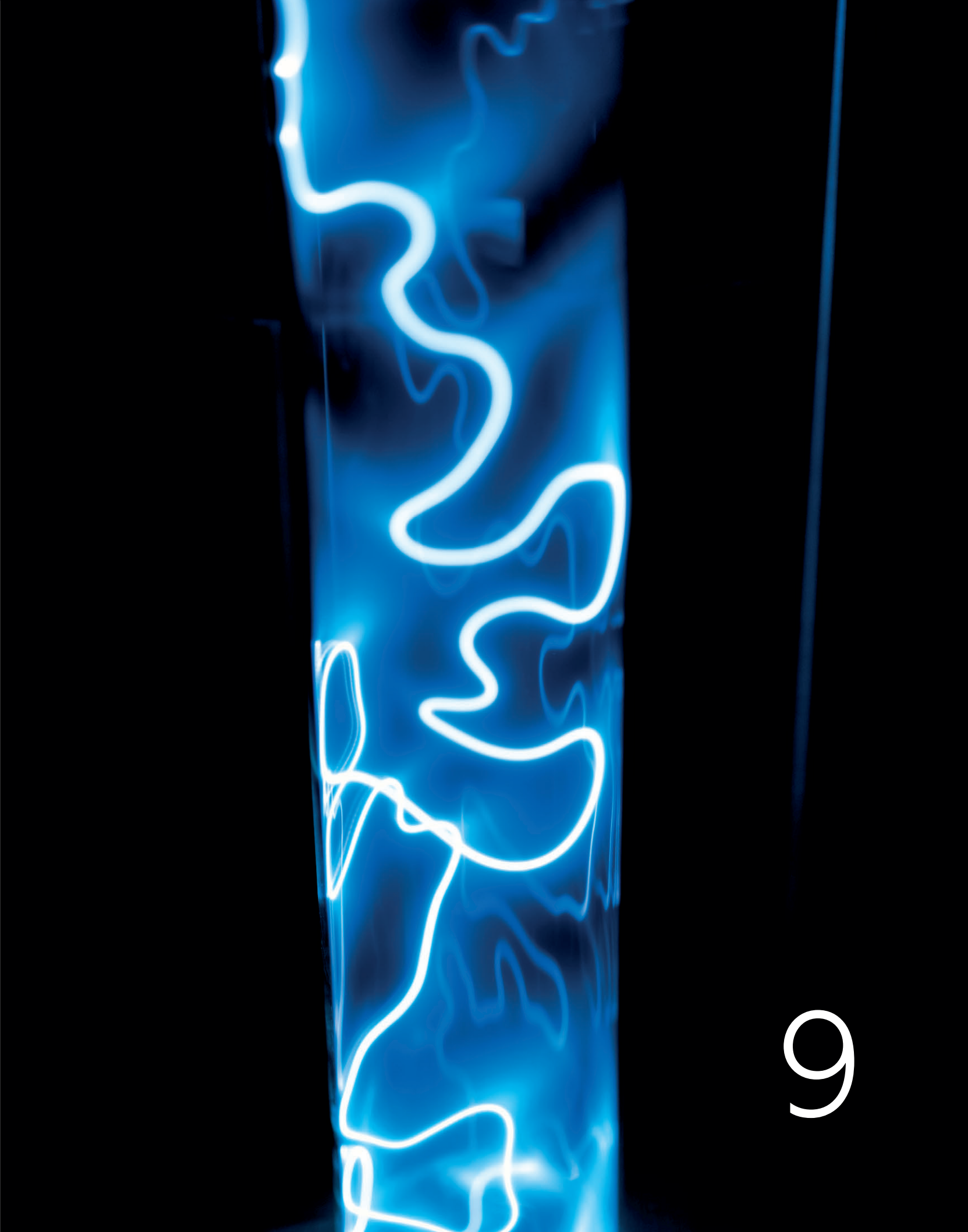
PRACTICAL EXAMPLES, PROMOTING HORIZONTAL MOBILITY

Great attention should be paid to the issue of cooperation with the application sphere in the creation and transfer of innovations and their commercialisation. Contractual arrangements for the transfer of copyright and a wide range of other professional services focused on the administration of the commercialisation of science and research results and the support of start-up companies are handled by the Vice-Rector for Development and Strategy of CTU. The Patent Centre of the Rector's Office of CTU plays an important role in securing patent protection in successful projects not only in Europe, but also in the countries of America, Asia and Africa.

Some faculties teach courses on fostering innovative entrepreneurship at both undergraduate and graduate levels. For example, the research group Centre for Business Informatics at the Faculty of Information Technology educates students in the creation of business models and business cases. A number of faculties benefit from long-standing contacts with partner foreign universities and research institutes, which often share the best examples for transferring research and development results into practice.

At the same time, it should be mentioned that the Faculty of Architecture, for example, is by the very nature of the architectural profession a multidisciplinary environment. Therefore, horizontal interdisciplinary mobility of students occurs both in the context of teaching and participation of students and academic staff in research, both basic (GA CR) and applied (TA CR, NAKI, contractual). This approach can be documented by research in the field of national and cultural identity (NAKI), in which academic staff and students of the Faculty of Architecture are also involved in cooperation with other parts of CTU (e.g. Klokner Institute - Technologies and Procedures for the Protection of Historic Concrete Bridges or Sustainable Management of Cultural Heritage Structures, Faculty of Civil Engineering - Development and Research of Materials, Procedures and Technologies for the Restoration, Conservation and Strengthening of Historic Masonry Structures and Surfaces and Preventive Protection Systems for Historic and Listed Buildings Threatened by Anthropogenic and Natural Hazards or Methods for Ensuring the Sustainability of Steel Bridge Structures of Industrial Cultural Heritage).

The Klokner Institute is a good example of cross-sectoral mobility of students and staff in the fields of civil engineering, materials engineering, chemistry, transport, energy or the aforementioned conservation. Also the University Centre for Energy Efficient Buildings as an interdisciplinary department of CTU is a place of professional meeting and cooperation of researchers and students from different faculties, disciplines and departments. One of the main strategic goals of the Centre is to intensively deepen internal cooperation within CTU and external cooperation with domestic and foreign research institutions, academic entities and the industrial sector. UCEEB is actively creating a background for joint projects and student work, for which it has greater opportunities and prerequisites as a part of CTU without its own accredited study programmes. In 2022, the Centre handled a total of 86 grant awards and 166 contract research contracts.



Ing. Radek Holý, Ph.D.
Vice-Rector for Quality Management

„Our goal is to monitor the status and development of the quality of educational, creative and other related activities at the Czech Technical University in Prague and to ensure the quality of its outputs. We are constantly striving to raise the standards of individual activities in accordance with the mission and goals of the university described in the strategic plan and other internal regulations. In evaluating quality, we rely on relevant data provided by the university's information system."

9 Quality assurance and evaluation of implemented activities

The traditional values of CTU, confirmed by its long history, include heterogeneity and a considerable degree of autonomy in the educational and creative activities of individual faculties and university institutes. The structure of the system of quality achievement and control also corresponds to this.

CTU strives to meet and raise the standards of its main activities in accordance with the European concept of the level of higher education and research and in accordance with its mission and set strategic goals. The system is based on the focus, medium-term orientation and the objectives of CTU and follows the development concept formulated in the CTU Strategic Plan 2021+ and annually updated CTU Strategic Development Plans.

The evaluation at CTU is based on data based on qualitative and quantitative information stored in the information system and validated by individual CTU units. An important source of data for the area of creative activity is also the application https://v3s.cvut.cz (hereinafter referred to as the „V3S application"), where, for example, the results of publishing activities, applied research and other activities of creative workers in the scientific community are recorded. The V3S Application is used to submit the results of the CTU to the Register of Information on Results (RIR), to experts for statistical analyses and for internal evaluations. Further information in the area of evaluation of the quality of creative activities is provided in the report on the internal evaluation of the quality of educational, creative and related activities of the university.

MAIN ACTIVITIES IN THE CONTEXT OF THE LONG-TERM STRATEGY

CTU provides students with quality education according to the focus of individual faculties so that they can apply themselves in their fields of study both nationally and internationally. The system of quality assurance and evaluation of educational, creative and related activities at CTU (hereinafter referred to as the „System") is motivated by the long-term effort to maintain and continuously improve the position of the best technical university in the Czech Republic and to increase its position in international rankings.

Gradually, the individual elements of the existing System are being adjusted and codified so that the impact on the level of all activities at CTU as a whole reaches a good level. This can be proved by the position of CTU in the world university rankings, taking into account the low level of the state contribution compared to comparable world universities.

In the international QS World University Ranking, CTU consistently ranks among the best domestic and regional universities. In the QS 2023 World University Ranking, CTU is ranked 378th in the world, the highest ranking it has ever achieved. Within the Czech Republic, CTU is ranked third behind Charles University (288) and the University of Chemical Technology in Prague (358). In the QS World University Subject Rankings, CTU ranks first in the Czech Republic in the broad category of Engineering and Technology (190 worldwide) and in the specialized categories of Civil Engineering and Construction (151-200), Computer Science and Information Systems (201-250), Electrical and Electronic Engineering (201-250), Mechanical Engineering, Aerospace and Manufacturing (201-250), Materials Science (201-250) and Architecture and the Built Environment (201-240). CTU is ranked second in the country in Mathematics (251-300), Physics and Astronomy (201-300) and Mechanical Engineering - Chemical (301-350).

One of the key activities ensuring the implementation of the CTU's long-term strategy is obtaining institutional accreditations. In 2022, CTU has obtained them in the following fields: architecture and urban planning, transport, electrical engineering, energy, informatics, cybernetics, civil engineering, mechanical engineering, technology and materials, and medical disciplines. On the basis of these, it has been authorised to create, approve and subsequently implement study programmes in all the above-mentioned fields of education and all university degrees (Bc., Ing., Ph.D.). In 2022, a new internal regulation on the Quality Assessment of Study Programmes of the Czech Technical University in Prague was created, which sets out the powers and duties in the processes of quality assurance of study programmes and deals with the formalities of the internal evaluation of the study programme (see in detail below).

QUALITY OF EDUCATION IN BACHELOR'S AND MASTER'S STUDIES

The quality management system in the field of educational activities is based on the primary responsibility of the dean towards the scientific council and the academic senate of the faculty as well as secondary responsibility towards the university authorities. The implementation of all study programmes is managed

by their guarantors, appointed by the deans, in cooperation with the heads of the relevant departments or faculty institutes. The interaction of the individual study programmes and doctoral study programmes is coordinated by the vice-deans for bachelor's and master's studies, respectively for creative activities and doctoral studies.

The study programmes are accredited and continuously updated to cover the latest requirements for the professional profiles of technically educated university students at national and international level. There is a growing demand for CTU Prague graduates on the market. The vast majority of them find employment in the fields they have studied. For general programmes, employment is even broader and testifies to the quality of the education provided.

The quality assessment of study programmes is an internal regulation of CTU, valid from May 2022 and closely linked to the Accreditation Regulations of CTU, Standards of Study Programmes, as well as other internal standards related to the quality management system and its assessment. This regulation sets out in detail the competences and responsibilities in the processes of quality assurance of study programmes and their internal evaluation at the level of individual faculties and from the point of view of the entire university. Each study programme that is seeking or has already obtained accreditation has a guarantor appointed by the dean. The degree programme guarantor also works closely with the guarantor of the specialisation of the degree programme or subject and is responsible for the activities of the degree programme council. Methodological support and guidance to the study programme guarantor is provided by the Department for Quality and Information System of the CTU Rectorate.

For each educational area within the framework of the obtained institutional accreditation of CTU, the rector may appoint a council for that educational area. Its task is to coordinate the implementation of the study programme in the given area, to propose recommendations aimed at development, improvement of the quality of education provided and especially the competitiveness of CTU graduates on the labour market. To increase the quality of teaching and creative activities in the context of evaluation according to European standards with an emphasis on excellence and international competitiveness, the regulation of the status and qualification procedure of academic and other staff involved in the educational and creative activities of CTU in the Career System, valid from April 2021, also contributes.

With the aim of improving quality, not only the procedures for recruiting academic and scientific staff to employment at CTU are adjusted, but also the organisation of selection procedures for senior non-academic staff. These procedures are summarised in an internal regulation valid from February 2021.

All faculties also use the university-wide electronic CTU Student Survey to evaluate the quality of educational activities. Within this application, faculties can define their own specific requirements for the collection and evaluation of survey ballots. Students have the possibility to answer anonymously and to add a verbal comment to their grade.

An important role is also played by the gradual digitalization of activities and operations, which not only brings significant simplification of administrative processes, but also, as a result, increases the quality and efficiency of the services provided.

DOCTORAL STUDIES

Educational and creative activities in doctoral studies are based on contemporary international knowledge. CTU prefers and supports that all outputs of creative activities of doctoral students (professional studies, publications, dissertations, etc.) are realized in English.

Doctoral students in technical disciplines must present the results of their creative activity in the form of publications in journals and conference proceedings included in the WoS or SCOPUS citation databases. Doctoral students publish significant results of their dissertations in the form of articles published in impacted journals. In the case of applied research, apart from publications, patents and their licensed use in application and commercial practice are considered the most important.

The quality and content of dissertation topic proposals are evaluated by the doctoral programme boards, which approve them. The assessment takes into account, among other things, whether the supervisor has shown quality publication results related to the topic in recent years. The supervisor is responsible for the quality of the dissertation.

The quality of each doctoral study programme is monitored and evaluated by the board of the doctoral study programme, which is responsible for its activities to the relevant scientific council of the faculty where the programme is implemented.

CREATIVE ACTIVITY

The quality of creative activity is evaluated on the basis of key criteria, which are publications and results of applied research in granted utility models and inventions listed in the V3S database. The results of research and other creative activities, including contract research, are also presented here. The nature of the results varies according to the field of study at individual CTU units. For technically oriented faculties and higher education institutes, one of the decisive criteria for the quality of creative results is publication in impacted journals, the best in their field, i.e. in Q1 (i.e. journals belonging to the top 25 percent of the most cited in their field). The V3S application also allows analytical comparison of the performance of specific staff, departments/institutes and faculties. These analyses are used by managers to assess the quality of creative activity, which in turn feeds into institutional support for excellence and support for junior staff.

In the area of creative activities, the proportion of foreign dissertation referees is increasing and support for the inclusion of high-quality foreign postdocs (with a minimum h-index of 2) in research teams is being provided. Academic staff are motivated to undertake a minimum of six-month stays at major foreign institutions.

RELATED ACTIVITIES

The expert institutes of individual parts of CTU provide forensic expert activities in the fields for which they are appointed. All activities are documented in expert journals.

ASSESSMENT OF THE QUALITY ASSURANCE AND INTERNAL EVALUATION SYSTEM AS A WHOLE

The structure of the quality assurance and control system at CTU is based on the principle of respecting the competences and diverse focus of individual faculties, university institutes and other units with their diverse focus. Even with this autonomy of educational and creative activities, historically applied at individual faculties and units, the quality is gradually improving, even in international comparison, in which CTU has long been ranked at the top of Czech technical universities in individual technical disciplines. CTU's ambition is to further improve its ranking and to become one of the world's excellent research universities.

Support in the area of implementation of standards for quality assurance of educational activities was paid attention to within the Centralised Development Programme of the Ministry of Education, Youth and Sports, where the project C20-2022 Implementation of standards for quality assurance of educational activities for various forms of study into the accreditation process and quality assurance system at individual universities was implemented. CTU was involved in this project as a co-lead university and the output was proposals for the implementation of previously approved terminology and standards. The aim of the presented set of deliverables was to present a consensus model of how individual universities would proceed in case of approval of relevant legislative changes at the national level. The implementation proposal was formulated at the level of individual colleges in general terms and assumed adaptation to the specificities of individual colleges.

INTERNAL EVALUATION BOARD

The quality management system at CTU is coordinated by the Internal Evaluation Board (IEB). This academic self-governing body manages the internal evaluation of the quality of educational, creative and related activities. CTU received institutional accreditation in the spring of 2022, in which the IEB is the decision-making body. Thus, by the end of 2022, the IEB had assessed the quality and granted IEB accreditation to less than a dozen study programmes. It also focused on setting up processes and creating a system for evaluating study programmes so that the whole process is as efficient as possible while maintaining all the requirements for quality assurance and development. It approves the draft rules of the quality assurance system for all activities, prepares the report on the internal evaluation of these activities and its amendments, and carries out other related activities leading to ensuring the quality level of all processes at CTU. The rector is the chairman of the IEB.

At the national level, the external evaluation is carried out by the Research, Development and Innovation Council according to the „Methodology for the Evaluation of Research Organisations and the Evaluation of Programmes of Special Purpose Support for Research, Development and Innovation" referred to as M17+. The research organisations have been divided into five modules according to the quality of their selected national research and development results. CTU in Prague was ranked in the group of technical universities and received the highest grade A.

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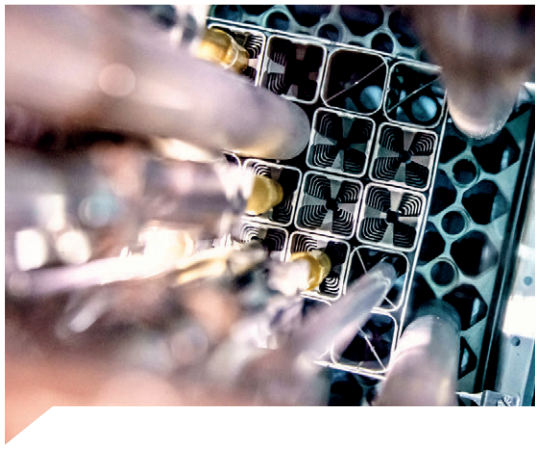
STÄUBLI



10 National and International Excellence of the University

NATIONAL AND INTERNATIONAL RESEARCH, DEVELOPMENT AND CREATIVE ACTIVITIES

CTU in Prague undoubtedly ranks among the universities that meet the highest criteria of international excellence. With its results it continuously demonstrates its competitiveness in education, science, technology and creative activities, not only on a national scale but also abroad. It focuses on and aims to promote interdisciplinary internationalisation, openness and diversity of opinion. In 2022, within the framework of interdisciplinary scientific research activities, CTU cooperated most frequently with the United States of America, Germany, the United Kingdom, France, Poland and Italy, in the fields of nuclear and particle physics, astronomy and astrophysics. Detailed data are given in the **Tabular Annex, Section 8.**

It continuously builds and develops prestigious research laboratories, testing facilities and centres of excellence with the aim of achieving international credibility. Increasingly, CTU research teams are important and indispensable partners in projects with global participation, and their achievements are recognized in both national and international competitions. The strategic goal of CTU for the next period is to maintain and strengthen the credit of a renowned university with the attribute of an international centre of excellence in science, creative activity and education. In the application sphere, CTU has set itself the goal of contributing to solving the challenges of global society and improving the quality of life.

CTU intends to continue to focus on cooperation with foreign scientific and industrial partners, not only in 2022. It will increase the offer of foreign language study programmes, support the international orientation of students and academic staff and expand the academic and scientific community with internationally recognised experts.

The key concept of the „CTU Strategic Plan 2021+" is excellence, which is reflected in the set measures and specific tools for their implementation. Excellence is significantly influenced by direct participation in international projects and cooperation with top foreign specialists and experts.

CTU has been a member of the EuroTeQ Engineering University, an association of six European schools, since 2020. This alliance represents an interesting, beneficial and, above all, an extraordinary opportunity for students, researchers and staff to participate in a project which, by linking prestigious universities, has the ambition to raise the quality of higher education to a higher level. As part of the new educational models, students can apply for the EuroTeQ Collider course - an educational competition based on real challenges from industrial partners, where inter-faculty teams work together to explore specific topics and work on innovative projects.

Another study option is the Course Catalogue. In it, students can virtually study selected elective courses at partner universities. In 2022, 272 „virtual outcoming" students of CTU used this option. The highest numbers of outgoing students were from the Faculty of Electrical Engineering and the Faculty of Information Technology. 181 foreign students participated in courses offered at CTU faculties. The highest numbers of incoming students were from the Faculty of Electrical Engineering, the Faculty of Information Technology, the Faculty of Nuclear Sciences and Physical Engineering and the Masaryk Institute of Advanced Studies.

The current theme for student-industry collaboration within EuroTeQ Collider is „Leave no waste behind", and at CTU four themes have been selected to address, namely „Rethinking Waste - Ocean Bound Plastics", „Waste Into Product: New Life for Ocean - Bound Plastics", „Optimization of power production at gas pressure reduction facilities", „Detection management of gas leakages" and „Reachable charging infrastructure".

Global challenges, connected with the need to find quick solutions, have in many cases helped to make the excellence of CTU's scientific teams and its technical focus visible. The participation of students, doctoral students and researchers in international conferences and research projects has been extremely important, maintaining and improving the established cooperation. Their work also succeeded in finding new applications of state-of-the-art technologies such as digitalization, 3D printing, cybernetics, robotics, artificial intelligence, nanotechnology, etc.

In April 2022, a unique experimental laboratory, the largest of its kind in Central and Eastern Europe, was inaugurated at the Czech Institute of Informatics, Robotics and Cybernetics CTU. Testbed for Industry 4.0 is a research infrastructure that is being built at CTU thanks to a significant investment of EU and Czech funds within the RICAIP centre.

The Faculty of Transportation Sciences is the only CTU faculty to have an accredited dual degree programme with the American university UTEP. In May 2022, the first three students graduated from this unique study programme: Ing. Kateřina Pithartová, MSc., Ing. Eliška Glaserová, MSc. Ing. Martin Čirkov, MSc. The excellent study results and the exemplary representation of the faculty abroad were also connected with the unique offer

to study the doctoral programme at the partner university UTEP, which Ing. Kateřina Pithartová, MSc., accepted and is now completing this study. Another important student success in 2022 was the award of the prestigious JUNIOR STAR grant of the GA of the Czech Republic for young scientists Ing. Tomáš Fíla, Ph.D., with the project „Impact dynamics using fast X-ray radiography and a flash X-ray source".

The Faculty of Transportation Sciences has a new dean, Professor Ondřej Přibyl, as of February 1. One of his first steps in office was the signing of the exclusive cooperation agreement between the faculty and the leading European university TU Berlin, DAI-Laboratory in the field of autonomous mobility.

On May 19, 2022, the 12th International Student Conference Instruments and Methods for Biology and Medicine (IMBM) was held at FBME. The conference focused on collaboration across departments and the participation of doctoral students whose research projects focused on EM fields in biomedicine, Diagnostics and imaging methods, Telemedicine and eHealth, and Applications of nanotechnology in biomedicine.

In 2022, FBME, specifically Mgr. Ksenia Sedova, Ph.D., from the Department of Biomedical Technology, hosted for the first time in the Czech Republic the participants of the 18th STAFF/MALT International Symposium focused on myocardial ischemia and related imaging technologies and ECG. Scientists, including 18 students, from 14 countries participated in the scientific discussion in a relaxed, friendly and collaborative atmosphere between biomedical engineers, physicians and physiologists.

At the beginning of October 2022, the national platform Transfera.cz announced the technologies that were selected and advanced to the final of the Transfera Technology Day 2022 competition. The aim of this event is to connect Czech science and the business environment. Eleven finalists including a representative from the CTU Faculty of Biomedical Engineering were selected from 28 entries from universities and public research institutions.

Academic staff from FBME organized the XII. year of the student scientific conference Aspects of the Work of Helping Professions - AWHP 2022. This year was rich in interesting lectures on the work of the IRS and also the helping professions, fourteen of which were presented in three blocks.

Virtually all faculties and institutes of CTU have demonstrated excellent adaptability and the ability to continue cooperation on international projects.

Also in 2022, experiments with GE Catalyst engines continued at the Aerospace Research Centre of the Faculty of Mechanical Engineering. A major success was the completion of a long-term test of the shortened lifetime IMI. Additional flight experiments were also conducted on the Beechcraft King Air 350 test aircraft.

The Gold Medal of the International Engineering Fair 2022 for a lifetime of creative technical work and achievements in innovation was awarded to Professor Jan Macek from the Department of Automotive, Combustion Engines and Railway Engineering of the Faculty of Mechanical Engineering, who has been involved in transport vehicles and energy and environmental aspects of transport throughout his professional career through simulations and experiments on vehicle power units.

Ing. Marek Tyburec, Ph.D., from the Department of Mechanics at the Faculty of Civil Engineering, received a special award from the IT4Innovations jury as part of the prestigious Joseph Fourier Prize, awarded for long-term research on modular materials and structures. In January 2022, Vojtěch Radakulan, a doctoral student at the Department of Computer Graphics and Interaction at the CTU Faculty of Electrical Engineering, was one of the five winners of the prestigious Jindřich Chalupecký Award for artists under 35. At the core of Radakulan's work is the exploration of simulations and the creation of fictional worlds, so-called worldbuilding, for which he uses hand-drawing, text and physical installation, as well as game engines and rendering software.

Ing. Jiří Ulrich from the Faculty of Electrical Engineering won the title of the best diploma thesis in computer science in the IT SPY 2022 competition. The graduate of the Open Informatics programme is currently working as a doctoral student at the Centre for Artificial Intelligence in the Department of Computer Science. He won the prestigious competition with his thesis on Multicamera Localization System Based on Black and White Pattern Detection.

Adam Zvada, a graduate of the Faculty of Information Technology, and his partner David Mokoš founded the start-up NFTScoring, which helps investors analyse the NFT phenomenon in the world of cryptocurrencies, where a person can trade a certain digital work, which is, for example, an image on the Internet or a musical composition. NFTScoring is used to verify the value of these purchased digital works and also helps in finding new investment opportunities among NFTs. Although the start-up has only been in existence for a few months, its founders have already managed to raise an investment of CZK 37 million. A student of the same faculty Bc. Roman Bushuiev was awarded the Via Chimica prize for 2022 for his bachelor thesis entitled Prediction of terpene biosynthesis using machine learning, which he worked on at the Department of Applied Mathematics at the FIT CTU in collaboration with the Institute of Organics Chemistry and Biochemistry of the CAS. Student Ondřej Cach is again a world champion in Excel. Two victories in competitions at the prestigious international conference NeurIPS 2022 (Neural Information Processing Systems) were scored by artificial intelligence experts from FIT. They won a competition to model the atmospheres of exoplanets and a competition to predict the most accurate weather forecasts, such as extreme rainfall in developing countries. Ten thousand artificial intelligence experts from around the world attended this machine learning conference in New Orleans.

Ing. Martin Vonka, Ph.D., and Mgr. Michal Horáček from the Faculty of Civil Engineering, Department of Architectural Engineering, who deal with the topic of factory chimneys as an endangered type of cultural heritage and try to make it known to the general public, were awarded the Patrimonium Pro Futuro Award in the category of Presentation and Popularization. The prize is awarded by the National Heritage Institute.

Two doctoral students from the Faculty of Nuclear Sciences and Physical Engineering were selected by the jury of the Henri Becquerel Scientific Prize for Nuclear Research, awarded by Électricité de France (EDF) in cooperation with the Embassy of France in Prague. The first prize for 2022 was awarded to Pavel Suk from

the Department of Nuclear Reactors, while the third prize went to Marek Sommer from the Department of Dosimetry and Ionizing Radiation, who is based at the Nuclear Physics Institute in Řež.

The best paper award of the IEEE/CVF CVPR 2022 conference, which took place in New Orleans at the end of June, went to Petr Hrubý (ETH Zurich), Timothy Duff (University of Washington), Anton Leykin (Georgia Institute of Technology) and Tomáš Pajdl (CIIRC CTU) for their joint paper „Learning to Solve Hard Minimal Problems".

On 23 April 2022, students of the Faculty of Biomedical Engineering, study programme Planning and Emergency Management, took part in the professionally oriented Urban Challenge competition, in which they scored well. It is a challenging obstacle race that includes 20 natural and technical obstacles over a 5 km distance. In the women's competition, Tereza Špačková took 3rd place out of 160 competitors and in the men's competition Matěj Dvořák took 2nd place out of 140 competitors. Competitions of this type contribute to the development of professional skills of our students.

An international jury of scientific figures such as Professor Wolfgang Wahlster, a world-renowned German researcher, awarded three young talents with the RYIA Industry 4.0 Award. The first prize was awarded to Varun Burde, who works in the RICAIP Testbed for Industry 4.0 at CIIRC CTU. He works on robotic manipulation of objects using computer vision methods and is also a doctoral student at the Faculty of Electrical Engineering. The RYIA competition - RICAIP Young Investigator Award - was announced for the first time this year by the Czech-German research centre RICAIP.

A team of student researchers comprising of William Campman, Marina Ionova, Serhii Voronovov, Elizaveta Isianova and Varun Burde was also awarded at the SICK Solution Hackathon, held at the SICK Sensor Intelligence training centre in Waldkirch, Germany, on 4-6 October 2022. The Testbed for Industry 4.1 team from CIIRC won the Best Technological Innovation award. The team members won with their solution against more than 100 young talents from universities and start-ups from over 16 countries.

INTERNATIONAL RANKINGS OF THE UNIVERSITY, FOREIGN ACCREDITATION

CTU regularly participates in the prestigious international „QS World University Ranking". In 2022, CTU has again significantly improved its position. It is ranked 403rd, which is a 29-place jump compared to the last ranking and the best result that CTU has managed to achieve. The „QS World University Ranking" is one of the three most prestigious international comparisons of universities. In 2022, it ranked 1,673 universities from 93 countries. The results of the ranking are based on six criteria: reputation among academics and researchers from other universities, reputation among employers, citation rate of authors, internationalization of the academic community, number of international students and average number of students per lecturer. CTU in Prague is the strongest in this ranking in 2022 in average number of students per lecturer, reputation among employers and number of international students. The significant percentile shift means that CTU is among the top 31% of top-ranked universities in the world. For the future, there is clearly room for improvement - further focus on publications and citations will be needed.

Another respected international university ranking is The Times Higher Education World University Ranking, where CTU is ranked in the 1,200+ category. It is strongest in the „International Outlook" category, where it achieved a ranking of 58.2/100, among the top 33 percent of universities, and „Industry Income" (ranking 48.4/100). There was also a slight improvement in the „Teaching" category.

The ranking is based on 13 indicators, with two of the citation and research indicators together accounting for 60 percent of the overall ranking. Despite the increasing values of the indicators monitored, a more detailed analysis shows that CTU's position has been falling year by year. It is necessary to reverse this trend and find an effective tool for improvement. Citations are one of the important indicators of both international evaluations, and therefore CTU tries to continuously reflect the incentives based on it into educational and research as well as creative activities. The conditions for study and research are constantly being improved in order to improve and strengthen the position in these evaluations and to strengthen the competitiveness of the CTU brand in both the European and international context.

Compared to previous years, the number of publications fell to 3,898 in 2022 and the number of citations increased by 453 to a total of 27,446. The citations counted are from publications in the previous six years. When weighting citations over the past five years according to the ranking methodology (weighting 30 percent for the most recent year and decreasing by 5 percent for each previous year), the average annual number of citations in 2022 is 25,820, a significant improvement of more than 6.5 percent over last year's result (24,245).

Using the five-year weighted score to account for the QS category „Citations per Staff", which is an interesting indicator that demonstrates the performance and productivity of individual faculties/departments, we obtain a score of 9.6 citations per academic/researcher, the increase from the 9.1 achieved in 2021.

Well above this average - compared to other faculties - is the Faculty of Nuclear Sciences and Physical Engineering with 29.9 citations per employee (again, a weighted average over the last 5 years). Among the university institutes, the Institute of Experimental and Applied Physics achieved an average of 116.2 citations per employee.

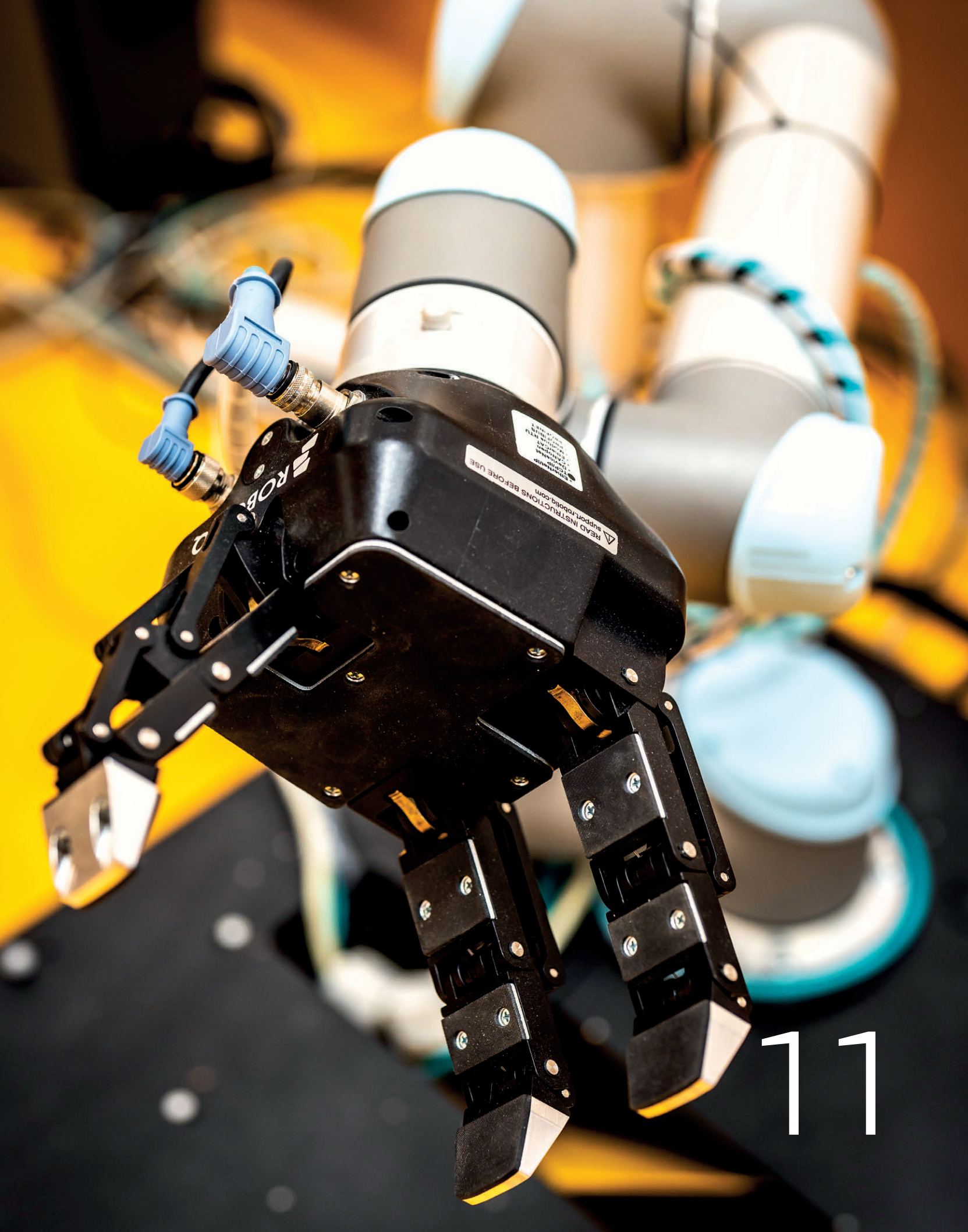
In 2022, CTU received 453 more citations than in 2021, with the largest increase recorded by FEE, which increased the number of citations by 737 in 2022 compared to 2021. The absolute most citations in 2022 were received by the Faculty of Nuclear Sciences and Physical Engineering (7,996), followed by the Institute of Experimental and Applied Physics (6,370).

According to the Times Higher Education, the average number of citations per publication (weighted over the last five years) reached 6.4 in 2022. The Faculty of Architecture (16.9) and the Klokner Institute (11.9) performed best in this area. The Institute of Experimental and Applied Physics (10.8), the Faculty of Me-

chanical Engineering (7.1) and the Faculty of Transportation Sciences (6.8) were also above the university average. The sources for the calculation of these indicators are the database of the CTU Central Library (for citations) and the Personnel Department of the CTU Rector's Office. It should also be noted that the international rankings for a given year are based on data from previous years, and therefore the outputs in the tabular section are processed in this chosen form.

There are significant differences in the proportion of foreign workers. The Faculty of Electrical Engineering, the Faculty of Information Technology, the Faculty of Nuclear Sciences and Physical Engineering are well above this average. On the contrary, the Faculty of Civil Engineering, Faculty of Mechanical Engineering, Faculty of Architecture, Faculty of Transportation Sciences and Faculty of Biomedical Engineering are significantly below the average. There is more balance in the proportion of international students among the faculties. The Faculty of Information Technology (32%), the Faculty of Architecture (29%), the Faculty of Electrical Engineering (28%) and the Faculty of Nuclear Sciences and Physical Engineering (25%) lead in this category, while the Faculty of Biomedical Engineering has the lowest internationalisation of students (8%). In case of the number of students per academic/researcher, the Faculty of Nuclear Sciences and Physical Engineering leads with 5.2 students per staff member, followed by the Faculty of Mechanical Engineering (5.4), the Faculty of Transportation Sciences (6.2) and the Faculty of Electrical Engineering (6.4). The most „full" are the Faculty of Information Technology (18.5), the Faculty of Architecture (13.6) and the Faculty of Biomedical Engineering (13.5).

On 23-24 November 2022, CTU hosted the 3rd meeting of the „Czech University Rankings Group" (CURG). 40 representatives from 16 universities attended the meeting. This is a group of experts and policy makers at universities who are responsible for the data used in „QS" or „THE" university rankings. The presentations given at the event focused on information about the new evaluation methodology, the strengths and weaknesses of Czech universities, and also focused on citation performance and possible methods for improvement. In 2023, the group would like to collaborate on a platform that will allow for faster data analysis and bring improvements in nominations for prestige surveys to further raise the profile of Czech higher education.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Ing. Lucie Orgoníková
Chancellor

„The university environment is inextricably linked to social developments in all areas, including events on the international scene that affect all of our lives. CTU's activities span across regions and areas.
The year 2022 brought new, completely unexpected challenges. After the outbreak of war in Ukraine, the CTU management, teachers and students took an active approach to the situation and clearly expressed their support for the invaded country not only in words but also in actions. Whether it was accommodating Ukrainian families in dormitories, supporting Ukrainian students, or organizing benefit concerts and exhibitions. We have received national and international recognition for many of our activities. I thank all my colleagues for their efforts and for their commitment.
Thanks to these activities, CTU is making a significant contribution to the development of society as a whole."

11 The third role of the university

TRANSFER OF KNOWLEDGE INTO PRACTICE

Within the third role of CTU faculties and institutes, their main task is to transfer research results into practical life. In this area, CTU is an important and indispensable partner for society in terms of the close link between its technological focus and the application sphere. The cooperation in this form is synergistic and mutually beneficial - the university's scientific teams are involved in industrial projects and industry experts help students understand the practice. The CTU has demonstrated its excellence and uniqueness in 2022 on many concrete examples, and its experts make it an excellent and recognised workplace.

A unique platform, the National Centre for Construction 4.0, has been created at CTU. It is a new way of thinking, planning, implementation and maintenance of buildings throughout their life cycle. It maps and minimizes the impact of construction on the external environment. The creation of the National Centre for Construction 4.0 is therefore an important step on the road to the technological future of the country.

The transfer of knowledge between academia and industry has long played an important role at the Czech Institute of Informatics, Robotics and Cybernetics, e.g. within the National Centre for Industry 4.0, the National Centre for Construction 4.0, the Future City Centre or the RICAIP Centre of Excellence. Experiments are conducted within the unique Tesbed for Industry 4.0 with a newly implemented stand-alone campus 5GSA private network. The CIIRC is also home to joint labs with Škoda Auto, Eaton or Rockwell Automation, where successful student start-ups are incubated through its own eClub accelerator.

The Faculty of Information Technology also excels in the transfer of technology into practice, for example in the licensing of intellectual property represented by software applications. Links with companies mean long-term cooperation in applied research and development. FIT participates in the activities of the prg.ai initiative together with Charles University, the Czech Academy of Sciences and the City of Prague. Its most important goal is to promote cutting-edge science and excellent research in the field of artificial intelligence. For example, FIT scientists are working with Meteopress on how to use AI to speed up and improve the accuracy of weather forecasts.

In January, a second detector, developed and manufactured by scientists from the Department of Physics of FNSPE in cooperation with the company esc Aerospace s. r. o., entered Earth orbit. The 2SD particle detector will map the so-called space weather and ionizing radiation in orbit. It was carried there by SpaceX's Falcon 9 rocket from the US Cape Canaveral.

However, other achievements in the field of science and research were also significant. The FBME has long been cooperating with the Kladruby Rehabilitation Institute on research dedicated to stroke patients. According to Eurostat, the Czech Republic is the EU leader in the use of wearables, such as smart watches and wristbands. But these physical activity monitoring devices were designed for a healthy population. The Telemonitoring team from the Faculty of Biomedical Engineering and the Rehabilitation Institute Kladruby investigated whether people with a walking disorder can also monitor their physical activity using these electronics.

Thanks to the involvement of FBME in the EXCELES project, implemented within the framework of the National Recovery Plan, CTU will participate in the establishment of the National Institute for Neurological Research (NINR). The task of FBME will be to introduce methods of analysis of kinesiological and neurophysiological data for the purpose of remote diagnosis and continuous monitoring of overall physical activity under the leadership of doc. Mgr. Radim Krupička, Ph.D., from the Department of Biomedical Informatics.

Another CTU faculty that is a member of the prg.ai initiative is FEE. Artificial intelligence research is also at the centre of research activities for practice, including the preservation of historical heritage. Unmanned helicopters with on-board intelligence, or robotic drones, from the Faculty of Electrical Engineering are helping with mapping historical objects, such as the Coronation Hall of the castle in Kroměříž, the churches of St. Maurice in Olomouc and St. Nicholas in Prague, the Plumlov castle or in Vranov nad Dyjí. They explore interiors where they move autonomously along a predetermined route and can react to unexpected obstacles. This is a unique project in the world - Dronument, where technology records rare historical values and helps conservationists in their restoration.

The method of automatic video analysis of facial movements, developed by a team from the Faculty of Electrical Engineering with neurologists from the 1st Medical Faculty of Charles University, can detect Parkinson's disease in the early stages of the disease. The method uses twelve biometric indicators describing movements of the forehead, root of the nose, eyebrows, eyes, cheeks, mouth and jaw. On behalf of the Faculty of Electrical Engineering the project was co-operated by doc. Jan Rusz, dr. Michal Novotný and dr. Tereza Tykalová from the Department of Circuit Theory.

The Faculty of Biomedical Engineering organized a unique event called Recruiting Heroes. On Thursday, March 10, 2022, a record recruitment for the bone marrow donor registry took place. The challenge was initiated by students of the Faculty of Biomedical Engineering of the CTU in Kladno. They contacted the volunteer society Recruitment Heroes with the aim of increasing the number of bone marrow donors and thus expanding the base of the Czech National Bone Marrow Donor Registry. In total, a record 261 volunteers, mainly FBME students, more than three dozen Central Bohemian firefighters and several residents, mainly from Kladno, registered during the whole day.

There is no doubt that the faculties and institutes of CTU have been able to fulfil the third role of the university as a whole. Their unique capabilities are described in detail in the presentation section of this annual report.

OPERATING IN THE REGION

CTU has a major position and influence not only in the capital city of Prague, where a significant part of the university is located, but also in the Central Bohemia Region. It is here that the Faculty of Biomedical Engineering and the University Centre for Energy Efficient Buildings operate. It is also the location of the motor and automotive testing facilities of the Faculty of Mechanical Engineering. Within the Centre of Vehicles for Sustainable Mobility, an official partnership with the American company Gamma Technologies (formerly Inc., now LLC), a world leader in the field of vehicle powertrain simulations (combustion engines, electric drives and batteries as well as fuel cells, optimum in-service control, cooling system, pollutant reduction, heating and air conditioning, etc.) in relation to the design of the whole vehicle, has been in place since 2002 and has resulted in numerous contracts with foreign partners, including work for the Formula 1 team. The results of this collaboration have also been presented in several papers at various international events. At the end of 2022, the Gamma Technologies office in Prague was established on the basis of this long-standing collaboration. Its activities will, among other things, enable the employment of doctoral students and post-docs of FME CTU.

Another important location is the Ústí Region, where the study centre of the Faculty of Nuclear Sciences and Physical Engineering and the Faculty of Transportation Sciences is located. It is also necessary to mention Hradec Králové, where the turboprop engine test facilities of the Faculty of Mechanical Engineering are located. The university's position in relation to society is also determined by its other activities in both the educational and cultural spheres.

Youth education

CTU is the founder of the University Primary School and Kindergarten Lvíčata. It is located on the Dejvice campus in Prague, the second branch is on the premises of the University of Economics in Prague 3 - Žižkov. The kindergarten in Dejvice is mainly attended by children of CTU employees, while the children of employees and students of the University of Economics also attend the kindergarten in Žižkov. The primary school is for technically and scientifically gifted children.

Both the school and the kindergarten cooperate closely with the individual faculties and institutes of the CTU, for example, pupils have the opportunity to visit professional workplaces. Experts from individual faculties are involved in teaching, which is focused mainly on mathematics, informatics and science subjects. CTU thus fundamentally assists employees and students in fulfilling their parental role, while also awakening children's interest in technology and science. Thanks to small class teams and close cooperation with parents, pupils achieve very good results in competitions such as the Mathematical Olympiad, Mathematical Kangaroo, Logical Olympiad, Pangea and others. The primary school has also become part of the network of schools cooperating with Mensa CR.

Lvíčata from CTU participated in the Christmas Astro art competition organized by the Czech Academy of Sciences in cooperation with the Planetum organization within the framework of the Space for Humanity platform. The theme for preschool children was „A Trip to the Stars", they could express themselves through drawing, model, their own poem, they could let their imagination run wild. Among the popularization and educational events for the general public, with an emphasis on secondary and primary schools that CTU (co-) organizes are events such as ScienceFest or Researcher's Night. In 2022, two thousand people visited the Researcher's Night.

During ScienceFest on 22 June 2022, the Rector also publicly signed a memorandum of cooperation with the headmaster of another school, the Bílá Primary School in Dejvice. Its pupils will thus be able to have an intensive encounter with information from science and technology from an early age. This primary school has, among other things, a rare specialist physics classroom and a modern computer room. Within the framework of the pilot cooperation, Božena Mannová from the Computer Department of FEE CTU led programming clubs at this primary school. The Bílá Primary School has thus become one of CTU's partner schools that are spread all over the country; thanks to cooperation memoranda, those interested in university studies and technology can get closer to academic teaching long before graduation, and at the same time these schools are marked with the CTU logo as university partners.

In 2022, the 6th year of the Children's University was also held, conceived as a week-long suburban camp that began with matriculation and ended with graduation in Bethlehem Chapel; 250 children wandered around the faculties and institutes of CTU and learned about science and academic teaching.

Cultural life with CTU

Culture is a living part of CTU. At the end of 2020, a new TV „station" TV9P broadcasted for the first time. Since then, the Rector's office on the 9th floor of the Rector's building has been regularly transformed into a TV studio, from where music programmes and interviews with interesting personalities are broadcast. The faculties and units of the CTU have also been actively involved. One of the biggest events recorded by the TV9P team in 2022 was the inauguration of the Rector and six Deans in Bethlehem Chapel in April.

CTU is the owner of the Bethlehem Beseda complex, where music and film events are held throughout the year. In 2020, the CTU contributed to the consolidation of the campus by purchasing the most important architecture gallery in the Czech Republic, the Jaroslav Fragner Gallery; together with the Bethlehem Chapel and Bethlehem Palace, it forms the „heart" of the campus. The dramaturgy of the Bethlehem Beseda includes concerts, commemorative cultural events and a summer biograph in the courtyard. The Jaroslav Fragner Gallery has its own exhibition plan, which will be launched as soon as the building is open.

CTU also has its own music ensemble. The CTU Academic Orchestra brings together students not only from CTU. They perform in the Bethlehem Chapel as well as on Czech and foreign stages. Their repertoire is wide, from classical to multi-genre. There is also the Artistic Association of the CTU, which consists of a symphony orchestra and a choir. These two ensembles work closely together, especially in performances during Advent and before Easter. Theatre is also represented at the CTU in the form of the theatre group Comica Economica.

In addition to cultural events organized by individual faculties, the traditional university-wide spring concert in Bethlehem Chapel was held after the covid break.

Sport at the university

After the last few years, which were characterised by a significant reduction in sporting activities, sporting activities were fully launched and it was possible to build on the successful years before the covid by involving students in sport at the university.

The need for exercise was significantly manifested during enrolment in physical education and participation in sporting events organized by the CTU. Approximately 874 students and employees participated in the Sports Day on 11 May 2022 in various competitions and over 7,500 students enrolled in classes.

At the Czech Academic Games in České Budějovice in June, students won a total of 66 medals, including 39 gold, 10 silver and 17 bronze.

Eight CTU representative teams successfully participated in the newly established university leagues.

IPES in cooperation with the physical education units of VŠTJ Technika Praha and VSK CTU Praha organized the traditional Academic Championship of the Czech Republic in cross-country running and the Run on 17 November in Obora Hvězda on 19 November 2022.

The best athletes for 2022 were awarded by the Rector. The competition was dominated by water slalom racers due to their outstanding sporting achievements. Vít Přindiš (the first Czech winner of the World Cup in the K1 category), water slalom racer and downhill racer Martina Satková, modern pentathlete Filip Houška.

The most significant achievement was undoubtedly the sporting performance of the CTU team, which won the VII. World Interuniversity Games in Barcelona in a competition of 64 universities from 25 countries and three continents with three 1st places, two 2nd places and four 3rd places.

OPERATION OF UNIVERSITY WITH SUPRA-REGIONAL SIGNIFICANCE

The international reach of CTU is not only due to extensive cooperation and partnerships with foreign institutions and companies, but is also proven by the international awards it has received. All faculties and institutes are actively involved in the international research infrastructure, participate in scientific and research programmes and organise conferences, both virtual and face-to-face.

For example, in January 2022, FBME representatives visited Cambodia and handed over the laboratory tasks with instructions. On that occasion, the field of biomedical engineering was reopened there with the participation of Ambassador of the Czech Republic Martin Vávra, Rector of the partner University of Health Science Prof. Sapun Vatanak and Dr. Om Roma, Director of the Technical Institute. A two-member team from FBME presented the university with laboratory equipment, instruments and study literature and taught the students how to use this laboratory equipment in detail, including printing on a 3D printer.

The Klokner Institute has collaborated with many prestigious research institutions (JRC Ispra, Politecnico di Torino, Torroja Institute, Madrid, TNO Delft, TU Ghent, EPF Lausanne, University of Stellenbosch, South Africa). The main focus of these collaborations is qualitative and quantitative research on the reliability of structures, monitoring the behaviour of buildings and the associated preparation of expert reports on the safety of materials and structures.

The cooperation of the Faculty of Mechanical Engineering with GE Aviation, the largest American manufacturer of aircraft engines, is exceptional. The organisation of GE Aviation's activities in Europe has changed to a more hierarchical one. The management of GEAC in Prague reports to Avio Aero in Turin, which in turn reports to GE Aviation headquarters in the USA. This creates new opportunities for the Faculty of Mechanical Engineering in the field of Aerospace at European level. An example is the award of the important EC project AMBER from the Clean Aviation programme on the development of hybrid aircraft propulsion for sustainable aviation.

The Czech Institute of Informatics, Robotics and Cybernetics also has a significant supra-regional reach and is a member of global and European initiatives and platforms, such as CLAIRE (Confederation of Laboratories for Artificial Intelligence in Europe) and ELLIS (The European Laboratory for Learning and Intelligent Systems). One of the most important is the participation in the Czech-German RICAIP Centre of Excellence. CIIRC CTU is also part of the major European Centres of Excellence (ICT48) ELISE, TAILOR, VISION and euROBIN.

Another confirmation of its international reputation is the nomination of CTU to the European call for the creation of a network of European Digital Innovation Hub (EDIH) funded by the „Digital Europe" programme. This is particularly significant as an agreement of centres of excellence that want to transfer their expertise in the field of artificial intelligence to industry, thereby strengthening and improving the digital maturity of small and medium enterprises.


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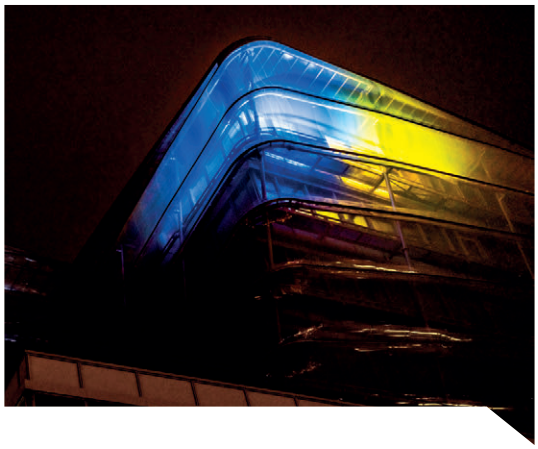


ČESKÉ

12 War in Ukraine

The CTU had to cope with the outbreak of war in Ukraine, as did the whole Czech and world society. Already on 22 February 2022, after Russian President Putin's speech in which he recognised the independence of the Donetsk and Luhansk regions, the Czech Rectors Conference issued a speech on the situation in Ukraine. Czech universities sided with the invaded state and Ukrainian flags flew at faculties and rectorates.

On 23 February, the leadership of the CTU and the Academic Senate of the CTU issued a statement condemning the military aggression of the Russian Federation on the territory of the sovereign state of Ukraine, expressing solidarity with the citizens of Ukraine and declaring their intention to help students and teachers of Ukrainian universities.

On 1 March, an order issued by CTU Rector Vojtěch Petráček came into force, which, among other things, prohibits CTU employees and students from travelling to the Russian Federation and Belarus for research and study, selling licenses and patents on the territory of both countries to companies owned by Russian or Belarusian entities, or hiring scientists from Russia and Belarus. The exceptions are those fleeing Putin, Lukashenko and their regimes. All contracts and agreements on the university's research cooperation with Russian and Belarusian institutions have also been suspended.

After the outbreak of the war in Ukraine and the influx of refugees to the Czech Republic, the staff of the Department of Languages at the Faculty of Mechanical Engineering willingly offered the faculty's management to teach for free Czech language to Ukrainian secondary school and university students. In agreement with the Rector's Office of the CTU, they organized Czech language courses for them, which were held during the summer holidays, so that they could master the language at the required level by the beginning of their studies. They also taught students who started their studies at the faculty during the first semester. The Department of Languages of the Faculty of Mechanical Engineering continues to teach Czech to Ukrainian applicants for university studies in the academic year 2022/2023. In two two-semester courses, it prepares Ukrainians to pass the B2 level exam, which is a prerequisite for studying in Czech at Czech universities for foreigners.

The Faculty of Electrical Engineering donated two and a half million crowns to the SOS Ukraine account set up by People in Need. All departments participated in the financial donation. These funds were earned by the faculty and its departments in the past years by their own economic activity, so it is not money from the state intended for teaching and scientific activities, nor is it the result of a collection among employees or students.

In March, the Dejvice campus hosted a concert by four bands in support of Ukraine, Students Against War. The concert „We are with you, we are together" followed in the Bethlehem Chapel, where the children's choir hLásky, Lenka Dusilová, Ivan Hlas, Radůza, Bratři Ebenové and others performed without remuneration. Proceeds from the concert were donated to People in Need - SOS Ukraine.

On 19 April, the Czech Institute of Informatics, Robotics and Cybernetics organized a concert by the CTU Academic Orchestra, which also featured harpists from Ukraine, and where Martina Konvičková presented her painting Peace in Yellow and Blue in support of Ukraine.

In April, VŠCHT in Prague, in cooperation with CTU and the organizations Adra and Zásilkovna, responded to the request of the Rector of the Admiral Makarov National University of Shipbuilding in Mykolaiv to send a truck with humanitarian aid.

The local university functioned as a humanitarian centre not only for the staff, students and their families, but also for the other inhabitants of the city of half a million. The humanitarian transport consisted of durable food, baby diapers and medical and hygiene supplies worth CZK 1 200 000.

After the rocket attacks on theatres, hospitals, churches and shopping centres in June, universities, including the aforementioned one, were also targeted in Mykolaiv. The Czech Rectors' Conference issued a statement on the attacks, where rectors expressed their outrage and condemned the Russian attacks. They also called on all members of the political representation of the Czech Republic, together with European partners and allies, to continue to work systematically to ensure that similar crimes committed by Russia do not go unanswered and that support and assistance to Ukraine, including to staff and students of Ukrainian universities who may be affected or threatened in any way, continues.

With the first refugees from Ukraine, the CTU offered the Strahov dormitories to relatives of Ukrainian students and staff. Mostly mothers with children were accommodated there.

The large number of children in the dormitories led a group of volunteers at the Rector's Office to consider whether it would be possible to offer assistance in meaningful leisure time in an unfamiliar environment.

We managed to carry out two sightseeing walks around the Lesser Town and Hradčany. Interesting places were presented to children and parents by the guide Veronika Hanson.

In July, an experiential suburban camp was organized for children. Under the name Science for Children, it was held with the support of the Rector doc. RNDr. Vojtěch Petráček, CSc., and the management of faculties and units of CTU, under the auspices of the Vice-Rector for International Relations Prof. Ing. Oldřich Starý, CSc. The event was attended by 31 children aged 8-14 years.

The Faculty of Civil Engineering, Faculty of Mechanical Engineering, Faculty of Electrical Engineering, Faculty of Architecture, Faculty of Transportation Sciences, Faculty of Biomedical Engineering, Czech Institute of Informatics, Robotics and Cybernetics and the Institute of Physical Education and Sport participated in the programme with educational and sporting activities. The children were accompanied all week by volunteers from among Ukrainian students of CTU who helped with organization and interpretation.

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Ing. Veronika Kramaříková, MBA
Vice-Rector for Development
and Strategy

„The year 2022 was very beneficial in terms of the development and strategic direction of CTU. We have launched a number of progressive projects that will move our university forward again in a significant way.“

13 Further development and strategic direction

In terms of the future direction of CTU, the year 2021 was already crucial, when the „CTU Strategic Plan 2021+" was successfully discussed. This is a key strategic document that determines the direction of the university in the coming years. In 2022, we successfully continued to implement the objectives of this document and thus continued the implementation started in 2021. The experience gained in 2022 clearly confirms that the implementation of strategic objectives and the implementation of the adopted measures can only be achieved in close cooperation of all faculties and university units.

With the activities of 2022, we have successfully continued the implementation of the „CTU Strategic Plan 2021+", which is based on the priorities of the Strategic Plan for the Development of Higher Education of the Ministry of Education, Youth and Sports (MEYS), approved by the Government of the Czech Republic in the first half of 2020.

Each year, the MEYS allocates funds under several thematic headings for „Centralized Development Programmes" (CDPs), which are addressed within the framework of cooperation and partnership of public universities. In 2022, CTU actively participated

in 14 projects, coordinating two of them, and used the allocated subsidy of EUR 11 million.

Within the framework of the „Programme to Support Strategic Management of Universities" (PPSŘ), CTU has applied for almost 107 million CZK in 2022. These funds were distributed to 36 projects, including an internal competition, thanks to which the strategic goals of CTU were fulfilled, especially in the area of providing quality teaching, international reputation and excellence in scientific research, as well as cooperation and partnership with the application sphere and orientation towards 21st century technologies. In the management of the PPSŘ projects for 2022, the proven changes set up in 2021 were continued: the guarantors were again responsible for the implementation of individual projects, who communicated with each other, cooperated and identified appropriate areas of support. Thanks to this, the synergy of activities of individual projects was maximised and the funds were used effectively and efficiently to meet the priority objectives of the PPSŘ.

DEVELOPMENT OF COMPETENCES DIRECTLY RELEVANT FOR LIFE AND PRACTICE IN THE 21ST CENTURY

In 2022, as part of this fulfilment of this priority goal, five projects were implemented with a financial contribution of approx. 15 million CZK. 1.6 million CZK was used to support gifted students, while the funds were distributed in three competitive categories among 150 students. As every year, this project had a very positive response among CTU students. Another project implemented was a project that contributed to the improvement and expansion of the advisory services of the CTU's Centre for Information and Counselling Services (CIPS). A project focused on software support for institutional accreditation processes was also implemented in fulfilment of this priority objective.

In an effort to create a pleasant and welcoming place to work and learn in line with the latest trends, projects related to the development of the Dejvice campus focused on socio-cultural and environmental issues continued in 2022. The main contribution of the project „Dejvice Campus Development 2022" lies in the renewal of social ties between students, student associations, faculties and institutions through the organisation of joint cultural, educational and other events. This also enables the Dejvice Campus to be made more accessible and presentable to the general public and residents of Prague 6. This creates a space for active leisure and relaxation. The ambition of the CTU is to create a „living" university campus comparable to those abroad.

In another project, which dealt with this location from a sustainable development perspective, a research for blue-green infrastructure measures was carried out. The current state of rainwater management was assessed and easily implementable measures were proposed to disconnect the rooftop rainwater outlets of CTU-owned buildings from the unified sewer system and use it in the irrigation system. Another easily implementable measure is the proposal to create a small biodiverse roof on the building of the Faculty of Civil Engineering. The construction of this green roof would significantly reduce rain water runoff into the unified sewer system. This measure could also lead to the Dejvice campus becoming an example of public space revitalisation and an inspiration for other similar projects.

In line with CTU's efforts to continuously improve the quality of studies, the „Internal Competition 2022" was implemented in 2022, in which a total of CZK 10.5 million was distributed to CTU faculties and units. The internal competition was prepared as a separate school-wide project already in 2021. The aim is to increase the quality and efficiency of teaching at individual faculties by supporting innovative projects of CTU academic staff. A total of 65 projects with an innovative character and focus on modernisation and development of various types of teaching, methods, study materials and aids were supported.

IMPROVING THE AVAILABILITY AND RELEVANCE OF FLEXIBLE FORMS OF EDUCATION

This priority objective has also been fulfilled by projects implemented both at the school level and at the level of specific units. More than 20% of the total amount of allocated funds of the PPSŘ was allocated to its support, which was used for the improvement, modernisation and long-term sustainability of CTU information systems, including a project aimed at building a data warehouse, and a project aimed at ensuring cyber security. The security of data transmission and the setup of its management system are undoubtedly necessary measures, having a direct effect on the support and implementation of this priority objective, since without quality information systems, it is not possible to support flexible forms of education, their accessibility, or the further development of lifelong learning (LLL), where in 2022 the process of unifying the registration and administration of the LLL programme was completed and this type of education was stabilised in the educational process of the CTU.

In 2022, CTU used the CDP subsidy for several projects focused on distance education, which has since become a common part of the educational process. CTU participated in projects aimed at expanding the use of distance methods, e.g. in providing feedback from graduates of public universities in the Czech Republic or supporting „blended learning" or helping to implement standards for quality assurance of educational activities with regard to different forms of study, including distance learning.

INCREASING THE EFFICIENCY AND QUALITY OF DOCTORAL STUDIES

To support this priority objective, CTU allocated more than 28 million CZK funds from the PPSŘ in 2022.

Faculty projects aimed at the purchase of high-quality modern machinery and equipment were implemented in order to strengthen the quality of doctoral studies.

In order to map the results of scientific research departments at CTU over the last five years, a logically structured overview was created with the possibility of searching by keywords and filtering according to pre-set categories. The main goal is to make the „CTU brand" more accessible and popular, especially to those interested in studying or working at CTU and to scientific research and business partners both from the Czech Republic and abroad. An overview of the results is easily accessible in Czech and English from https://results.cvut.cz/.

The project „Support for Effective Project Management at CTU", which aimed to increase the qualifications in project management not only among doctoral students but also among other employees of key CTU units, also contributed to the increase in the efficiency and quality of doctoral studies. Strengthening this ability will lead to higher success and competitiveness of CTU in obtaining domestic and foreign grants and subsidies.

A similar goal was fulfilled within the implementation of the project „Development of the ability to submit international projects CELSA", which is oriented, among other things, on the development of the ability of doctoral students and academic staff of CTU to join international teams or initiate their formation.

The project „Open Science Portal of CTU" provided information support to the academic community in the field of Open Access and Open Science. It provided useful and practical information for applicants and researchers of research projects as well as among doctoral students.

CAPACITY BUILDING FOR STRATEGIC MANAGEMENT

Under this priority objective, a total of five projects were supported by the PPSŘ in 2022, with a total of EUR 17.5 million used for their implementation.

The project „Support for the development of technology transfer and incubation", which represents another step supporting the new strategy of CTU in the transfer of science and research knowledge into practice, has contributed to a fundamental strengthening of the general perception of CTU as a place where scientific research results are transferred to practice on a commercial basis.

In relation to the established priority objectives and current strategic documents, the project „Generel - Complete Preparation" was implemented in 2022. The spatial and conceptual studies prepared within the project will significantly facilitate and accelerate decision-making on further spatial and investment development of the university.

Another important project was the „Completion of data for the management of CTU property", which created a functional model system of innovation in the management and registration of immovable property corresponding to current needs and requirements.

Within the framework of the above priority objective, projects were also implemented to reduce the administrative burden on staff by expanding electronic circulations within the CTU information systems, improving the quality of support for distance administration and setting up the process of processing strategic material and related methodologies in the area of mandatory documentation of the life cycle of electronic document circulation.

REDUCING THE ADMINISTRATIVE BURDEN ON EMPLOYEES

A thorough evaluation of the proposed measures in the framework of strategic management cannot be done without a complete and user-friendly data infrastructure. Its role in terms of quality assurance is absolutely crucial. At the same time, the whole system is built on the interconnection and communication of all the components involved. This requires an appropriate investment in time, expertise and funding, which is why 12.5 million CZK has been invested in this priority in 2022 under PPSŘ and CDP.

In 2022, CTU coordinated two CDP projects in which almost all public universities participated as partners. The project „Analysis of the impact of DEPO in the VVŠ sector" focused on the implementation of legislative requirements and guidelines of state administration bodies regulating the internal organisation and systems of universities. The second project „Increasing the availability of economic information of VVŠ" aimed in particular to reduce the administrative burden on university staff and at the same time to increase the availability and security of information through existing or new computerised agendas and services, including mandatory reporting and transmission of information to the state administration.

In order to simplify administration, the development and improvement of information systems, including the digitalization of processes, was supported within the framework of the PPSŘ, especially in the area of the student agenda and institutional accreditation.

INTERNATIONALISATION

A very important area that contributes to the development of both students and academic staff, as well as the whole institution, is gaining experience from abroad and involvement in international structures. In 2022, the PPSŘ again supported student and staff mobility projects, whose main contribution is to deepen the internationalisation of academic life at CTU, increase the attractiveness of teaching and gain foreign experience.

In 2022, the Mobility app was also completed, which supports and enhances the services offered not only to outbound/inbound students and staff, but also to Rector's Office and faculty administrators. As part of the CDP, CTU has been involved in a project aimed at the sustainability and further development of virtual mobility at universities and in another part of the project on the implementation of the European Commission's „Erasmus Without Paper" initiative.

Among other important projects that have been aimed at fulfilling the priority objective of internationalisation, again with the support of the PPSŘ, we must not forget to mention the following projects:

„CTU Alumni", whose main goal is to create a platform for graduates of English study programmes at CTU. In the long term, this project will help develop the international student-university relationship, contribute to better visibility of CTU and strengthen the internationalisation of the CTU environment. In 2022, this project has also made a significant contribution to this by simplifying the entire process of recognition of study abroad, from the assessment of the application to the entry of data on applicants into the Ministry of Education's nostrification register.

The „Ranking 2022" project is extremely important, which followed the successful increase of CTU's position in major international university comparison rankings in 2021, while in 2022 CTU further strengthened its position. The aim of the project was to support this upward movement with activities aimed in particular at improving the collection of quality data, optimising the results of the reputation survey and developing more accurate information for decision-making and management at the CTU management level.

OTHER MEASURES

Projects dedicated to this priority objective have been supported by PPSŘ in 2022 with the amount of 4.5 million CZK. As part of the „package" of projects implemented by the individual parts of CTU with the aim of popularising science and technical education, especially in secondary/primary schools, but also in relation to the general public, a number of educational events, presentations or trips to schools have been organised, presenting CTU studies to the general public in an engaging and highly qualified way. To name a few of the many successful activities: eleven educational videos were created to popularise science and technology among primary and secondary school pupils. CTU organised educational events reaching approximately 1,500 students from 22 secondary schools. A further 480 secondary school students attended popular educational events organised directly at CTU. As part of the „Science Week at Jaderka" event, which was attended by 148 secondary school students, 131 student projects were presented. Another annual conference and presentation of interesting works of secondary school students „Secondary School Technology 2022 - StreTech" was also held. CTU has been organising this event since 2007, and in 2022 it managed to organise it after a two-year hiatus caused by the covid-19 pandemic. The CTU Career Centre has also been involved in the promotion of studies at CTU through its activities within the project „Development of competences of Czech and international students through workshops and seminars", which competently communicates and responds to the current needs of students.

In 2022, the first mobile FabLab was created at CTU, which is registered in the international network of mobile FabLabs. It is a shared workshop designed for individuals to produce computer-designed products, projects and artworks. It is equipped with computer-controlled production machines such as a laser cutter, CNC milling machine, 3D printer, cutting plotter and 3D scanner. FabLabs tend to be strongly associated with DIY (Do It Yourself) culture, open-source hardware and free and open source software. The openness of the platform for educational purposes, sharing of projects and know-how is a prerequisite for this designation. The CTU Mobile FabLab can take the aforementioned equipment virtually anywhere, to a school, an educational centre, a festival or a square. Within the whole project, not only was the pilot workshop with the mobile FabLab for primary school pupils in Velká Bíteš successful, but also 18 other polytechnic workshops were held at the Faculty of Architecture of the CTU, at VŠCHT, at the Scout Institute and at the MakerFair festival.

With the support of the CDP funds, CTU joined the traditional and popular event 2022 Researcher's Night. It also became a co-organiser of the project „We will reveal it to Europe" within the framework of the Czech Presidency of the Council of the European Union 2022.

OTHER IMPORTANT PROJECTS

In March 2022, CTU submitted an application for a grant under the Ministry of Education's call for universities in the National

Renewal Plan. The project entitled „Transformation of the form and content of higher education at CTU" has 38 sub-activities and thirteen CTU units are participating in it. The total budget of the project and the amount of the grant provided is 220 million CZK. The project was approved by MEYS without reduction in September 2022 and is fully implemented.

Another important financial source is the Operational Programme Jan Ámos Komenský (OP JAK), from which it is possible to draw financial resources from the Structural and Investment Funds of the European Union in the programming period 2021-2027. CTU has submitted an application for support in 2022 under the call number 2 „MSCA Fellowship", oriented towards the development of internationalization of the research environment and increasing the quality of research organizations in the Czech Republic, including the professional growth of researchers. The application was successful and the implementation of the project „CTU Mobility MSCA-F-CZ-I" subsidized with the amount of 11.3 million CZK. The project will support research stays of CTU staff.

CTU took full advantage of another opportunity offered in 2022 by OP JAK and within the framework of the call number 2 „Top Research" four applications for support in the total amount of 1 994.5 million CZK were prepared. 1) Centre for Quantum Technologies, 2) National Centre for Artificial Intelligence and Machine Learning, 3) Robotics and Advanced Industrial Production and 4) Advanced and Sustainable Aviation Technologies (note: applications for the „Top Research" call were submitted in January 2023). The benefits of the projects include increasing the number of cutting-edge science and research results, developing and supporting excellent and highly equipped research teams, including the development of the competitiveness of the teams and of CTU as a research institution.

The Top Research Call also allowed to participate as a project partner, which CTU used in eighteen cases.

NEW TECHNOLOGIES

Technology transfer is one of the important activities to be promoted in order to motivate scientific teams to produce commercializable research results. To this end, it is necessary to set up mechanisms and rules that allow for a fast but transparent route for collaboration with the market. One of the options is the establishment of its own spin-off or start-up, whose ownership structure includes the intellectual property created by the CTU research team. That is why CTU Tech, a limited liability company, was established in 2021, with CTU as its 100% owner. This is a groundbreaking step that will open the way for new possibilities in technology transfer at CTU.

The UniLion project was implemented in 2022 as a technology transfer tool. It is a platform that will help simplify and clarify step by step how to deal with the results of science and research if researchers decide to commercialise the project. It will remind researchers that they need to protect and license their results before they can publish them. UniLion is a way to create interesting start-ups and spin-offs under the CTU brand that can reach the commercial market. It is a guide through the entire commercialisation process and highlights all aspects of administrative and task-related aspects to make it simple and easy to understand in the end.

In 2022, the first steps have been taken towards the creation of the largest technology hub and sandbox in the world, which is being built on the initiative of the CTU in Prague Strahov. This environment will enable the creation of national and European innovation projects combining academia and business. on 21 September 2022, the founding memorandum of this important project to transform Strahov Stadium into a centre for innovative companies and testing of state-of-the-art technologies was signed by representatives of the Prague City Hall, the CTU, the CTU Student Union and partners - 3D printer manufacturer Průša Research together with venture studio and investment fund DLTG. At the same time, work began on the preparation of the first 500 m2 of co-working space, which will also house the aforementioned CTU FabLab project.

Another successful project completed in 2022 is the „European Centre of Excellence in Artificial Intelligence for a Safer Society". In a collaboration between CTU and two other universities, MUNI and UK, international groups of experts have been prepared and an institutional and organisational structure has been set up to help both in the development of artificial intelligence, but also to guide society in understanding the regulatory measures that are being prepared within the EU.

On 3 and 4 November 2022, the SOLAIR 2022 conference took place at the CTU. Speakers from the Czech Republic, major European institutions, Israel and the USA spoke on the topic „Artificial Intelligence for the Safer World: the EU - US - IL Perspective". CTU was a partner of this year. The conference has been organized by the CAS since 2018 and its main goal is to create a space and platform for communication and partnership between the public and private spheres in the field of artificial intelligence and its regulation, including building security and resilience.

An equally important event was the 2nd year of the student exchange program „CIPA" (Czech Israel Partnership Accelerator). The event was held under the auspices of the Minister of Industry and Trade Ing. Jozef Síkela and the Minister of Science, Research and Innovation Mgr. Helena Langšádlová. The introductory workshop was held from 17 to 20 October 2022 in Prague. „CIPA" is a unique program involving multicultural research teams composed of representatives of the CTU in Prague, the Israel Institute of Technology Technion in Haifa, Israeli and Czech companies, professional mentors and students (and graduates) interested in the field of innovation and technology transfer. The international teams have the opportunity to visit each other's countries and work with partners from the commercial sphere to solve their tasks. The theme in 2022 was sustainability. The CIPA project thus strengthens the efforts to connect and closely, effectively collaborate academia and the commercial market in the field of technology transfer.

Prof. Ing. Alena Kohoutková, CSc.
Vice-Rector for Construction

„An important priority of CTU is the continuous improvement of the entire university campus. The aim is to provide a suitable environment for research, educational and creative activities, but also to develop quality facilities for accommodation, catering, leisure activities and cultural and educational events."

14 University facilities

ACCOMMODATION AND CATERING SERVICES

For many students, the possibility of living in a dormitory is a prerequisite for them to even consider studying at university. CTU offers its students accommodation in dormitories in Prague with a capacity of more than 7,000 beds. The overall occupancy rate of dormitories in 2022 was 11% lower than in the pre-covid period. Although we did not face any restrictions in 2022, even the occupancy of the canteen facilities of the SFA still did not fully return to the level of 2019. In 2022, we cooked a total of about 1,310 thousand main meals in the canteens and about half of this number for students. Detailed data is provided in the **Table Annex, Section 12**.

The outbreak of war in Ukraine was an extraordinary event that affected the running of the dormitories and canteens. From the very first days, CTU volunteered to help the affected country, and in the first refugee wave, SFA provided accommodation for more than three hundred refugees, mostly mothers with children, in CTU dormitories. By the end of August, it was also fully catering for them.

LIBRARY SERVICES

The CTU Central Library provides library and information support for studies and scientific, research, creative and artistic activities. It is a university-wide workplace consisting of the central library in Dejvice and three local libraries located at faculties outside the Dejvice campus (FBME, FTS, FNSPE). It also manages library collections stored at faculties and institutes of CTU.

The addition of the Central Library in 2022 amounted to 5,104 library items. In addition to the traditional acquisition process, we have set up a new service for the acquisition of e-books, where users themselves propose the purchase of e-books (Demand Driven Acquisition). On the ProQuest Ebook Central platform, there was an opportunity to co-create the e-book collection of the CTU, where users had the opportunity to suggest purchases from more than 200,000 titles selected according to the disciplines taught at CTU.

Another e-book acquisition service we set up in 2022 in collaboration with Taylor and Francis Publishing was based on the use of Evidence-based Acquisition - EBA. This was a new method of acquisition that worked on the principle of unlimited access to all titles in a selected e-book collection for 12 months with a pre-determined budget. The library paid an agreed deposit before launching the access, designed the e-book collection according to the subject areas, and at the end of the year, based on detailed usage statistics and user feedback, decided on the selection of specific titles to acquire permanently. In total, 28 titles were selected.

The Summon Discovery System is used to search all information resources available to CTU from one place (subscription, Open Access or trial access).

Paid electronic resources are open to CTU students using IP addresses. Users who authorize themselves can access them remotely even outside the CTU network. They can use the e-Learning resources at any time and from anywhere in 24/7 mode.

In 2022, the data base of the CTU Digital Library (institutional repository) continued to grow with additional theses, dissertations, new publications by CTU authors and teaching materials. Services used include e.g. electronic publishing of books, scripts and study materials in Open Access mode. DK platform is interconnected with the CTU IS resource subsystems (KOS, V3S) and continues to make available, in addition to the above-mentioned documents, publication outputs of other types (article, article in a collection, chapter in a book, book, collection, certified methodology).

In 2022, the library launched the digitization of old prints with the aim of preserving cultural heritage and building a historical library collection at CTU. Both the organization and workflow of the digitization process and online access in open mode were set up throughout the university and the general public. Digitized publications are registered in the Czech Collections Catalogue and in the Digitization Register of the Czech Republic and are promoted on the library website and social networks of the CTU.

In connection with the increase in activities and services in the field of information support for science, research and publishing, the library also provided in 2022 the agenda of bibliometrics, corrections of data in citation databases, including the management of the institutional profile of CTU. In cooperation with V3S and taking into account the evaluation of the RVVI, the evaluation of CTU and individual authors, the CL together with the producers of citation databases carried out simple and more complex data corrections in records or assigned citations. It was involved in uploading the full text of publications to the CTU Digital Library via the IS V3S component, managed publication standards and publication platforms for the whole CTU.

It monitored the issues of Open Access and Open Science and to support them it created a portal of information support and services for authors and researchers of CTU projects as a central information point. In one place, information about projects, about the conditions of funders, about Open Access, research data, about storing the results of publications and scientific work, including links to educational events, set services and available tools, can be found.

The library also publishes the university-wide peer-reviewed scientific journal Acta Polytechnica. The journal is published in Open Access mode six times a year and is indexed in the Web of Science (ESCI edition), Scopus, CAS, Inspec and DOAJ databases. This year the editorial board was expanded by two representatives; from Karlstad University, Sweden and the Institute of Nuclear Physics of the CAS. All documents on the journal website were also updated and social media promotion was intensified. The journal has its own pages on Facebook, Twitter and LinkedIn.

An integral part of the library services offered is also to help academics develop their skills and knowledge for finding information resources and then using them effectively and also ethically in their professional work. Various outreach materials and educational events are prepared and information education is also introduced in the curriculum in collaboration with teachers. For students from Ukraine, the library has prepared information materials, leaflets and guides to the services of the CTU in Ukrainian.

INVESTING IN FURTHER DEVELOPMENT

CTU uses dozens of buildings in Prague and other locations for its activities, which of course require financial resources for repairs and maintenance. Efforts to gradually build modern facilities and spaces as well as a quality environment for students and employees are limited by the volume of available funds. Nevertheless, the implementation of the comprehensive reconstruction of Bubeneč Dormitory with a capacity of almost 500 accommodated students continued in 2022. Unfortunately, the contractor was unable to complete the construction in the required quality in time, and the works will be completed only in early 2023. Reconstruction of the former boiler room building in Strahov intended for the modern CTU archive has begun, which will enable its relocation from the leased premises. Work on this building is proceeding in accordance with the contract and the building will be handed over for use in spring 2023.

In 2022, two historic buildings of the CTU in the centre of Prague were renovated. The first was the renovation of the lecture halls in the FNSPE building in Trojanova Street, including unique blackout drives designed by František Křižík, and the second was the renovation of the facades of Building D in the premises on Charles Square.

A step leading to an increase in the quality of teaching, especially its laboratory and practical part, was the replacement of the perimeter cladding on the side of the block of indoor laboratories to Velflíkova Street. The original condition was unsatisfactory and there was a risk of physical damage to the integrity of the lightweight panel structure.

The preparation of the reconstruction of the FBME building in Kladno was completed and a qualified application for a subsidy was submitted, enabling its implementation. Another important step is the completion of the preparation of the reconstruction of Block 12 in the Strahov dormitory area, which was carried out completely in the digital BIM (Building Information Modelling) mode, obtained a building permit and is also awaiting the decision on the allocation of the subsidy so that the tender for its implementation, also conducted in this standard, can be launched.

Preparations continued for the largest project of the current planning period, which is the reconstruction of Building B of the Faculty of Civil Engineering. The size and complexity of the project is reflected in the size of the projected budget. In 2023, the process of selecting a contractor for the construction will begin.

CTU has available equipped sports facilities, the maintenance, development and modernisation of which is provided by the Institute of Physical Education and Sport (IPES). The largest facility is the Pod Juliskou Sports Centre with a multi-purpose sports hall, two indoor gyms, a modern equipped gym, a climbing wall, a table tennis hall and a regeneration centre. The multipurpose outdoor sports ground Kotlářka is used almost all year round thanks to the installation of an inflatable hall. Tennis, volleyball and netball are played here. The Loděnice Malá Chuchle sports centre has two modern gyms used mainly for martial arts and cardio exercises. There is also a gym and sauna. Canoeing lessons take place in the boathouse all year round. The Karlovo náměstí sports ground consists of several gyms and a hall for martial arts.

The CTU sports facilities offer over 40 different physical activities. In addition, various sports courses are organized all year round, for example, downhill and cross-country skiing and snowboarding lessons in winter, and in summer, mainly courses in boating, windsurfing, cycling, hiking, tennis, horse riding, as well as frisbee, archery, swimming and softball. The CTU also has several professional sports teams and athletes who successfully represent the university in both national and international sports competitions (see Chapter 11 for details). The campuses are widely used by students and staff of the university. They are visited by over 9 000 athletes per week.

1.8 million CZK was spent on maintenance and operation of sports facilities in 2022. CZK Another CZK 1.6 million was invested in repairs and modernisation of both the facilities themselves and their equipment.

Table annex

1.1 Basic facts, seat of CTU constituent parts

FACULTIES OF CTU

Faculty of Civil Engineering (FCE) – Thákurova 7, Prague 6 – Dejvice, 166 29

Faculty of Mechanical Engineering (FME) – Technická 4, Prague 6 – Dejvice, 166 07

Faculty of Electrical Engineering (FEE) – Technická 2, Prague 6 – Dejvice, 166 27

Faculty of Nuclear Sciences and Physical Engineering (FNSPE) – Břehová 7, Prague 1 – Staré Město, 115 19

Faculty of Architecture (FA) – Thákurova 9, Prague 6 – Dejvice, 166 34

Faculty of Transportation Sciences (FTS) – Konviktská 20, Prague 1 – Old Town, 110 00

Faculty of Biomedical Engineering (FBME) – nám. Sítná 3105, Kladno, 272 01

Faculty of Information Technology (FIT) – Thákurova 9, Prague 6 – Dejvice, 160 00

UNIVERSITY INSTITUTES

Klokner Institute (KI) – Šolínova 7, Prague 6 – Dejvice, 166 08

Masaryk Institute of Advanced Studies (MIAS) – Kolejní 2637/2a, Prague 6 – Dejvice, 160 00

Institute of Physical Education and Sport (IPES) – Pod Juliskou 4, Prague 6 – Dejvice, 160 00

University Centre for Energy Efficient Buildings (UCEEB) – Třinecká 1024, Buštěhrad, 273 43

Czech Institute of Informatics, Robotics and Cybernetics (CIIRC) – Jugoslávských partyzánů 1580/3, Prague 6 – Dejvice, 160 00

Institute of Experimental and Applied Physics (IEAP) – Husova 240/5, Prague 1 – Staré Město, 110 00

OTHER CONSTITUENT PARTS OF CTU

Computer and Information Centre (CIC) – Jugoslávských partzánů 1580/3, Prague 6 – Dejvice, 160 00

CTU Central Library (CL) – Technická 6, Prague 6 – Dejvice 160 80

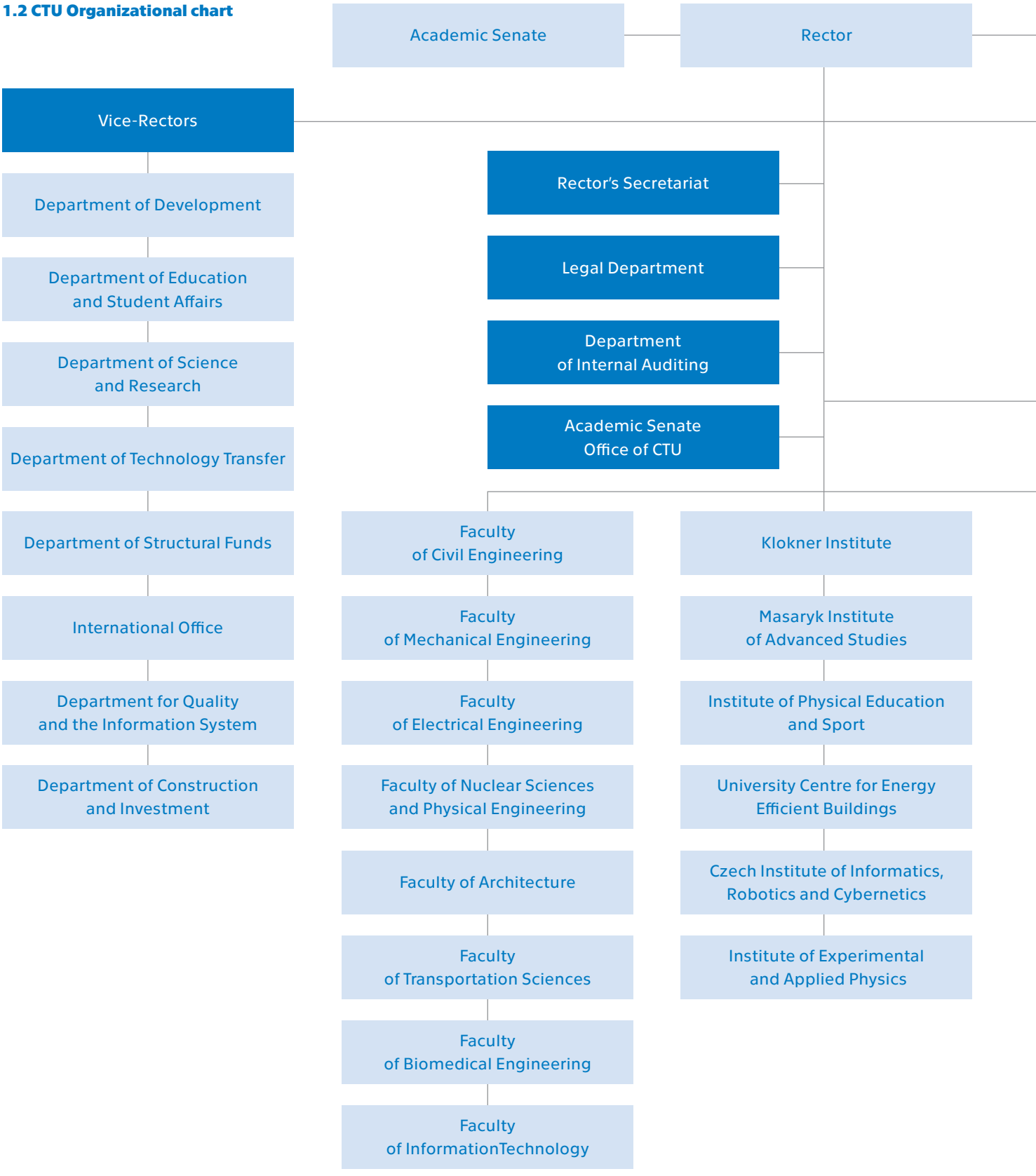
PURPOSE-BUILT FACILITIES OF CTU

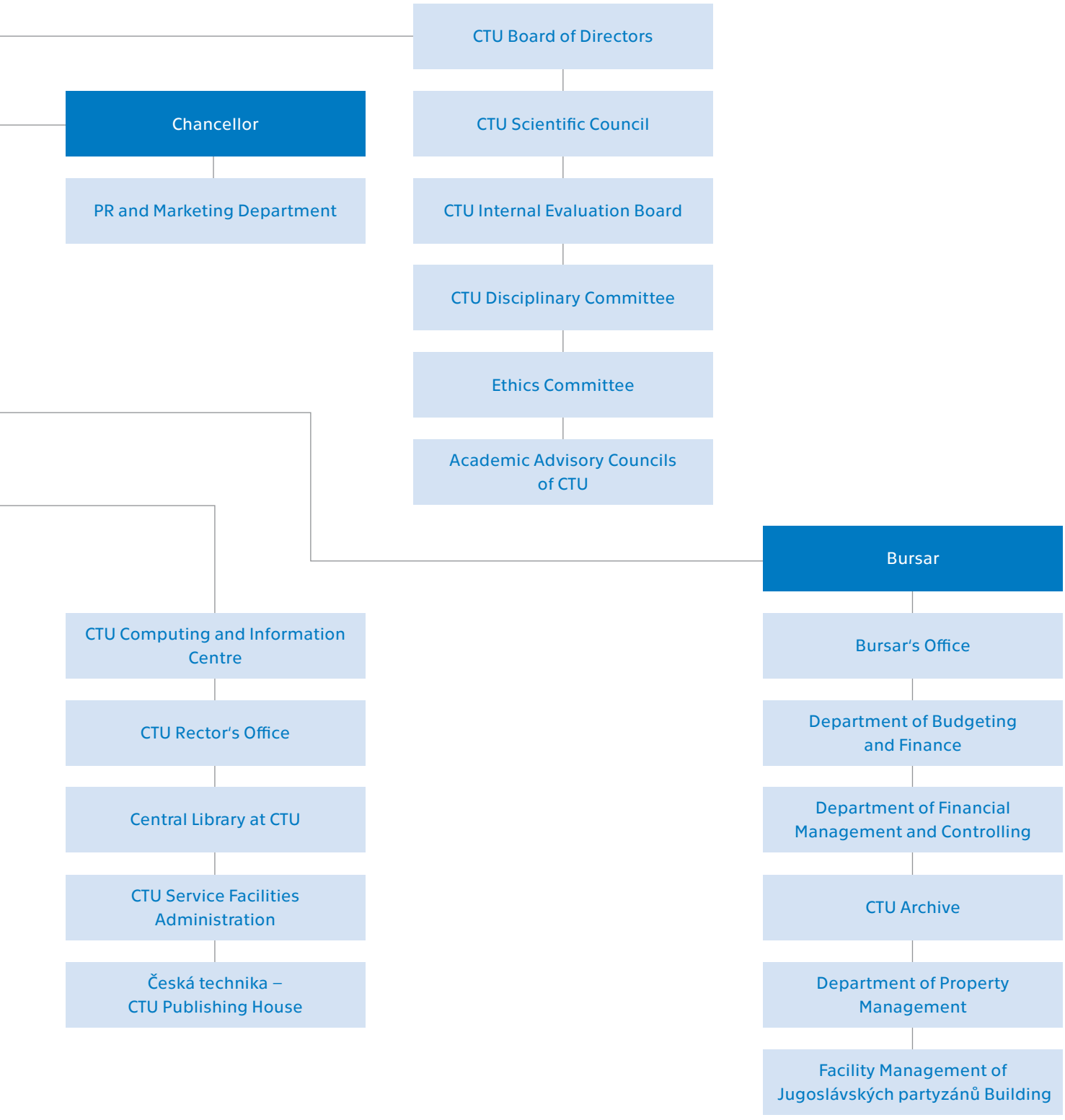
Rector's Office of the CTU (R CTU) – Jugoslávských partzánů 1580/3, Prague 6 – Dejvice, 160 00

Service Facilities Administration (SFA) – Vaníčkova 315/7, Prague 6 – Dejvice, 160 17

CTU Publishing House (CTN) – Thákurova 1, Prague 6 – Dejvice, 160 41

1.2 CTU Organizational chart




CTU Board of Directors
Chancellor
CTU Scientific Council
PR and Marketing Department
CTU Internal Evaluation Board
CTU Disciplinary Committee
Ethics Committee
Academic Advisory Councils of CTU
Bursar
CTU Computing and Information Centre
Bursar's Office
CTU Rector's Office
Department of Budgeting and Finance
Central Library at CTU
Department of Financial Management and Controlling
CTU Service Facilities Administration
CTU Archive
Česká technika – CTU Publishing House
Department of Property Management
Facility Management of Jugoslávských partyzánů Building

1.3 Bodies of CTU

Table 1.3.1: CTU Management	
Rector	doc. RNDr. Vojtěch PETRÁČEK, CSc.
Vice-Rectors	
For Science, Creative Activity and Doctoral Studies	Prof. Ing. Zbyněk ŠKVOR, CSc.
For Bachelor and Master Studies	doc. Dr. Ing. Gabriela ACHTENOVÁ
For Quality Management	Ing. Radek HOLÝ, Ph.D.
For Development and Strategy	Ing. Veronika KRAMAŘÍKOVÁ, MBA
For Construction	Prof. Ing. Alena KOHOUTKOVÁ, CSc., FEng.
For International Relations	Prof. Ing. Oldřich STARÝ, CSc.
Bursar	Ing. Jiří BOHÁČEK until 22 September 2022 (from 22 September 2022 until 6 November 2022, doc. RNDr. Vojtěch PETRÁČEK, CSc., from 7 November 2022 the function of Bursar was entrusted to Ing. Veronika KRAMAŘÍKOVÁ, MBA)
Chancellor	Ing. Lucie ORGONIKOVÁ
Permanent guest of the CTU Management – Chairman of the CTU Academic Senate	doc. Ing. Jan JANOUŠEK, Ph.D.

Table 1.3.2: CTU Board of Directors		
Chairman	Prof. Ing. Petr SÁHA, CSc.	Vice-Rector for Creative Activities of Tomas Bata University in Zlín
1st Vice-Chairman	Ing. Dana DRÁBOVÁ, Ph.D.	Chair of the State Office for Nuclear Safety
Vice-Chairman	Mgr. František BUREŠ, MBA, LL.M	Independent expert advisor and consultant in the field of mechanical engineering, manufacturing and services
Members	Ing. Vladimír DLOUHÝ, CSc.	President of the Chamber of Commerce of the Czech Rep.
	Ing. Petr DVOŘÁK, MBA	Director General of Czech Television
	Ing. arch. Jan FIBIGER, CSc.	Chairman of the Board of Directors of the Foundation for the Development of Architecture and Construction of Architecture and Construction (ABF)
	Ing. Martin JAHN, MBA	Member of the Board of Management for Sales and Marketing at ŠKODA AUTO a. s.
	Ing. arch. Jan KASL	JK ARCHITEKTI s. r. o., Chairman of the Czech Chamber of Architects (ČKA)
	Mgr. Ondřej KOLÁŘ	Mayor of Prague 6 until 24 October 2022, Member of the Czech Parliament
	Mgr. Karel KOMÁREK, st.	Manager and Managing Director at Smart Brain, s. r. o. – until November 2022
	Ing. Vlastimil PICEK	Mayor of Brandýs nad Labem-Stará Boleslav
	Ing. Jiří RUSNOK	Governor of the Czech National Bank – until 30 June 2022
	Ing. Michaela ŠOJDROVÁ	Member of the European Parliament
	Mgr. Radek VONDRÁČEK	Chairman of the Constitutional Law Committee of the Chamber of Deputies of the Czech Republic
	RNDr. Jiří SLOVÁK	The mandate ended during 2022
Secretary	Ing. Lucie ORGONIKOVÁ	Chancellor of the CTU in Prague

Table 1.3.3: CTU Scientific Council		
Chairman	doc. RNDr. Vojtěch PETRÁČEK, CSc.	Rector of CTU
Vice-Rector for Science, Creative Activities and Doctoral Studies	Prof. Ing. Zbyněk ŠKVOR, CSc.	FEE
Regular internal members of the CTU SC	doc. Ing. Václav ČUBA, Ph.D.	Dean of FNSPE
	Prof. Dr. Ing. Zdeněk HANZÁLEK	CIIRC
	Prof. Ing. Petr HÁJEK, CSc.	FCE
	doc. Ing. arch. Dalibor HLAVÁČEK, Ph.D.	Dean of FA
	Prof. Ing. Igor JEX, DrSc.	FNSPE
	Prof. Ing. Ondřej JIROUŠEK, Ph.D.	FTS
	Prof. Ing. Tomáš JIROUT, Ph.D.	FME
	doc. RNDr. Ing. Marcel JIŘINA, Ph.D.	Dean of FIT
	Prof. Ing. Hana KUBÁTOVÁ, CSc.	FIT
	Prof. Ing. arch. Ladislav LÁBUS, Hon. FAIA	FA
	doc. Ing. Antonín LUPÍŠEK, Ph.D.;	UCEEB
	Prof. Ing. Jiří MÁCA, CSc.	Dean of FCE
	Prof. Ing. Jan MACEK, DrSc.	FME
	Prof. Ing. Jiří MATAS, Ph.D.	FEE
	Prof. MUDr. Leoš NAVRÁTIL, CSc. MBA, dr. h. c.	FBME
	Prof. Mgr. Petr PÁTA, Ph.D.	Dean of FEE
	doc. RNDr. Vojtěch PETRÁČEK, CSc.	Rector of CTU
	Prof. Ing. Ondřej PŘIBYL, Ph.D.	Dean of FTS
	Prof. Ing. Pavel RIPKA, CSc.	FEE
	Prof. MUDr. Jozef ROSINA, Ph.D., MBA	Dean of FBME
	Prof. Ing. Karel ROUBÍK, Ph.D.	FBME
	Prof. Dr. Ing. Miroslav SVÍTEK, dr. h. c.	FTS
	Prof. Ing. Zbyněk ŠKVOR, CSc.	Vice-Rector for Science, Creative Activities and Doctoral Studies
	doc. Ing. Miroslav ŠPANIEL, CSc.	Dean of FME
	doc. Ing. Ivan ŠTEKL, CSc.	Director of IEAP
	Prof. Ing. Pavel TVRDÍK, CSc.	FIT
	Prof. Ing. František WALD, CSc.	FCE
	Prof. Ing. arch. ir. Zdeněk ZAVŘEL, dr. h. c.	FA
	Prof. RNDr. Vít DOLEJŠÍ, Ph.D., DSc.	MFF UK
	Ing. Dana DRÁBOVÁ, Ph.D.	SONS, CHair
	Ing. Zdeněk GÄRTNER	Českomoravský beton, a. s.
	Univ.-Prof. Dr.-Ing. habil. Ivo HERLE	Technische Universität Dresden
	doc. Ing. Ladislav JANÍČEK, Ph.D., MBA, L.L.M.	BUT Brno, Rector
	Ing. arch. Jan KASL	Czech Chamber of Architects, Chairman
	Prof. RNDr. Jan KRATOCHVÍL, CSc.	IFF UK
	Dr. František J. KRAUS, Dr. Sc. Wiss Adjunct	ETH Zurich
	Prof. Ing. Petr NOSKIEVIČ, CSc.	VSB TUO
	Prof. Ing. Marek PENHAKER, Ph.D.	VSB TUO

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Table 1.3.3: CTU Scientific Council

Regular external members of the CTU SC	Prof. Ing. Stanislav POSPÍŠIL, Ph.D., FEng.	ISTAM, CAS
	Prof. Ing. Ivo PROVAZNÍK, Ph.D.	Brno University of Technology
	Ing. Jaroslav ŘASA	ABRA Software
	doc. Ing. Libor ŠVADLENKA, Ph.D.	UP, Dean of DFJP
	Prof. Ing. arch. Ľubica VITKOVÁ, PhD.	STU Bratislava
	Prof. Ing. Miroslav VOZŇÁK, Ph.D.	VSB TUO
	Prof. Dr. Ing. Pavel ZEMČÍK	BUT Brno, Dean of FIT
Extraordinary members of the CTU SC	Prof. Dr. Ing. Vladimír BLAŽEK, dr. h. c.	RWTH Aachen
	Prof. PhDr. Vladimíra DVOŘÁKOVÁ, CSc.	Director of MIAS
	Prof. Ing. Stanislava HRONOVÁ, CSc.	ALL
	Prof. Ing. Helena JELÍNKOVÁ, DrSc.	FNSPE
	Prof. Ing. Jiří KOLÍSKO, Ph.D.	KI, Director
	Prof. RNDr. Bohumil KRATOCHVÍL, DSc.	UCT Prague
	doc. Ing. Jaroslav MACHAN, CSc.	FME
	Prof. Dr. Ing. Martin POSPÍŠIL, Ph.D.	FA
	Prof. RNDr. Karel ŠAFAŘÍK, CSc.	CERN
	Prof. Ing. Michael VALÁŠEK, DrSc.	FME
Rectors Emeritus	Prof. Ing. Václav HAVLÍČEK, CSc.	Rector Emeritus of CTU
	Prof. Ing. Jiří WITZANY, DrSc, dr. h. c., FEng.	Rector Emeritus of CTU
	Prof. Ing. Petr ZUNA, CSc., D.Eng. h. c., FEng.	Rector Emeritus of CTU
	Prof. Ing. Petr KONVALINKA, CSc., FEng.	Rector Emeritus of CTU
	doc. Ing. Antonín POKORNÝ, CSc.	Rector Emeritus of CTU

Table 1.3.4: Academic Senate of CTU		
Chairman	doc. Ing. Jan JANOUŠEK, Ph.D.	FIT
Vice-Chair – female employee	doc. Ing. arch. Dana MATĚJOVSKÁ, Ph.D.	FA
Vice-Chairman – Student	Ing. Jakub SLÁMA	FEE
Chairman of the Legislative Commission	Mgr. Veronika VYMĚTALOVÁ, Ph.D.	FBME
Chairman of the Economic Commission	Prof. Ing. Pavel RIPKA, CSc.	FEE
Chairman of the Development and Quality Committee	Prof. Ing. Václav HLAVÁČ, CSc.	CIIRC
Chairman of the Educational Commission	Ing. Jan ŘEZNÍČEK	FIT – from January 2022
Chairman of the Commission for SFA	Bc. Lukáš KULIČKA	FNSPE – until March 2022
Chairman of the Commission for SFA	Bc. Ondřej VÁŇA	FCE – from April 2022
Chairman of the Student Committee	Bc. Adolf VALÁŠEK	FME
Chairman of the Information Strategy Committee	Prof. Dr. Ing. Jan KYBIC	FEE – until June 2022
Chairman of the Commission for Science, Creative Activities and Doctoral Studies	Prof. Dr. Ing. Ivan RICHTER	FNSPE
Members of the Academic Senate	doc. Ing. Josef JETTMAR, CSc.	FME
	Prof. Ing. Jan TYWONIAK, CSc.	FME
	Prof. Ing. František WALD, CSc.	FME
	Bc. Ondřej VÁŇA	FME
	Ing. Jakub HOLAN	FME
	doc. Ing. Václav BAUMA, CSc.	FCE
	Prof. Ing. Jan HRDLIČKA, Ph.D.	FCE
	Ing. Karel VÍTEK, CSc.	FCE
	Bc. Adolf VALÁŠEK	FCE
	Bc. Jaroslav SEIFRT	FCE – from April 2022
	RNDr. Ilona Ali BLÁHOVÁ, Ph.D.	FEE
	Prof. Ing. Pavel RIPKA, CSc.	FEE
	Bc. Petra FRIDRICHOVÁ	FEE
	Ing. Jakub SLÁMA	FEE
	Ing. Petr AMBROŽ, Ph.D.	FNSPE
	doc. Mgr. Jaroslav BIELČÍK, Ph.D.	FNSPE
	Prof. Dr. Ing. Ivan RICHTER	FNSPE
	Ing. Michal FARNÍK	FNSPE – until April 2022
	Bc. Lukáš KULIČKA	FNSPE – until June 2022
	Ing. Jakub KORENEK	FNSPE – from October 2022
	Bc. Štěpán TICHÝ	FNSPE – from October 2022
	doc. Ing. arch. Dalibor HLAVÁČEK, Ph.D.	FA – until January 2022
	doc. Ing. arch. Dana MATĚJOVSKÁ, Ph.D.	FA, Vice-Chairwoman of AS
	Prof. Ing. arch. Ladislav LÁBUS, Hon. FAIA	FA – from April 2022
	Ing. arch. Mgr. Klára BRŮHOVÁ, Ph.D.	FA – from February 2022
	Lucie KADRMASOVÁ	FA
	Ing. arch. Kristýna SCHULZOVÁ	FA
	Mgr. Jitka HEŘMANOVÁ	FTS
	Ing. Tomas DOCTOR	FTS

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Table 1.3.4: Academic Senate of CTU

Members of the Academic Senate	Ing. Luboš NOUZOVSKÝ, Ph.D.	FTS
	Ing. Michaela NEUHÄSEROVÁ	FTS
	Jakub ŤUKAL	FTS – from April 2022
	Ing. Yulia ČUPROVÁ, Ph.D.	FBME – until June 2022
	Mgr. Romana ŠIROKÁ, Ph. D.	FBME – from September 2022
	Ing. Jan KAŠPAR	FBME
	Mgr. Veronika VYMĚTALOVÁ, Ph.D.	FBME
	Ing. Tomáš POKORNÝ	FBME
	Hana PROTIVOVÁ	FBME
	PhDr. Ing. Tomáš EVAN, Ph.D.	FIT
	Ing. Lukáš BAŘINKA	FIT
	doc. Ing. Jan JANOUŠEK, Ph.D.	FIT, Chairman of AS
	Ing. Stanislav JEŘÁBEK	FIT
	Ing. Jan ŘEZNÍČEK	FIT
	Prof. Ing. Václav HLAVÁČ, CSc.	CIIRC, Chairman of the AS Development and Quality Committee
	Mgr. Libor VYKYDAL	IPES
	Ing. Bc. Pavel ANDRES, Ph.D., ING. PAED. IGIP	MIAS
	Mgr. Adam ZABLOUDIL	KI
	Jan MIKEŠ	Member of the AS Student Committee, MIAS – until June 2022

Table 1.3.5: Disciplinary Commission of CTU	
Members – academics	doc. Ing. Miroslav SÝKORA, Ph.D. (KI)
	Ing. Petr TEJ, Ph.D. (KI)
	Mgr. Vít KLEPÁRNÍK, Ph.D. (MIAS)
	doc. Ing. David VANĚČEK, Ph.D. (MIAS)
Members – students	Ing. Martin KRYŠTOV (KI)
	Ing. Adam ČÍTEK (KI)
	Markéta BITTMANOVÁ (MIAS)
	Martin KLOUČEK (MIAS)
Substitutes – academics	Ing. Lukáš BALÍK, Ph.D. (KI)
	doc. Ing. Petr VYMĚTAL, Ph.D. (MIAS)
Substitutes – students	Ing. JIŘÍ ŽALSKÝ (KI)
	Tereza POLENOVÁ (MIAS)

Table 1.3.6: Ethics Committee	
Chairman	Prof. Ing. Jan UHLÍŘ, CSc. (FEE)
Members of the Commission	Prof. Ing. Miloslav HAVLÍČEK, DrSc. (FNSPE)
	Prof. Ing. Jan HOLUB, Ph.D. (FIT)
	doc. Ing. Jitka VAŠKOVÁ, CSc. (FCE)

Table 1.3.7: CTU Internal Evaluation Board	
Chairman	doc. RNDr. Vojtěch PETRÁČEK, CSc. (Rector of CTU)
Vice-Chair	Prof. Ing. Petr HÁJEK, CSc. (FCE)
Members	Ing. Lucie JIROTKOVÁ (FCE)
	doc. Ing. Jiří HOZMAN, Ph.D. (FBME)
	Prof. Ing. Josef JÍRA, CSc. (FTS)
	Prof. Ing. Pavel TVRDÍK, CSc. (FIT)
	Prof. Ing. Milan JIRÁSEK, DrSc. (FCE)
	Prof. Ing. Jan MACEK, DrSc. (FME)
	doc. Ing. Tomáš PAJDLA, Ph.D. (CIIRC)
	Prof. Ing. Jiří JAKOVENKO, Ph.D. (FEE)
	Prof. Ing. arch. Ladislav LÁBUS, Hon. FAIA (FA)
	doc. Ing. Jan JANOUŠEK, Ph.D. (FIT)
	Prof. Ing. Milena PAVLÍKOVÁ, Ph.D. (FCE)
	Prof. Ing. Igor JEX, DrSc. (FNSPE)
Secretary	Mgr. Renáta MATOUŠKOVÁ (R CTU)

1.4 CTU Presence in the Czech Universities Representation

Czech Rectors' Conference
doc. RNDr. Vojtěch PETRÁČEK, CSc. (Rector of CTU)

CTU Delegates in the Council of Universities Board
Presidency of the Council of Universities Board
Ing. Michal FARNÍK (FNSPE)
Prof. Dr. Ing. Ivan RICHTER (FNSPE)

Members of the Assembly of the Council of Universities Board
Prof. Dr. Ing. Ivan RICHTER (FNSPE)
Mgr. Veronika VYMĚTALOVÁ, Ph.D. (FBMI)
Ing. arch. Jana ZDRÁHALOVÁ, Ph.D. (FA)
Ing. Jan MUŽÍK, Ph.D. (FBME)
JUDr. Milena MACKOVÁ (FTS)
doc. Ing. Ľubomír SKLENKA, Ph.D. (FNSPE)
doc. Ing. Stanislav VÍTEK, Ph.D. (FEE)
Prof. Ing. Hana KUBÁTOVÁ, CSc. (FIT)
Prof. Ing. Michal POLÁK, CSc. (FME)
Prof. Ing. Zbyněk ŠIKA, Ph.D. (FME)

Legislative Working Committee
Mgr. Veronika VYMĚTALOVÁ, Ph.D. (FBME)

Working Committee on Economic
Prof. Dr. Ing. Ivan RICHTER (FNSPE)

Working Commission for Educational Activities
doc. Ing. Ľubomír SKLENKA, Ph.D. (FNSPE)

Working Commission for Scientific Activities
doc. Ing. Stanislav VÍTEK, Ph.D. (FEE)
Ing. arch. Jana ZDRÁHALOVÁ, Ph.D. (FA)
Prof. Dr. Ing. Ivan RICHTER (FNSPE)
Prof. Ing. Michal POLÁK, CSc. (FCE)
Prof. Ing. Zbyněk ŠIKA, Ph.D. (FME)

Working Commission on Strategy and Development in Higher Education
Ing. Michal FARNÍK (FNSPE)
Ing. Jan MUŽÍK, Ph.D. (FBME)
doc. Ing. Stanislav VÍTEK, Ph.D. (FEE)

Working Commission on Quality of Higher Education Institutions and its Evaluation
Ing. Michal FARNÍK (FNSPE)
Prof. Ing. Hana KUBÁTOVÁ, CSc. (FIT)

Working Committee on External and International Relations
Ing. Jan MUŽÍK, Ph.D. (FBME)
doc. Ing. Ľubomír SKLENKA, Ph.D. (FNSPE)

Student Chamber of the Council of Universities
Ing. Michal FARNÍK, delegate (FNSPE)
Bc. Lukáš KULIČKA, alternate delegate (FNSPE)

Table 2.1: Accredited study programmes (numbers)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Civil Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05							1		1
Technology, manufacturing and construction	07	9				9		22	13	53
Faculty total	X	9				9		23	13	54
Faculty of Mechanical Engineering*										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04					1	1			2
Technology, manufacturing and construction	07	5	4			16	8	10	7	50
Faculty total	X	5	4			17	9	10	7	52
Faculty of Electrical Engineering*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02							2	1	
Business, Administration and Law	04							2	1	3
Natural Sciences, Mathematics and Statistics	05							4		4
Information and communication technologies	06	4	1			2		4	3	14
Technology, manufacturing and construction	07	8	1			13	1	8	5	36
Faculty total	X	12	2			15	1	18	9	57
Faculty of Nuclear Sciences and Physical Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05	14				17		6	2	39
Information and communication technologies	06	1				2		1	1	5
Technology, manufacturing and construction	07	0				1		3	2	6
Health and social care, care for favourable living conditions	09	1								1
Faculty total	X	16				20		10	5	51
Faculty of Architecture*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02	1				1		1	1	4
Technology, manufacturing and construction	07	3				3		2	2	10
Faculty total	X	4				4		3	3	14
Faculty of Transportation Sciences*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	1						2	2	5
Services	10	4	2			7	3	6	5	27
Faculty total	X	5	2			7	3	8	7	32

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Table 2.1: Accredited study programmes (numbers)

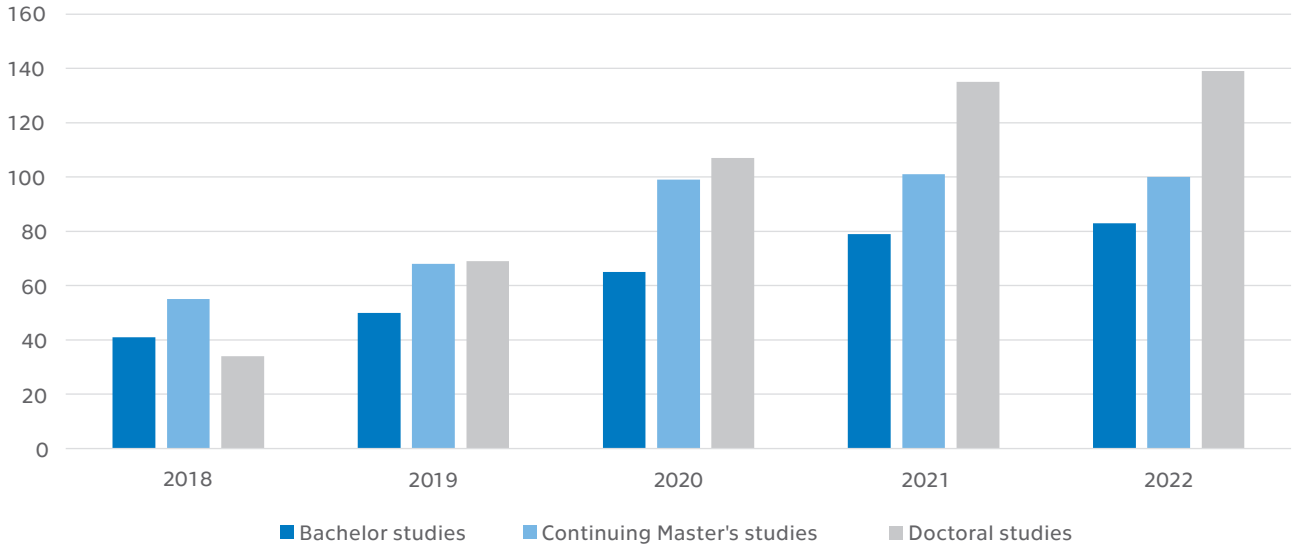
CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Biomedical Engineering*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	1				1		1	1	4
Technology, manufacturing and construction	07	1	1					1	1	4
Health and social care, care for favourable living conditions	09	8				5	1	2	2	18
Services	10	2	2			1	1	2	2	10
Faculty total	X	12	3			7	2	6	6	36
Faculty of Information Technology*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	3	2			3		2	2	12
Faculty total	X	3	2			3		2	2	12
School-wide workplaces (study outside the faculty)*										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		2							2
Business, Administration and Law	04	2				2	1			5
Technology, manufacturing and construction	07							2	2	4
School-wide workplaces total	X	2	2			2	1	2	2	11
CTU in Prague										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		2							2
Arts and Human Sciences	02	1				1		3	2	7
Business, Administration and Law	04	2				3	2	2	1	10
Natural Sciences, Mathematics and Statistics	05	14				17		11	2	44
Information and communication technologies	06	9	3			8		8	7	35
Technology, manufacturing and construction	07	27	6			42	9	50	34	168
Health and social care, care for favourable living conditions	09	9				5	1	2	2	19
Services	10	6	4			8	4	8	7	37
CTU TOTAL	X	68	15			84	16	84	55	238**

Note: * Faculty or other part of the university implementing the accredited study programme

Note: ** The total number is not the sum of the table numbers by individual faculty, but it is the sum of unique external codes across the entire CTU.

FT = full-time
PT/DL = part-time / distance learning

ACCREDITED STUDY PROGRAMMES – Bc., NMgr., Ph.D. STUDIES (NUMBERS)



STUDY PROGRAMMES IN A FOREIGN LANGUAGE (NUMBERS)

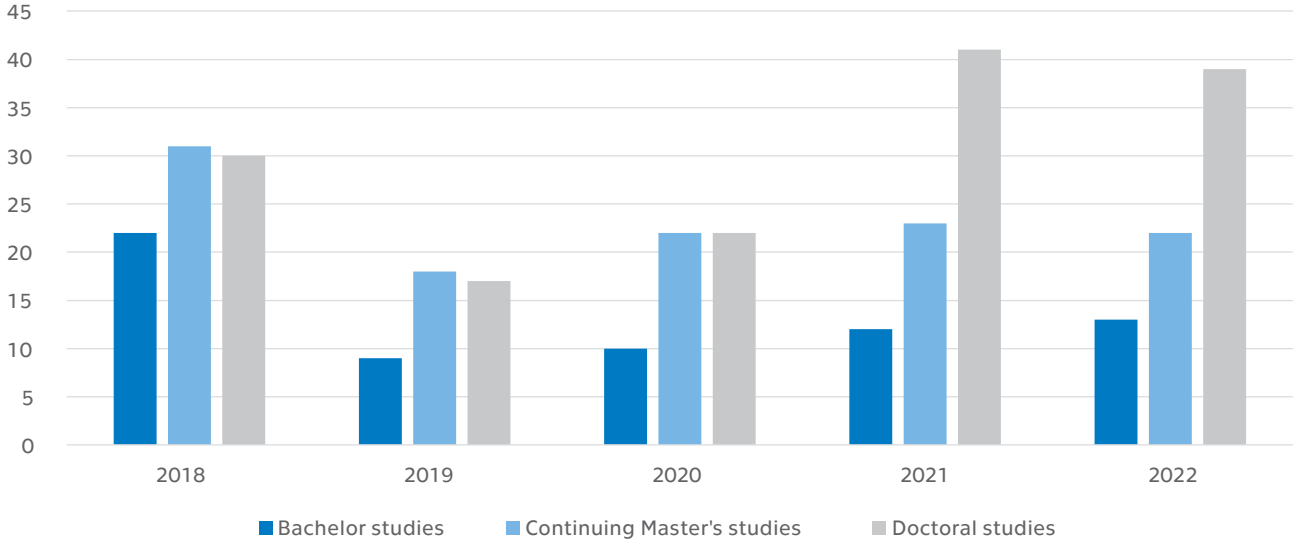


Table 2.2: Study programmes in a foreign language (numbers)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Civil Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	2				2		7	2	13
Faculty total	X	2				2		7	2	13
Faculty of Mechanical Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	1				4		4	1	10
Faculty total	X	1				4		4		10
Faculty of Electrical Engineering*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02							1		1
Business, Administration and Law	04							1		1
Natural Sciences, Mathematics and Statistics	05							2		2
Information and communication technologies	06					1		2	1	4
Technology, manufacturing and construction	07	1				5		3	1	10
Faculty total	X	1				6		9	2	18
Faculty of Nuclear Sciences and Physical Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05	3				3		3	1	10
Technology, manufacturing and construction	07							2	1	3
Faculty total	X					3		5	2	13
Faculty of Architecture*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07					1		1	1	3
Faculty total	X					1		1	1	3
Faculty of Transport Sciences*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07							1		1
Services	10	1				2		1		4
Faculty total	X	1				2		1		4

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Table 2.2: Study programmes in a foreign language (numbers)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Biomedical Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	1								1
Health and social care, care for favourable living conditions	09	1				2		1	1	5
Faculty total	X	2				2			1	6
Faculty of Information Technology*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	2				1		1		4
Faculty total	X	2				1		1		4
School-wide workplaces (study outside the faculty)*										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04	1				1				2
School-wide workplaces total	X	1				1				2
CTU in Prague										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02							1		1
Business, Administration and Law	04	1				1		1		3
Natural Sciences, Mathematics and Statistics	05	3				3		5	1	12
Information and communication technologies	06	2				2		3	1	8
Technology, manufacturing and construction	07	5				12		18	6	41
Health and social care, care for favourable living conditions	09	1				2		1	1	5
Services	10	1				2		1		4
CTU TOTAL	X	13				22		30	9	66**

Note: * Faculty or other part of the university implementing the accredited study programme

Note: ** The total number is not the sum of the table numbers by individual faculty, but it is the sum of unique external codes across the entire CTU.

FT = full-time
PT/DL = part-time / distance learning

Table 2.3: Joint/Double/Multiple Degree Study Programmes with Foreign HEIs	
CTU in Prague	
Faculty of Civil Engineering – Programme name 1	Study program Civil Engineering, Advanced Masters in Structural Analysis of Monuments and Historical Constructions
Partner organisations	University of Minho, Portugal Technical University of Catalonia, Spain University of Padova, Italy
Associated organisations	Institute of Theoretical and Applied Mechanics of the CAS
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Civil Engineering – Programme name 2	Study program Civil Engineering, Double Degree Master Program in Civil Engineering
Partner organisations	École Nationale Des Ponts et Chaussées (ENPC), France
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Civil Engineering – Programme name 3	Study program Civil Engineering, Double Degree Master Program in Civil Engineering
Partner organisations	Technische Universität München, Germany Fakultät für Bauingenieur- und Vermessungswesen, Germany
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Civil Engineering – Programme name 4	Study program Civil Engineering, Double degree Master Program in Civil Engineering
Partner organisations	École Centrale de Nantes, France
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0

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Table 2.3: Joint/Double/Multiple Degree Study Programmes with Foreign HEIs	
CTU in Prague	
Faculty of Civil Engineering – Programme name 5	Study program Civil Engineering, Sustainable Constructions under Natural Hazard and Catastrophic Events
Partner organisations	University of Coimbra (UC), Portugal Luleå University of Technology (LTU), Sweden Politehnica University of Timisoara (PUT), Rumunia University of Liège (Ulg), Belgium University of Naples Federico II, Italy
Associated organisations	Universidade do Estado do Rio de Janeiro, Brazil Moscow State University of Civil Engineering, Russia ArcelorMittal Global R&D, Luxembourg European Convention for Constructional Steelwork, Belgium Donbas National Academy of Civil Engineering and Architecture, Ukraine Tongji University, China Kyrgyz State University of Construction, Transport and Architecture, Kyrgyzstan Univerza v Ljubljani, Slovenia Associação Portuguesa de Construção Metálica e Mista, Portugal University of Mosul, Iraq
Type of programme (Joint/Double/Multiple Degree)	Multiple Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Civil Engineering – Programme name 6	Study program Civil Engineering, Double Degree Master Program in Civil Engineering
Partner organisations	KTH Royal Institute of Technology, Stockholm, Sweden
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	1
Faculty of Civil Engineering – Programme name 7	Study program Civil Engineering, Double degree Master Program in Civil Engineering
Partner organisations	RWTH Aachen, Aaachen, Germany, Faculty of Civil Engeneering
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	double degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Mechanical Engineering – Programme name 1	Master of Automotive Engineering
Partner organisations	TU Chemnitz (D), ENSTA Bretagne (F), HAN Arnhem (NL) and ITB Bandung (RI)
Associated organisations	
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	22

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Table 2.3: Joint/Double/Multiple Degree Study Programmes with Foreign HEIs	
CTU in Prague	
Faculty of Electrical Engineering – Programme name 1	Erasmus Mundus Master Course – Joint European Master in Space Science and Technology (SpaceMaster)
Partner organisations	Luleå University of Technology (LTU), Sweden Julius-Maximilian's University of Würzburg (JMUW), Germany Cranfield University (CU), United Kingdom Aalto University (Aalto), Finland Université Paul Sabatier Toulouse III (UPS), France University of Tokyo (Todai), Japan Utah State University (USU), USA
Associated organisations	Swedish Institute of Space Physics (IRF), Sweden Swedish Space Corporation (SSC), Sweden European Incoherent Scatter Scientific Association (EISCAT), Norway Honeywell s.r.o. (Honeywell), Czech Republic European Aeronautics Defence and Space Company, Innovation Works Division (EADS), France
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	13
Faculty of Electrical Engineering – Programme name 2	Double degree program with National Taiwan University of Science and Technology
Partner organisations	National Taiwan University of Science and Technology), DECE (Department of Electronic and Computer Engineering
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	6
Faculty of Electrical Engineering – Programme name 3	Double degree with RWTH Aachen
Partner organisations	RWTH Aachen
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	5
Faculty of Electrical Engineering – Programme name 4	Double degree program EURECOM, France
Partner organisations	Graduate School and Research Center in Digital Sciences, BIOT, Sophia Antipolis, France
Associated organisations	Mobile Computing Systems
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	1

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Table 2.3: Joint/Double/Multiple Degree Study Programmes with Foreign HEIs	
CTU in Prague	
Faculty of Electrical Engineering – Programme name 5	Joint degree program ERASMUS MUNDUS +, France
Partner organisations	Université Paris 1 Panthéon Sorbonne
Associated organisations	Universidade de Évora, Università degli Studi di Padova
Type of programme (Joint/Double/Multiple Degree)	Joint Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	10
Faculty of Nuclear Sciences and Physical Engineering – Programme name 1	DSP Applications of Natural Sciences, field of Nuclear Engineering
Partner organisations	Univerzita Gent, Belgium
Associated organisations	
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	0
Faculty of Nuclear Sciences and Physical Engineering – Programme name 2	NMSP Mathematical Engineering
Partner organisations	University of Kanazawa, Japan
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Nuclear Sciences and Physical Engineering – Programme name 3	NMSP Solid State Engineering
Partner organisations	University of Kanazawa, Japan
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0
Faculty of Transportation Sciences – Programme name 1	Intelligent Transport Systems
Partner organisations	Linköpings universitet, Sweden
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	5
Faculty of Transportation Sciences – Programme name 2	Smart Cities
Partner organisations	The University of Texas in El Paso
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	6

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Table 2.3: Joint/Double/Multiple Degree Study Programmes with Foreign HEIs	
CTU in Prague	
Masaryk Institute of Advanced Studies – Programme name 1	Economics and Management
Partner organisations	Wuhan University of Technology (WUT)
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Bachelor's
Number of active studies as of 31. 12.	0
Masaryk Institute of Advanced Studies – Programme name 2	Innovation Project Management
Partner organisations	Wuhan University of Technology (WUT)
Associated organisations	none
Type of programme (Joint/Double/Multiple Degree)	Double Degree
Type of programme (bachelor's, postgraduate, master's, doctoral)	Master's degree
Number of active studies as of 31. 12.	0

Summary information on Table 2.3

CTU in Prague	Bachelor's Degree	Master's studies	Continuing Master's studies	Doctoral studies	Total
Number of study programmes	1		18	1	20
Number of active studies in the following programmes	0		69		69

Table 2.4: Accredited study programmes implemented jointly with another university or public research institution* based in the Czech Republic	
CTU in Prague	
Faculty of Mechanical Engineering – Programme name 1	Mechatronics
The broadly defined field of ISCED-F	714
Partner university/institution*	University of South Bohemia in České Budějovice
Type of programme (bachelor's, postgraduate, master's, doctoral)	Bachelor's
Number of active studies as of 31. 12.	1
Faculty of Nuclear Sciences and Physical Engineering – programme name 1	Mathematical Engineering
The broadly defined field of ISCED-F	0541
Partner university/institution*	CAS, v.v.i.
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	41
Faculty of Nuclear Sciences and Physical Engineering – programme name 2	Applications of Natural Sciences in Physical Engineering
The broadly defined field of ISCED-F	0533
Partner university/institution*	Institute of Thermomechanics, Institute of Photonics and Electronics, Institute of Physics, Institute of Theoretical and Applied Mechanics, Jaroslav Heyrovský Institute of Physical Chemistry, Institute of Nuclear Physics
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	91
Faculty of Nuclear and Physical Engineering – programme name 3	Applications of Natural Sciences in Nuclear Engineering
The broadly defined field of ISCED-F	0533, 0713
Partner university/institution*	Institute of Nuclear Physics
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	78

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Table 2.4: Accredited study programmes implemented jointly with another university or public research institution* based in the Czech Republic	
CTU in Prague	
Faculty of Nuclear and Physical Engineering – programme name 4	Applications of Natural Sciences in Nuclear Chemistry
The broadly defined field of ISCED-F	0531
Partner university/institution*	Jaroslav Heyrovský Institute of Physical Chemistry
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	27
Faculty of Nuclear and Physical Engineering – programme name 5	Applications of Natural Sciences in Radiological Physics
The broadly defined field of ISCED-F	0533, 0914, 0915
Partner university/institution*	Institute of Nuclear Physics
Type of programme (bachelor's, postgraduate, master's, doctoral)	doctoral
Number of active studies as of 31. 12.	16
Faculty of Architecture – programme name 1	Landscape architecture
The broadly defined field of ISCED-F	731
Partner university/institution*	Czech University of Agriculture
Type of programme (bachelor's, postgraduate, master's, doctoral)	Bachelor's
Number of active studies as of 31. 12.	1

Note: * These are, for example, accredited study programmes carried out jointly with the CAS or other public research institutions based in the Czech Republic.

Summary information on Table 2.4					
CTU in Prague	**Bachelor's Degree**	**Master's studies**	**Continuing Master's studies**	**Doctoral studies**	**Total**
Number of study programmes	2		0	5	7
Number of active studies in the following programmes	2		0	253	255

Table 2.6: Lifelong learning (LLL) courses at the university (number of courses)

CTU in Prague		Career-oriented courses			Courses of interest			U3V	TOTAL
		up to 15 hrs	from 16 to 100 hrs	over 100 hrs	up to 15 hod	from 16 to 100 hrs	over 100 hrs		
Broadly defined fields of ISCED-F	code								
Programmes and qualifications – general education	00	4	2	1				7	14
Education and upbringing	01	3	11	6					20
Arts and Human Sciences	02	3	76	45		3		35	162
Social Sciences, Journalism and Information Sciences	03		2						2
Natural Sciences, Mathematics and Statistics	05	5	17	1	5			8	36
Information and communication technologies	06		103	29		76		34	242
Technology, manufacturing and construction	07	2	19	10			2	15	48
Agriculture, forestry, fishing and veterinary medicine	08							2	2
Health and social care, care for favourable living conditions	09	1	1	2					4
Services	10							5	5
TOTAL	X	18	231	94	5	79	2	106	535

Table 2.7: Lifelong learning (LLL) courses at the university (number of participants)

CTU in Prague		Career-oriented courses		
		up to 15 hrs	from 16 to 100 hrs	over 100 hrs
Broadly defined fields of ISCED-F	code			
Programmes and qualifications – general education	00	244	38	22
Education and upbringing	01		99	32
Arts and Human Sciences	02	22	318	204
Social Sciences, Journalism and Information Sciences	03			
Natural Sciences, Mathematics and Statistics	05	101	407	4
Information and communication technologies	06		40	122
Technology, manufacturing and construction	07	155	75	103
Agriculture, forestry, fishing and veterinary medicine	08			
Health and social care, care for favourable living conditions	09	11	2	15
TOTAL*	X	533	979	502

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Note: * As individuals who may attend more than one course are reported, the total is not the sum of the previous rows or columns, but reflects the actual total number of course participants.

Courses of interest			U3V	TOTAL*	Of which the number of participants who were admitted to accredited study programmes pursuant to Section 60 of the Higher Education Act
up to 15 hod	from 16 to 100 hrs	over 100 hrs			
			128	432	
				131	90
	26		863	1,433	17
				0	32
258			180	950	346
	29		309	500	43
			318	651	227
			68	68	
				28	10
258	55	0	1,866	4,193	765

Table 3.1: Students in accredited study programmes (number of studies)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Civil Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05							1		1
Technology, manufacturing and construction	07	2,239				717		196	163	3,315
Faculty total	**X**	**2,239**				**717**		**197**	**163**	**3,316**
Of which the number of women	X	875				306		73	44	1,298
Of which the number of foreigners	X	143				47		21	11	222
Faculty of Mechanical Engineering*										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04					35	6			41
Technology, manufacturing and construction	07	928	40			533	27	180	121	1,829
Faculty total	**X**	**928**	**40**			**568**	**33**	**180**	**121**	**1,870**
Of which the number of women	X	53	4			51	3	32	18	161
Of which the number of foreigners	X	123	3			30	4	25	14	199
Faculty of Electrical Engineering*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02							5	2	7
Business, Administration and Law	04							11	2	13
Natural Sciences, Mathematics and Statistics	05							13		13
Information and communication technologies	06	713	1			312		95	6	1,127
Technology, manufacturing and construction	07	974	35			450	9	91	90	1,649
Faculty total	**X**	**1,687**	**36**			**762**	**9**	**215**	**100**	**2,809**
Of which the number of women	X	251	5			115	2	31	13	417
Of which the number of foreigners	X	417	4			137	1	71	24	654
Faculty of Nuclear and Physical Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05	665				178		42	2	887
Information and communication technologies	06	173				25		3	1	202
Technology, manufacturing and construction	07					1		140	85	226
Health and social care, care for favourable living conditions	09	51								51
Faculty total	**X**	**889**				**204**		**185**	**88**	**1,366**
Of which the number of women	X	275				67		55	24	421
Of which the number of foreigners	X	240				25		52	11	328

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Table 3.1: Students in accredited study programmes (number of studies)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Architecture*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02	79				45		9	1	134
Technology, manufacturing and construction	07	936				465		75	40	1,516
Faculty total	**X**	**1,015**				**510**		**84**	**41**	**1,650**
Of which the number of women	X	630				328		38	17	1,013
Of which the number of foreigners	X	268				131		21	4	424
Faculty of Transport Sciences*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	24						7	8	39
Services	10	569	25			229	66	65	41	995
Faculty total	**X**	**593**	**25**			**229**	**66**	**72**	**49**	**1,034**
Of which the number of women	X	99	10			51	21	18	15	214
Of which the number of foreigners	X	131	4			23	6	15	5	184
Faculty of Biomedical Engineering*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	33				20		24	7	84
Technology, manufacturing and construction	07	44	4					7	19	74
Health and social care, care for favourable living conditions	09	886				145	60	26	15	1,132
Services	10	118	113			76	126	6	50	489
Faculty total	**X**	**1,081**	**117**			**241**	**186**	**63**	**91**	**1,779**
Of which the number of women	X	721	30			166	90	28	35	1,070
Of which the number of foreigners	X	84				15	9	7	5	120
Faculty of Information Technology*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	1,829	111			501		42	18	2,501
Faculty total	**X**	**1,829**	**111**			**501**		**42**	**18**	**2,501**
Of which the number of women	X	249	22			58		5	1	335
Of which the number of foreigners	X	572	22			129		8	1	732
School-wide workplaces (study outside the faculty)*										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		134							134
Business, Administration and Law	04	520				185	132			837
Technology, manufacturing and construction	07							11	9	20
School-wide workplaces total	**X**	**520**	**134**			**185**	**132**	**11**	**9**	**991**
Of which the number of women	X	263	50			97	67	3		480
Of which the number of foreigners	X	64	1			21	23			109

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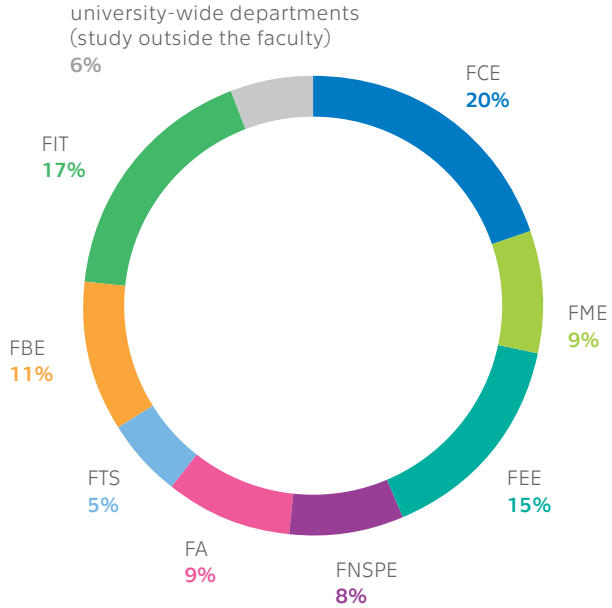
Table 3.1: Students in accredited study programmes (number of studies)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
CTU in Prague										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		134							134
Arts and Human Sciences	02	79				45		14	3	141
Business, Administration and Law	04	520				220	138	11	2	891
Natural Sciences, Mathematics and Statistics	05	665				178		56	2	901
Information and communication technologies	06	2,748	112			858		164	32	3,914
Technology, manufacturing and construction	07	5,145	79			2,166	36	707	535	8,668
Health and social care, care for favourable living conditions	09	937				145	60	26	15	1,183
Services	10	687	138			305	192	71	91	1,484
CTU TOTAL	X	10,781	463	0	0	3,917	426	1,049	680	17,316
Of which the number of women	X	3,416	121	0	0	1,239	183	283	167	5,409
Of which the number of foreigners	X	2,042	34	0	0	558	43	220	75	2,972

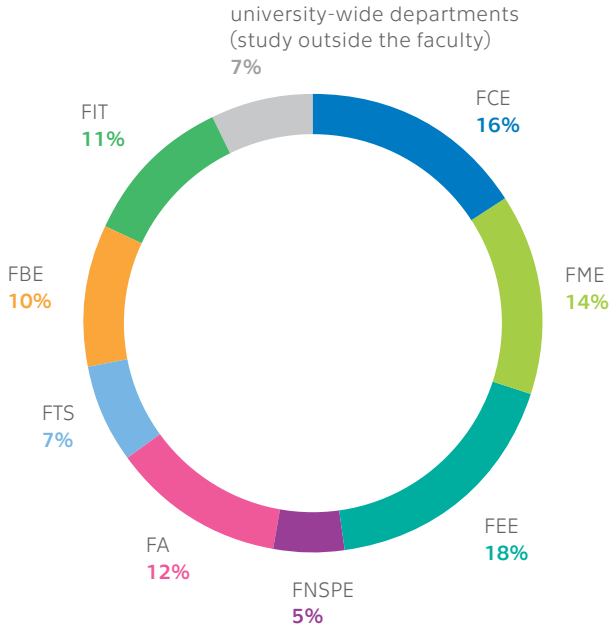
Note: * Faculty or other part of the university implementing the accredited study programme

FT = full-time
PT/DL = part-time / distance learning

STUDENTS IN BACHELOR'S DEGREE PROGRAMMES IN 2022



STUDENTS IN CONTINUING MASTER'S DEGREE PROGRAMMES IN 2022



STUDENTS IN DOCTORAL DEGREE PROGRAMMES IN 2022

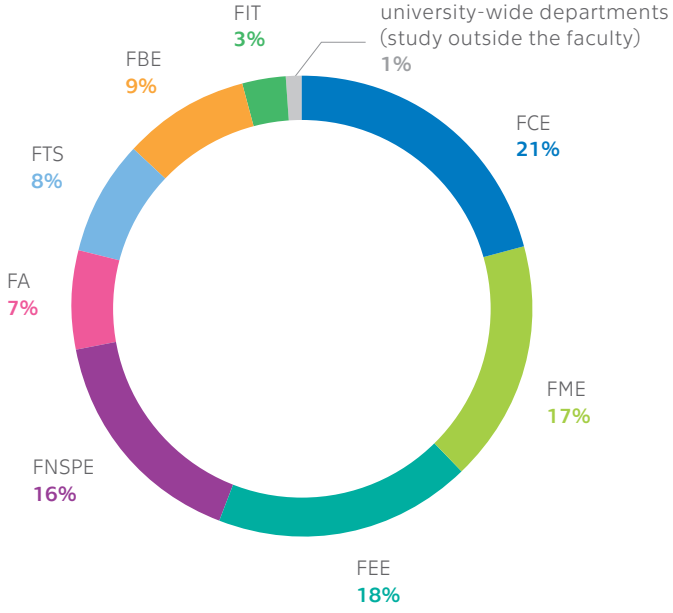


Table 3.2: Self-paying students** (number of studies)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Civil Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	9				6				15
Faculty total	X	9				6				15
Faculty of Mechanical Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	49				19				68
Faculty total	X	49				19				68
Faculty of Electrical Engineering*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06					3		1		4
Technology, manufacturing and construction	07	69				16		1	1	87
Faculty total	X	69				19		2	1	91
Faculty of Nuclear Sciences and Physical Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05	6				3				9
Technology, manufacturing and construction	07							1		1
Faculty total	X					3		1		10
Faculty of Architecture*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07					16				16
Faculty total	X					16			0	16
Faculty of Transportation Sciences*										
Broadly defined fields of ISCED-F	code									
Services	10	20								20
Faculty total	X	20								20
Faculty of Biomedical Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	3								3
Health and social care, care for favourable living conditions	09	14				4				18
Faculty total	X	17				4				21
Faculty of Information Technology*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	109				7				116
Faculty total	X	109				7				116
School-wide workplaces (study outside the faculty)*										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04	8				3				11
School-wide workplaces total	X	8				3				11

>>>

Table 3.2: Self-paying students** (number of studies)

CTU in Prague		Bachelor's studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
CTU in Prague										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04	8				3				11
Natural Sciences, Mathematics and Statistics	05	6				3				9
Information and communication technologies	06	109				10		1		120
Technology, manufacturing and construction	07	130				57		2	1	190
Health and social care, care for favourable living conditions	09	14				4				18
Services	10	20								20
CTU TOTAL	X	287				77		3	1	368

Note: * Faculty or other part of the university implementing the accredited study programme

Note: ** A self-paying student is a person (student) who pays for his/her studies in a foreign language in full on his/her own and the university does not include him/her in the number of students determining the amount of the state contribution to educational activities.

FT = full-time
PT/DL = part-time / distance learning

Table 3.3: Academic failure* in the first year** of study (%)

CTU in Prague	Bachelor's studies			Master's studies		
	FT	PT/DL	TOTAL	FT	PT/DL	TOTAL
Faculty of Civil Engineering***	45.8		45.8			
Faculty of Mechanical Engineering***	39.3	56.2	41.2			
Faculty of Electrical Engineering***	29.1	59.1	30.0			
Faculty of Nuclear Sciences and Physical Engineering***	49.6		49.6			
Faculty of Architecture***	13.9		13.9			
Faculty of Transportation Sciences***	53.8	32.0	52.1			
Faculty of Biomedical Engineering***	22.1	30.8	22.8			
Faculty of Information Technology***	38.4	51.1	39.6			
School-wide workplaces (study outside the faculty)***	13.4	33.3	20.1			
CTU TOTAL	36.4	44.3	36.9			

Note: * Study failure rate is the ratio of the number of studies started in calendar year n to the sum of failed studies of this cohort in calendar years n and n+1.

Note: ** These are all students who enrolled in a given college in calendar year n, whether they are first-time enrollees or not.

Note: *** Faculty or other part of the university implementing the accredited study programme

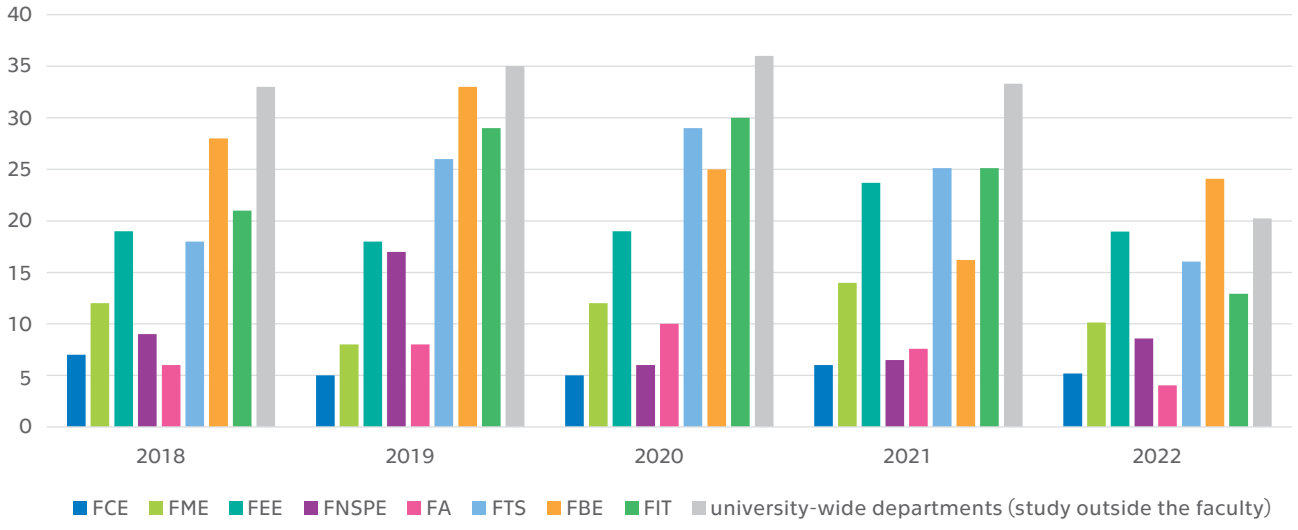
FT = full-time
PT/DL = part-time / distance learning

The TOTAL value is neither the sum nor the average of the previous values (e.g. for P and K/D in a certain type of study). A separate calculation must be made for each field in the table.

Example:

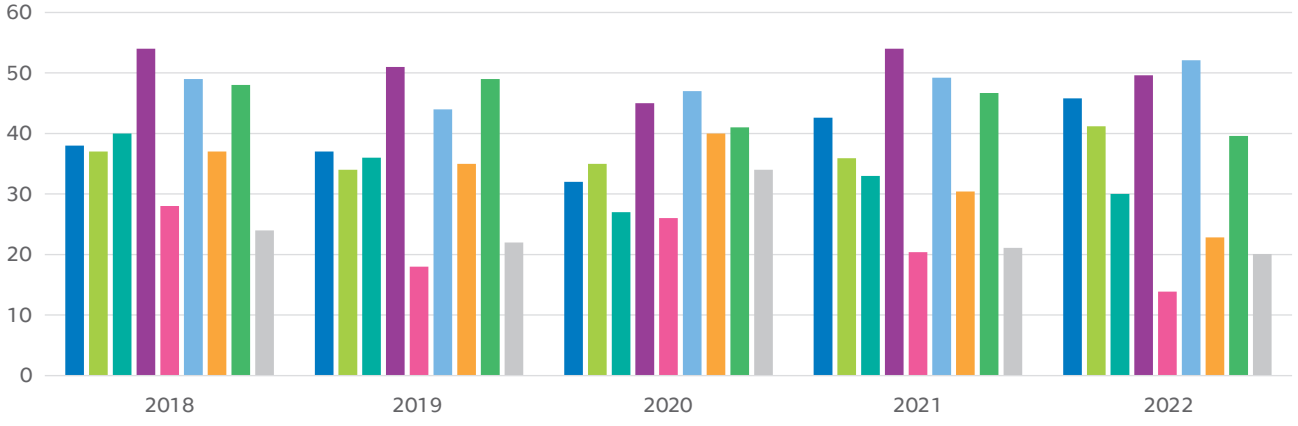
In 2020 (between 1 January and 31 December), 500 full-time undergraduate students were enrolled at the Faculty. In the same and the following year, 180 of this cohort were unsuccessfully completed. The first year failure rate for this cohort is 180/500=0.36, or 36%.

ACADEMIC FAILURE RATE OF THE 1ST YEAR OF THE FOLLOW-UP MASTER'S DEGREE (%)



Continuing Master's studies			Doctoral studies				TOTAL
FT	PT/DL	TOTAL	FT	PT/DL	TOTAL		
5.2		5.2	9.5	0.0	7.2	34.2	
7.3	43.3	10.1	9.1	18.2	12.1	28.6	
19.0	16.7	19.0	9.2	15.4	10.0	24.8	
8.6		8.6	9.3	16.7	10.2	38.9	
4.0		4.0	17.4	12.9	15.3	11.3	
11.0	29.7	16.1	3.4	25.0	8.1	38.6	
17.2	32.5	24.1	10.5	30.4	21.4	23.1	
19.9		19.9	9.1	100.0	16.7	35.4	
6.8	30.5	20.2	0.0		0.0	20.1	
11.5	32.3	14.1	10.4	16.1	12.1	29.0	

ACADEMIC FAILURE RATE IN THE 1ST YEAR OF BACHELOR STUDIES (%)



ACADEMIC FAILURE RATE IN THE FIRST YEAR OF DOCTORAL STUDIES (%)

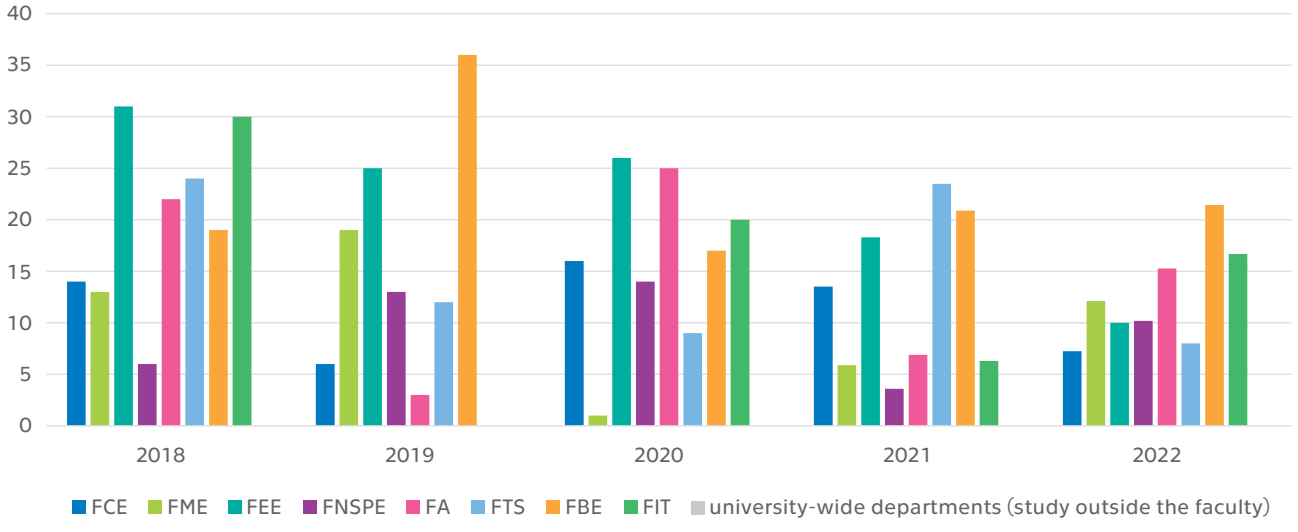


Table 3.4: Scholarships* to students by purpose of the scholarship (number of individuals)

CTU in Prague

Purpose of the scholarship	Number of students	Average scholarship amount**
For outstanding academic performance according to § 91 (2) (a)	2,885	10,802
For outstanding scientific, research, development, artistic or other creative achievements pursuant to Section 91 (2) (b)	604	28,711
For research, development and innovation activities according to a special legal regulation, § 91 (2) (c)	699	48,841
In the case of a student in a difficult social situation according to § 91 (2) (d)	29	10,997
In the case of a student in a difficult social situation according to § 91 (3)	24	11,881
In cases of special consideration pursuant to Section 91 (2) (e)	13,974	6,208
Of which accommodation scholarship	13,938	1,902
To support study abroad according to § 91 (4) (a)	102	19,974
To support studies in the Czech Republic according to § 91 (4) (b)	551	34,334
Students of doctoral study programmes according to § 91 (4) (c)	1,344	111,672
Other scholarships	1,170	5,039
TOTAL***	21,382	16,226

Note: * Irrespective of the source of funds, it does not refer only to funds from the Ministry of Education.

Note: ** Proportion of the total amount paid out for a given type of scholarship per year and the total number of individuals to whom the scholarship was paid at least once per year. If a scholarship has been paid to one person more than once, the person is counted only once, but the sum of the amounts paid to that person enters the calculation.

Note: *** As individuals who may be recipients of multiple scholarships are reported, the total number of students is not the sum of the previous columns, but reflects the actual number of students.

Example: the university paid a total of CZK 15,000 to students for outstanding academic performance under Section 91 (2) (a) for the year. A total of 3 students received this scholarship, two of whom received it once and the third student received it three times. The average amount of this scholarship was CZK 5,000 (= CZK 15,000/3).

Table 4.1: Graduates of accredited study programmes (number of graduates)

CTU in Prague		Bachelor studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Civil Engineering*										
Broadly defined fields of ISCED-F	code									
Technology, manufacturing and construction	07	350				400		1	43	794
Total faculty	**X**	**350**				**400**		**1**	**43**	**794**
Of which the number of women	X	157				162		1	13	333
Of which number of foreigners	X	41				55		1	4	101
Faculty of Mechanical Engineering*										
Broadly defined fields of ISCED-F	code									
Business, Administration and Law	04					18	1			19
Technology, manufacturing and construction	07	260	12			261	8	9	17	567
Total faculty	**X**	**260**	**12**			**279**	**9**	**9**	**17**	**586**
Of which the number of women	X	21	1			30		2		54
Of which number of foreigners	X	30				35	2	2	3	72
Faculty of Electrical Engineering*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	151	1			103				255
Technology, manufacturing and construction	07	195	5			140	3	4	23	370
Total faculty	**X**	**346**	**6**			**243**	**3**	**4**	**23**	**625**
Of which the number of women	X	52	2			39			2	95
Of which number of foreigners	X	69	1			54			5	129
Faculty of Nuclear Sciences and Physical Engineering*										
Broadly defined fields of ISCED-F	code									
Natural Sciences, Mathematics and Statistics	05	89				49		3	24	165
Information and communication technologies	06					31		0	0	31
Health and social care, care for favourable living conditions	09	1				0		0	0	1
Total faculty	**X**	**90**				**80**		**3**	**24**	**197**
Of which the number of women	X	32				21		1	2	56
Of which number of foreigners	X	12				12		0	0	24
Faculty of Architecture*										
Broadly defined fields of ISCED-F	code									
Arts and Human Sciences	02	32				16				48
Technology, manufacturing and construction	07	168				142		2	10	322
Total faculty	**X**	**200**				**158**		**2**	**10**	**370**
Of which the number of women	X	122				102			5	229
Of which number of foreigners	X	32				42			1	75

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Table 4.1: Graduates of accredited study programmes (number of graduates)

CTU in Prague		Bachelor studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
Faculty of Transportation Sciences*										
Broadly defined fields of ISCED-F	code									
Services	10	135	1			75	12	1	4	228
Total faculty	**X**	**135**	**1**			**75**	**12**	**1**	**4**	**228**
Of which the number of women	X	22				18	2		3	45
Of which number of foreigners	X	26				5			1	32
Faculty of Biomedical Engineering*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06					4				4
Technology, manufacturing and construction	07	55	5			2			4	66
Health and social care, care for favourable living conditions	09	126				32	17			175
Services	10	14	19			44	57	1	2	137
Total faculty	**X**	**195**	**24**			**82**	**74**	**1**	**6**	**382**
Of which the number of women	X	145	8			50	34			237
Of which number of foreigners	X	15	1			7	3			26
Faculty of Information Technology*										
Broadly defined fields of ISCED-F	code									
Information and communication technologies	06	242	8			138			9	397
Total faculty	**X**	**242**	**8**			**138**			**9**	**397**
Of which the number of women	X	33	0			19			1	53
Of which number of foreigners	X	66	1			34			1	102
School-wide workplaces (study outside the faculty)*										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		67							67
Arts and Human Sciences	02								1	1
Business, Administration and Law	04	112				47	28			187
Technology, manufacturing and construction	07								6	6
Total faculty	**X**	**112**	**67**			**47**	**28**		**7**	**261**
Of which the number of women	X	72	33			29	10		2	146
Of which number of foreigners	X	9	1			4	2			16

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Table 4.1: Graduates of accredited study programmes (number of graduates)

CTU in Prague		Bachelor studies		Master's studies		Continuing Master's studies		Doctoral studies		TOTAL
		FT	PT/DL	FT	PT/DL	FT	PT/DL	FT	PT/DL	
CTU in Prague										
Broadly defined fields of ISCED-F	code									
Education and upbringing	01		67							67
Arts and Human Sciences	02	32				16			1	49
Business, Administration and Law	04	112				65	29			206
Natural sciences, mathematics and statistics	05	89				49		3	24	165
Information and communication technologies	06	393	9			276			9	687
Technology, manufacturing and construction	07	1,028	22			945	11	16	103	2,125
Health and social care, care for favourable living conditions	09	127				32	17			176
Services	10	149	20			119	69	2	6	365
CTU TOTAL	X	1,930	118			1,502	126	21	143	3,840
Of which the number of women	X	656	44			470	46	4	28	1,248
Of which number of foreigners	X	300	4			248	7	3	15	577

FT = full-time
PT/DL = part-time / distance learning; the number of successful graduates (not individuals) between 1 January and 31 December is reported.

Note: * Faculty or other part of the university implementing the accredited study programme.

GRADUATES OF ACCREDITED STUDY PROGRAMMES (NUMBER OF GRADUATES)

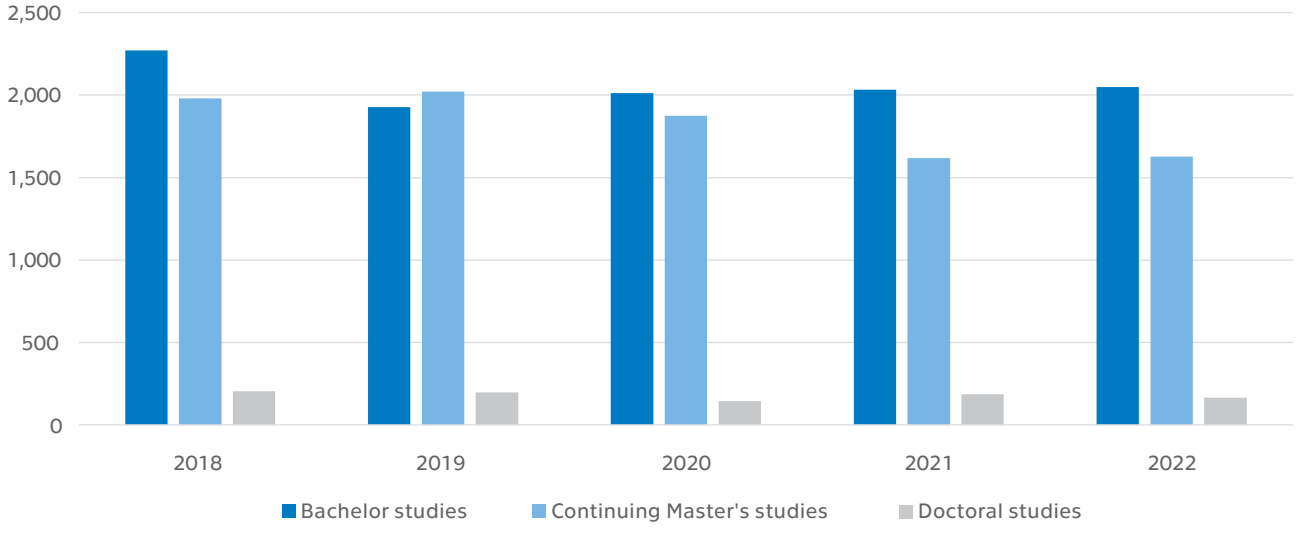

Table 5.1: Interest in studying at university

CTU in Prague		Bachelor studies				Master's studies	
		Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications
Faculty of Civil Engineering*							
Broadly defined ISCED-F disciplines	code						
Technology, manufacturing and construction	07	1,731	2,170	1,403	971		
Total faculty	X	**1,731**	**2,170**	**1,403**	**971**		
Faculty of Mechanical Engineering*							
ISCED-F broadly defined disciplines	code						
Business, Administration and Law	04						
Technology, manufacturing and construction	07	781	790	465	376		
Total faculty	X	**781**	**790**	**465**	**376**		
Faculty of Electrical Engineering*							
ISCED-F broadly defined fields	code						
Arts and Human Sciences	02						
Business, Administration and Law	04						
Natural sciences, mathematics and statistics	05						
Information and Communication Technologies	06	887	1,009	402	321		
Technology, manufacturing and construction	07	985	1,137	574	424		
Total faculty	X	**1,761**	**2,146**	**976**	**745**		
Faculty of Nuclear Sciences and Physical Engineering*							
ISCED-F broadly defined disciplines	code						
Natural sciences, mathematics and statistics	05	699	706	429	367		
Information and communication technologies	06	310	312	168	152		
Technology, manufacturing and construction	07						
Health and social care, care for favourable living conditions	09	41	41	31	28		
Total faculty	X	**1,045**	**1,059**	**628**	**547**		
Faculty of Architecture*							
ISCED-F broadly defined disciplines	code						
Arts and Human Sciences	02	136	137	47	39		
Technology, manufacturing and construction	07	837	918	415	372		
Total Faculty	X	**933**	**1,055**	**462**	**411**		
Faculty of Transportation Sciences*							
ISCED-F broadly defined disciplines	code						
Information and communication technologies	07	67	67	50	31		
Health and social care, care for favourable living conditions	09	606	643	379	282		
Total faculty	X	**654**	**710**	**429**	**313**		

		Continuing Master's studies				Doctoral studies			
Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study
		460	502	411	360	73	73	72	72
		460	502	411	360	73	73	72	72
		29	29	18	18				
		309	326	224	218	64	64	52	48
		335	355	242	236	64	64	52	48
						8	8	6	6
						3	3	3	3
						6	6	4	4
		242	270	173	135	29	29	24	24
		323	366	296	224	34	34	27	27
		545	636	469	359	80	80	64	64
		120	122	84	81	19	19	18	17
		9	9	7	7	2	2	2	2
						35	35	32	27
		129	131	91	88	56	56	52	46
		43	43	22	22	5	5	4	4
		274	285	204	190	33	33	26	25
		317	328	226	212	38	38	30	29
						7	8	8	7
		226	290	152	122	31	31	31	31
		226	290	152	122	38	39	39	38

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Table 5.1: Interest in studying at university

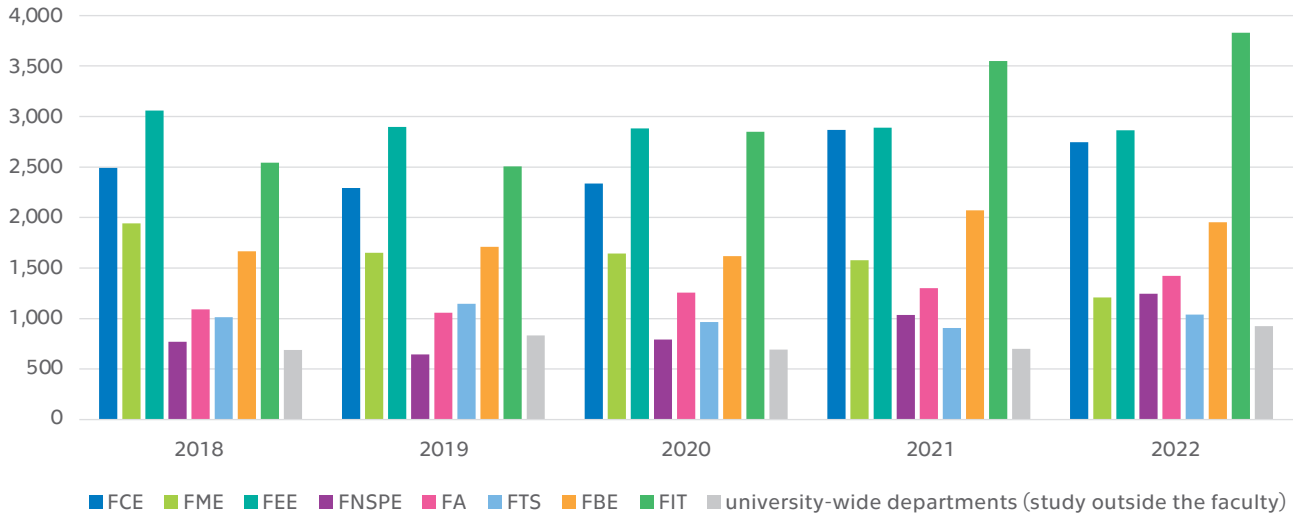
CTU in Prague		Bachelor studies				Master's studies	
		Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications
Faculty of Biomedical Engineering*							
ISCED-F broadly defined disciplines	code						
Information and Communication Technologies	06	35	38	18	10		
Health and social care, care for favourable living conditions	09	1,015	1,157	479	347		
Services	10	178	199	92	85		
Total faculty	X	1,196	1,394	589	442		
Faculty of Information Technology*							
ISCED-F broadly defined disciplines	code						
Information and Communication Technology	06	3,148	3,376	1,230	1,109		
Total Faculty	X	3,148	3,376	1,230	1,109		
Masaryk Institute of Advanced Studies*							
ISCED-F broadly defined fields of study	code						
Education and upbringing	01	89	89	78	78		
Business, Administration and Law	04	590	600	443	277		
Total Institute	X	679	689	521	355		
CTU in Prague	– the total figure for HEIs is not the sum of the figures for individual faculties!						
ISCED-F broadly defined disciplines	code						
Education and upbringing	01	89	89	78	78		
Arts and Human Sciences	02	136	137	47	39		
Business, Administration and Law	04	590	600	443	277		
Natural sciences, mathematics and statistics	05	699	706	429	367		
Information and communication technologies	06	4,380	4,735	1,818	1,592		
Technology, manufacturing and construction	07	4,401	5,082	2,907	2,174		
Health and social care, care for favourable living conditions	09	1,056	1,198	510	375		
Services	10	784	842	471	367		
CTU TOTAL	X	10,226	13,389	6,703	5,269		

Note: * Faculty or other part of the university implementing the accredited study programme

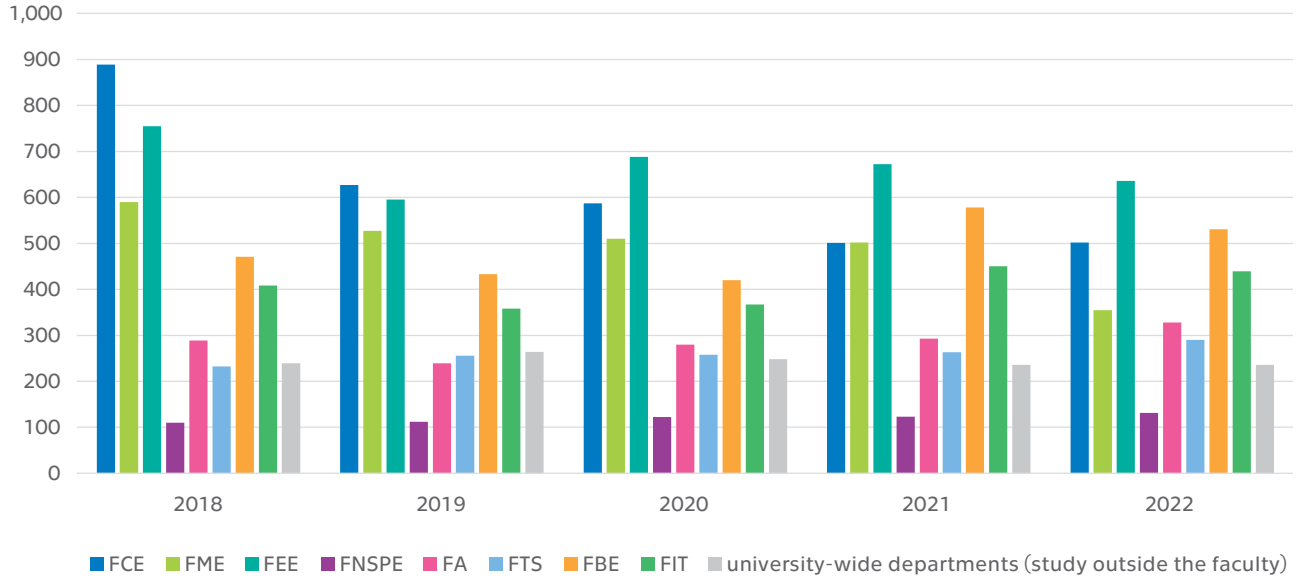
FT = full-time
PT/DL = part-time / distance learning

		Continuing Master's studies				Doctoral studies			
Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study	Number of applicants (natural persons)	Number of applications	Number of admissions	Number of enrolments to study
		18	20	10	10	6	6	6	6
		226	268	134	108	9	9	9	9
		227	243	103	94	14	14	13	13
		453	**531**	**247**	**212**	**29**	**29**	**28**	**28**
		436	439	260	242	16	16	14	13
		436	**439**	**260**	**242**	**16**	**16**	**14**	**13**
		229	236	185	156				
		229	**236**	**185**	**156**				
		0	0	0	0	0	0	0	0
		43	43	22	22	13	13	10	10
		258	265	203	174	3	3	3	3
		120	122	84	81	25	25	22	21
		705	738	450	394	53	53	46	45
		1,366	1,479	1,135	992	246	247	217	206
		226	268	134	108	9	9	9	9
		453	533	255	216	45	45	44	44
		3,039	**3,448**	**2,283**	**1,987**	**397**	**398**	**354**	**341**

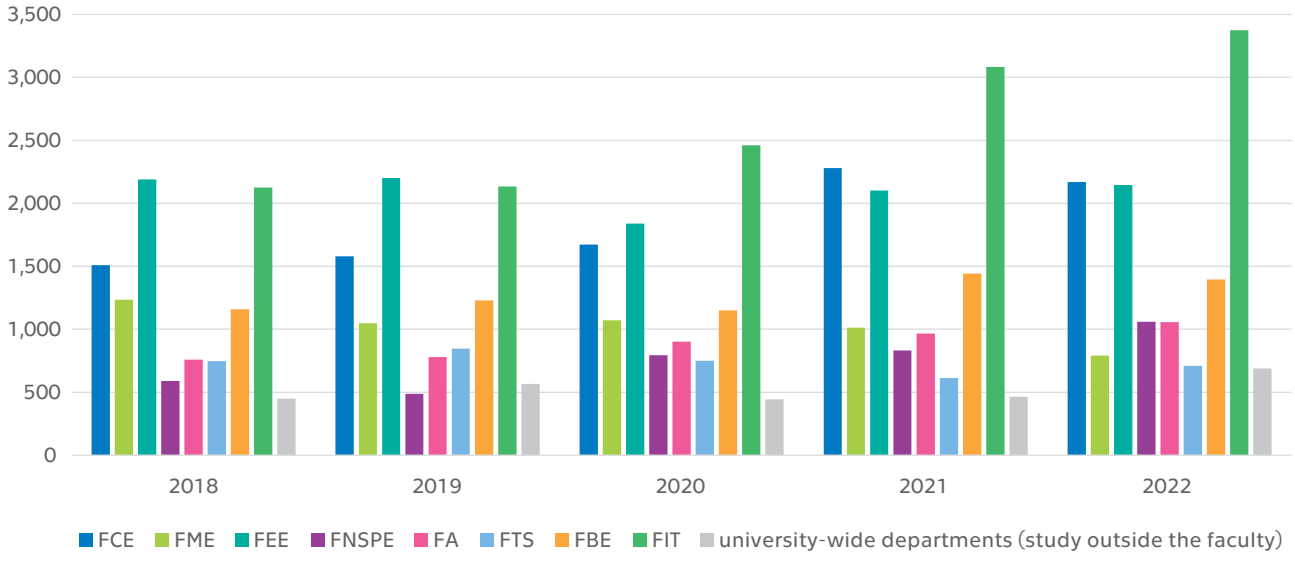
NUMBER OF APPLICATIONS (Bc., NMgr., Ph.D. STUDIES TOTAL)



NUMBER OF APPLICATIONS (NMgr. STUDIES)



NUMBER OF APPLICATIONS (Bc. STUDIES)



NUMBER OF APPLICATIONS (Ph.D. STUDIES)

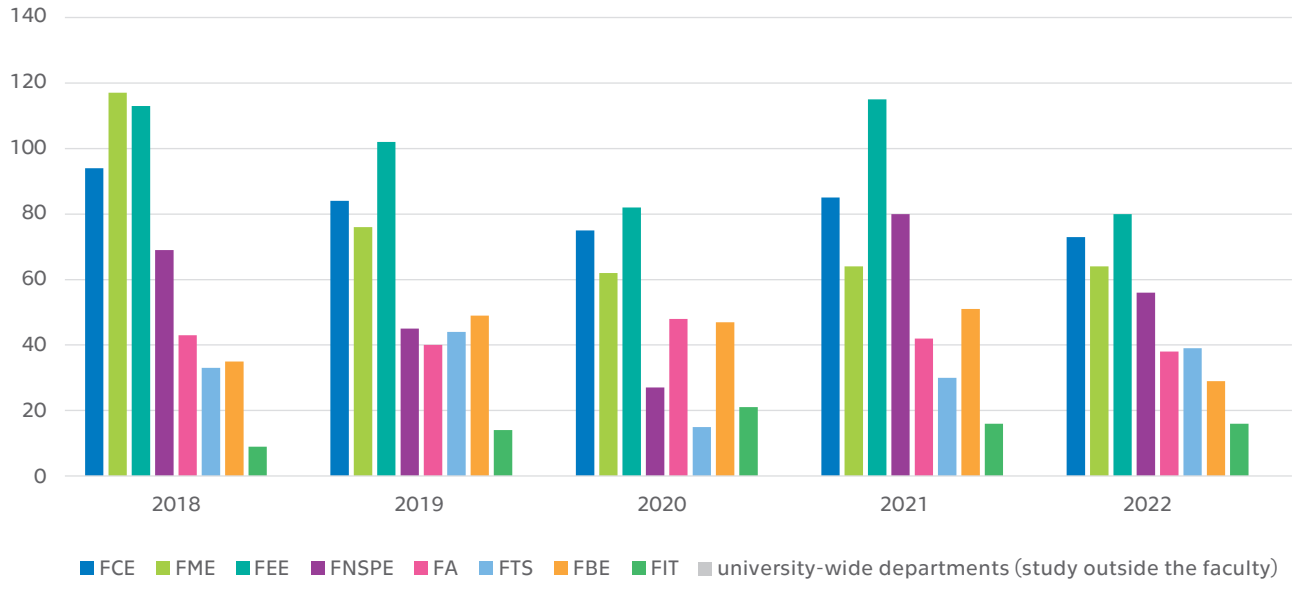


Table 6.1: Total academic and scientific staff and other employees (average headcount*)

CTU in Prague		Academic staff				
	TOTAL academic staff	Professors	Associate Professors	Assistant Professors	Assistant	Lecturers
Faculty of Civil Engineering******	357.4	49.4	101.6	201.0	3.4	2.0
Number of women	94.6	6.9	18.2	67.3	1.6	0.7
Faculty of Mechanical Engineering******	259.3	27.2	35.7	149.4	39.9	4.2
Number of women	29.1	0.3	3.0	21.5	2.3	1.0
Faculty of Electrical Engineering******	262.0	52.2	70.3	105.8	1.2	32.5
Number of women	22.9	2.0	3.0	13.0	0.0	5.0
Faculty of Nuclear Sciences and Physical Engineering******	150.6	26.2	40.7	80.6	0.0	3.0
Number of women	23.8	3.0	1.0	19.6	0.0	0.2
Faculty of Architecture******	119.7	15.4	24.8	78.7	0.0	0.0
Number of women	40.1	1.2	7.3	30.9	0.0	0.0
Faculty of Transportation Sciences******	131.9	6.8	31.4	74.1	12.4	7.2
Number of women	43.9	1.3	6.6	27.9	3.4	4.6
Faculty of Biomedical Engineering******	109.7	11.4	20.0	40.2	33.4	4.7
Number of women	41.3	0.8	4.3	18.2	14.3	3.7
Faculty of Information Technology******	102.3	5.9	14.6	54.4	13.1	14.2
Number of women	17.7	0.8	2.2	9.9	3.0	1.8
Masaryk Institute of Advaced Studies******	43.3	1.1	8.7	33.5	0.0	0.0
Number of women	21.0	0.2	2.9	17.9	0.0	0.0
Total other departments	45.2	2.5	6.5	26.9	2.6	0.6
Number of women	7.0	0.2	1.0	5.3	0.5	0.0
TOTAL	1,581.5	198.1	354.3	844.6	106.0	68.4
Total number of women	341.6	16.7	49.5	231.5	25.1	17.0

Note: * Average converted number is the ratio of the total number of hours actually worked in the reference period from 1 January to 31 December (by all employees in the reference category; incl. FTE, non-FTE) to the total annual working time pool per full-time employee.

Note: ** A researcher in this case means a researcher who is not an academic according to Section 70 of Act No. 111/1998 Coll., on Higher Education.

Note: *** Employee of the research institution or university within five years after receiving the Ph.D. degree or its equivalent. Works as part of a research team at the institution, usually under the supervision of experienced researchers on a specific task, and publishes his/her results independently and as part of a creative team. He/she has a fixed-term employment contract (of 1–3 years) with the research institution for one, maximum three consecutive periods. His/her salary is subject to the rules of the institution's payroll system, in addition to which he/she may receive rewards under research grant projects. Only an indicative number of postdoctoral students is given, due to the fact that they are registered in the CTU IS under other categories (separate functionality of postdoctoral students is not implemented in the EGJE IS).

Note: **** The category „Other scientific, research and development personnel" includes technical and professional staff who are not directly involved in the research but are indispensable to the research activity (e.g. operators of research facilities).

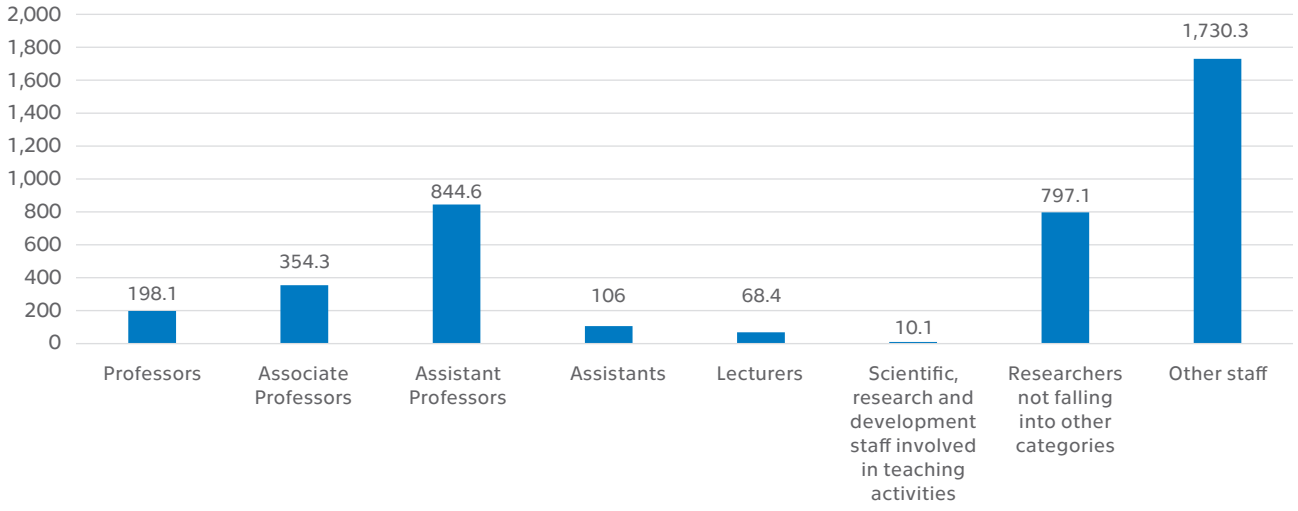
Note: ***** Other staff means all other staff not directly involved in education and research. This includes administrative, technical and other staff.

Note: ****** Faculty or other part of a higher education institution carrying out an accredited study programme.

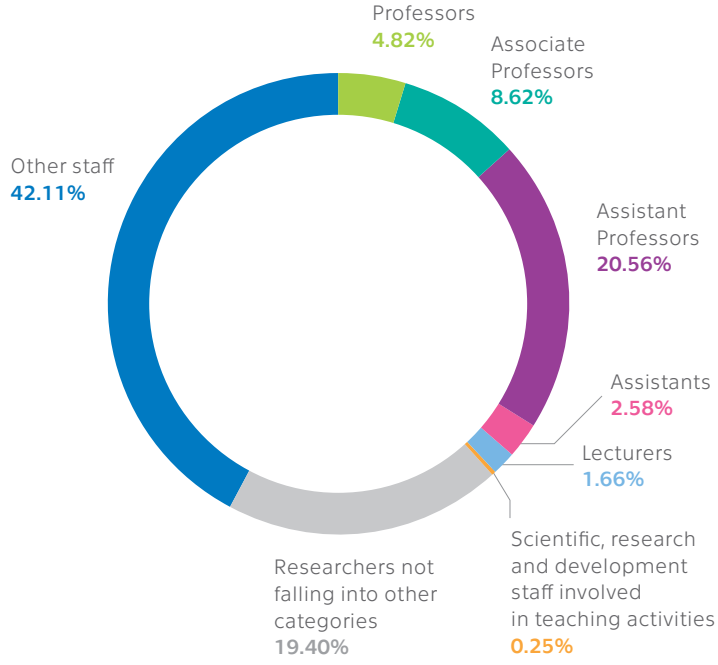
Note: ******* The number of extraordinary professors is given as the number of visiting professors.

		Scientific and professional staff**				
Scientific, research and development staff involved in teaching activities	Extraordinary professors*******	Postdoctoral fellows („postdocs")*** Indicative number	Researchers not falling into other categories	Other scientific, research and development personnel****	Other staff*****	TOTAL employees
0.0	1.0	5.0	79.2		216.9	653.5
0.0	1.0	1.0	20.1		125.5	240.2
2.9	0.0	8.0	30.2		227.5	517.0
1.0	0.0	1.0	2.8		82.8	114.7
0.0	0.0	5.0	202.9		189.0	653.9
0.0	0.0	1.0	18.1		99.9	140.9
0.2	0.0	7.4	109.4		111.0	371.0
0.0	0.0	1.4	26.9		78.0	128.7
0.9	1.0	2.0	6.5		60.6	186.8
0.8	0.0	0.0	1.1		44.0	85.2
0.0	0.0	3.0	31.4		128.9	292.2
0.0	0.0	1.0	10.0		68.3	122.2
0.0	2.0	1.0	15.2		42.1	167.0
0.0	0.0	1.0	3.9		27.3	72.5
0.0	0.0	2.0	23.1		65.2	190.6
0.0	0.0	0.0	2.4		35.9	56.0
0.0	0.0	1.0	2.3		25.3	70.9
0.0	0.0	0.0	0.2		19.3	40.5
6.1	0.0	9.5	296.9		663.8	1,005.9
0.0	0.0	1.5	43.2		388.0	438.2
10.1	4.0	43.9	797.1		1,730.3	4,108.9
1.8	1.0	7.9	128.7		969.0	1,439.3

STRUCTURE OF STAFF IN 2022 (AVERAGE RECALCULATED NUMBERS)

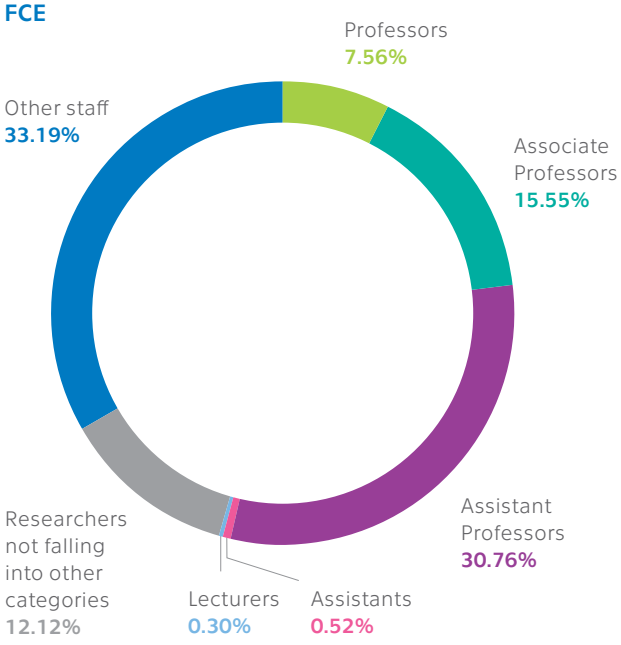


STAFF STRUCTURE OF CTU IN 2022
(AVARAGE RECALCULATED NUMBERS)



STRUCTURE OF EMPLOYEES BY INDIVIDUAL FACULTIES IN 2022 (AVERAGE RECALCULATED NUMBERS)

FCE



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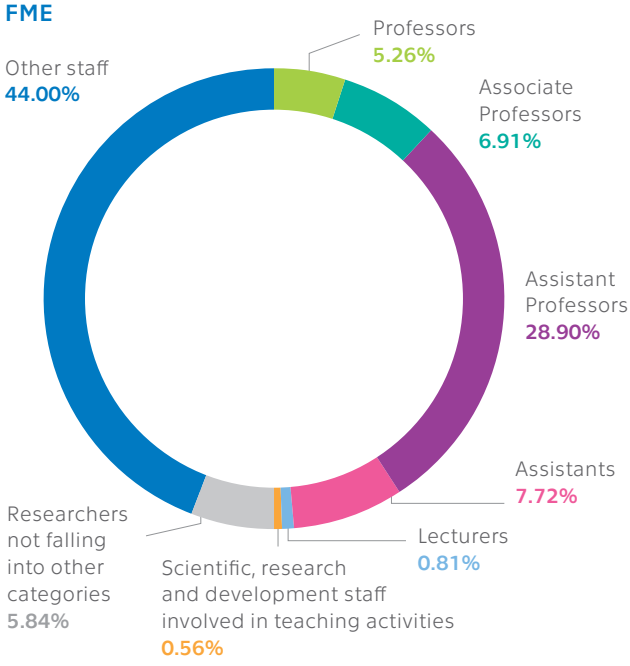

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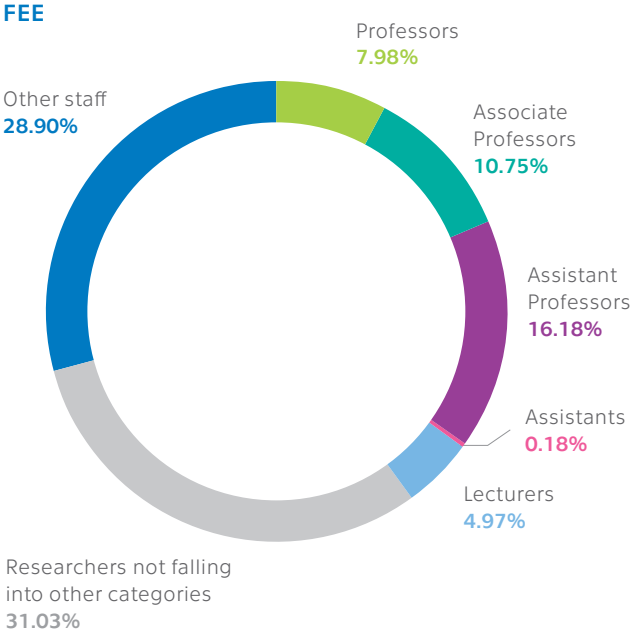

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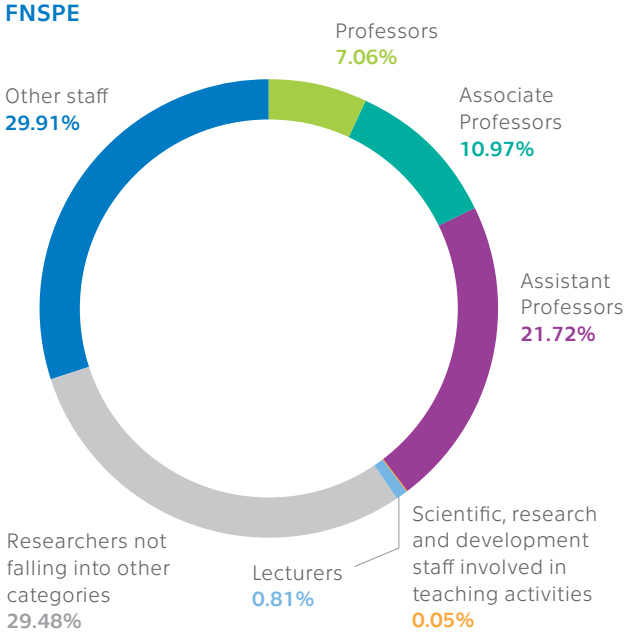
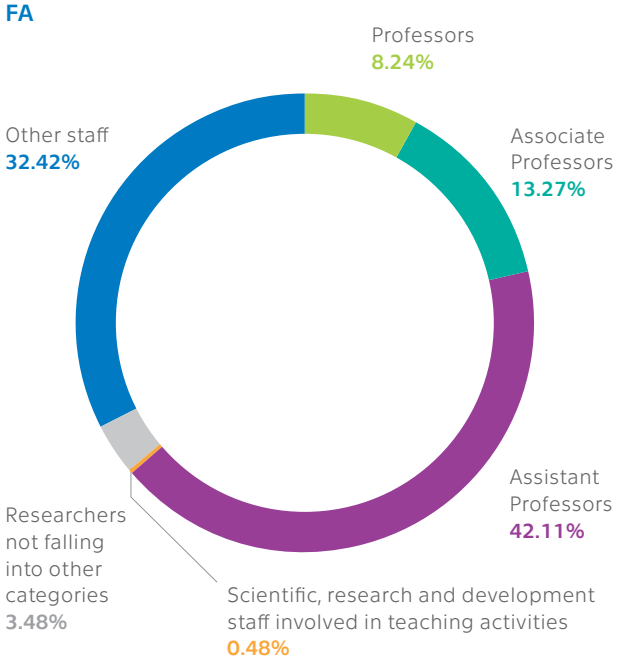


STRUCTURE OF EMPLOYEES BY INDIVIDUAL FACULTIES IN 2022
(AVARAGE RECALCULATED NUMBERS)

FA



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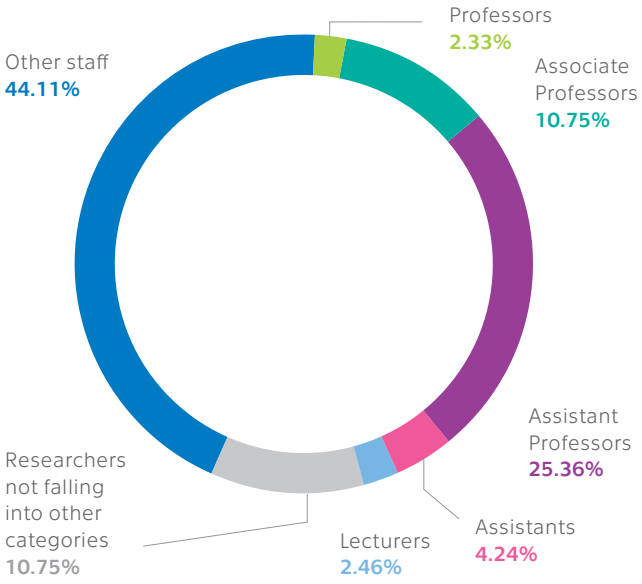

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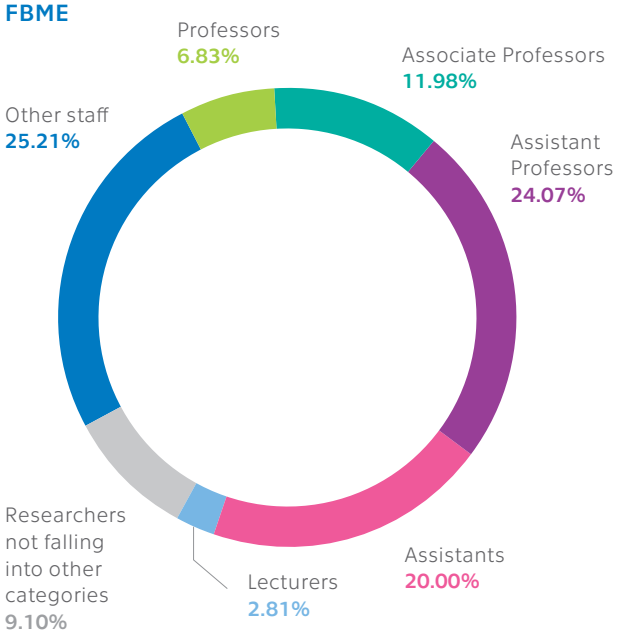

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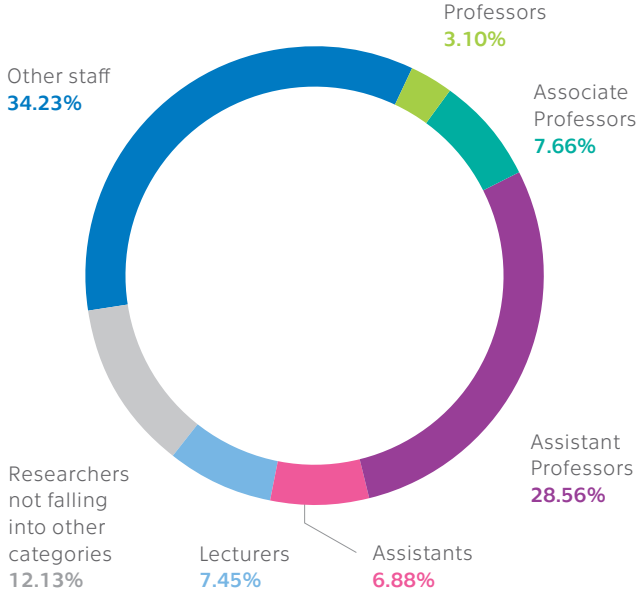

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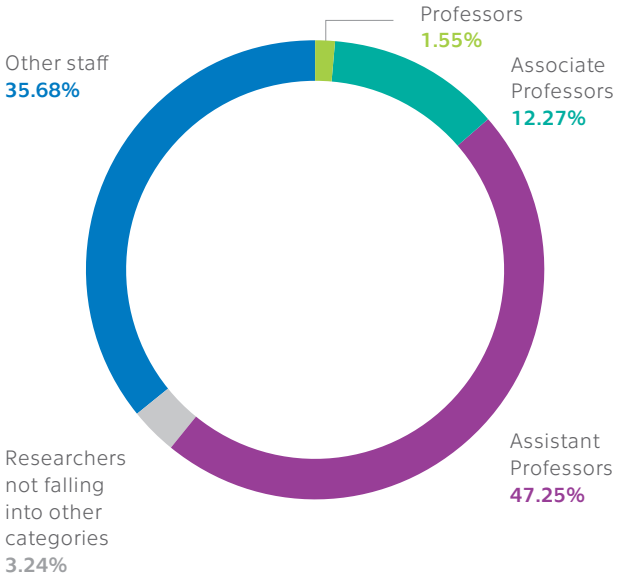

UNIVERSITY-WIDE DEPARTMENTS
(STUDIES OUTSIDE THE FACULTY)

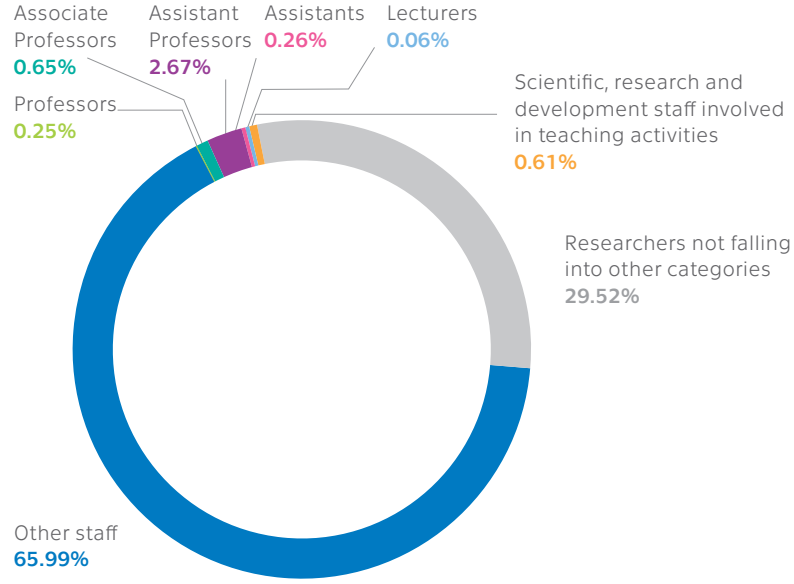

Table 6.2: Age structure of academic, scientific and other staff (number of natural persons*)

CTU in Prague	Academic staff											
	Professors		Associate Professors		Professional assistants		Assistants		Lecturers		Scientific, research and development staff involved in teaching activities	
	TOTAL	Women	TOTAL	Women	TOTAL	Women	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 29 years	0	0	0	0	9	1	41	14	3	2	1	0
30–39 years	0	0	28	2	302	78	92	22	17	4	1	0
40–49 years	44	4	163	13	478	125	30	9	40	9	7	1
50–59 years	49	3	96	13	175	68	11	4	28	9	2	0
60–69 years	82	10	89	24	133	49	4	0	21	6	1	0
over 70 years	102	8	93	8	43	13	4	0	5	0	1	1
TOTAL	277	25	469	60	1,140	334	182	49	114	30	13	2

Note: * The total number of employees/workers is given regardless of the amount of time worked, but only in an employment relationship, not including persons working on FTE and SNE. Excludes other types of contractual relationships under the Civil Code which are in the nature of purchase of services

Note: * The total number of employees/workers is given regardless of the amount of time worked, but only in an employment relationship, excluding persons working on FTE and FTE. Excludes other types of contractual relations under the Civil Code which are in the nature of purchase of services.

Note: *** Employee of the research institution or university within five years after receiving the Ph.D. degree or its equivalent. Works as part of a research team at the institution, usually under the supervision of experienced researchers on a specific task, and publishes his/her results independently and as part of a creative team. He or she has a fixed-term employment contract (of 1–3 years) with the research institution for one, maximum three consecutive periods. His/her salary is subject to the rules of the institution's payroll system, in addition to which he/she may receive rewards under research grant projects. Only an indicative number of postdoctoral fellows is given, given that they are registered in the CTU IS under other categories (separate functionality of postdoctoral fellows within the EGJE IS is not implemented).

Note: **** The category 'Other scientific, research and development personnel' includes technical and professional staff who are not directly involved in the research but are indispensable to the research activity (e.g. operators of research facilities)

Note: ***** Other staff means all other staff not directly involved in education and research. This includes administrative, technical and other staff.

Note: ****** The number of extraordinary professors is given as the number of visiting professors.

Scientific and professional staff**											
Extraordinary professors******		Postdoctoral fellows ('postdocs')*** Indicative number		Researchers not falling into other categories		Other scientific, research and development personnel****		Other staff*****		TOTAL	of which women
TOTAL	Women	TOTAL	Women	TOTAL	Women	TOTAL	Women	TOTAL	Women		
0	0	9	3	441	90			296	121	791	228
0	0	30	5	568	122			460	202	1,468	430
1	1	5	1	238	39			611	344	1,611	544
0	0	0	0	75	4			532	340	968	441
2	0	0	0	42	3			382	210	754	302
1	0	0	0	40	4			166	68	454	102
4	1	44	9	1,404	262			2,447	1,285	6,046	2,047

Table 6.3: Numbers of academic and scientific staff by range of working hours and highest qualification attained (numbers of individuals by full-time equivalent)

CTU in Prague	Academic staff					
Faculty of Civil Engineering**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	5	0	14	0	26	10
0.31–0.5	0	0	17	2	27	9
0.51–0.7	7	2	2	2	4	2
0.71–1	51	7	92	15	159	50
TOTAL	63	9	125	19	216	71
Faculty of Mechanical Engineering**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	11	1	12	1	23	1
0.31–0.5	5	0	10	1	13	2
0.51–0.7	5	0	5	2	8	3
0.71–1	20	0	31	1	119	11
TOTAL	41	1	58	5	163	17
Faculty of Electrical Engineering**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	7	0	3	0	21	0
0.31–0.5	7	0	8	0	11	4
0.51–0.7	6	0	2	0	4	1
0.71–1	44	2	68	3	108	7
TOTAL	64	2	81	3	144	12
Faculty of Nuclear Sciences and Physical Engineering**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	5	0	3	0	11	2
0.31–0.5	5	0	3	0	6	1
0.51–0.7	1	0	3	0	5	1
0.71–1	24	3	37	1	67	14
TOTAL	35	3	46	1	89	18
Faculty of Architecture**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	2	0	1	0	6	2
0.31–0.5	7	1	12	1	12	3
0.51–0.7	3	0	3	0	6	2
0.71–1	12	1	20	8	17	11
TOTAL	24	2	36	9	41	18

		Scientific staff*		TOTAL	of which women
Other		TOTAL	Women		
TOTAL	Women				
6	0	24	4	75	14
23	5	41	9	108	25
0	0	13	5	26	11
34	20	61	18	397	110
63	**25**	**139**	**36**	**606**	**160**
Other		TOTAL	Women		
TOTAL	Women				
19	0	82	13	147	16
12	3	19	3	59	9
5	1	13	4	36	10
60	10	42	8	272	30
96	**14**	**156**	**28**	**514**	**65**
Other		TOTAL	Women		
TOTAL	Women				
7	2	73	6	111	8
3	1	93	9	122	14
2	1	28	2	42	4
20	8	155	17	395	37
32	**12**	**349**	**34**	**670**	**63**
Other		TOTAL	Women		
TOTAL	Women				
2	2	85	22	106	26
2	1	35	7	51	9
1	1	18	5	28	7
11	5	85	24	224	47
16	**9**	**223**	**58**	**409**	**89**
Other		TOTAL	Women		
TOTAL	Women				
4	1	7	4	20	7
62	22	4	2	97	29
12	3	2	1	26	6
20	10	3	0	72	30
98	**36**	**16**	**7**	**215**	**72**

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Table 6.3: Numbers of academic and scientific staff by range of working hours and highest qualification attained (numbers of individuals by full-time equivalent)

CTU in Prague	Academic staff					
Faculty of Transportation Sciences**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	5	1	8	1	20	1
0.31–0.5	2	0	8	1	14	5
0.51–0.7	2	0	2	0	4	0
0.71–1	4	1	27	6	50	17
TOTAL	13	2	45	8	88	23
Faculty of Biomedical Engineering**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	9	3	15	4	16	4
0.31–0.5	3	1	6	1	6	4
0.51–0.7	1	0	0	0	5	2
0.71–1	7	0	16	3	36	20
TOTAL	20	4	37	8	63	30
Faculty of Information Technology**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	3	0	4	0	8	0
0.31–0.5	1	0	4	0	12	4
0.51–0.7	0	0	1	0	8	5
0.71–1	5	1	14	2	58	8
TOTAL	9	1	23	2	86	17
Masaryk Institute of Advanced Studies**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0,3	0	0	1	0	0	0
0.31–0.5	3	1	5	2	13	7
0.51–0.7	0	0	1	0	2	1
0.71–1	0	0	6	2	24	12
TOTAL	3	1	13	4	39	20
Total other departments**						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	0	0	1	0	1	0
0.31–0.5	0	0	0	0	1	0
0.51–0.7	0	0	0	0	0	0
0.71–1	5	0	4	1	12	2
TOTAL	5	0	5	1	14	2

	Scientific staff*		TOTAL	of which women
Other	TOTAL	Women		
TOTAL / Women				
18 / 6	24	4	75	13
14 / 8	14	4	52	18
3 / 1	13	5	24	6
24 / 14	27	7	132	45
59 / 29	**78**	**20**	**283**	**82**
Other	TOTAL	Women		
TOTAL / Women				
19 / 6	25	6	84	23
17 / 7	13	1	45	14
9 / 2	2	1	17	5
31 / 18	11	3	101	44
76 / 33	**51**	**11**	**247**	**86**
Other	TOTAL	Women		
TOTAL / Women				
9 / 2	17	2	41	4
10 / 5	17	1	44	10
4 / 1	3	0	16	6
12 / 0	13	4	102	15
35 / 8	**50**	**7**	**203**	**35**
Other	TOTAL	Women		
TOTAL / Women				
0 / 0	0	0	1	0
3 / 2	1	0	25	12
2 / 1	0	0	5	2
6 / 6	2	0	38	20
11 / 9	**3**	**0**	**69**	**34**
Other	TOTAL	Women		
TOTAL / Women				
2 / 2	60	10	64	12
1 / 0	63	12	65	12
0 / 0	22	7	22	7
17 / 10	194	32	232	45
20 / 12	**339**	**61**	**383**	**76**

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Table 6.3: Numbers of academic and scientific staff by range of working hours and highest qualification attained (numbers of individuals by full-time equivalent)

CTU in Prague	Academic staff					
CTU in Prague						
	prof.		doc.		DrSc., CSc., Dr., Ph.D., Th.D.	
Time ranges	TOTAL	Women	TOTAL	Women	TOTAL	Women
up to 0.3	47	5	62	6	132	20
0.31–0.5	33	3	73	8	115	39
0.51–0.7	25	2	19	4	46	17
0.71–1	172	15	315	42	650	152
CTU TOTAL	277	25	469	60	943	228

Note: Only the highest academic degree obtained is given

Note: * A researcher in this case means a person who is not an academic according to Section 70 of Act No. 111/1998 Coll., on Higher Education.

Note: ** Faculty or other part of the university implementing the accredited study programme.

		Scientific staff*		TOTAL	of which women
Other		TOTAL	Women		
TOTAL	Women				
86	21	397	71	724	123
147	54	300	48	668	152
38	11	114	30	242	64
235	101	593	113	1,965	423
506	187	1,404	262	3,599	762

Table 6.4: Managers (natural persons)

CTU in Prague	Rector/Dean	Vice-Rector/Provost	Academic Senate	Scientific/Artistic/ Academic Council	Bursar/ Secretary**
Rectorate of CTU	1	6	0	2	1
of which women	0	3	0	0	1
Faculty of Civil Engineering*	1	5	5	3	1
of which women	0	1	0	0	0
Faculty of Mechanical Engineering*	1	3	5	5	1
of which women	0	0	0	0	0
Faculty of Electrical Engineering*	1	6	5	3	1
of which women	0	1	1	0	0
Faculty of Nuclear Sciences and Physical Engineering*	1	4	7	2	1
of which women	0	0	0	0	1
Faculty of Architecture*	1	5	7	4	1
of which women	0	3	4	0	1
Faculty of Transportation Sciences*	1	5	5	4	1
of which women	0	0	2	0	1
Faculty of Biomedical Engineering*	1	4	6	3	1
of which women	0	0	4	0	0
Faculty of Information Technology*	1	5	5	3	1
of which women	0	2	0	0	0
Higher education institutes and agricultural or forestry estates		3			
of which women		2			
Total other departments***					
of which women					
Faculties*, higher education institutes and other workplaces total	8	37	50	31	11
of which women	0	9	11	1	3
CTU TOTAL*****	9	43	50	33	12
of which women	0	12	11	1	4

Only units of the university and workplaces for educational and research, development and innovation, artistic or other creative activities or for the provision of information services or technology transfer are recorded in the table.Data for administrative, purpose-built facilities for cultural and sporting activities, for accommodation and catering or for the operation of the school are not included.

Note: * Only faculties and units under them (according to the above characteristics)

Note: ** According to the Higher Education Act, Section 25, Article 2.

Note: *** Workplace for educational and research, development and innovation, artistic or other creative activities or for the provision of information services or technology transfer pursuant to Section 22 (c) of Act No.111/1998 Coll.

Note: **** Listed and similar workplaces for educational and research, development and innovation, artistic or other creative activities or for the provision of information services or technology transfer pursuant to Section 22 (c) of Act No.111/1998 Coll., falling under the scope of a higher education institution.

Note: ***** The total may not reflect the actual status of individuals (one person may hold multiple positions within a university or faculty), it is a simple sum of cells.

Board of Directors	Director of an institute, university agricultural or forestry farm	Head of department/institute/research institute****	Senior management TOTAL *****
16			26
3			7
		27	42
		2	3
		28	43
		1	1
		19	35
		1	3
		10	25
		1	2
		17	35
		3	11
		11	27
		2	5
		10	25
		2	6
		6	21
		1	3
	6	11	20
	1	4	7
	2	14	16
	1	5	6
	8	153	289
	2	22	47
16	8	153	315
3	2	22	54

Table 6.5: Academic and scientific staff with foreign citizenship (average recalculated numbers******)

CTU in Prague	Academic staff				
	Professors	Associate Professors	Professional assistants	Assistants	Lecturers
Faculty of Civil Engineering	0.25	0.25	3.67	0	0
in that: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	0.25	0.25	2	0	0
other EU countries	0	0	0.5	0	0
other non-EU countries	0	0	1.17	0	0
Women out of total (regardless of nationality)	0	0	2.17	0	0
Faculty of Mechanical Engineering	1.25	1	3	0	0
of which: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	1	1	1	0	0
other EU countries	0.25	0	0	0	0
other non-EU countries	0	0	2	0	0
Women out of total (regardless of nationality)	0	0	1	0	0
Faculty of Electrical Engineering	1	4.76	6.46	0	3.91
of which: Germany	0	1	0	0	0
Poland	0	0	1	0	0
Austria	0	0	0	0	0
Slovakia	1	2.8	0.76	0	0
other EU countries	0	0.96	1	0	1
other non-EU countries	0	0	3.7	0	2.91
Women out of total (regardless of nationality)	0	0	0.6		1.54
Faculty of Nuclear Sciences and Physical Engineering	2	2	8.63	0	0.77
including: Germany	0	0	0	0	0
Poland	0	0	1	0	0
Austria	0	0	0	0	0
Slovakia	1	2	2.8	0	0.1
other EU countries	0	0	3.33	0	0.67
other non-EU countries	1	0	1.5	0	0
Women out of total (regardless of nationality)	0	0	3	0	0

Scientific, research and development staff involved in teaching activities	Scientific and professional staff**			Other staff*****
	Postdoctoral fellows ('postdocs')*** Indicative number	Researchers not falling into other categories	Other scientific, research and development personnel****	
	5	16.2	0	5.25
	0	1.17	0	0
	0	0	0	0
	1	0	0	0
	0	1.45	0	3.5
	2	3.36	0	0
	2	10.22	0	1.75
	1	4.29	0	1.75
	8	5.56	0	15.97
	0	0.25	0	0.1
	0	0	0	0
	0	0	0	0
	1	0	0	4.7
	3	0.5	0	2.89
	4	4.81	0	8.28
	1	0.43	0	4.21
	4	70.7	0	4.85
	0	1.45	0	0
	0	1.13	0	0
	0	0	0	0
	0	9.25	0	3.4
	1	17.02	0	0
	3	41.85	0	1.45
	1	9.93	0	2.62
	7.41	34.11	0	2.31
	0	0.1	0	0
	0	1.1	0	0
	0	0.81	0	0
	0	11.73	0	1.34
	0.83	4.21	0	0
	6.58	16.16	0	0.97
	1.4	10.68	0	1.34

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Table 6.5: Academic and scientific staff with foreign citizenship (average recalculated numbers******)

CTU in Prague	Academic staff				
	Professors	Associate Professors	Professional assistants	Assistants	Lecturers
Faculty of Architecture	1.63	0.5	2.21	0	0
including: Germany	0	0	0.63	0	0
Poland	0	0	1	0	0
Austria	0	0	0	0	0
Slovakia	0.63	0	0.5	0	0
other EU countries	1	0.5	0	0	0
other non-EU countries	0	0	0.08	0	0
Women out of total (regardless of nationality)	0	0	0.13	0	0
Faculty of Transportation Sciences	0	3	3.98	0	0.1
of which: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	0	3	2.88	0	0.1
other EU countries	0	0	0	0	0
other non-EU countries	0	0	1.1	0	0
Women out of total (regardless of nationality)	0	1	0.81	0	0
Faculty of Biomedical Engineering	1	1	3.92	1.35	0
of which: Germany	0	0	0	0.13	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	1	1	1.17	0	0
other EU countries	0	0	0	0	0
other non-EU countries	0	0	2.75	1.22	0
Women out of total (regardless of nationality)	0	0	3.92	1.13	0
Faculty of Information Technology	1	0.5	8.6	3.39	0
of which: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0.5	0	0	0
Slovakia	1	0	2	1.5	0
other EU countries	0	0	3.35	0	0
other non-EU countries	0	0	3.25	1.89	0
Women out of total (regardless of nationality)	0	0	3.35	2.39	0

Scientific, research and development staff involved in teaching activities	Scientific and professional staff**			Other staff*****
	Postdoctoral fellows ('postdocs')*** Indicative number	Researchers not falling into other categories	Other scientific, research and development personnel****	
	2	2.52	0	1.6
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0.35	0	1.6
	0	0.25	0	0
	2	1.92	0	0
	0	0.25	0	1.6
	3	6.48	0	5.64
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	1.39	0	3.1
	0	1	0	0
	3	4.09	0	2.54
	1	2.47	0	2.54
	0	0.78	0	0.93
	0	0	0	0.33
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0.08	0	0.2
	0	0.7	0	0.4
	0	0	0	0.33
	2	10.65	0	8.4
	0	0.55	0	0
	0	0.54	0	0
	0	0	0	0
	0	1	0	6.08
	2	3.64	0	0.21
	0	5.47	0	2.11
	0	1.85	0	1

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Table 6.5: Academic and scientific staff with foreign citizenship (average recalculated numbers******)

CTU in Prague	Academic staff				
	Professors	Associate Professors	Professional assistants	Assistants	Lecturers
Masaryk Institute of Advanced Studies	0	1.92	2.75	0	0
including: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	0	1.42	0.75	0	0
other EU countries	0	0	1	0	0
other non-EU countries	0	0.5	1	0	0
Women out of total (regardless of nationality)	0	0.92	1.25	0	0
Total other workplaces	0	0.08	1.03	1	0
of which: Germany	0	0	0	0	0
Poland	0	0	0	0	0
Austria	0	0	0	0	0
Slovakia	0	0	0.29	1	0
other EU countries	0	0	0	0	0
other non-EU countries	0	0.08	0.74	0	0
Women out of total (regardless of nationality)		1	1.1	0	0
CTU TOTAL	8.13	15.01	44.25	5.74	4.78
of which: Germany	0	1	0.63	0.13	0
Poland	0	0	3	0	0
Austria	0	0.5	0	0	0
Slovakia	5.88	11.47	14.15	2.5	0.2
other EU countries	1.25	1.46	9.18	0	1.67
other non-EU countries	1	0.58	17.29	3.11	2.91
Women out of total (regardless of nationality)	0	2.92	17.33	3.52	1.54

Note: * Faculty or other part of the university implementing the accredited study programme.

Note: ** A researcher in this case means a researcher who is not an academic according to Section 70 of Act No. 111/1998 Coll., on Higher Education.

Note: *** Employee of a given research institution or university within five years of receiving a Ph.D. or equivalent. Works as part of a research team at the institution, usually under the supervision of experienced researchers on a specific task, and publishes his/her results independently and as part of a creative team. He or she has a fixed-term employment contract (of 1–3 years) with the research institution for one, maximum three consecutive periods. His/her salary is subject to the rules of the institution's payroll system, in addition to which he/she may receive rewards under research grant projects. Only an indicative number of postdoctoral fellows is given, given that they are registered in the CTU IS under other categories (separate functionality of postdoctoral fellows within the EGJE IS is not implemented).

Note: **** The category „Other scientific, research and development personnel" includes technical and professional staff who are not directly involved in the research but are indispensable to the research activity (e.g. operators of research facilities).

Note: ***** Other staff means all other staff not directly involved in education and research. This includes administrative, technical and other staff.

Note: ****** Average converted number means the ratio of the total number of hours actually worked in the reference period from 1 January to 31 December by all employees (in the category under review; including FTEs, excluding FTEs) to the total annual working time pool per full-time employee.

	Scientific and professional staff**			Other staff*****
Scientific, research and development staff involved in teaching activities	Postdoctoral fellows ('postdocs')*** Indicative number	Researchers not falling into other categories	Other scientific, research and development personnel****	
	1	1.25	0	1.67
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0.35	0	1.67
	0	0	0	0
	1	0.9	0	0
	0	0.35	0	0.67
	5	66.71	0	27.33
	0	6.16	0	0.16
	0	1.28	0	0
	0	0.25	0	0
	0	14.43	0	9.52
	2	13.02	0	2.78
	3	31.57	0	14.87
	1	17.04		19.73
	37.41	215.51	0	73.95
	0	9.68	0	0.59
	0	4.05	0	0
	1	1.06	0	0
	1	39.95	0	34.91
	10.83	43.08	0	6.08
	24.58	117.69	0	32.37
	6.4	47.29	0	35.79

Table 6.6: Newly appointed associate professors and professors (numbers)

CTU in Prague	number			Average age of new appointees***
	At the university*		Academic staff appointed at another university**	
	Total	Of these, core staff of the HEI in question		
Faculty of Civil Engineering**				
Professors appointed in 2022	8	7	0	51
of which women	2	2	0	52
Associate professors appointed in 2022	8	8	0	42
of which women	0	0	0	
Faculty of Mechanical Engineering**				
Professors appointed in 2022	1	1	0	48
of which women	0	0	0	
Associate professors appointed in 2022	4	3	0	46
of which women	0	0	0	
Faculty of Electrical Engineering**				
Professors appointed in 2022	3	2	0	52
of which women	0	0	0	
Associate professors appointed in 2022	5	5	0	42
of which women	0	0	0	
Faculty of Nuclear Sciences and Physical Engineering**				
Professors appointed in 2022	4	4	0	52
of which women	1	1	0	57
Associate professors appointed in 2022	6	6	0	44
of which women	0	0	0	
Faculty of Architecture**				
Professors appointed in 2022	4	3	0	61
of which women	1	1	0	65
Associate professors appointed in 2022	6	6	0	57
of which women	3	3	0	56
Faculty of Transportation Sciences**				
Professors appointed in 2022	0	0	0	
of which women	0	0	0	
Associate professors appointed in 2022	3	2	0	43
of which women	0	0	0	

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Table 6.6: Newly appointed associate professors and professors (numbers)

CTU in Prague	number			Average age of new appointees***
	At the university*		Academic staff appointed at another university**	
	Total	Of these, core staff of the HEI in question		
Faculty of Biomedical Engineering****				
Professors appointed in 2022	0	0	0	
of which women	0	0	0	
Associate professors appointed in 2022	5	5	0	40
of which women	0	0	0	
Faculty of Information Technology****				
Professors appointed in 2022	1	1	0	43
of which women	0	0	0	
Associate professors appointed in 2022	2	2	0	39
of which women	0	0	0	
TOTAL professors	21	18	0	53
of which women	4	4	0	56
TOTAL associate professors	39	37	0	44
of which women	3	0	0	56

Note: * Included are all habilitations and appointments that took place in a given calendar year at a given HEI, regardless of whether the newly appointed associate professors and professors were tribally affiliated with that HEI.

Note: ** The number of associate professors and professors who are tribally affiliated to the given HEI but have been appointed at another HEI is given.

Note: *** The average age is calculated from the total number of new appointments at a given HEI (faculty or total number).

Note: **** Faculty or other part of a university implementing an accredited study programme

Table 7.1: University involvement in international cooperation programmes (regardless of funding source)

CTU in Prague	H2020 / 7th Framework Programme EK			TOTAL
	TOTAL	Of which Marie-Curie Actions	Other	
Number of projects*	92	9	90	182
Number of students sent**	1	1	150	151
Number of accepted students***	258	–	265	523
Number of academic and scientific staff seconded****	17	4	110	127
Number of academic and scientific staff recruited*****	77	2	25	102
Grants in thous. CZK******	646,010	28,902	297,762	943,772

Note: * These are ongoing projects in a given year.

Note: ** Outgoing students (i.e. number of departures) – who have completed a stay abroad in 2022; students whose stay started in 2021 are also counted. Only students whose stay lasted more than 4 weeks (28 days) are counted. If the HEI reports other lengthy trips, please indicate this in a note to the table.

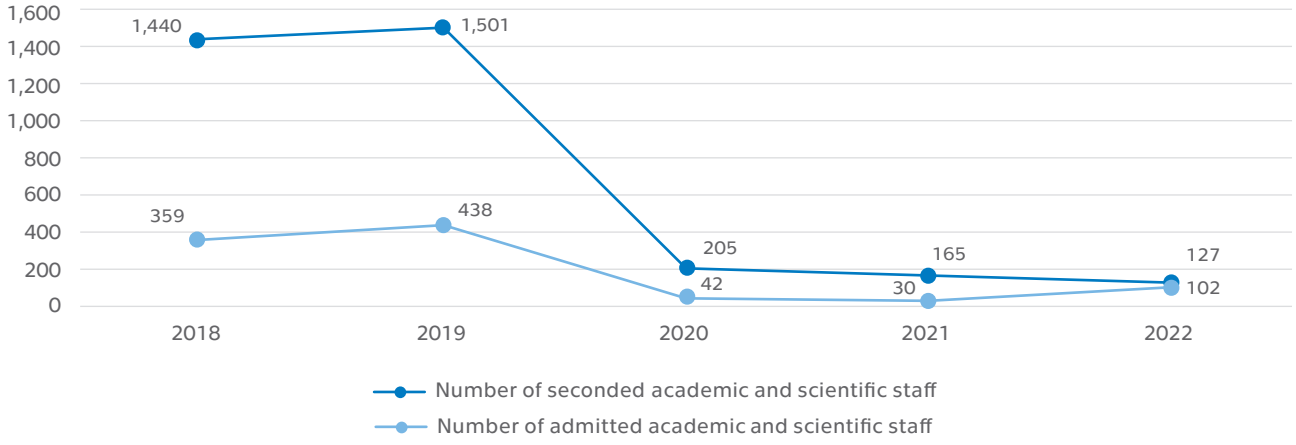
Note: *** Arriving students (i.e. number of arrivals) – who arrived in 2022; students whose stay started in 2021 are also counted. Only students whose stay lasted more than 4 weeks (28 days) are counted. If the HEI reports other lengthy trips, please indicate this in a note to the table.

Note: **** Outgoing academic staff (i.e. numbers of trips) – who undertook an overseas placement in 2022; staff whose placement started in 2020 are also counted.

Note: ***** Incoming academics (i.e. arrival numbers) – who arrived in 2021; those whose stay started in 2021 are also counted.

Note: ****** The amounts represent the total financial resources of the projects, including co-financing by the Ministry of Education and Science.

UNIVERSITY INVOLVEMENT IN INTERNATIONAL COOPERATION PROGRAMMES – ACADEMIC AND SCIENTIFIC STAFF (REGARDLESS OF FUNDING SOURCE)



UNIVERSITY INVOLVEMENT IN INTERNATIONAL COOPERATION PROGRAMMES – STUDENTS (REGARDLESS OF FUNDING SOURCE)

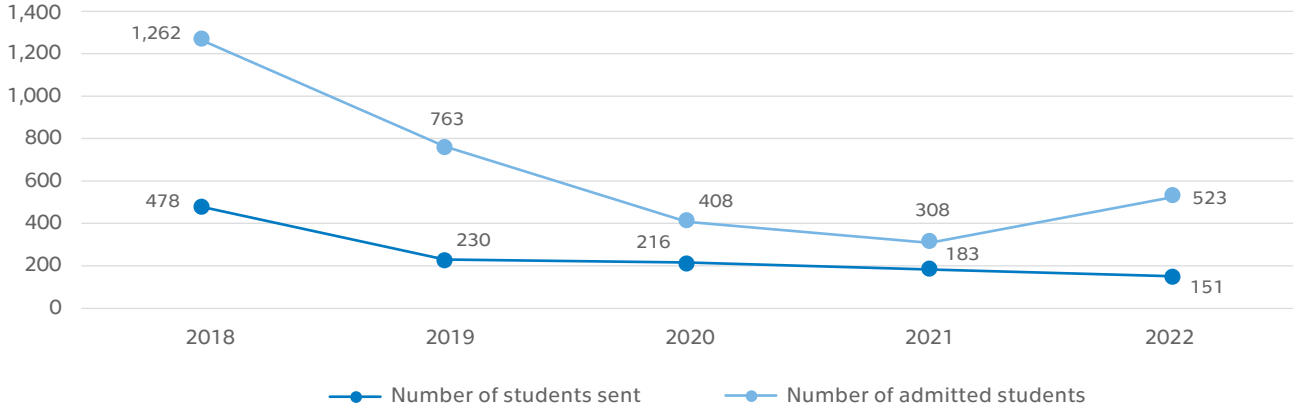


Table 7.2: Mobility of students, academic and other staff by country***** (irrespective of funding source)

CTU in Prague	Number of students sent*			Number of admitted students**	
Country	Total	Graduate internships (from total)******	Virtually[1] (of total)	Virtually[1] (of total)	Total
Republic of Albania	0	0	0	0	1
Democratic and People's Republic of Algeria	0	0	0	0	1
Republic of Angola	0	0	0	0	1
Republic of Argentina	2	0	0	0	6
Republic of Armenia	9	0	0	0	8
Commonwealth of Australia	27	0	2	0	3
Republic of Azerbaijan	0	0	0	0	39
People's Republic of Bangladesh	0	0	0	0	3
Kingdom of Belgium	25	4	4	4	16
Republic of Belarus	0	0	0	2	95
Plurinational State of Bolivia	0	0	0	0	1
Bosnia and Herzegovina	0	0	0	2	18
Federal Republic of Brazil	0	0	0	1	7
Republic of Bulgaria	0	0	0	1	13
Montenegro	0	0	0	0	1
People's Republic of China	3	0	0	2	38
Republic of China (Taiwan)	24	0	0	2	23
Kingdom of Denmark	31	0	11	6	8
Arab Republic of Egypt	0	0	0	0	10
Republic of Ecuador	0	0	0	0	2
Republic of Estonia	11	0	7	2	2
Federal Democratic Republic of Ethiopia	0	0	0	0	3
Republic of Fiji	0	0	0	0	1
Republic of Finland	37	0	2	2	8
Republic of France	44	0	11	12	136
Grenada	0	0	0	0	1
Georgia	0	0	0	0	13
Chilská republika	0	0	0	0	3
Republic of Croatia	4	0	0	0	2
Republic of India	1	0	0	4	76
Republic of Indonesia	1	0	0	0	1
Republic of Iraq	0	0	0	0	3
Islamic Republic of Iran	0	0	0	0	6
Ireland	3	0	0	0	2
Republic of Iceland	1	0	0	0	1
Republic of Italy	33	0	1	2	35
Japan	11	0	0	0	5
Republic of Yemen	0	0	0	0	3
Republic of South Africa	0	0	0	0	0
The Hashemite Kingdom of Jordan	0	0	0	0	5
Kingdom of Cambodia	0	0	0	0	2
Republic of Cameroon	0	0	0	0	2

Number of seconded academic staff***	Number of admitted academic staff****	Number of other staff seconded***	Number of other staff recruited****	TOTAL for the country
0	0	0	0	1
0	0	0	0	1
0	0	0	0	1
1	1	1	4	15
0	0	0	0	17
4	2	2	12	50
0	0	1	1	41
0	0	0	0	3
7	5	18	24	95
0	0	0	0	95
0	0	0	0	1
0	0	0	0	18
4	5	2	7	25
2	0	0	4	19
1	0	1	2	5
2	2	4	8	57
8	4	15	26	100
27	24	12	26	128
0	0	0	0	10
1	2	0	0	5
4	6	11	29	63
0	0	0	0	3
0	0	0	0	1
4	4	1	3	57
27	35	26	16	284
0	0	0	0	1
0	0	0	0	13
4	2	1	1	11
6	4	4	5	25
1	0	1	0	79
0	0	0	0	2
0	0	0	0	3
0	0	0	0	6
1	0	2	0	8
2	0	2	1	7
4	4	2	4	82
2	4	2	2	26
0	0	0	0	3
1	1	1	0	3
0	0	0	0	5
0	0	0	0	2
0	0	0	0	2

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Table 7.2: Mobility of students, academic and other staff by country***** (irrespective of funding source)

CTU in Prague	Number of students sent*			Number of admitted students**	
Country	Total	Graduate internships (from total)******	Virtually[1] (of total)	Virtually[1] (of total)	Total
Canada	12	0	0	1	16
Republic of Colombia	0	0	0	0	5
Republic of Korea	29	0	0	0	22
Republic of Kosovo	0	0	0	0	3
Republic of Costa Rica	3	0	0	0	1
Kingdom of Saudi Arabia	0	0	0	0	1
State of Kuwait	0	0	0	0	1
Republic of Cyprus	5	0	0	0	3
Republic of Kyrgyzstan	0	0	0	0	17
Republic of Lebanon	0	0	0	0	2
Principality of Liechtenstein	1	0	0	0	0
Republic of Lithuania	4	0	0	0	6
Republic of Latvia	0	0	0	0	4
The Grand Duchy of Luxembourg	0	0	0	0	1
Hungary	3	0	0	0	7
Malaysia	0	0	0	0	1
Republic of Malta	0	0	0	0	1
Kingdom of Morocco	0	0	0	0	3
Republic of Mauritius	0	0	0	0	1
Plurinational State of Bolivia	0	0	0	0	2
Republic of Moldova	0	0	0	0	10
Mongolia	0	0	0	0	5
Republic of Namibia	0	0	0	0	1
Federal Democratic Republic of Nepal	0	0	0	0	1
Federal Republic of Nigeria	0	0	0	0	6
The Netherlands	39	0	12	5	15
Kingdom of Norway	14	0	0	0	7
New Zealand	1	0	0	0	0
Islamic Republic of Pakistan	0	0	0	0	8
Palestinian Autonomous Territories	0	0	0	0	1
Republic of Peru	1	0	0	0	3
Republic of Poland	13	0	0	1	12
Republic of Portugal	33	0	0	2	19
Republic of Austria	0	0	0	0	1
Republic of Kazakhstan	0	0	0	4	235
Republic of the Union of Myanmar	0	0	0	0	7
Republic of Northern Macedonia	0	0	0	0	9
Republic of Tajikistan	0	0	0	0	2
Republic of Uzbekistan	0	0	0	0	7
Romania	3	0	0	0	11
Russian Federation	2	0	0	0	780
Republic of Greece	3	0	0	0	9

Number of seconded academic staff***	Number of admitted academic staff****	Number of other staff seconded***	Number of other staff recruited****	TOTAL for the country
4	3	4	4	43
2	2	2	1	12
2	2	1	4	60
0	0	1	0	4
1	1	1	1	8
1	1	1	0	4
0	0	0	0	1
1	0	0	0	9
0	0	0	0	17
0	0	0	0	2
0	0	2	1	4
5	4	5	2	26
0	0	0	0	4
0	0	0	1	2
1	1	0	0	12
0	0	2	0	3
0	0	0	0	1
0	0	0	0	3
0	0	0	0	1
0	0	0	0	2
0	0	0	0	10
0	0	0	0	5
0	0	0	0	1
1	0	0	0	2
0	0	0	0	6
7	14	14	8	97
2	1	2	4	30
1	1	0	0	3
0	0	0	0	8
0	0	0	0	1
2	1	1	1	9
14	27	9	19	94
11	4	8	8	83
8	4	4	4	21
2	4	2	5	248
0	0	0	0	7
0	0	0	0	9
0	0	0	0	2
0	0	2	5	14
1	1	1	0	17
0	0	0	0	782
1	1	0	0	14

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Table 7.2: Mobility of students, academic and other staff by country***** (irrespective of funding source)

CTU in Prague	Number of students sent*			Number of admitted students**	
Country	Total	Graduate internships (from total)******	Virtually[1] (of total)	Virtually[1] (of total)	Total
Republic of Senegal	0	0	0	0	1
Republic of Singapore	8	0	0	0	8
Slovak Republic	1	0	0	4	997
Republic of Slovenia	19	0	0	0	10
United Kingdom of Great Britain and Northern Ireland	20	0	0	1	11
United States of America	28	0	0	1	20
United Mexican States	5	0	0	1	16
Federal Republic of Germany	78	0	14	19	46
Republic of Serbia	1	0	0	0	2
State of Israel	5	0	0	0	10
Stát Katar	0	0	0	0	0
Kingdom of Saudi Arabia	0	0	0	0	0
Syrian Arab Republic	0	0	0	0	21
Kingdom of Spain	53	0	2	4	90
Democratic Socialist Republic of Sri Lanka	0	0	0	0	4
Kingdom of Sweden	34	0	0	1	12
Swiss Confederation	28	0	0	0	4
Kingdom of Thailand	1	0	0	0	1
Republic of Tunisia	0	0	0	0	4
Republic of Turkey	6	0	0	1	56
Ukraine	0	0	0	2	621
Eastern Republic of Uruguay	0	0	0	0	1
Socialist Republic of Vietnam	2	0	0	0	14
Republic of Zambia	0	0	0	0	2
Hong Kong Special Administrative Region of the People's Republic of China	0	0	0	0	1
TOTAL	722	4	66	89	3,802

Note: * Outgoing students (i.e. number of departures) – students who completed their stay abroad in 2022; students whose stay started in 2021 are also counted. Only students whose stay lasted at least 2 weeks (14 days) are counted.

Note: ** Arriving students (i.e. number of arrivals) – students who arrived in 2022; students whose stay started in 2021 are also counted. Only students whose stay lasted at least 2 weeks (14 days) are counted.

Note: *** Outgoing Academic/Other staff (i.e. number of departures) – staff who have completed their stay abroad in 2022; staff whose stay started in 2021 are also counted. Only staff whose stay lasted at least 5 days are counted.

Note: **** Arriving academic/other staff (i.e. arrival numbers) – staff who arrived in 2022; staff whose stay started in 2021 are also counted. Only staff whose stay lasted at least 5 days are counted.

Note: ***** Table 7.2 Mobility of students and academic and other staff by country lists all countries; the purpose is to facilitate the processing of the data obtained by the MoEYS. At the same time, it should not represent an additional burden for universities to complete. If there is no mobility from a given country, please do not fill in the cell.

Number of seconded academic staff***	Number of admitted academic staff****	Number of other staff seconded***	Number of other staff recruited****	TOTAL for the country
0	0	0	0	1
1	2	2	0	21
17	22	37	28	1,102
2	2	3	1	37
4	2	12	8	57
4	4	1	4	61
1	1	1	0	24
49	41	34	17	265
1	1	1	0	6
14	6	8	7	50
1	0	1	0	2
2	2	2	0	6
0	0	0	0	21
17	14	24	25	223
1	0	1	0	6
12	11	7	4	80
2	2	2	2	40
1	0	1	0	4
0	0	0	0	4
4	6	4	8	84
0	0	4	6	631
1	2	1	1	6
0	0	0	0	16
0	0	0	0	2
0	0	0	0	1
314	295	317	354	5,804

Note: ****** Graduate internship means a practical internship in a foreign company or organisation for a period of 2–12 months, started after successful graduation and completed within one year of graduation. The graduate traineeship is implemented on the basis of a tripartite agreement between the student, the sending higher education institution and the receiving organisation, institution, enterprise.

Note: [1] If virtual mobility has not been implemented at the HEI, enter zero. If it has taken place but data are not available, please provide a qualified estimate and comment on the cell(s)/column (e.g. qualified estimate). If a qualified estimate cannot be provided, leave the cell blank and comment on the cell(s)/column (e.g. n/a).

Table 7.3: Graduate mobility** (numbers and proportions of graduates)

CTU in Prague	Bachelor studies	
	proportion	number
Faculty of Civil Engineering*		
Percentage [%] and number of graduates who went on a foreign stay of at least 14 days during their studies	2.6%	9.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Mechanical Engineering*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	2.6%	7.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Electrical Engineering*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	5.1%	18.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Nuclear Sciences and Physical Engineering*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	0.0%	0.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Architecture*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	1.0%	2.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Transportation Sciences*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	0.0%	0.0
Percentage [%] and number of doctoral graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Biomedical Engineering*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	0.9%	2.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
Faculty of Information Technology*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	2.8%	7.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
University-wide departments (study outside faculties)*		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	1.1%	2.0
Percentage [%] and number of PhD graduates whose duration of their stay abroad was at least 1 month (i.e. 30 days)		
CTU in Prague		
Percentage [%] and number of graduates who went on a stay abroad of at least 14 days during their studies	2.5%	51
Percentage [%] and number of doctoral graduates whose length of stay abroad was at least 1 month (i.e. 30 days)		

Note: * Faculty or other part of the university implementing the accredited study programme.

Note: ** The totals for both the faculty (last field in the top row for each faculty) and the college (all blank fields for the college in the LFS structure) are not the sum or average of the previous data in the rows or columns. The values in these cells need to be calculated separately.

Master's studies		Continuing Master's studies		Doctoral studies		TOTAL**	
proportion	number	proportion	number	proportion	number	proportion	number
		7.3%	29.0	31.8%	14.0	6.5%	52.0
				29.5%	13.0	2.6%	7.0
		12.8%	37.0	11.5%	3.0	8.0%	47.0
				11.5%	3.0	11.5%	3.0
		15.4%	38.0	29.6%	8.0	10.2%	64.0
				29.6%	8.0	29.6%	8.0
		10.0%	8.0	22.2%	6.0	7.1%	14.0
				18.5%	5.0	18.5%	5.0
		22.2%	35.0	0.0%	0.0	10.0%	37.0
				0.0%	0.0	0.0%	0.0
		10.0%	8.0	22.2%	6.0	7.1%	14.0
				0.0%	0.0	0.0%	0.0
		0.6%	1.0	0.0%	0.0	0.8%	3.0
				0.0%	0.0	0.0%	0.0
		10.7%	14.0	11.1%	1.0	5.7%	22.0
				11.1%	1.0	11.1%	1.0
		6.7%	5.0	0.0%	0.0	2.7%	7.0
				0.0%	0.0	0.0%	0.0
0,0%	0	10.9%	177	19.5%	32	6.8%	260
				18.3%	30.0	18.3%	0.0

Table 8.1: Conferences (co-)organised by the university (numbers)

CTU in Prague	With more than 60 participants		International Conference**	
	Physical***	Virtual***	Physical***	Virtual***
Faculty of Civil Engineering*	13		8	
Faculty of Mechanical Engineering*	5		5	
Faculty of Electrical Engineering	0	0	3	0
Faculty of Nuclear Sciences and Physical Engineering*	7	0	4	0
Faculty of Architecture*		3	4	1
Faculty of Transportation Sciences*	4		3	
Faculty of Biomedical Engineering*	3		1	
Faculty of Information Technology*	7	0	5	0
Masaryk Institute of Advanced Studies*	0	0	1	0
Other workplaces total	10	0	13	0
CTU TOTAL	49	3	47	1

Note: * Faculty or other part of the university implementing the accredited study programme.

Note: ** An international conference is a conference in which at least one foreign speaker participates and all papers are localized in at least one of the following languages – English, French, German, or in a language specific to the discipline of the conference, e.g. for philology.

Note: *** A conference falls into a category if more than 50% of the participants (also estimated) attended the conference in a given form. Categories are exclusive.

CONFERENCES (TOGETHER) ORGANISED BY THE UNIVERSITY

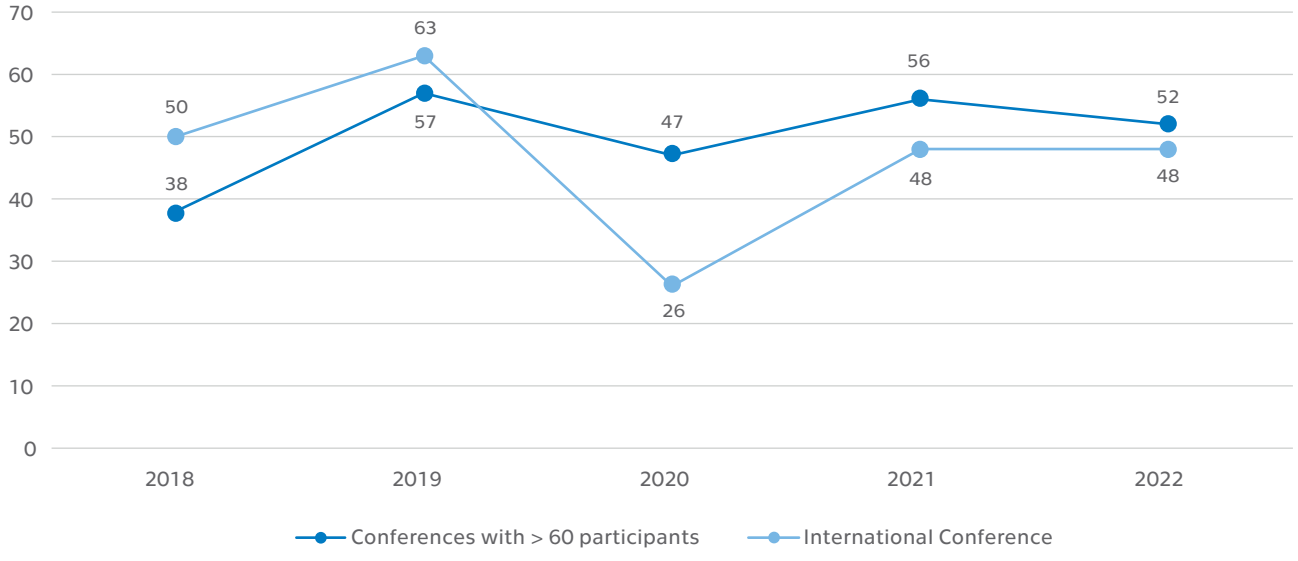


Table 8.2: Experts from the application sphere* involved in teaching and practice in accredited study programmes (numbers)

CTU in Prague	Persons having an employment relationship with the university or a part thereof			Persons who do not have an employment relationship with the university or any part thereof		
	Number of persons involved in teaching	Number of persons involved in the supervision of the thesis	Number of people involved in providing work experience**	Number of persons involved in teaching	Number of persons involved in the supervision of the thesis	Number of people involved in providing work experience***
Faculty of Civil Engineering**	157					
of which women	56					
Faculty of Mechanical Engineering **	51	22	0	39	7	0
of which women	0	2	0	2	0	0
Faculty of Electrical Engineering**	29	79	0	4	0	6
of which women	4	5	0	0	0	0
Faculty of Nuclear Sciences and Physical Engineering**	26	6	1	30	51	2
of which women	6	2	1	3	10	2
Faculty of Architecture**	72	46	0			
of which women	20	10				
Faculty of Transportation Sciences**	195	195				
of which women	64	64				
Faculty of Biomedical Engineering**	102	58	22	0	0	36
of which women	45	25	15	0	0	26
Faculty of Information Technology**	39	21			47	
of which women	4	0			1	
Masaryk Institute of Advanced Studies**	23	19	2			39
of which women	10	7	2			22
TOTAL	694	446	25	73	105	83
of which women	209	7	2	0	0	50

Note: * Professionals from the application sphere participating at least one third of the time in teaching at least one course or supervising the student's thesis. If the professional is a full-time employee of the HEI/faculty, he/she should have at least the same amount of time outside the HEI/faculty.

Note: ** Faculty or other part of the university implementing the accredited study programme/discipline.

Note: *** These are the persons directly responsible for the student's professional practice.

Table 8.3: Study fields/programmes**** that have in their content the compulsory completion of professional practice*** for at least 1 month* (numbers)

CTU in Prague	Number of fields of study/ programmes ****	Number of active studies					
		Bachelor studies		Master's studies		Continuing Master's studies	
		Academic profile	Professional profile	Academic profile	Professional profile	Academic profile	Professional profile
Faculty of Civil Engineering**	2		1				1
Faculty of Transportation Sciences*	2	0	0	0	0	2	0
Faculty of Biomedical Engineering**	17	229	978				199
Masaryk Institute of Advanced Studies**	1	0	1	0	0	0	0
TOTAL	22	229	980	0	0	2	200

Note: * The duration of the individual compulsory work experience could be shorter, but it must be at least 1 month in total.

Note: ** Faculty or other part of the university implementing the accredited study programme/discipline.

Note: *** A compulsory internship is one that is part of the accreditation of a given field of study, which may be part of a course or a separate course. These are professional professional practices.

Note: **** HEI shall provide the data related to the lowest accredited unit – graduate study programme, if the study programme is not divided into study programmes, the data for the study should be indicated.

Table 8.4: Transfer of knowledge and research results into practice

CTU in Prague	IN THE CR	Abroad	Number TOTAL	TOTAL revenue
Number of new spin-off/start-up companies*				
Patent applicatons filed	10	14	24	
Granted patents**	26	8	34	
Registered utility models	57	1	58	
Licence agreements valid as of 31. 12.	40	2	42	
Newly concluded licence agreements	26	0	26	983,000 CZK
Contract research***, consulting and advisory services***			1,169	338,076,000 CZK
Paid training courses for employees of application entities***			4	371,000 CZK

Note: * These are newly established spin-off/start-up companies supported by the university in 2021 (numbers)

Note: ** In the case of the European patent, the item 'Abroad' is only reported once in the table, regardless of the number of countries designed.

Note.: *** The definitions of the items relating to income and the values in the table for these items correspond to the Annual Financial Report 2021 for HEIs (Table 6). The SVS shall fill in these items at its discretion.

A licence agreement is defined as the grant of a right, to an agreed extent and in an agreed territory, to acquire or licence any of the intellectual and industrial property rights. Licensing agreements are concluded for patented inventions or registered utility models, industrial designs, topographies of semiconductor products, new plant varieties and animal breeds or trademarks by means of a written agreement. The provider authorises the acquirer to exercise the intellectual and industrial property rights to the agreed extent and in the agreed territory and the acquirer undertakes to provide certain remuneration (royalties) or other property value. In doing so, the acquirer is not at risk of being accused of infringing the intellectual property or copyright of the licensor.

Contract research is custom research that is based on collaboration (interaction) specifically meeting the research needs of the application entities and is carried out by the higher education institution for the application entity according to its requirements and needs. It receives funding for this research from the HEI. Typically, this includes large-scale projects, original research and written reports. Usually, the research is commissioned by one particular external organisation (for its needs). It is not decisive whether the funding spent by the application entity on such contract research comes from public or private sources. Contract research cannot be considered to be a case where the university is the recipient of earmarked support for applied research.

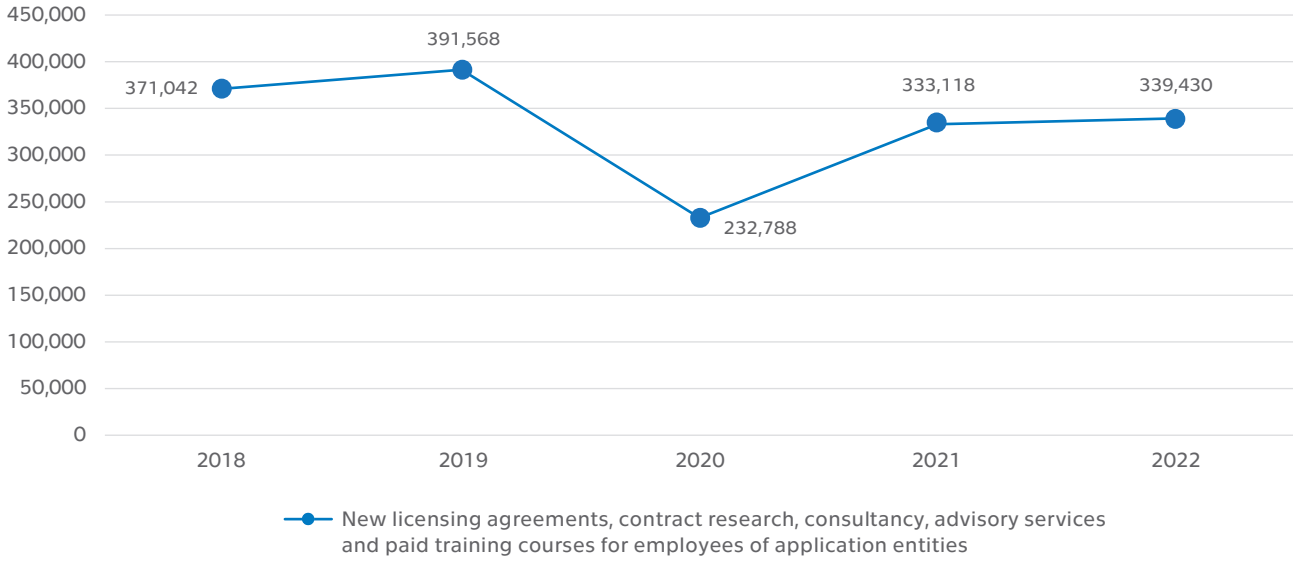
Paid training courses to improve the qualifications of employees of the application entities (e.g. corporate training courses). An application sector entity is defined here as a legal entity whose main activity is not research and development. It can be a business entity, a public administration body, a non-profit organisation, etc. – always with the condition that the main activity is not research. Revenue will be included from those training courses which are 'bespoke', i.e. agreed with the organisation concerned for its staff. This does not involve quantifying the costs of participants in training courses who are employed by a company that meets the above definition. On the contrary, these are courses that were created in agreement with the selected company because it wanted to train its employees.

Consultation and advice is based on the provision of expert advice, opinion or action, which depends on a high level of intellectual input from the higher education institution to the client. The university provides consulting and advisory services to application entities for a fee and in accordance with market conditions. The main desired outcome of the consultancy is not the creation of new knowledge, but the understanding or comprehension of a certain condition.

Summary information on Table 8.4

	Number TOTAL	Total revenue
New licensing agreements, contract research, consultancy, advisory services and paid training courses for employees of application entities	1,199	339,430,000 CZK
	Average revenue per 1 order	
	283,094 CZK	

TRANSFER OF KNOWLEDGE AND RESEARCH RESULTS INTO PRACTICE (TOTAL INCOME IN THOUSANDS CZK)



NEWLY CONCLUDED LICENCE AGREEMENTS

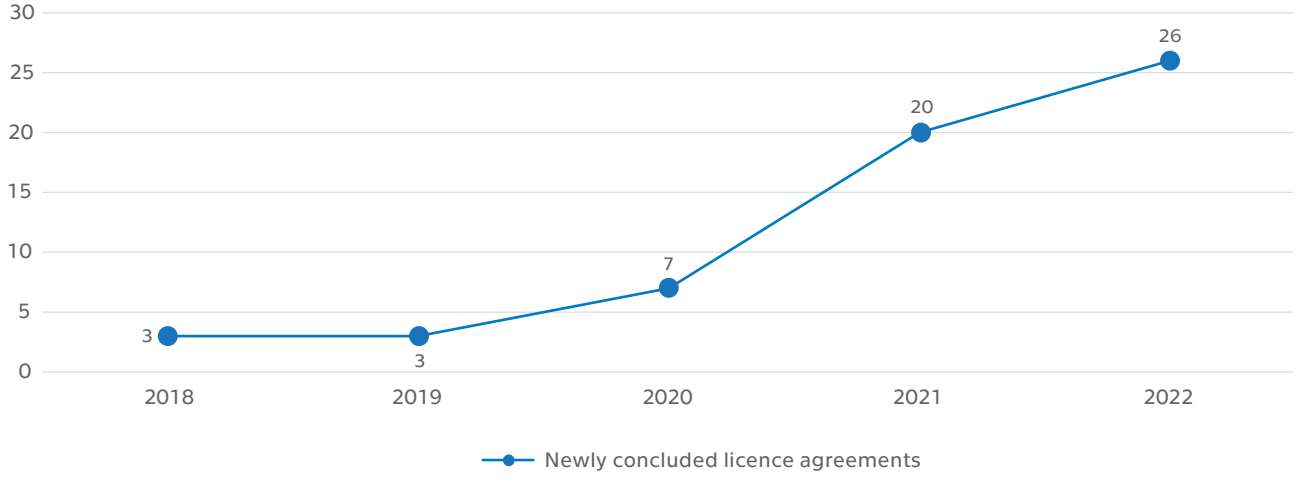
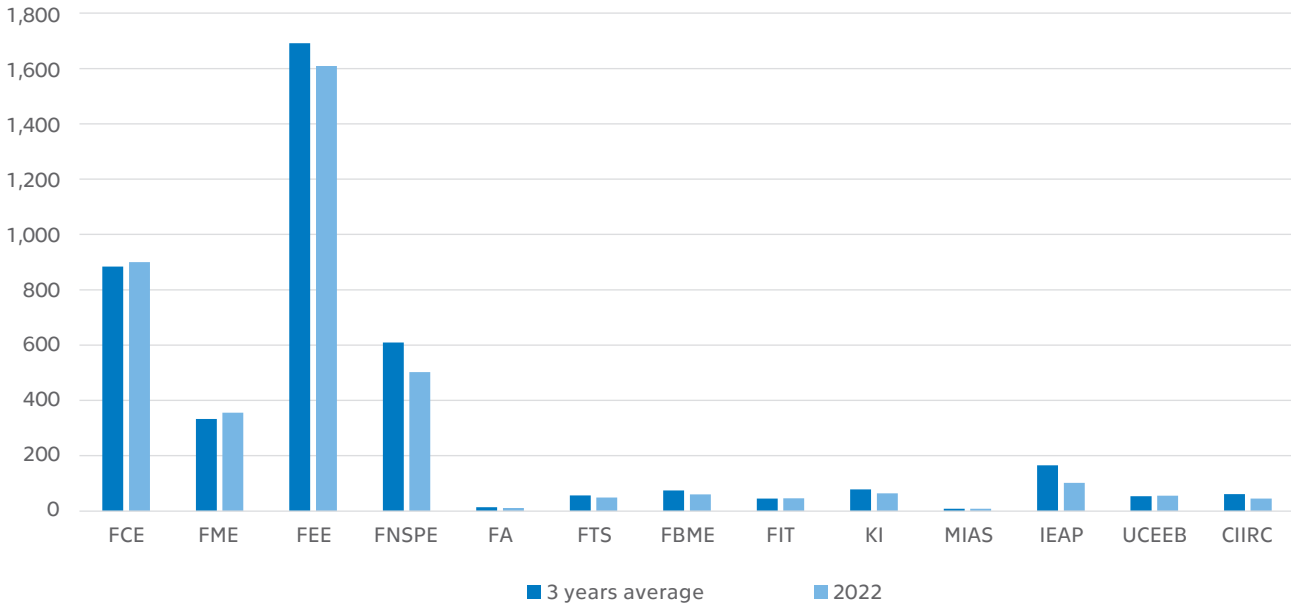


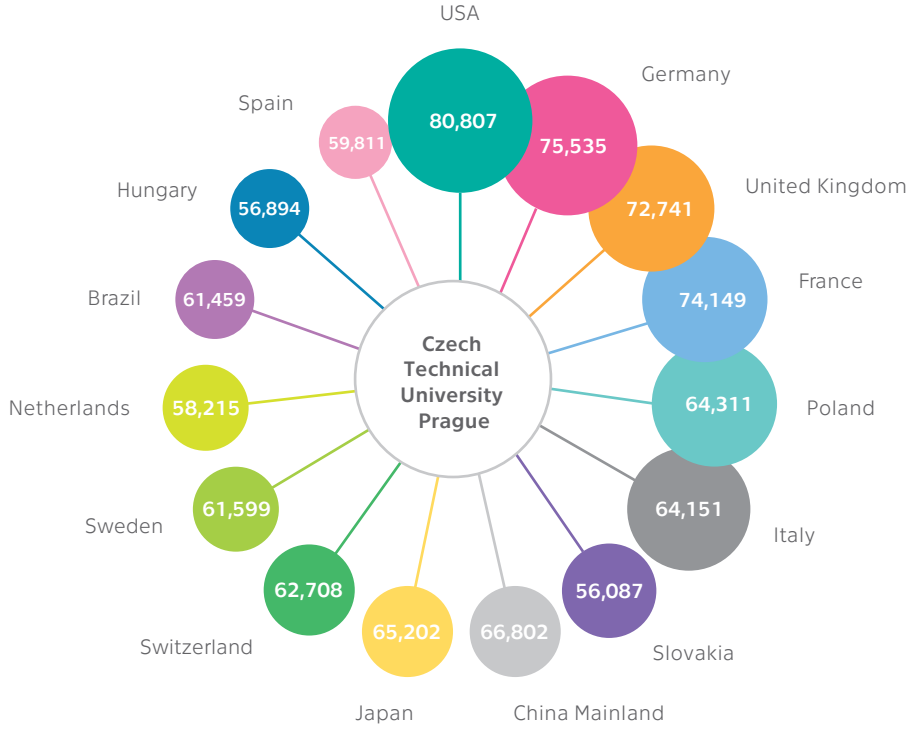
Table 8.5: Citations and publications 2022
(points for impacted publications and citations by V3S)

CTU in Prague	CITATION		PUBLICATIONS	
	3 years average	2022	3 years average	2022
Faculty of Civil Engineering***	883.96	899.82	143.06	147.02
Faculty of Mechanical Engineering***	332.43	355.43	91.13	101.74
Faculty of Electrical Engineering	1,690.98	1,608.74	232.03	270.07
Faculty of Nuclear Sciences and Physical Engineering	609.50	502.75	134.68	121.66
Faculty of Architecture	13.55	11.29	0.66	0.43
Faculty of Transportation Sciences	56.17	48.78	13.87	12.01
Faculty of Biomedical Engineering	73.96	60.04	29.02	40.63
Faculty of Information Technology	45.38	46.12	18.68	21.48
Klokner Institute	77.85	64.27	5.59	9.99
Masaryk Institute of Advanced Studies	0.61	0.97	1.38	2.03
Institute of Technical and Experimental Physics	165.04	101.98	24.97	22.49
University Centre for Energy Efficient Buildings	53.52	55.14	17.59	25.48
Czech Institute of Informatics, Robotics and Cybernetics	61.22	45.38	33.86	41.11
CTU TOTAL	4,064.16	3,800.71	746.51	816.15

CITATION

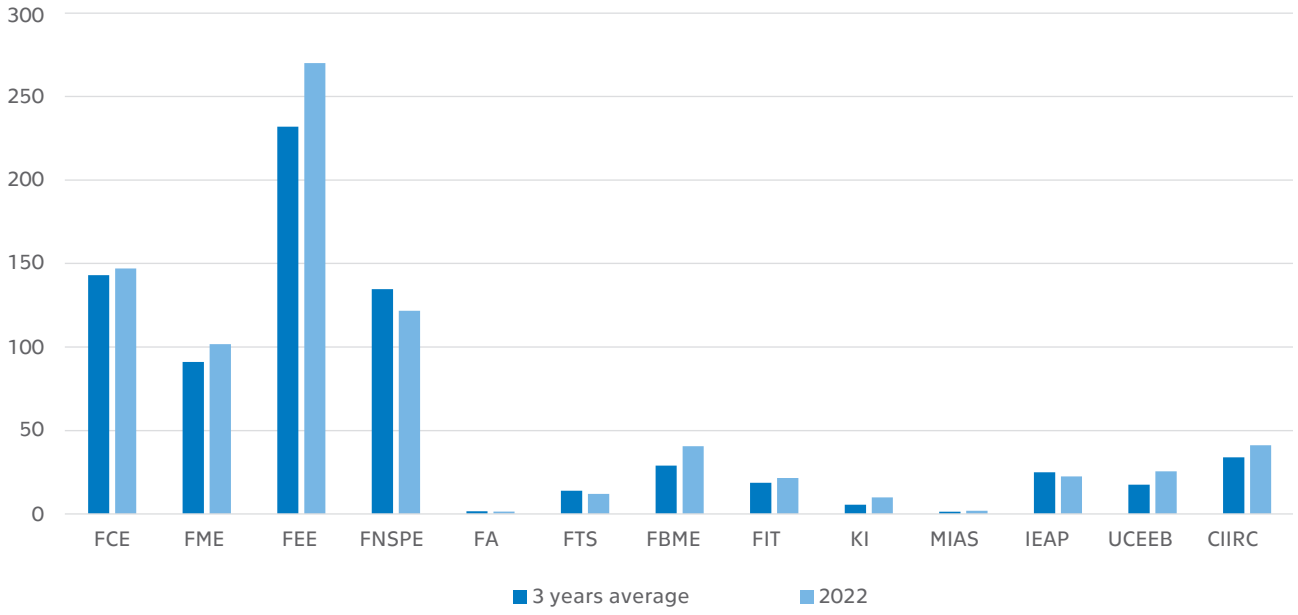


NUMBER OF CITATIONS BY CTU AUTHORS IN INDIVIDUAL COUNTRIES FOR THE PERIOD 2012–2022 IN THOUSANDS.
THE GRAPH SHOWS THE NUMBER OF CITATIONS RECEIVED BY PUBLICATIONS BY AUTHORS FROM THE CTU IN COLLABORATION WITH AUTHORS FROM THE LISTED COUNTRIES.

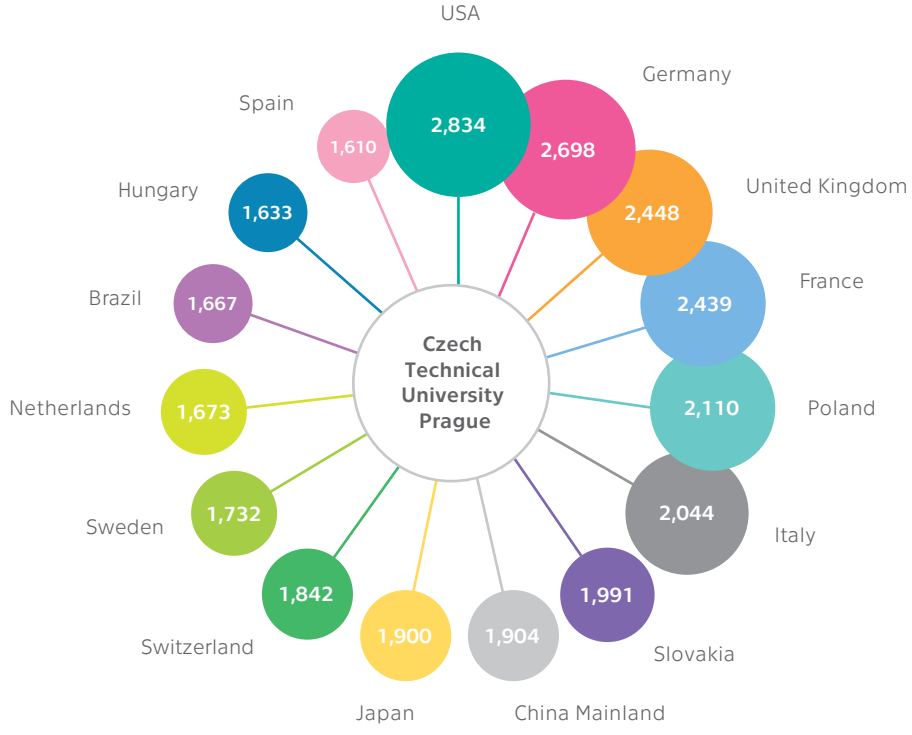


The data was exported from the InCites database on 3/23/2023

PUBLICATIONS



NUMBER OF PUBLICATIONS BY CTU AUTHORS AND AUTHORS FROM INSTITUTIONS BASED IN INDIVIDUAL COUNTRIES FOR THE PERIOD 2013–2022 IN THOUSAND. THE GRAPH SHOWS THE NUMBER OF PUBLICATIONS PRODUCED BY AUTHORS FROM THE CTU IN COLLABORATION WITH AUTHORS FROM THE COUNTRIES MENTIONED ABOVE OVER THE LAST TEN YEARS.



The data was exported from the InCites database on 3/23/2023

Table 8.6: Key indicators from the perspective of the international ranking of QS and THE universities

CTU in Prague	CTU Average	FCE	FME	FEE	FNSPE
QS/THE: International headcount ratio	13.62%	5.42%	7.08%	21.24%	19.66%
QS/THE: International student ratio	21.56%	14.35%	16.46%	27.71%	25.38%
QS/THE: Staff to student ratio	7.0	7.3	5.4	6.4	5.2
QS citacitons / employees, weighted average over 5 years	9.6	5.2	6.0	8.4	29.9
THE Citations / Publications, five-year weighted average	6.4	6.3	7.1	6.0	5.4

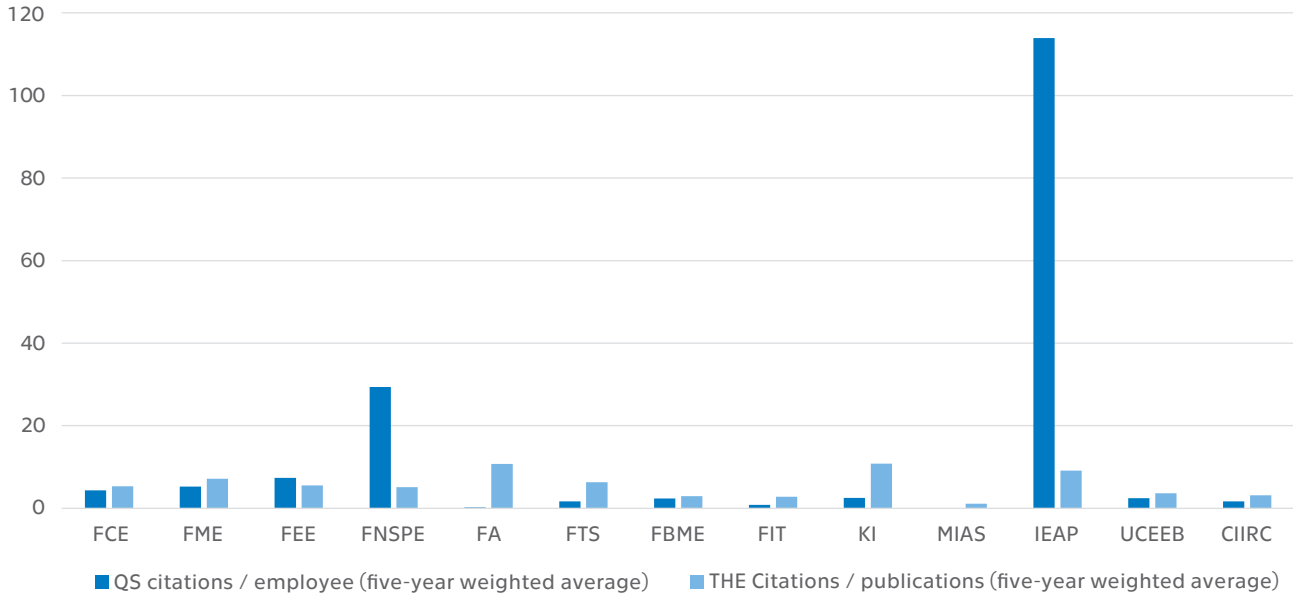
>>>

Staff and student categories: the QS and THE use the FTE (Full Time Equivalent) model. This calculation is used in the staff and student statistics in the chart.

Citation categories: the CTU does not submit citation data from QS and THE rankings, but obtains them directly from the Scopus database and adjusts them according to its own methodology. A precise retrospective analysis of the impact of citations on the rankings is not possible for the following reasons:

- Both QS and THE use a complex process of standardisation and weighting across topics and publication types; this process is not public and THE weights change each year according to THE averages within each category.
- QS and THE select data somewhat differently (although both collect data from the Scopus database)
- QS and THE use a different methodology for calculating the final score (citation per faculty member vs. citation per publication).

CITATION



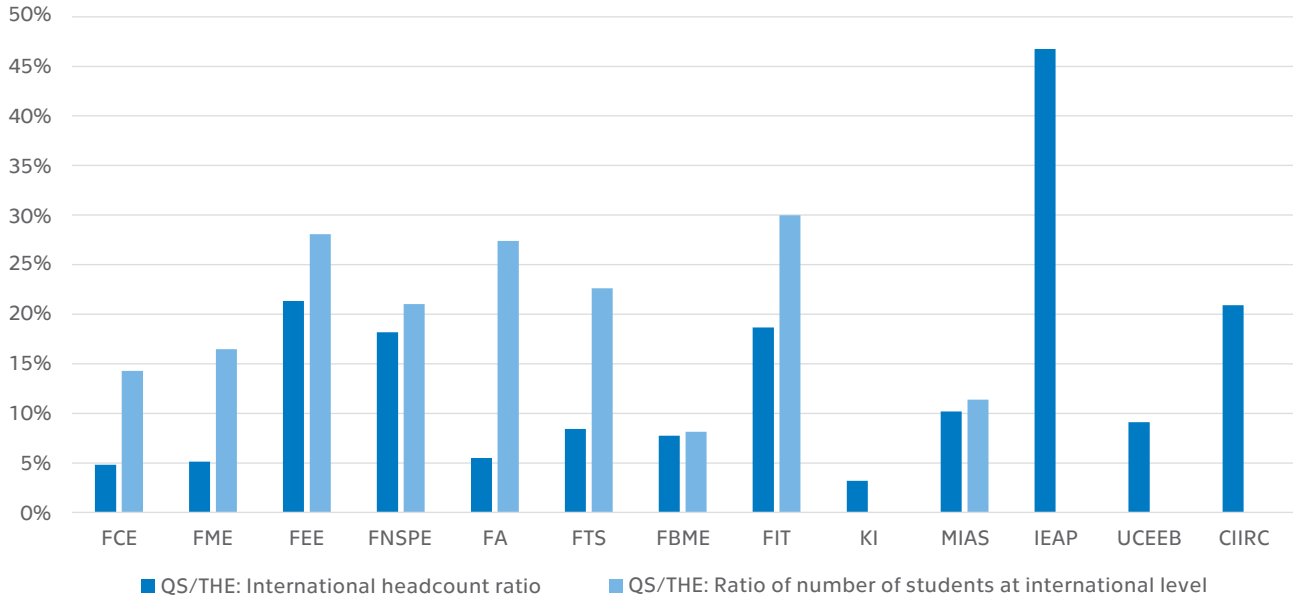
FA	FTS	FBME	FIT	KU	MIAS	IEAP	UCEEB	CIIRC
6.42%	9.81%	6.84%	18.72%	3.51%	12.83%	48.45%	12.59%	26.51%
29.39%	21.52%	8.16%	32.08%	0.00%	17.38%	0.00%	0.00%	0.00%
13.6	6.2	13.5	18.5	0.4	20.0	0.0	0.0	0.0
0.3	1.8	3.1	1.0	3.4	0.1	116.2	3.0	1.9
16.9	6.8	3.2	3.2	11.9	1.5	10.8	3.8	3.3

To get a clearer picture of faculty performance in terms of evaluation, available internal data was used and proprietary evaluation methodologies were developed:

Citation data provided by the Central Library of CTU, 2016–2021.
The absolute number of publications and citations was normalized annually according to the weight of the evaluation agencies:
(2022 × 0.30) + (2021 × 0.25) + (2020 × 0.20) + (2019 × 0.15) + (2018 × 0.10)

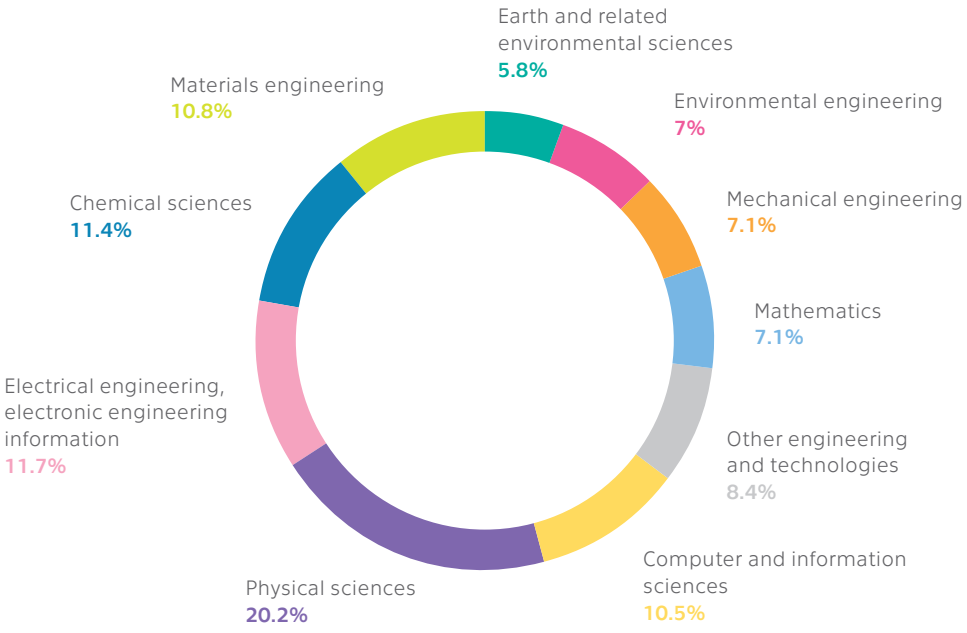
Based on the data on employees (provided by the HR department of R CTU) and citation data (normalized for the previous 5 years), the citation score per faculty (QS) and citation score per thesis (THE) can be calculated. This calculation is a rough approximation of performance in international rankings.

QS/THE



THE FIELDS IN WHICH THE AUTHORS MOST OFTEN PUBLISH

THE CHART SHOWS THE FIELDS IN WHICH CTU AUTHORS PUBLISHED THE MOST IN 2022 BY NUMBER OF DOCUMENTS. THE DISCIPLINES ARE CHOSEN ACCORDING TO THE OECD SUBJECT CLASSIFICATION.



The data was exported from the InCites database on 3/23/2023

Table 8.7: National and international cooperation of CTU authors by fields and countries

Field	Czech Republic	USA	Germany (Fedrepger)	France	United Kingdom	Poland	China Mainland	Italy
Materials science, multidisciplinary	481	22	42	19	36	45	19	21
Physics, particles & fields	425	334	322	293	290	306	299	298
Engineering, electrical & electronic	415	38	24	39	68	31	12	18
Physics, applied	374	20	29	6	38	31	9	17
Computer science, artificial intelligence	236	23	24	26	37	8	8	10
Physics, nuclear	210	148	141	110	96	123	124	106
Instruments & instrumentation	196	44	39	26	49	40	16	33
Astronomy & astrophysics	195	145	133	116	113	123	121	114
Optics	188	21	15	15	50	2	7	5
Chemistry, physical	186	6	13	5	15	24	5	3
Mathematics, applied	178	18	17	25	11	12	4	27
Physics, multidisciplinary	163	67	65	49	44	56	54	57
Metallurgy & metallurgical engineering	160	8	9	1	6	20	3	3
Physics, condensed matter	147	4	10	3	9	20	3	5
Nuclear science & technology	144	29	28	15	12	14	4	22
Chemistry, multidisciplinary	141	8	7	12	11	6	3	11
Telecommunications	140	13	11	9	30	15	3	2
Mathematics	128	18	12	21	17	4	2	17
Computer science, information systems	126	13	3	11	17	12	3	3
Computer science, theory & methods	124	21	15	12	8	4	2	1
Environmental sciences	111	6	7	3	5	8	2	7
Engineering, civil	98	7	12	7	11	11	10	13
Energy & fuels	95	5	2	2	5	9	5	4
Computer science, interdisciplinary applications	92	17	16	9	9	2	5	4
Automation & control systems	87	6	5	22	6	1	2	3
Chemistry, analytical	87	8	8	3	20	10	4	7
Engineering, multidisciplinary	86	3	8	4	6	5	1	11
Nanoscience & nanotechnology	83	4	5	8	6	4	3	4
Computer science, software engineering	74	18	6	3	7	2	3	3
Engineering, biomedical	71	11	3	2	4	1	2	1
Clinical neurology	71	16	9	2	10	2	1	3
Engineering, mechanical	69	3	6	7	6	3	1	3
Construction & building technology	68	4	7	7	7	12	7	6
Physics, mathematical	65	9	5	7	4	5	4	7
Robotics	64	1	3	12	9	2	2	2
Materials science, coatings & films	62	3	5	1	7	1	1	5
Neurosciences	62	13	6	4	9	4	1	4
Mechanics	61	5	7	11	4	3	1	6
Imaging science & photographic technology	61	14	4	8	9	1	7	4
Radiology, nuclear medicine & medical imaging	59	14	7	6	8	4	2	5
Physics, fluids & plasmas	58	11	11	12	12	15	8	8
Green & sustainable science & technology	51	3	3	0	0	2	2	3

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Table 8.7: National and international cooperation of CTU authors by fields and countries

Field	Czech Republic	USA	Germany (Fedrepger)	France	United Kingdom	Poland	China Mainland	Italy
Engineering, chemical	46	3	0	2	1	8	3	0
Biochemistry & molecular biology	44	3	6	0	2	2	2	3
Operations research & management science	43	3	5	9	2	1	2	6
Physics, atomic, molecular & chemical	41	9	6	4	6	3	0	3
Thermodynamics	35	3	3	0	4	2	0	0
Public, environmental & occupational health	35	3	4	2	3	2	1	3
Environmental studies	34	1	4	1	1	2	0	2
Geosciences, multidisciplinary	33	2	4	3	4	2	1	6
Crystallography	31	0	4	5	1	2	0	0
Mathematics, interdisciplinary applications	28	2	1	1	0	0	0	3
Engineering, manufacturing	28	1	1	2	1	0	2	0
Polymer science	26	2	4	0	0	1	0	2
Surgery	26	0	2	0	2	0	0	0
Statistics & probability	25	3	4	1	1	1	0	0
Mathematical & computational biology	25	4	2	1	3	1	0	0
Water resources	24	1	3	0	1	6	2	3
Engineering, environmental	24	0	2	0	3	3	3	1
Computer science, hardware & architecture	23	3	2	0	1	3	0	0
Medicine, research & experimental	23	3	0	1	2	1	0	0
Remote sensing	22	2	2	2	0	0	0	1
Geochemistry & geophysics	21	7	3	2	4	0	1	1
Acoustics	20	2	2	5	1	1	0	1
Quantum science & technology	18	3	4	0	1	0	0	0
Logic	18	1	2	0	0	3	0	0
Transportation science & technology	17	0	1	1	5	1	0	1
Materials science, ceramics	16	0	1	0	0	0	0	0
Engineering, industrial	16	1	3	1	0	0	1	0
Education, scientific disciplines	16	0	4	1	2	1	0	0
Biophysics	15	0	4	0	0	1	0	2
Biotechnology & applied microbiology	15	0	1	1	0	1	0	1
Health care sciences & services	15	1	0	0	0	0	0	0
Chemistry, inorganic & nuclear	14	1	4	1	1	0	0	4
Medical informatics	14	1	0	0	0	0	0	0
Materials science, composites	14	0	0	0	0	1	0	0
Biology	14	3	1	0	6	1	0	1
Oncology	14	2	0	0	1	0	0	1
Biochemical research methods	14	2	2	0	1	0	0	0
Pharmacology & pharmacy	14	1	0	0	0	0	1	1
Mining & mineral processing	13	2	0	0	1	1	1	0
Soil science	13	1	5	1	1	0	2	1
Economics	12	0	1	2	0	1	0	1
Materials science, characterization & testing	12	1	0	1	0	1	0	0
Engineering, aerospace	12	1	0	1	1	0	0	0

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Table 8.7: National and international cooperation of CTU authors by fields and countries

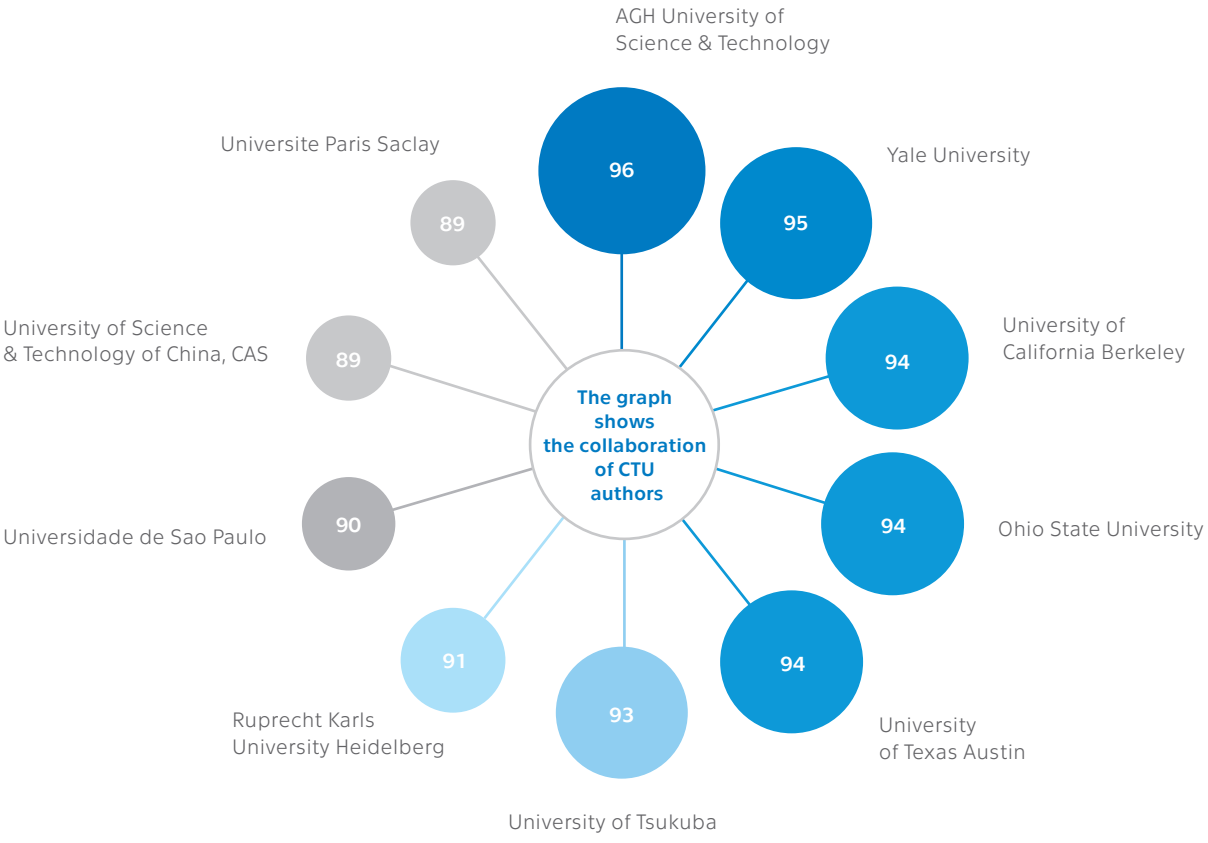
Field	Czech Republic	USA	Germany (Fedrepger)	France	United Kingdom	Poland	China Mainland	Italy
Meteorology & atmospheric sciences	12	1	2	1	1	0	1	3
Cardiac & cardiovascular systems	12	6	1	6	6	0	0	1
Psychiatry	12	3	6	0	3	0	0	1
Engineering, geological	12	1	0	0	2	1	1	2
Physiology	11	0	3	0	0	0	0	0
Management	11	2	0	2	1	2	2	1
Electrochemistry	11	1	0	0	1	1	2	1
Audiology & speech-language pathology	11	0	3	0	0	0	0	0
Rehabilitation	11	1	0	0	1	0	1	0
Pediatrics	11	4	1	2	6	0	0	1
Materials science, biomaterials	10	1	0	0	0	0	0	0
Urban studies	9	0	1	1	1	0	0	0
Anatomy & morphology	9	0	0	0	0	0	0	0
Spectroscopy	8	1	0	0	5	0	0	0
Cell biology	8	1	0	0	2	0	0	2
Orthopedics	8	0	0	0	0	1	0	0
Mineralogy	8	1	0	0	1	0	1	0
Multidisciplinary sciences	8	0	1	0	1	0	0	0
Transplantation	7	0	0	0	0	0	0	0
Geography, physical	7	0	1	1	0	0	0	0
Chemistry, organic	7	0	2	0	1	0	0	0
Computer science, cybernetics	6	0	1	0	1	0	0	0
Architecture	6	1	0	0	0	0	0	0
Critical care medicine	6	2	0	0	0	0	0	1
Chemistry, applied	6	0	0	0	0	1	1	0
Neuroimaging	6	3	2	1	4	1	1	1

The table shows the number of documents that have been produced in 2022 in the field in collaboration with that country.

The data was exported from the InCites database on 3/14/2023

INTERNATIONAL COOPERATION WITH ACADEMIC INSTITUTIONS

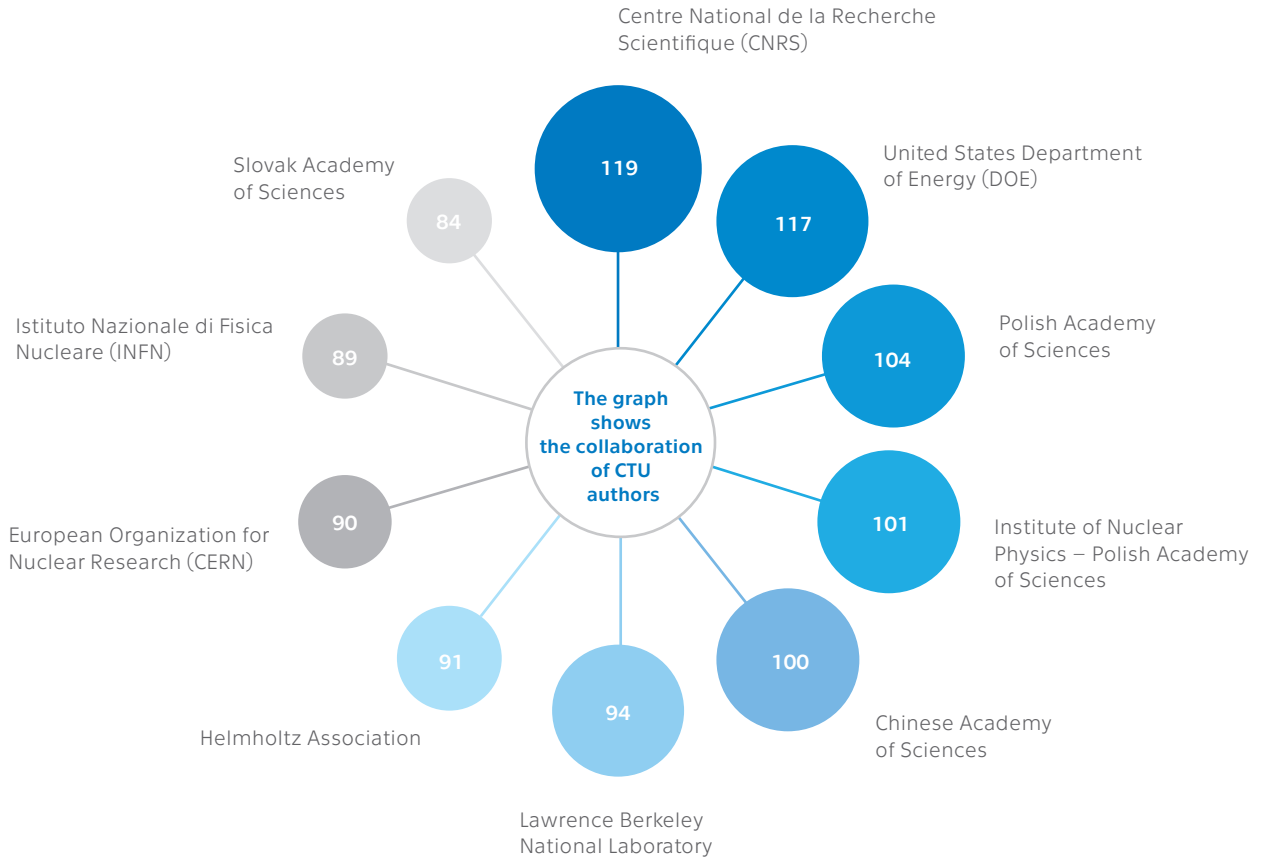
TU AUTHORS WITH FOREIGN ACADEMIC INSTITUTIONS, WHICH RESULTED IN THE NUMBER OF DOCUMENTS PRODUCED IN 2022.



The data was exported from the InCites database on 3/23/2023

INTERNATIONAL COOPERATION OUTSIDE ACADEMIC INSTITUTIONS

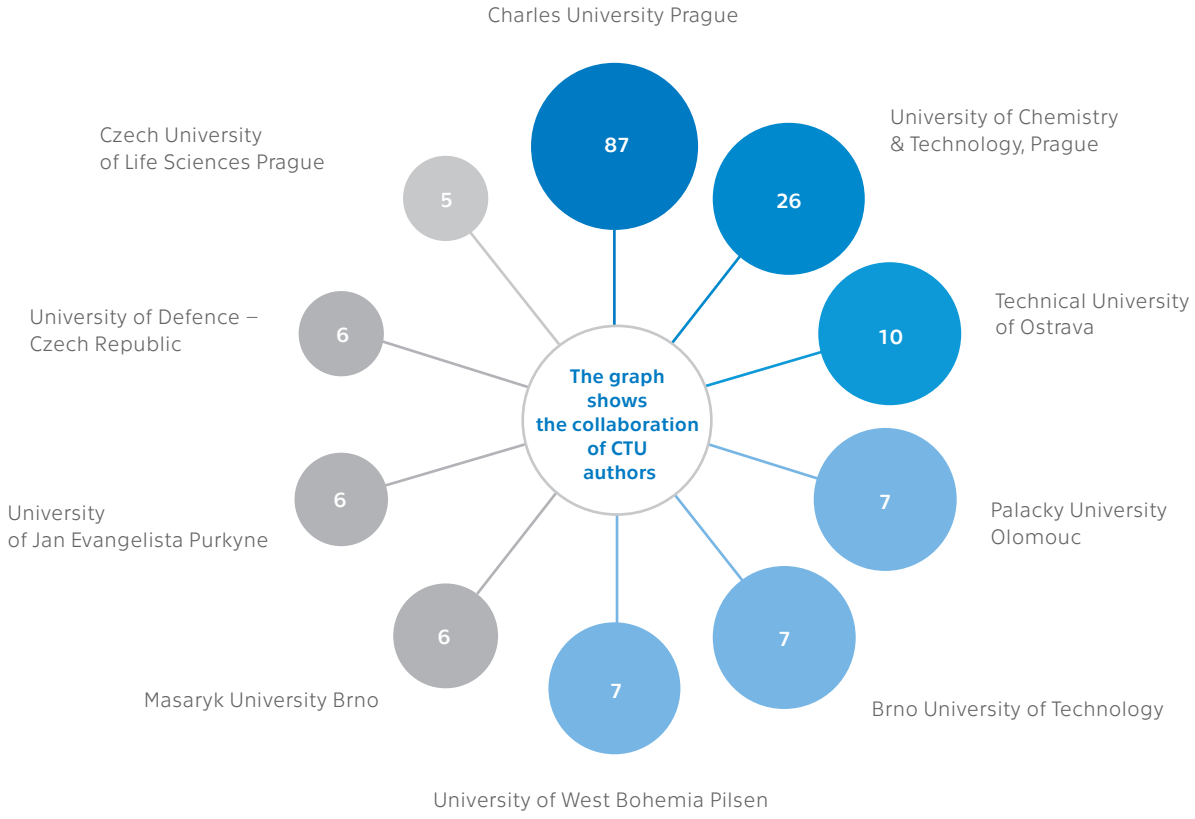
THE GRAPH SHOWS THE COOPERATION OF CTU AUTHORS WITH FOREIGN INSTITUTIONS, WHICH RESULTED IN THE NUMBER OF DOCUMENTS PRODUCED IN 2022.



The data was exported from the InCites database on 3/23/2023

NATIONAL COOPERATION WITH ACADEMIC INSTITUTIONS

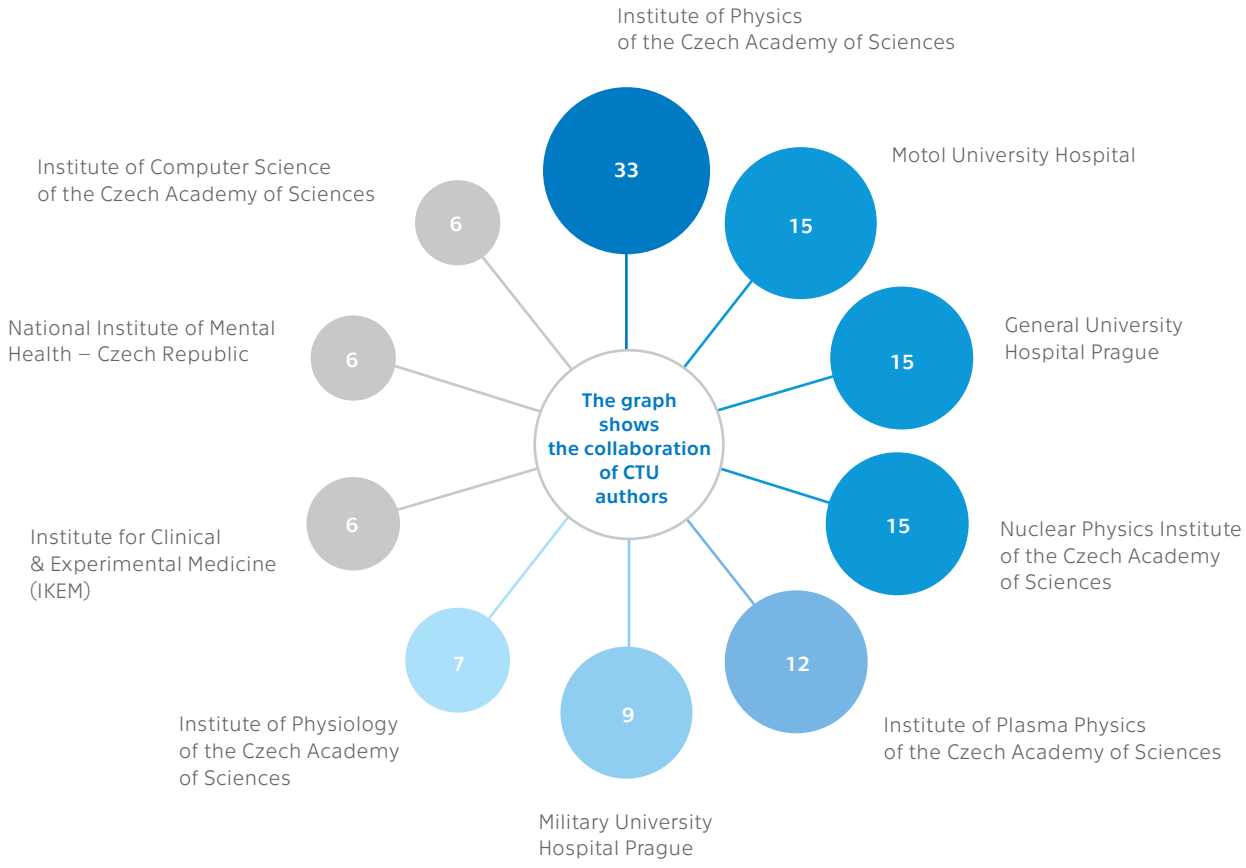
THE CHART SHOWS THE COOPERATION OF CTU AUTHORS WITH ACADEMIC INSTITUTIONS FROM THE CZECH REPUBLIC, WHICH RESULTED IN THE NUMBER OF DOCUMENTS PRODUCED IN 2022.



The data was exported from the InCites database on 3/23/2023

NATIONAL COOPERATION OUTSIDE ACADEMIC INSTITUTIONS

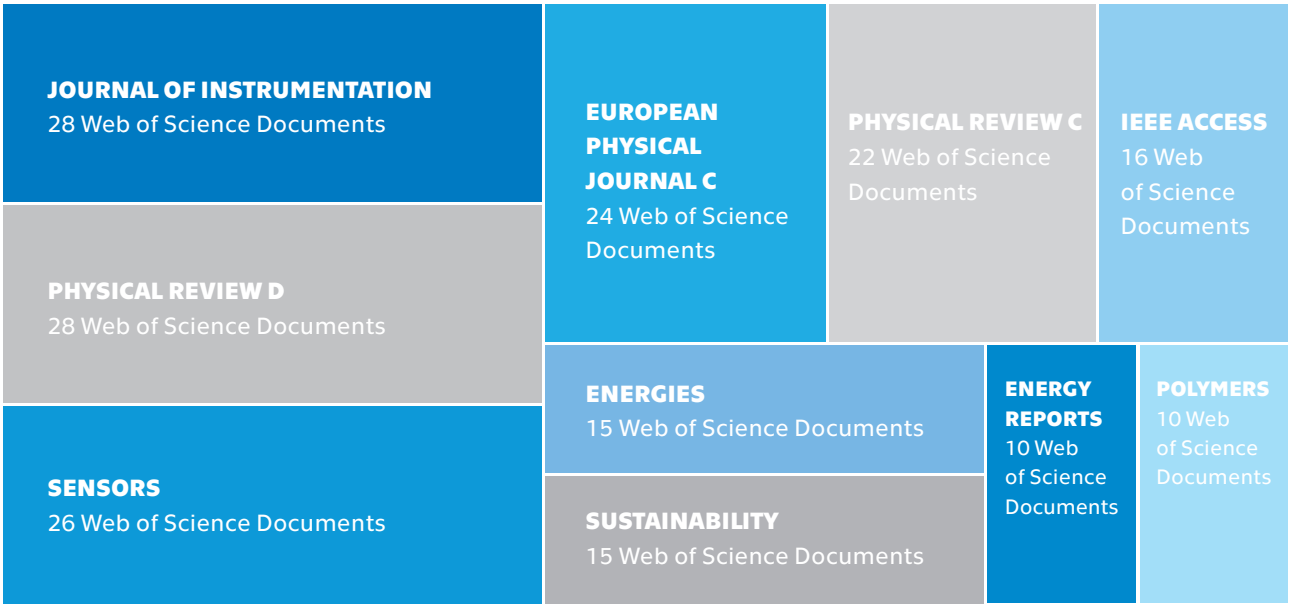
THE CHART SHOWS THE COOPERATION OF CTU AUTHORS WITH INSTITUTIONS FROM THE CZECH REPUBLIC OUTSIDE THE ACADEMIC FIELD, WHICH RESULTED IN THE NUMBER OF DOCUMENTS PRODUCED IN 2022.



The data was exported from the InCites database on 3/23/2023

PUBLICATION OF CTU AUTHORS IN JOURNALS

THE CHART SHOWS THE JOURNALS IN WHICH CTU AUTHORS PUBLISHED MOST FREQUENTLY IN 2022 BY NUMBER OF PAPERS



Box size indicates Web of Science Documents

The data was exported from the InCites database on 3/23/2023

Table 8.8: Specific university research projects at CTU (2018–2022).
Overview of the number of results achieved with the support of SVV.

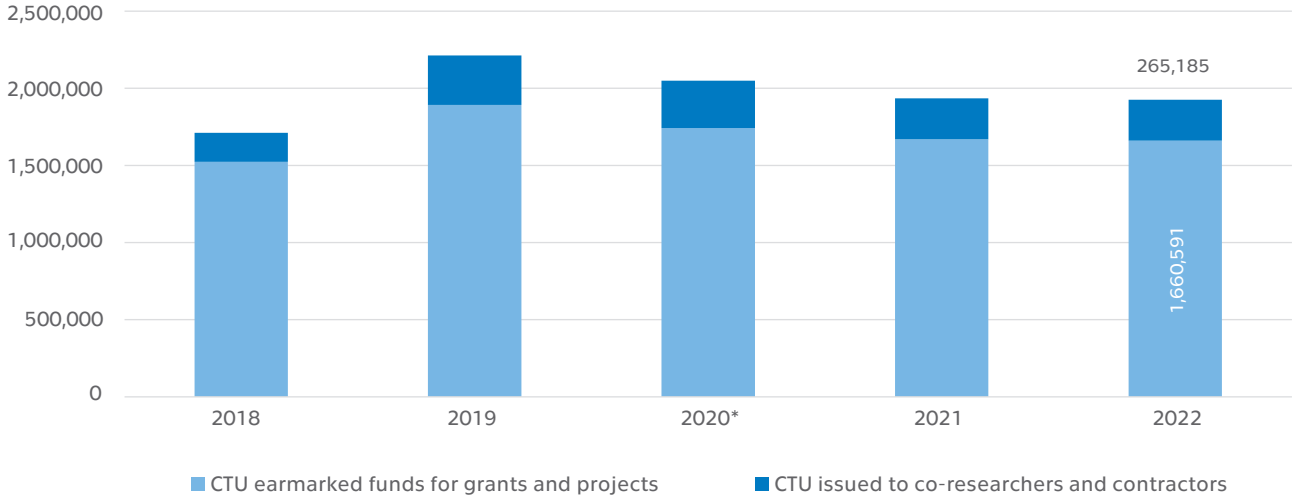
CTU in Prague	2018	2019	2020	2021	2022
Article in a professional periodical	340	296	310	388	323
Professional book	9	4	4	1	2
Chapter(s) in a professional book	8	2	6	4	13
Article in the proceedings	753	633	494	480	398
Patent	6	4	5	3	3
Results with legal protection (utility model, industrial design)	5	3	4	6	2
Semi-production, proven technology, variety, breed	0	3	1	2	0
Technically realised results (prototype, working sample)	21	12	19	23	19
Provider-implemented results	2	0	3	1	0
Certified methodologies, therapeutic procedures, heritage procedures, specialized maps with specialized content	8	7	0	4	0
Software	11	14	8	9	2
Research report containing classified information or summary research report	4	5	6	2	1
Audiovisual production, electronic documents	1	0	0	1	1
Organisation of a conference	4	2	3	2	1
Organisation of a workshop	6	4	6	6	4
Organisation (organisation) of an exhibition	0	2	2	1	0
Total number of results	1,178	991	871	933	769

Table 8.9: Funds earmarked for research, development and innovation received in 2018–2022 (thous. CZK)

CTU in Prague	2018	2019	2020*	2021	2022
Total earmarked funds	1,711,424	2,216,072	2,049,632	1,934,417	1,925,776
Of which: earmarked funds of CTU for grants and projects	1,523,131	1,891,937	1,741,865	1,669,232	1,660,591
Of which: CTU issued to co-researchers and suppliers	188,293	321,135	307,768	265,185	265,185

Note: * Note: based on the refinement of the financial statements for 2020, there has been an increase compared to the amount originally stated in AR 2020.

EARMARKED FUNDS FOR RESEARCH, DEVELOPMENT AND INNOVATION RECEIVED IN 2018–2022 (THOUS. CZK)



Note: * Note: based on the refinement of the financial statements for 2020, there has been an increase compared to the amount originally stated in AR 2020.

Table 12.1: Accommodation, catering	
CTU in Prague	**Number of**
Total bed capacity of university halls of residence	7,413
Number of beds in rented facilities	0
Number of applications/reservations for accommodation submitted as of 31/12/2021	11,050
Number of successful applications/reservations for accommodation as of 31/12/2021	6,528
Number of bed days in 2021	1,912,093
Total number of terminated contracts (pandemic)*	0
Total number of modified contracts (pandemic)**	0
Total number of contracts with exceptions (pandemic)***	0
Number of main meals issued to students in 2021	634,379
Number of main meals issued in 2021 to college staff	46,663
Number of main meals issued in 2021 to other diners	628,466

Note: * Number of contracts that were terminated during the year as a result of the government's anti-pandemic accommodation measures.

Note: ** Number of contracts that were modified during the year as a result of the government's anti-pandemic accommodation measures. This does not have to be a formal modification of the contract, but a change in performance – typically a reduction in the price of accommodation where accommodation is retained by the student although not physically used.

Note: *** Number of contracts that remained in force with an exception to the accommodation ban resulting from the government's anti-pandemic accommodation measures. This includes, for example, students with work orders, volunteers, students who have declared a college residence, etc.

ACCOMMODATION SERVICES AT CTU

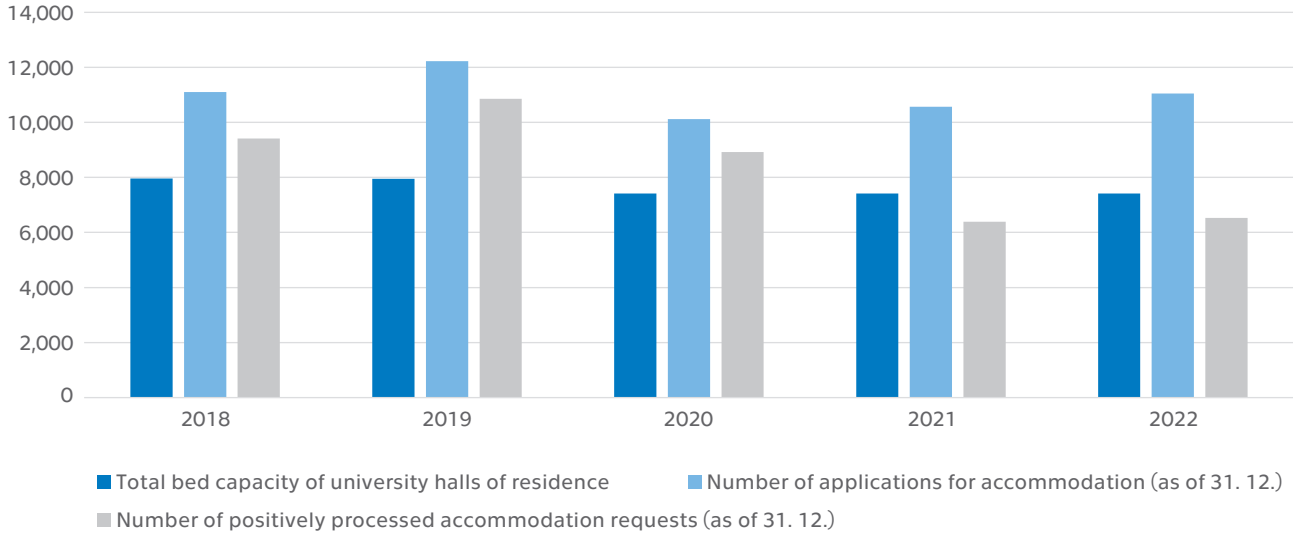


Table 12.2 University libraries	
CTU in Prague	**Number of**
Library collection growth for the year	5,104
of which increase in physical units	5,014
of which increment of e-books in permanent purchase	90
Total library collection	334,104
of which physical units	330,980
of which e-books in permanent purchase	3,124
Number of periodical titles subscribed:	
– Physical	184
– electronically (estimate)*	8
– in both forms**	0

Note: * Only periodical titles that the library itself subscribes to (or receives as a gift, exchange) in paper or electronic versions are listed; other periodicals that library users have access to as part of full-text resource consortia are not included.

Note: ** Only titles where both forms are paid for separately are included in the number of titles in both forms (i.e. if the printed form is prepaid and the electronic form is free as a bonus, only the printed form is included, etc.).

Note: Electronic units include only individually purchased titles, not books and periodicals that are part of subscription „packages" from publishers of scholarly and scientific literature.

The addition to the library collection for 2021 was 3,860. Of these, 3,632 were books, 130 bound journals and 98 e-books.

1,373 books are placed in the Dejvice Library (NTK building), 1,710 in local libraries (FD, FJFI, FBMI) and 549 books are deposited at faculty offices in Dejvice.

Thanks to the preparation of the transition to the new library platform, a detailed analysis, comparison and analysis of the library units in the printed accession lists (from 1954 to 1980) and in the ALEPH database was carried out. We discovered a statistical error, the retroconversion was not taken into account. Duplicate records were cleaned up, resulting in a large decrease in the 'number' of library units. This is not a matter of depreciation of library units, but of correct reporting of the volume of the library collection of the CCHR. This discrepancy is explained in the CTU's Annual Report for 2021.

LIBRARY FUND (PHYSICAL UNITS, E-BOOKS ON PERMANENT PURCHASE)