University of Chemistry and Technology in Prague

A public higher education institution

Annual Report on Activities in 2020

Presented by

Prof. Dr. RNDr. Pavel Matějka

Rector

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A. Annual Report on Activities – Main Part

Introduction by the Rector

The University of Chemistry and Technology in Prague presents its Annual Report on Activities in the calendar year of 2021 in accordance with Section 21 of Act No. 11/1998 Coll., on Higher Education Institutions.

A year ago, I wrote here that UCT Prague had faced a great number of major challenges and that it had successfully addressed all of them. I had no idea back then that the challenges of 2019 would pale in the face of the gravity of the tasks presented to us by the year 2020. The repeated shutting down of universities caused by the pandemic and the transition to distance learning, the abrupt opening of laboratories followed by long periods when they were closed again, setting up and using home offices, ensuring the continuity of research activity when people were not allowed to come to work… And in addition to all this, the purely personal and extremely grave concerns over the health and lives of our loved ones that a big part of our chemistry family had to deal with in 2020. Therefore, I am very grateful that I can write here: UCT Prague has stood this test with honour.

Although many months have passed since the outbreak of the pandemic, I still rejoice at how our teachers and students have handled the unexpected and constantly changing situation and have built an efficient system of distance learning basically from scratch and how researchers have not compromised their high standards and have successfully completed their projects. The students fulfilled their obligations during the examination period and passed state examinations. And most important of all, the UCT Prague community got involved in volunteer activities without the slightest hesitation and in great numbers, from sewing face masks to the preparation and distribution of disinfectants to various institutions in need, from offering learning support to high school students to expert activities, all this without expecting any pay in return. All those who offered a helping hand have my admiration and sincere respect. On a more general level, I believe that I can safely say that during the pandemic universities have proved and continue to prove that they are essential infrastructure that is able to help the country significantly in critical situations and beyond.

From the strategic and legislative perspectives, it is important to note that even under these unusual conditions, UCT Prague has succeeded in achieving the goals defined in the Long-Term Plan of UCT Prague for 2016–2020 in all eight areas, which include the development of scientific and research activities, the improvement of quality and efficiency of education, intense collaboration with industry partners and more.

It is also important to stress that we were able to maintain a high level of acquired financial resources for research, development and innovation (income) from domestic and foreign providers (over 1 billion Czech crowns). Compared to the previous year, the amount of international research projects from foreign providers grew to 30, including 18 Horizon projects,

which is proof of the high quality of our research activities. High-quality research cannot be done without PhD students and I am delighted by the fact that the number of applications to the doctoral programme increased by nearly 40%. More great news is the launching of the *Project Centre*, which UCT Prague desperately needed and which will ensure even better results in submitting grant applications in future.

From outside, UCT Prague is often considered a prestigious institution, the ambitions of which do not end at the borders of the Czech Republic. This is also confirmed by UCT's position in international university rankings. In 2020, for the second consecutive year, we ranked among the top 350 universities in QS World University Rankings, which is a great success for a university of our size. It is even better news that in the *individual support in education and natural involvement of students in research* category we earned 40th place globally and came first in the Czech Republic.

Unfortunately, the promising internationalization trend was slowed down by the pandemic. This was most evident in mobilities, as the vast majority could not be completed but had to be ended early. On the other hand, the new *Welcome Centre* is wonderful news. Its aim is to provide comprehensive service and assistance with integration to foreign members of the academic community at UCT Prague.

UCT Prague is proud of its close collaboration with industrial partners, therefore a major task for the upcoming year is to reverse the downward trend of income from contractual (contracted) research and development, which fell by 14% in a year-on-year comparison.

2020 was also the year when we welcomed back economic programmes taught by new colleagues. The plan is to transform the Department of Economics and Management to an expert workplace that, in addition to offering students high-quality demanding programmes in the relevant areas of education will also successfully carry out creative activity, cooperate with UCT faculties and be a wind of change in lifelong learning.

In the autumn, the university was evaluated by an international evaluation board in the framework of the evaluation of research organizations in the university segment. We scored very well and received some well-meaning advice that we need to take to heart in order to further increase the quality of our university.

Other noteworthy events include our successful mission to Taiwan that resulted in collaboration with three leading universities in Taiwan and a number of awards for our academics (the Medal of the Ministry of Industry and Trade awarded to Prof. Pašek, the Siemens Award for best pedagogical worker given to Prof. Štěpánek and the Award of the Ministry of Education, Youth and Sport for extraordinary research results, experimental development and innovation in natural sciences to Prof. Friess, to name just a few); Prof. Sofer's success in the ERC CZ programme; Prof. Slavíček, who scored very well in the EXPRO excellent research projects category in the Grant Agency of the Czech Republic. We also signed a memorandum of cooperation with the CzechInvest agency.

In the year 2020, our two buildings in Dejvice were connected by two futuristic footbridges. I am very happy that this ambitious project, which received critical responses in the visualisation stage is an aesthetic and functional jewel appreciated by renowned architects and the general public. I would also like to mention another project – the book *Robot 100: Sto rozumů* (Robot 100: One Hundred Reasons), which proved that UCT is able to step out of the world of natural sciences and contribute to the cultural wealth of our society.

Despite all our difficulties, the Latin phrase "Omnis habet sua dona dies" (Marcus Valerius Martialis) also held true in the year 2020.

Prof. Dr. RNDr. Pavel Matějka

Rector

1 Optimization of the system of education for the purpose of improving quality and efficiency

1.1 Internal grant competition to support pedagogical projects (PIGA)

In 2020, a competition of pedagogical projects of students and academic workers (PIGA) was announced in the framework of the internal grant agency, category C. A total of 65 projects received support in the amount of ca CZK 8.8 million from the contribution for the implementation of the Institutional Plan of UCT Prague. The focus of the supported pedagogical projects announced in PIGA corresponded to the priorities of the annual Plan of Implementation of the Strategic Plan of UCT Prague 2020. In addition to 64 innovative projects (type C1), one all-school pedagogical project (type C2) called *Motivational support to pedagogical work of PhD students 2020* impacting 300 PhD students was supported; its support represented 27% of the total financial resources allocated to PIGA.

1.2 Implementation of educational projects in the framework of OP RDE

2020 was the fourth year of the implementation of the strategic project ***Priority UCT Prague*** under the ESF call for universities OP RDE. In 2020, around 120 natural persons from among the employees of the four faculties and the majority of Rectors Offices were involved in the implementation. The aim of the implementation of the project, whose total eligible costs exceed CZK 146 million, is to increase the quality and efficiency of education at UCT Prague, which is carried out by interventions, including support of the development of bachelor and master programmes focused on practice, strengthening of internationalization, teaching in line with the latest trends in education, setting up minimum standards of service for students with special needs, reducing academic failure, support of cooperation with the Alumni Club, development and creation of transparent systems of internal quality assurance at the university. The implementation of the project is fulfilled by nine key activities. The end of the project is planned by the end of 2022. At the same time, the implementation phase of a complementary project under the ERDF call for universities OP RDE that ensures an adequate infrastructure support for the activities in the ESF project is under way.

Until June 2020, a project called ***3L UCT Prague*** under the OP RDE call "Lifelong Learning at Universities" was implemented. The project had available total eligible costs in the amount of CZK 3.9m. During the 14 months of implementation of the project, the project's aim was fulfilled and 5 new lifelong learning programmes at all four faculties of UCT Prague were prepared.

In 2020, the implementation of the project ***CHEMPRAX*** under the ESF call for universities II in the framework of OP RDE continued. The total eligible costs of the project, which is planned until October 2022, are in the amount of CZK 19m. The aim of the project is to increase the quality and efficiency of practical education at UCT Prague by supporting the development of bachelor and

follow-up master study programmes reflecting the needs of outside practice, matching current social and economic needs, strengthening and deepening of the internal internationalization at the university, teaching in line with the latest trends in education and expanding services for students with special needs. In parallel, a complementary project under the ERDF call for universities II OP RDE that ensures an adequate infrastructure support for the activities in the ESF project is under way.

1.3 Quality Assurance and Assessment

Position in university rankings

In June, UCT confirmed its position as the second best Czech university in the prestigious QS World University Rankings 2021, which evaluated more than 5,500 universities around the world. Year-on-year, our university climbed 13 places and ranks 342nd globally. The main reason why we rank so high is the low faculty/student ratio, which in terms of the qulaity of care for students ensures individual approach to students. Also the international environment at our university contributes to our good ranking – compared to other unviversities in the Czech Republic, UCT has a large number of international students. In the past years, our unviersity has attracted foreign academics who have tied their academic career to UCT Prague.

"I am glad that after we were first included in the ranking last year, we have confirmed that our good position was not a coincidence. UCT is open to students and treats them fairly and offers them a friendly environment, intense contact with teachers and participation in scientific work. I know that rankings are just numbers. For me it's crucial that we should move forward and constantly improve," says Pavel Matějka, Rector of UCT.

U-multirank, which is created by a consortium of Dutch and German universities, evaluates universities using dozens of criteria divided into five areas. UCT Prague received the best evaluation results in 11 criteria, which makes it the best university among other evaluated Czech universities. We received top marks in research (specialized publications, collaboration with industry and the private sector) and student mobility, among other things. U-multirank evaluates nearly 1,800 universities in 92 countries. On its website, visitors can compare universities according to criteria of their choice or search for universities with a similar profile. The ranking includes 15 universities in the Czech Republic. However, not all data is available for all of them, so it is not possible to make a comparison of all criteria.

Rector of UCT Prague agreed on cooperation with leading universities in Taiwan

The University of Chemistry and Technology in Prague has new international partners. During a trip to Taiwan in September, in he which, participated as a member of the official Czech delegation, Prof. Pavel Matějka, Rector of UCT Prague, signed three memoranda of cooperation and exchange of students with three leading universities in Taiwan: the National Tsing Hua University (168th in QS Global World Ranking 2021), the National Taipei University of Technology (488th place) and Tunghai University, the oldest private university in Taiwan.

In addition to these ceremonial acts, Rector Matějka discussed new opportunities for cooperation in the field of biomedical research or circular economy with the Industrial Technology Research Institute and established new contacts with Academia Sinica, the Czech Academy of Sciences' counterpart in Taiwan. On the agenda was also a meeting with representatives of the National Chung Hsing University, with which UCT Prague has a memorandum of cooperation and a lasting cooperation in research, and representatives of the National Chiao Tung University, which cooperates with our university in the field of supramolecular chemistry.

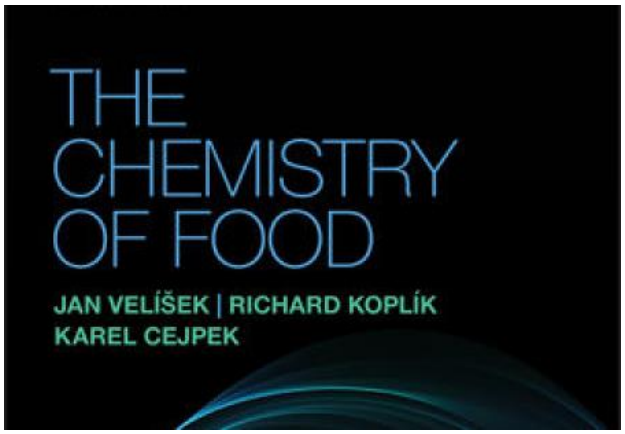
UCT Prague offers economic programmes

UCT Prague received accreditation for bachelor and master study programmes in economic disciplines. Since September 2020, an experienced team of 60 experts that previously built and implemented similar programmes at the CTU Masaryk Institute of Advanced Studies has implemented a bachelor study programme in Economics and Management and a master study programme in Sectoral Management. In this way, our university is among the prestigious Czech and international universities that consider these disciplines an inseparable part of their pedagogical and research activities. *"The advantages of including these programmes are clear – a good career perspective and extensive knowledge, which are the best investment in students' future. Studying at UCT has been and will be hard by definition and that applies also to the newly accredited programmes,"* says Rector Matějka. This is not the first time UCT Prague has accredited economic programmes – one of the faculties even used to have the word "economic" in its name from 1960. Many UCT graduates work in key management positions in large companies.

Updated second edition of The Chemistry of Food

In August 2020, the revised and updated second edition of a detailed food chemistry textbook called *The Chemistry of Food* was published by John Wiley & Sons. The book was authored by UCT's Prof. Ing. Jan Velíšek, DrSc., Prof. Dr. Ing. Richard Koplík and doc. Dr. Ing. Karel Cejpek. On 1,200 pages, the monograph *The Chemistry of Food* provides a comprehensive overview of important compounds that are contained in food, and raw materials for their production. The book focuses on structural properties of components of food and their chemical reactions, organoleptic properties and nutritional and toxicological significance. It also includes an extensive bibliography and index and a number of reaction schemes, figures and tables, as well as over 2,000 chemical structures.

The current edition includes a lot of new findings from hundreds of scientific works in food chemistry and related subjects that have been published since 2012. The new information concerns both common and newly discovered food components, their origin, reactivity, degradation, reaction with other compounds, their ogranoleptic, biological and other properties.



The revised second edition of *The Chemistry of Food* is designed for university students, teachers and workers in food research and industry. The book can be used for a quick orientation in almost any set of questions related to chemical composition or related chemical reactions of food.

University Centre Litvínov – FME CTU – ORLEN Unipetrol

At the end of the year, a memorandum of cooperation between Unipetrol Group, UCT Prague and the Faculty of Mechanical Engineering of CTU in Prague was signed. FME CTU became a new partner of the University Centre Litvínov of UCT Prague – Unipetrol, which was subsequently renamed as University Centre Litvínov – UCT – FME CTU – ORLEN. The Faculty of Mechanical Engineering of CTU in Prague is planning to teach two to three subjects in Litvínov. The University Centre is based in Chempark and is a significant partner to ORLEN Unipetrol Centre of Research and Education (ORLEN UniCRE), which offers students a number of ways to get involved in real-life projects. Thirty-five students study in three bachelor and one follow-up master study programme. Chempark in Záluží near Litvínov is the largest manufacturing plant of ORLEN Unipetrol Group and employs 2,500 people. The extension of the University Centre ORLEN Unipetrol increases the opportunities to study in the Ústí nad Labem Region, and in this way, UCT Prague helps make the region more attractive and competitive.

1.4 Awards for students of UCT Prague

The high quality of students' theses at all levels of studies at UCT Prague is attested by numerous awards given every year to students' bachelor, master and PhD theses and to the presentation of their involvement in research activities in the form of posters at international conferences.

2020 Josef Hlávka Award

Under the auspices of the Foundation of Josef, Marie and Zdenka Hlávka, the 2020 **Josef Hlávka Awards** were presented to the following students at UCT Prague: **Ing. Marek Šoltys** (FCE), **Ing. Miloš Auersvald** (FET), **Ing. Kamila Bechyňská** (FFBT) and **Ing. Andrea Školáková** (FCT) for their master theses. The award is intended for gifted students in bachelor, master and doctoral studies who have proven their exceptional talent and creative thinking in their respective fields. The award comes with a diploma and CZK 25,000 from the Foundation for each awarded person. The awards were presented on the occasion of the anniversary of 17th November. Due to the epidemic situation, the diplomas will be physically presented in a ceremony in 2021.

First place in the 2020 Biosignal Challenge

In May, the results of the **Biosignal Challenge** students' competition organized by the Department of Circuit Theory, FEL CTU, were announced in an online meeting. The competition is supported by MathWorks. The 4th edition was focused on the qualification of Czech children's articulation from audio recordings using MATLAB. The aim was to predict the number of syllables in the recording, where the biggest challenge was to distinguish real syllables from unarticulated sounds. The methods developed for this purpose can also be used in clinical practice in defining the stages of neurodegenerative diseases using qualification of speech impediments. Ten teams composed of 18 students from 3 universities entered the competition. The winning team was comprised of PhD students Ing. Ondřej Klempíř from FBME CTU and **Ing. Davida Příhoda** from UCT Prague (Laboratory of Informatics and Chemistry, FCT). The winners received a financial reward.

2020 Preciosa Foundation scholarships

In December, the scholarship committee of the PRECIOSA Foundation assessed the applications submitted by 28 applicants for the annual one-off scholarships for 2020. Our students received a total of CZK 76,000 from the PRECIOSA Foundation. The scholarships were awarded to eight students in doctoral study programme and six students in the follow-up master study programme at FCT and one student in the follow-up master study programme at FCE. The decrees on granting the scholarships will be presented to the students in a ceremony that will be held once the epidemic situation gets better.

2020 Crytur Awards

The Crytur Awards for the best master thesis in material sciences are intended for students of Czech and Slovak universities. In the 7th edition of the competition, each submitted thesis in Czech or English was assessed by at least three reviewers. **Ing. Filip Antončík** (FCT) came second with his thesis on *Properties of superconducting magnetic bearings based on YBCO single-domain bulks processed with artificial holes*. The thesis revealed that these thin bulks have huge potential and that the presence of artificial holes improves their properties, primarily their toughness and levitation strength. The thesis was supervised by doc. Ing. Ondřej Jankovský, Ph.D. (Department of Inorganic Chemistry, FCT). They both received a financial award. **Ing. František Vaněk** (FCT) under the supervision of doc. Ing. Petr Macháč, CSc. (Department of Solid State Engineering, FCT) received a special mention for his master thesis on *Preparation of graphene by transfer-free method on SiO_2/Si dielectric substrate*.

1.5 Lifelong learning

Educational events for teachers of primary and secondary schools

In 2020, the restrictions caused by the COVID-19 pandemic affected also the organization of regular educational events for teachers at primary and secondary schools focused on natural and engineering sciences. Some regular events held face-to-face were held online, some were repeatedly postponed and others were cancelled due to the bad epidemic situation (Autumn School for Chemistry Teachers). As regards the planned seminars for primary and secondary school teachers called "Chemistry Around Us", one was held face-to-face and two were postponed until 2021.

The **34th year of the Summer School for Secondary School Teachers and Students** titled "Chemistry for Life" was held in August 2020. Unipetrol and the National Library of Technology were partners of the Summer School. The event was attended by 136 secondary school teachers and students. Expert lectures were given also by top scientists at UCT Prague on the current topics of research performed at UCT Prague (e.g., Prof. Ing. Vladimír Setnička, Ph.D.: *New Trends in Diagnosing Tumorous and Neurodegenerative Diseases*, Prof. Ing. Jana Hajšlová, CSc.: *Pesticides: Can Their Residues in Food Be Eliminated?*, Prof. Ing. Pavel Jeníček, CSc.: *Microplastics in Water*, doc. Dr. Ing. Michaela Rumlová: *HIV Was, Is and Will Be, or Current Viral Pandemics*, doc. Ing. Kateřina Rubešová and Ph.D., Prof. Ing. Radek Cibulka, Ph.D.: *Required Knowledge of Applicants in General, Inorganic and Organic Chemistry*). A wide choice of laboratory tasks in the modern laboratories at UCT Prague was prepared for the students of the Summer School. At the end, every participant received a certificate of attendance.

Circular economy course at UCT Prague

For the fourth time this year, the **Course in Circular Economy** was held in the autumn. The course is organized by FEP UCT Prague in cooperation with the Institute of Circular Economy, SUEZ CZ

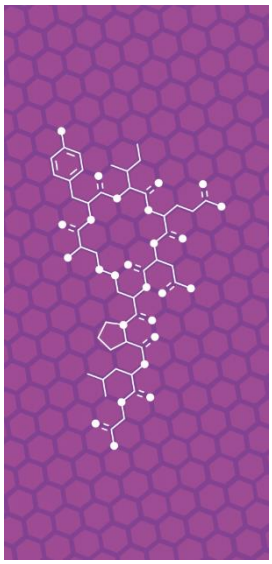
and Veolia Czech Republic and cluster WASTEN. Due to the pandemic of COVID-19, the course was taught online and it went very well. The course will end in May 2021. It will offer students 11 all-day blocks on Fridays and a 2-day trip to south Moravia. Students will receive certificates of attendance. Students will also visit a water treatment plant, a facility for using and recycling of waste and will attend dozens of presentations given by outside experts and renowned academics. In the course, students will learn about all stages of material flows, new business models and will have the opportunity to test the newly acquired knowledge in own projects the outcomes of which they will present at the last meeting. Participants in previous courses valued most the comprehensiveness and broad scope of the course, its practical focus and possibility of networking.

"Circular economy offers a possibility to search for interdisciplinary solutions with the aim to reduce the adverse impact of human activity on the environment. The conflict between

economically advantageous and environmentally friendly approach is often defined not by the laws of nature, but by our unwillingness to look for appropriate solutions. In the 4th edition of the course, we will show participants opportunities for new business models as well as weaknesses of certain oversimplified or activist approaches. Circular economy is not simply an upgraded version of the existing system of waste management, but a reinvented way to rationally use resources that are found on the planet in limited amount. I am happy that the course is attended by such a heterogeneous group that continues to cooperate also after the end of the course," says doc. Ing. Vladimír Kočí, Ph.D., MBA, guarantor of the course and dean of FEP UCT Prague, where the course is held.

2 Development and sustainability of scientific and research activity, efficient collaboration with practice, transfer of technologies

2.1 Science Rendezvous 2020



The third year of the showcase of scientific teams working at UCT Prague called **Science Rendezvous** was held in November, this time **online**. The following researchers involved in the mobility projects ChemFells and ChemJets supported from the Operational Programme Research, Development and Education presented their work at the event: Paula Da Silva Tourinho – *Microplastic Fibers as a Vector of Silver Nanoparticles: Adsorption Mechanisms and Ecotoxicity*, Gabriela Ruphuy Chan – *Yeast-Derived Particles for Drug Delivery*, Aiym Tleuova – *Temperature-Responsive Safer Formulation of Fungicide*, Magdalena Urbaniak – *Plant Secondary Metabolites and Microbial Degradation of Structurally Related Xenobiotics*, Alexandr Zubov – *Discrete Element Modelling of Colloidal Suspensions*, Prasad Talluri – *High-Performance Membranes for Separation of Biofuels*, Martin Janda – *Bacterial Extracellular Vesicles and Their Functions in Plants* and Eva Muchová, RNDr., Ph.D. (Department of Physical Chemistry, FCE) – *Theoretical Modelling of X-Ray Processes: Probe of Aqueous Structure*. Online presentations were followed by a Q&A session and discussion with the researchers who gave their presentations.

2.2 Implementation and preparation of scientific research projects under EU Operational Programmes

Operational Programme Research, Development and Education (OP RDE)

In 2020, the implementation of three projects recommended for financing from the OP RDE call "Development of Research Oriented Study Programmes" continued. In the framework of the ***MOST DSP*** project focused on modernization of the existing doctoral study programmes and creation of new ones at the four faculties, 15 new accredited doctoral study programmes were opened and an activity to support foreign stays of selected students in the first year of the newly accredited DSPs was initiated. The MOST DSP project has total eligible costs of CZK 14.1m and it will continue until the end of 2021. In the ***MEDOK UCT Prague*** project, eight double degree doctoral study programmes were prepared and approved by internal accreditation. The DD DSPs were prepared in cooperation with partner institutions in Europe. The MEDOK UCT Prague project has total eligible costs of nearly CZK 9m. It will continue until November 2021. Employees of all four faculties are involved in the implementation of the two projects. The project ***Conservation Sciences***, which has a budget of CZK 3.5m and is implemented at FCT, was aimed to prepare a doctoral study

programme in cooperation with project partners at CTU and the Academy of Performing Arts (AMU) that would be based on interdisciplinarity and respect the current needs of conservation in the Czech Republic and in Europe. However, in the autumn of 2020, AMU announced it would be leaving the joint project since the accreditation of the joint DSP was rejected by the AMU Internal Evaluation Board. After the respective change procedures are submitted, the project will continue in cooperation with project partner CTU until September 2022. All three projects will report values of the following indicators: students in revised or newly accredited doctoral study programmes enrolled in the second year of studies.

In 2020, UCT Prague solved six projects announced in OP RDE calls and focused on mobility of researchers. At the end of the year, the implementation of the project ***ChemJets*** ended (call "International Mobility of Researchers") with total eligible costs in the amount of CZK 41.9m. The project supported two-year incoming stays for 14 talented junior researchers in respective fields of chemistry with the aim to help them set up an own research group at UCT Prague. The ***CHEMFELLS II*** (call "International Mobility of Researchers – MSCA-IF II") was also concluded before the end of the year. The project, which had total eligible costs in the amount of CZK 3.3m, provided support to incoming mobility of one researcher. The implementation of the projects ***CHEMFELLS4UCTP*** (call "International Mobility of Researchers – MSCA-IF") with total eligible costs in the amount of CZK 17.9m supporting 3 incoming and 1 outgoing mobility and ***CHEMFELLS II*** (call "International Mobility of Researchers – MSCA-IF III") with total eligible costs in the amount of CZK 5.5m supporting 1 incoming and 1 outgoing researcher mobility is ongoing. Project applications for projects ***CHEMFELLS IV*** (call "International Mobility of Researchers – MSCA-IF IV") supporting 9 foreign researchers coming to the Czech Republic and 1 researcher travelling abroad with total eligible costs in the amount of CZK 39m and ***ChemJets2*** ("International Mobility of Researchers, Technical and Administrative Staff of Research Organizations") with total eligible costs in the amount of CZK 21.5m that will support 8 incoming mobilities were submitted in 2020. The projects will be gradually concluded in 2021, 2022 and 2023.

The implementation of the project ***IGRA@UCTP*** in the framework of the OP RDE call "Increasing the Quality of Internal Grant Schemes at Universities" began in May 2020. The project has a budget of CZK 24m. The aim of the project is to implement system measures leading to support of competitions for student scientific projects at UCT Prague that are a key component in research oriented study programmes. Until the end of 2020, the principles and rules for a modernized internal grant competition for research projects of PhD students were prepared. The implementation is planned until mid-2023.

The project ***NANOROBOTS*** was in its fourth year of implementation. The project received CZK 219.5m from the OP RDE call "Excellent Research Teams". The international team equipped with the necessary planned equipment infrastructure led by key foreign researcher doc. RNDr. Martin Pumera, Ph.D., who came from the Nanyang Technological University, Singapore, does excellent research in a new category of

nanotechnologies, namely autonomous robots that can be used primarily in medicine and ecological restoration. In cooperation with strategic foreign partners, the research team does excellent research with a number of published top quality publications. The implementation phase of the project will continue at UCT Prague until October 2022.

2020 was also the third year of implementation of three projects at UCT Prague supported from the OP RDE call "Pre-Application Research". In case of the project ***ORGBAT*** (FCE), the grant was given to UCT Prague together with two project partners, the University of Pardubice and Centrum organické chemie s.r.o. The total eligible costs of the project are CZK 54.5m, of which the UCT's share is CZK 26.9m. UCT Prague is a partner in another two projects. The project ***PaC-NG*** (FCT) has total eligible costs in the amount of CZK 32.3m and the recipient of the grant is the Faculty of Mathematics and Physics CU. The recipient of the grant in case of the project ***CEREBIT*** (FFBT) is the Palacký University Olomouc. The total eligible costs of UCT Prague are CZK 6.4m. All three projects will end in 2022.

For four years now the experts at the Centre for Information Services UCT Prague have been actively involved in the implementation of the individual system project ***CzechELib*** under OP RDE. The main recipient of the grant is the National Library of Technology. The project's aim is to create a national centre that will make centralized purchases and will make available to the whole research and educational sector in the Czech Republic key electronic information sources (EIS) for the needs of science, research and education. The project's implementation will end at the end of 2022.

Operational Programme Enterprise and Innovation for Competitiveness (OP EIC)

Under the auspices of Technopark Kralupy, a total of 11 projects from the OP EIC calls "Application" and "Partnership for Transfer of Knowledge" where UCT Prague acts as a partner were implemented in 2020. The total amount of financial resources for UCT Prague is CZK 40.5m.

2.3 International scientific research grants

In 2020, a total of 30 international grants were solved at UCT Prague, of which 18 projects were carried out under the Horizon 2020 (H2020) programme, 1 project was carried out under the Research Fund for Coal and Steel (RFCS) programme, 1 project was carried out under the Interreg Central EUROPE programme and 2 projects were carried out under the collaboration programme Czech Republic – Free State of Saxony 2014–2020, and 7 projects were projects of other international providers.

H2020 MSCA projects solved at UCT Prague

The EU framework programme for research and innovation, **Horizon 2020**, offers several schemes focused on researcher mobility that come under the umbrella of the **Marie Skłodowska-Curie Actions** (MSCA). Thanks to this grant, researchers can participate in long-term research stays as well as short-term stays at research institutions or in the private sector. In 2020, two

prestigious MSCA grants were solved at the Center for Advanced Functional Nanorobots at UCT Prague, which is led by Prof. Martin Pumera and which was established as part of the NANOROBOTS project from the OP RDE call "Support to Excellent Research Teams".

Dr. Lorena Manzanares Palenzuela was the lead researcher of the **UGMNanoSens** (H2020, MSCA – Individual Fellowship) grant. The two-year project supported with € 142,700 was completed in 2020. Dr. Manzanares Palenzuela earned a PhD degree in molecular biology at the Complutense University in Madrid. The grant focused on a new approach to performing checks to detect the presence of genetically modified plants in food and fodder. Nanomaterials show optical and electronic properties that can significantly affect the way DNA is detected and can serve as an efficient system for DNA testing in order to discover genetically modified organisms in food and for DNA testing in general.

Since mid-2020, Dr. Huaijuan Zhou has been working on the grant **Microbots4Enviro**. She received her PhD in materials physics and chemistry at the University of Chinese Academy of Sciences. Before joining the Center for the Advanced Functional Nanorobots, she worked for the Chinese Academy of Sciences in Shanghai. Her project is focused on the solution of global problems linked to environmental pollution using autonomous micromotors based on photocatalytic degradation. Advanced universal light-driven BiVO4 micromotors can efficiently degrade organic pollutants (dyes and explosives) and kill bacteria in large scale when irradiated by visible light. The project is planned until the end of 2022 and has available financial resources in the amount of € 157,000.

ECC SMART project

Since September 2020, **doc. Ing. Jan Macák, CSc.** (Department of Power Engineering, FET) has been solving the "Joint European Canadian Chinese Development of Small Modular Reactor Technology" (ECC SMART) project. The project is solved by a consortium of 20 partners in 15 countries. In addition to EU countries, the partners come also from Ukraine, Canada and China. The project deals with 4th generation small modular reactors that are cooled by supercritical water, which will contribute to making the technology less complex and cheaper. Supercritical water is water with parameters above its critical point (i.e. 374 C a 22.05 MPa). A 4th generation reactor shall be cheaper, more economical and safer than the existing types of reactors. Researchers at UCT Prague are involved in the project in a group of

teams that will focus on materials. *"Our contribution to the project relies on our strengths; we are able to carry out a supercritical experiment with in situ measurements, and we have an excellent analytical section,"* says doc. Masák. The ECC SMART project should contribute to nuclear energy being a safe, environmentally friendly and economical part of the energy mix in the near future, and a tool for achieving future energy systems.

Wastewater as an energy source for cities

In August 2020, the European project "Increased renewable energy and energy efficiency by integrating, combining and empowering urban wastewater and organic waste management systems" (REEF 2W) under the Interteg Central Europe programme, in which UCT Prague and Veolia CZ participated on behalf of the Czech Republic, was concluded. The project indicated ways to find new opportunities and reserves in power generation from renewable sources at wastewater treatment plants, to integrate power generation from wastewater and other communal waste and to be able to optimize the use of the power generated in cities. The shared knowledge from pilot projects in the Czech Republic, Germany, Austria, Italy and Croatia and sharing the experience with overcoming legislative and economic barriers will help with faster and more efficient application of the tested solutions.

In the Czech Republic, the possibility of using diversified biogas for power and heat generation using cogeneration units together with production of biomethane to be used in transportation was tested. *"It has been confirmed that the ability to flexibly change the share of produced electrical power, heat and biomethane from biogas based on the current needs for these commodities is realistic and has numerous benefits,"* says **Prof. Ing. Pavel Jeníček, CSc.** (Department of Water Technology and Environmental Engineering, FET).

The project's major contribution is that it provides a simple software tool for assessing the potential for power generation from renewable sources in specific local conditions and another tool for integrated sustainability assessment from the point of view of economy, technology, social aspects and the environment. State authorities in the participating countries, including the Ministry of the Environment of the Czech Republic, showed interest in the results of the project.

2.4 Motivation support for young researchers

Start-up grant of the Experientia Foundation at UCT Prague

The second-ever **start-up grant from the Experientia Foundation** founded by Hana and Dalimil Dvořák was given to young researcher **Ing. Petr Kovaříček, Ph.D.**, in mid-2020. In January 2021, the Department of Organic Chemistry (FCT), UCT Prague, will set up an own research group. The research will study a new approach to catalysis. *"The project will focus on an overlap between organic chemistry – self-organization of molecules, a topic I explored in my PhD studies, and materials chemistry – surfaces, which I study now."* Kovaříček received a 2-year grant in the annual amount of CZK 2 million from the Experientia Foundation, and he will get additional CZK 0.7m a year from UCT Prague. Kovaříček studied organic chemistry at UCT Prague and earned a

PhD in the laboratory of Nobel Prize winner J. M. Lehn at the University of Strasbourg in France. He worked as a postdoc at Humbolt University in Berlin in Prof. S. Hecht's group. At the time when he received the grant he worked at the J. Heyrovský Institute of Physical Chemistry of the Czech Academy of Sciences.

For eight years now, Ing. Hana Dvořáková, CSc., and Prof. Ing. Dalimil Dvořák, CSc., founders of the Experientia Foundation, have been donating own financial resources from license fees for antiviral substances developed at IOCB Prague to science. So far, the Experientia Foundation has given out CZK 26 million in grants to young scientists.

Ing. Petr Kovaříček, Ph.D., has at the same time received financial support from a 2020 initiation grant at UCT Prague (Dagmar Procházková Fund) for his project focused on *Reaction networks and self-assembly for organic electronics*.

Winners of junior grants

In the **Junior Grant competition** of the Rector of UCT (JIGA) financed from the resources of the contribution to the Institutional Plan of UCT Prague, a total of 11 projects up to CZK 220,000 per project were supported in 2020. The allocated financial resources are used to support research and kick off a career in science for junior researchers. The support was given to 4 projects at FCT (**Ing. Jiří Tůma, Ph.D.**, „Preparation of photoreversible optically pure chiral selectors on the basis of spiropyran for nano_LC applications", **Ing. Jakub Cajzl, Ph.D.**, "Study of electro-optical properties of heterostructures of the perovskite diamond type doped with rare earth metal ions", **Ing. Martin Prokop, Ph.D.**, "Interaction of a Pt catalyst with H3PO4 in operation of a fuel cell with proton-exchange membrane", **Mgr. Olga Guselnikova, Ph.D.**, "New generation of functional materials for rational sensing and utilization of CO2, using the power of plasmon"), 2 projects at FET (**Ing. Marek Martinec, Ph.D.**, "Using a mobile NIF and FTIR spectrometer for mobile analysis of composition of plastics in the waste", **Ing. Pavla Renkerová, Ph.D.**, "Feedstock use of energy byproducts"), 4 project applications at FFBT (**Ing. Petr Svoboda, Ph.D.**, "Impact of mitochondria-targeted tamoxifen on adipogenesis *in vitro*", **Ing. Jáchym Šuman, Ph.D.**, "Metagenomic analysis of soil bacterial communities involved in lignin degradation", **Ing. Zbyněk Džuman, Ph.D.**, "Biomonitoring of trichothecene mycotoxins" and **Ing. Michal Jurášek, Ph.D.**, "Derivatives of natural substances for biological and bioanalytic applications") and 1 project of a researcher at FCE (**Ing. Michal Klajmon, Ph.D.**, "Prediction of thermodynamic properties of ionic liquids: a comparison of the PC-SAFT and COSMO-RS models").

2.5 Collaboration with industry

UCT Prague has a long-standing and intense collaboration with industry in the Czech Republic and abroad. For more information and examples of collaboration between UCT Prague and the application sector, see Part C, Chapter 11a.

A TA ČR project searches for technology for detection and removal of viruses and bacteria from wastewater and sludge

In June 2020, teams at FET, UCT Prague, and Pražské vodovody a kanalizace, a.s., started the implementation of a three-year project **ARG Tech** (Technologies for removal of antibiotic resistance genes from sewage sludge applied in agriculture) funded from the Environment for Life programme by TA ČR. The project will test the effectiveness of available technologies for the sanitation of sewage sludge in terms of their ability to remove antibiotic resistance and contamination with the SARS-CoV-2 virus. For all technologies, process conditions will be sought to ensure the removal of these pollutants. Sludges from thermophilic and mesophilic anaerobic stabilization, sludges after aerobic stabilization, sludges from fat separators and wastes exported to waste water treatment plants will be selected as test sludges. In addition, the presence of ARG and the SARS-CoV-2 virus in the Prague sewage system in places selected considering the type of settlement and potential sources of infection will be monitored. The aim of the project is to propose parameters of sludge sanitation processes that ensure a safe removal of ARB and ARG so that the sludge can be used as fertilizer. The project was extended by long-term monitoring of the presence of the SARS-CoV-2 virus, the cause of COVID-19, in sewage water. Twenty testing sites were selected, which represent various types of settlements. The presence of the virus will be monitored for two years with a 2-week interval at most sites. Members of the research team include researchers at the Department of Water Technology and Environmental Engineering, FET, **Prof. Ing. Pavel Jeníček CSc.**, **doc. RNDr. Jana Říhová Ambrožová, PhD.**, **doc. Ing. Jan Bartáček, Ph.D.**, **Ing. Dana Vejmelková, Ph.D.** and **Prof. Ing. Jana Zábranská, CSc.**

Pharmaceutical Applied Research Center (The Parc)

In September, a government delegation visiting Zentiva and led by the PM of the Czech Republic, Andrej Babiš, met with the representatives of the Pharmaceutical Applied Research Center (The Parc) and representatives of academic institutions participating in the project.

"Our delegation got to know the initiative of the scientific virtual centre Parc. We discussed it with the academic community and we came to the agreement that our government and the Research, Development and Innovation Council (R&D&I Council) support its establishment. It is important for students as well as for R&D in medicine," Czech PM Andrej Babiš posted on Twitter. In this way, the Czech PM announced the start of the partnership of the two parties that agreed to continue in the discussion in near future.

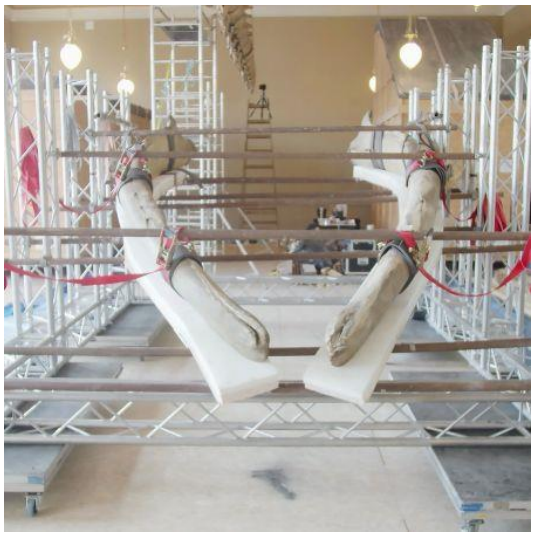
The Parc was established thanks to an initiative by Zentiva in collaboration with three academic partners: UCT Prague, the CUNI Faculty of Science and IOCB. This highly successful initiative has brought together young talent with leading experts in industry and academia, who jointly work on accelerating innovation in drug research and development. It provides top academic education combined with practical experience in industry and business under the leadership of

scientists, engineers and managers from the academic community and the pharmaceutical industry.

"The Parc is a research platform that connects the whole process of development of drugs from searching for solid forms of active ingredients, to preformulation experiments, pharmaceutical technology, to clinical testing and production. We offer talented students excellent academic education at the level of PhD, together with practical experience in industry and business. At the moment, 33 doctoral students participate in the programme. Since the programme was established, a total of 13 students have completed it, of which 6 started working for Zentiva, 2 continue in the academia, expanding the number of researchers working at the Parc, and 5 work in leading pharmaceutical companies in the Czech Republic and abroad," says Prof. Ing. František Štěpánek, Ph.D., scientific director of the Parc (Department of Chemical Engineering, FCE).

The Parc collaborates with top universities in Europe. Thanks to this, it offers its students a number of international research stays and transboundary academic collaboration. The members of the project are also involved in two pan-European projects under the EU programme Horizon 2020. The Parc has introduced plans to build a research centre at the Zentiva industrial park. New laboratories would make it possible to further enhance the quality of scientific work and testing of academic concepts in pilot scale, which would accelerate their application in industry. The research centre also plans to support start-up pharmaceutical companies.

UCT is involved in restoration of fin whale



The National Museum continues to operate even when it is closed to the public. Since the spring, a complete restoration of the biggest item in the collections of the National Museum, the skeleton of the female fin whale, has been under way. It will be displayed as part of the new permanent nature exhibition of the National Museum in Prague. The National Museum has collaborated on this demanding project with the CTU Klokner Institute and FCT, UCT Prague. The scientists at the Department of Chemical Technology of Monument Conservation (FCT) had consultation roles concerning the technology of conservation. For example, **Ing. Klára Drábková, Ph.D.**, was involved in the project. The conservation took place in the hall where the skeleton has been placed for over one hundred years, and it had to be done since the skeleton was in a bad shape. The jaws were in the worst condition and called for the most extensive restoration work.

UCT Prague successfully implemented a key regeneration line for VUAB Pharma

As part of the solution of a project concerned with the recovery of anhydrous methanol, supported by the Ministry of Industry and Trade of the Czech Republic under OP EIC, the research group of **Ing. Jiří Trejbal, Ph.D.**, (Department of Organic Technology, FCT) designed a new line for regeneration of anhydrous methanol for VUAB Pharma a.s., a well-established Czech producer in the field of pharmacy. VUAB Pharma is an important producer and exporter of nystatin, which is used to treat yeast infections. In its production, methanol is used as a solvent. During the production, an aqueous methanol solution is formed that is contaminated with other substances. The recovery of methanol from the waste solution to the original form is a key part of the technology, without which nystatin cannot be efficiently produced. The new equipment was successfully tested in trial operation in 2019, and is now fully operational. The newly designed equipment has replaced a 50-year old column and it has a higher capacity and significantly lower consumption of heat and can be cleaned more easily. The Department of Organic Technology has a long-standing collaboration with VUAB Pharma, based in Roztoky near Prague.

Neural network to protect waterways from contamination

Since May 2020, the project *Machine Learning Approach Using Cloud Computing and Water Quality Prediction to Reduce Emissions to Water Ecosystems* has been solved. The project is funded by the Technology Agency of the Czech Republic. The project brought together UCT Prague's **doc. Ing. Jan Bartáček, Ph.D.**, and **Ing. Petr Dolejš, Ph.D.**, (Department of Water Technology and Environmental Engineering, FET) with researchers at CTU, VDT Technology a.s., and Pražské vodovody a kanalizace, the only operator of water infrastructure in the Czech Republic that uses a real-time monitoring station equipped with modern analytical instrumentation.

Extreme weather phenomena such as torrential rains and extreme drought are closely linked to the changes in the quality of sewage water released from wastewater treatment plants in the Czech Republic to the surrounding environment. This problem will be solved with the help of a new smart IT system that will provide a timely prediction of the level of contamination and its changes in urban sewage networks and help select such technological solutions in real time that will eliminate the risks of contamination of the water ecosystem.

"*Using predefined operation scenarios, our new software tool, Water Scan Toolbox, will advise the engineer at the wastewater treatment plant on how to enhance the effectiveness of the wastewater treatment process using unique knowledge of predicted data concerning the quality and quantity of wastewater. In addition, the developed neural network will be able to assess the water entering the treatment plant as well as the quality and amount of diluted water, i.e. the water that enters the environment during rains without being pretreated,"* explains Ing. Dolejš. The proposed solution is original in how it uses the latest knowledge in information technology, such as deep data analysis, creation of neural networks and machine learning, in the relatively conservative field of administration of water infrastructure in towns and villages.

UCT designed equipment for removal of pathogens from air

The fact that the risk of COVID-19 transmission is higher in enclosed areas with limited ventilation inspired **doc. Ing. Tomáš Hlinčík, Ph.D.**, (Department of Gaseous and Solid Fuels and Air Protection, FET), **doc. Ing. Pavel Ulbrich, Ph.D.**, (Department of Biochemistry and Microbiology, FFBT) and **Prof. Ing. Milan Pospíšil, CSc.**, (Department of Petroleum Technology and Alternative Fuels, FET) to design equipment that would safely remove pathogens from air using air-conditioning and ventilation equipment, which is often the case in offices, trains and planes. The equipment works on the basis of high temperature liquidation of pathogens, such as viruses or bacteria, using a metal grid from resistance wires. The authors registered the invention with the Industrial Property Office in May. The construction of the equipment allows for a smooth user connection to the air-conditioning and ventilation equipment. The parallel connection of more units ensures a modular increase in the capacity for the purification of large volume of air. *"The equipment has not been experimentally tested yet; however, based on the available theoretical knowledge, the equipment should be fully operational and when placed in ventilation or air-conditioning, e.g. in planes, it should kill these pathogens without the need for changing the fillings, which is the case when using filters,"* says doc. Hlinčík. After the patent is approved by the Industrial Property Office, the equipment will be offered for licensing. The production of the equipment will be easy, since the equipment is made from widely available materials.

CzechInvest and UCT Prague signed a memorandum of cooperation

In the first half of August 2020, CzechInvest and UCT Prague signed a memorandum of cooperation. The two institutions pledged joined support to science and research and exchange of information in, for example, alternative energies, nanotechnologies, food safety, hydrogen technologies and industrial pharmacy.

CzechInvest will use the shared experience, for example, in a prepared project to support technology start-ups. Another joined aim is the support to researchers and scientists in establishing own technology companies, so-called spin-offs. *"This vision is in line with the 2019–2030 Innovation Strategy of the Czech Republic, the aim of which is, among other things, to provide support to innovative companies in the Czech Republic. A good scientist or researcher does not automatically have business skills. Therefore, it is important to give a helping hand to these people when they enter the market,"* says Patrik Reichl, director of CzechInvest.

"The cooperation with CzechInvest will boost the position of UCT Prague in its cooperation with industrial partners, primarily in establishment of start-ups and spin-offs. At UCT, we want to support entrepreneurship among academic workers as well as PhD students or even younger students. We think that the possibility to try implement an own idea will help their careers as well as the technological development in the Czech Republic. I personally believe that the collaboration with CzechInvest will motivate more people are fans of new technologies to work and study at our university," says Prof. Matějka, Rector of UCT Prague.

2.6 Awards and achievements in scientific research activity

An EXPRO grant for Professor Slavíček's team

An international panel of evaluators selected 16 out of the 123 applications for innovative projects submitted in a call for projects in the category of EXPRO excellent research projects of the Grant Agency of the Czech Republic. Among the supported projects is also a joint project of the teams of Prof. RNDr. Bc. Petr Slavíček, Ph.D., (Department of Physical Chemistry, FCE) and Dr. Juraj Fedor from the J. Heyrovský Institute of Physical Chemistry of the Czech Academy of Sciences under the name *Research and transformation of matter by electrons in liquid microjets*. The EXPRO grants aim to create conditions for the development of excellent research, set up standards for excellent science and help overcome barriers for project applications to succeed in the prestigious European grant competition ERC. The award of the EXPRO grant ensures financial support for the period of 5 years, allowing researchers to take new paths without being under pressure for immediate results. *"We have started something completely new. Thanks to securing support for a relatively long period of time, we can build a team of people with different specializations and fully focus on research,"* says Prof. Slavíček. Together with his group and the J. Heyrovský Institute

of Physical Chemistry, also the Department of Organic Chemistry (FCT) will participate in research; some experiments will also be carried out at ELI Beamlines, a research centre specializing in laser technology.

In the project, liquid microjets will be used as a unique medium for spectroscopic technology that needs vacuum. The structure of liquids will be studied using inelastic scattering (electron energy loss spectroscopy). Liquid microjets will also serve as a unique reactor – here, the project will focus on the reactivity of forbidden states and the reactivity caused by electrons in general.

"The project will be executed in close cooperation between experiment and theory and will introduce new approaches in both. Newly developed techniques will allow the study of spectroscopy and reactivity of interphases, which play an important role in the chemistry of the atmosphere and in radiation chemistry," says Prof. Slavíček, adding that under the project also a concept of electron analogy to photochemistry and photocatalysis as a new approach to the transformation of molecules will be developed. Professor Slavíček admits that the project is ambitious. *"In other words, it may not lead to the expected results in all aspects. But at least we will be able to say that we have truly tried."*

Werner von Siemens Award

Top twenty young researchers, students and teachers received an award at the 22nd edition of the prestigious Werner von Siemens Award. Among the laureates were two representatives of UCT Prague. **Prof. Ing. František Štěpánek, Ph.D., (Department of Chemical Engineering, FCE) received the award for best pedagogical worker.** Prof. Štěpánek promotes a long-standing collaboration between his branch of science and related branches and works with students of other universities, for example those specialized in pharmacy. He connects the academic world and the world of renowned companies and corporations and a number of his students work in research departments in multinational companies specialized in biomedicine, pharmacy and agricultural chemistry. Prof. Štěpánek helps students develop and strengthen the so-called engineering thinking, which is necessary for the solution of scientific and technical tasks. Students very much appreciate his extraordinarily extensive and profound knowledge as well as his empathy, human approach and managerial skills. He was also acknowledged as the supervisor of the runner-up in the category of Best Diploma Thesis, **Ing. Martin Balouch** (DSP).

Medal of the Minister of Industry and Trade

At the 72nd Congress of Chemical Societies, the **Medal of the Minister of Industry and Trade** was given by the vice-minister of industry and trade to **Prof. Ing. Josef Pašek, DrSc.** (Department of Organic Chemistry, FCT).

"Professor Pašek from the University of Chemistry and Technology in Prague celebrated his 90th birthday in June 2020. He is still active and is currently involved in the intensification of production of cyclohexylamine and dicyclohexylamine. In his 60 years of career, he has implemented about 50 processes in Czech and international chemical industry with the estimated annual production worth CZK 25 billion. Prof. Pašek combines theoretical knowledge, computer simulation of processes with many years of experience in chemical technology. For this, we owe him many thanks, which is why we present him with the Medal of the Minister of Industry and Trade," Karel Havlíček, Minister of Industry and Trade, announced in a press release. Professor Pašek was also acknowledged for his long-term collaboration with the Unipetrol Group and his life-long contribution to science, technology, education and pedagogy.

Success at ERC CZ competition

Prof. Ing. Zdeněk Sofer, Ph.D., (Department of Inorganic Chemistry, FCT) succeeded with his project *New Generation of Monoelementary 2D Materials* in the ERC CZ programme announced by the Ministry of Education, Youth and Sports of the Czech Republic. The amount of support is CZK 25 million. The project primarily focuses on the possibility to prepare materials that are made of just one element using chemical vapour deposition (CVD), which can be performed on an industrial scale. The project also focuses on the study of chemical properties and possibilities of chemical functionalization of the surface of these materials. The project will also look into the potential applications of these new and unexplored materials. *"The received funds will allow us to significantly expand our research group and invite new postdoc and PhD students. We will be able to do a detailed research of CVD of these new materials and study their application potential. The acquired knowledge and the study of materials to store energy and optoelectronics in the future will be used in other directions of research,"* says Prof. Sofer.

The aim of the ERC CZ project is to support excellent research in the Czech Republic by implementing projects submitted to a call announced by the European Research Council that were put in category A or B in the second round of international peer review done by specialized panels of the European Research Council, but did not receive support from the European funds.

Election of the managing body of the European Membrane Society & Award of the Ministry of Education, Youth and Sports

At the end 2020, **doc. Ing. Karel Friess, Ph.D.**, (Department of Physical Chemistry, FCE) was elected to the managing body of the European Membrane Society (EMS) for 4 years. Since 1989, the platform has united leading scientists and experts from practice in the field of membrane processes (research, preparation and production of membranes and their technological use in, for example, water treatment or separation of gases and vapours) in Europe and elsewhere. EMS organizes the international conference Euromembrane, which is held every 3 years, and events for students and junior researchers. In his research, doc. Friess focuses on the development and testing of unique new membrane polymer materials for targeted separation of gases, vapours and liquids (e.g., separation of methane from biogas, separation of oxygen and nitrogen from air, etc.).

In December, doc. Ing. Karel Friess, Ph.D., (Department of Physical Chemistry, FCE) received the Award of the Ministry of Education, Youth and Sports from the Minister of Education, Youth and Sports, Robert Plaga, for exceptional results in research, experimental development and innovation in natural sciences.

Microrobots from gel and gold controlled by light

The research group of **RNDr. Ivan Řehoř, Ph.D.**, (Department of Chemical Engineering, FCE) can make microrobots the size of a human cell that are remotely powered and navigated by light. The robots can perform mechanically absolutely precise tasks at a microlevel infinitely (provided a source of light is preserved), without the need of any invasive intervention from outside. The new invention was recently published in the prestigious Soft Robotics journal. The research was done in collaboration with the CAS Institute of Organic Chemistry and Biochemistry and the Utrecht University.

"The ability of robotic manipulation in the past has completely changed a number of areas of human activity, such as the automotive industry and industry in general. We are taking the first steps to being able to perform the same tasks at a microlevel, i.e. at the level of a few tens of microns," says Dr. Řehoř. This can radically change the production of materials, biomedicine applications and other areas, where it will be possible to easily, cheaply and safely handle individual cells and, for example, put them in larger functional units.

Microrobots are made of hydrogel microparticles that are sensitive to light. They are produced by stop-flow lithography and they also include particles of gold. *"When you make a small robot, it cannot carry its energy source. This is why our robots are powered remotely by a beam of light.*

Gold particles efficiently capture this light and turn it to heat energy, which makes the robot move by repeated contractions of its body," explains Dr. Řehoř.

Compared to the standard approaches to micromanipulation, microrobots are great because they are cheap. *"The price of production of one microrobot is negligible,"* says Dr. Řehoř, adding that his project is competitive with other approaches to manipulation on a microlevel that typically use the magnetic field instead of light. *"Our equipment that controls the robots is much simpler than in the case of magnetic robots and can be built for 500 Euros. We are also working on the development of microrobots that could one day be fully powered by sunlight and could crawl anywhere. But this is the future."*

2.7 Conferences, lectures, meetings

72nd Congress of Chemical Societies

On the occasion the **72nd Congress of Chemical Societies**, which was held in September 2020 when it returned to Prague after four years, 9 announcements were presented in the Economy and Management in Chemical Industry section; the section was overseen by the Department of Economics and Management, UCT Prague. The presented topics covered the development and performance in chemical industry, economic modelling and several other subtopics, such as human resource management.

National Cheese Competition

In January, the **18th edition of the National Cheese Competition** was held. The event is organized by the **Department of Dairy, Fat and Cosmetics (FFBT)**, UCT Prague, and co-organized by the Czech-Moravian Dairy Association and the working group for food and agricultural chemistry of the Czech Chemical Society. The competition and the follow-up **15th edition of the Cheese and Milk conference** were held under the auspices of Prof. Dr. RNDr. Pavel Matějka, Rector of UCT. A total of 46 types of cheese by 16 Czech producers and 11 cheeses by 4 producers from Slovakia were assessed at the National Competition. Cheeses assessed as outstanding and excellent received diplomas. Sixteen lectures and 18 posters were presented at the Cheese and Milk conference. Joint proceedings were published from the National Cheese Competition and the Cheese and Milk conference, which include the results and the full text of lectures and posters.

Food Technology, Food Quality: New Trends in Food Preservation

The 1st year of the conference "Food Technology, Food Quality: New Trends in Food Preservation", organized by the Department of Food Preservation (FFBT), UCT Prague, continued in the tradition of the Food Preservation Days in the organization and expert oversight of which the department regularly participated. The conference focused on the preservation of food and the quality of food in a broader context. In the food industry, the development of new technologies and products is a matter of competitiveness, and the role of research teams in this field is indispensable. The conference was aimed at researchers as well as workers in the food industry, expert employees in the state administration and anyone interested in the field. Presentations at the conference were given by experts from UCT Prague, the Ministry of Agriculture of the Czech Republic, the Federation of the Food and Drink Industries of the Czech Republic, the Veterinary Research Institute, the Masaryk Institute and Archives of the CAS, and CTU in Prague, among others. The aim of the joint conference was to provide an opportunity for expanding the awareness of the current topics in the food industry and for boosting cooperation between the research and application sectors.

3 Enhancing employability of graduates and deepening collaboration with practice partners

iCareer Chemistry Fair

The iCareer Chemistry Fair, which is traditionally held in March, was done online due to the epidemic situation. On 5 May, a list of companies, vacancies, self-development lectures and career couching possibilities was published on the website of the Counselling and Career Centre, UCT Prague, which organizes the event in cooperation with IAESTE UCT Prague. For the whole month of May, posts with tips on what to do/not to do when searching for job opportunities, how to sell yourself in an interview and how to write cover letters were regularly published on the website. The event was attended by around 1,000 people. The Contact event, which is usually organized in parallel by FCT in cooperation with IAESTE UCT Prague, was turned into an online fair "BEZKONTAKT 2020" (Contactless), which replaced the traditional meetings between representatives of companies and students by informing about job opportunities at companies for students and graduates on the faculty's website.

Student Scientific Conference

Due to the adverse epidemic situation and the ensuing measures to prevent the spread of COVID-19, the **2020 Student Scientific Conference** organized by faculties at the end of November was held online for the first time, which was a new experience for everyone, but the experience teachers had with online education ensured that the conference went smoothly. Contributions were put in 70 sections based on the topic. Each one of the 526 competing students presented their work before an expert committee in the form of a short lecture or poster. The high scientific level of the contributions and the even performance of the presenters meant the decisions taken by section committees were not easy. The best works in all sections received material or pecuniary prizes from our industry partners, who attended the students' presentations. The partners of the 2020 edition of the conference included leading companies Zentiva, Unipetrol, Lonza, Merck, Plzeňský Prazdroj, Madeta, Nicolet CZ, NET4GAS, ŠKOENERGO, Bonett, Lanxess, HPST, Veolia, Donaulab, Preciosa, ČEZ, Roche, LECO, P-Lab, Mondi, Optik Instruments, MELVIA TRADE, Shimadzu, Helago, AAK Czech Republic.

4 Development and reconstruction of university infrastructure

4.1 Projects to develop infrastructure in the framework of OP

In 2020, three infrastructure projects under OP RDE were implemented, one OP RDE project entered the sustainability phase and the sustainability period ended in the fifth year of KvaLab project under OP RDI.

In the middle of May, the five-year sustainability period began for the ***POSTUP*** project under the OP RDE call "Support of the Development of Study Environment at Universities". The physical implementation ended in August 2019; however, the implementation phase was completed with the final financial settlement in May 2020. The aim of the project, which was worth CZK 50.8m, was the modernization and acquisition of equipment infrastructure and material requirements, software and purchase of electronic information sources in English for bachelor and master classes at UCT Prague. The sustainability of the project concerns the infrastructure acquired in the project.

The projects "Infrastructure for Priority UCT Prague" from the OP RDE ERDF call for universities and "INMODOS" from the OP RDE call "Research Infrastructures for Educational Purposes – Building or Modernization" were in their fourth year of implementation. All faculties and the central Rector's Offices providing IT and other information services – the Computer Centre and the Centre of Information Services – are part of the implementation of the two projects. The aim of the project ***Infrastructure for Priority UCT Prague*** is to ensure and improve the material and technical resources for the so-called soft activities implemented in the "Priority UCT Prague" project, i.e. an activity that is

aimed at bachelor and master studies and the improvement of systems for strategic management and quality assessment at UCT Prague. The project has an allocated budget of CZK 141.2m. In 2020, the remaining equipment infrastructure was purchased. In the ***INMODOS*** project focused on the improvement of infrastructure for modernized and new doctoral study programmes prepared under the "MOST DSP" project, the remaining equipment was purchased in 2020. The overall eligible costs of the project are CZK 199m. The implementation of the two projects will end by the end of 2021.

As part of the ***Infrastructure for CHEMPRAX*** project from the ERDF call for universities II in the framework of OP RDE, a bigger part of the equipment infrastructure was purchased in 2020. The total eligible costs of the project, which is planned until September 2022, are CZK 45.1m. The aim of the project is to enhance the quality and efficiency of education focused on the practical needs of UCT Prague by providing modern laboratory equipment for newly created education centres in the "CHEMPRAX" project so that it better reflects the needs of the contemporary manufacturing sector. The centres will be used by students in bachelor and master study programmes across all faculties of UCT Prague.

4.2 Development Plan of UCT Prague

The **Development Plan of UCT Prague** complements and specifies the long-term strategic plan of the university in the field of construction and investment development of UCT Prague in the next 10 to 20 years. In line with the Plan, the construction of the two connecting footbridges between buildings A and B was completed, and the renovation of the sections of building B facing Zikova Street began.

Footbridges connect UCT Prague buildings

In June 2020, two footbridges made of glass and steel that connect the UCT Prague buildings were inaugurated. The event was attended by many guests of honour. The structures were designed by ov-a architecture firm, the winner of the architecture competition, and the construction was undertaken by Metrostav. The structure is glazed and the colour is white, which is unusual. The spatial grid of steel pipes connects a rectangle with a hexagon, which references the world of organic chemistry – the benzene nucleus.

The primary reason for connecting the two university buildings was to provide better comfort to students and employees and ensure better safety. Thanks to the footbridges, both buildings now have a barrier-free access. No major problems occurred during the complicated construction although complex preparatory work preceded the construction associated mainly with the protection and relocation of engineering structures, foundation of the construction and demolition work that was not suppose to interfere with the work of specialized workplaces and laboratories at UCT.

Běstvina comes to life again

The student education centre in Běstvina, which was acquired by UCT Prague in 2018, is gradually being renovated. In March, the greatest problem affecting Běstvina was resolved. The derelict showers and toilets were replaced with bathrooms that are on par with the 21st century standards. Subsequently, the second phase of revitalization began, in which a new wastewater treatment plant was constructed and a sewer system was built in the camp. Step by step, the camp is equipped with new mattresses, blankets and bedding, equipment is provided for the kitchen and dining room, public lighting has been repaired and the huts and courts have been partly renovated. In the summer of 2020, several traditional events took place in Běstvina – Běstvina (Summer Camp for Young Chemists and Biologists) and Běstvinka (Summer Camp for the Youngest Chemists and Biologists), orientation courses for students of UCT Prague and a number of stays of employees of UCT Prague and other individuals. After the completion of the planned phases of revitalization, the summer operation of the camp base should be changed to a year-long operation. The plan is to have about 60 beds in a building that can be used all year round. The camp will be used for educational, sport and social events of UCT Prague and of other entities.

Renovation of the halls of residence

In 2020, the last phase of renovation of the Sázava Hall with 26 accommodation units (104 beds) was completed. The renovation was financed from a Ministry of Education, Youth and Sports

grant with 40% share from own resources. In addition, shared kitchens at the Volha Hall were renovated.

4.3 IT infrastructure

Communications

In line with the investment plan, UCT Prague acquired a **new telephone system** in 2019, which combines the advantages of a data and voice network. New software and hardware was delivered and transferred to UCT Prague, including the required licences and a communication platform. In 2020, the technology was extended also to the halls of residence in Jižní Město and to Technopark Kralupy. Together with the installation of the new exchange, the network infrastructure was modernized.

A completely **new solution for protection of e-mail communication** with advanced SW and HW was acquired to further increase protection against common and more complex attacks in the form of unsolicited messages (SPAM), dangerous attachments with malware with the Advanced Threat Protection technology that allows a deeper analysis of incoming e-mail messages in order to detect scam e-mails and other threats.

Modernization and extension of network infrastructure

In 2020, the **wireless network infrastructure in large auditoriums** – AI, AII, BI and BII (Dejvice Campus) **was modernized and extended**. The existing wireless infrastructure was insufficient in terms of the number of users and could not prevent overloading of access points, which led to a significantly worse data transfer. Further, the port capacity in Dejvice was enhanced due to the installed capacity being exceeded and based on requirements of departments. The equipment was acquired with support for the next 5 years.

From the autumn until the end of the year, **full coverage with WiFi signal of the halls of residence in Prague 4 was acquired and installed** (wireless control units, access points, a category 6A cable system) and the connection at the halls was modernized. The equipment was acquired with support for the next 5 years.

Cybersecurity

The fact that the National Cyber and Information Security Agency (NÚKIB) perceives public higher education institutions as “public authority bodies” means that UCT Prague must comply with obligations stipulated in Act No. 181/2014 Coll., on Cyber Security and change of related acts through Act No. 104/2017 Coll., effective from 1 July 2017, and Act No. 205/2017 Coll., effective from 1 August 2017 (including further amendments to this Act as on this day – amendment by Act No. 183/2017 Coll., Act No. 35/2018 Coll., Act No. 111/2019 Coll. and currently the latest amendment by Act No. 12/2020 Coll.). In this regard, an **analysis of the implemented organizational and technical measures in IT** was done at UCT Prague in 2020 in collaboration with an external contractor to check compliance with obligations imposed by the

abovementioned Act. In this analysis, so far three major information systems were selected and reported to NÚKIB at the beginning of 2021.

Renovation of the backup system

In 2020, long-term storage of bigger amount of measurement data was solved centrally by acquiring a **scalable backup disk repository** that can be expanded in the future in terms of performance and capacity. The overall disk space of the repository is 240 TB.

As part of the regular replacement of HW, four servers in the UCT Prague data centre in the Dejvice Campus were replaced whose support by the manufacturer had ended.

Due to the pandemic situation, the greatest emphasis and effort was put on IT support of on-line teaching using the available means. Gradually, the means for supporting teaching were consolidated and MS Teams and the portfolio of services under Office 365 under the Campus licence were used on a broader scale. In 2020, also servers for synchronization and verification of users in cloud were modernized and boosted.

Modernization of SW to support IGA

SW support of the existing Internal Grant Agency (IGA) was functionally partly insufficient. Moreover, it ran on outdated technology with serious security threats and its further development was inefficient from the point of view of functionality and security, as well as being expensive. Therefore, the necessary SW was modernized and other functionalities and extensions were added based on the requirements of this agenda that is divided in accordance with the fields in which IGA is implemented.

5 Maintaining and developing the level of relationship with study applicants

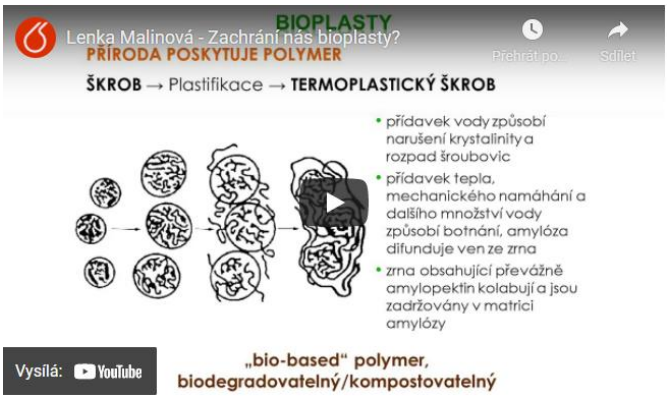
Best exhibit at education fairs Gaudeamus Prague

Education fairs are a place where study applicants who want to study at a university actively seek answers to their questions regarding university studies. UCT Prague regularly participates in education fairs. At the information stand, people interested in studying chemistry can learn from students and employees of UCT Prague about **what they can study at UCT Prague, the employability of UCT graduates** and about the **joys and threats of university studies** in general. They can also find information about **life in Prague**, accommodation and culture events in the Dejvice Campus.

At the **21st higher education exhibition, Gaudeamus 2020**, held in January in Letňany, Prague, UCT Prague received the best exhibit award among 290 exhibitors from the Czech Republic and abroad, presented by an independent jury. The overall presentation at the exhibition, visual rendering of the exhibit, helpfulness and friendliness of the representatives of the university in communication with study applicants, presentation in the accompanying programme and other activities for exhibition visitors were assessed. The Gaudeamus Brno exhibition regularly held in October was cancelled due to the pandemic.

53rd edition of the Youth Academy

The annual **Youth Academy** is organized by UCT Prague and the Centre for Young Naturalists of the House of Children and Youth of Prague for students of high schools, vocational schools and other interested individuals. Because of the pandemic situation, the 53rd edition was in the form of video lectures given by UCT scientists on interesting and current topics: *Coronavirus in the Eyes of a Biochemist* (doc. Ing. Dr. Michaela Rumlová), *Modern Trends in Food Industry* – with a focus on cereal chemistry, technology and nutrition (doc. Ing. Marcela Sluková, Ph.D.), *Will Bioplastics Save Us?* (Ing. Lenka Malinová, Ph.D.), *Where to Put It? Renewable Energy Storage in Batteries and Vanadium Redox Batteries* (Prof. Ing.



Dr. Juraj Kosek), and the *Role of Fluorinated Compounds in Today's World* (Prof. Ing. Jaroslav Kvíčala, CSc.).

Preparatory courses for study applicants at UCT Prague

A team of teachers and students prepared three electronic courses for high school students interested in studying at UCT Prague financially supported from the ESIF (OP RDE). The courses are offered to study applicants, who can check for free in an on-line course that their knowledge of chemistry and mathematics is enough to start successfully studying at UCT Prague. Based on the content of the courses they will have an idea about the level of knowledge that is required to start studying at UCT Prague and what they are expected to know. Currently there are three "Get Ready" courses on offer – General and Inorganic Chemistry, Chemical Calculations, and Mathematics.

6 Supporting sufficient staffing to ensure primary activities at university

New professors and associate professors at UCT Prague

In June and December 2020, following a proposal of the UCT Prague Scientific Council, President of the Czech Republic, Miloš Zeman, signed appointment decrees for **1 new female professor and 3 new male professors** at UCT Prague. The appointment decrees were presented to them in a ceremony by the Minister of Education, Youth and Sports. **Prof. Ing. Jana Pulkrabová, Ph.D.**, (Department of Food Analysis and Nutrition, FFBT) was appointed professor in chemistry and food analysis, **Prof. Dr. Ing. Tomáš Moucha** (Department of Chemical Engineering, FCE) was appointed professor in chemical engineering, **Prof. Ing. Karel Friess, Ph.D.**, (Department of Physical Chemistry, FCE) was appointed professor in physical chemistry, and **Prof. Ing. Petr Slepička, Ph.D.**, (Department of Solid State Engineering, FCT) was appointed professor in materials engineering.

In 2020, **4 female associate professors and 1 male associate professor** were appointed at UCT Prague. In the field of metallurgy, **doc. Ing. Jaroslav Fojt, Ph.D.**, (Department of Metals and Corrosion Engineering, FCT) was appointed. In the field of biochemistry, **doc. Ing. Jan Lipov, Ph.D.**, (Department of Biochemistry and Microbiology, FFBT) and **doc. Ing. Jaroslav Zelenka, Ph.D.**, (Department of Biochemistry and Microbiology, FFBT) were appointed. In the field of chemical engineering, **doc. Ing. Jitka Čejková, Ph.D.**, (Department of Chemical Engineering, FCE) was appointed. In the field of urban engineering and construction at VSB-TUO **doc. RNDr. Tomáš Hudeček, Ph.D.**, (Department of Economics and Management) was appointed.

2020 Julie Hamáčková Award

In 2020, the **Julie Hamáčková Award** in category a) public acknowledgment of extraordinary contribution of women, employees at UCT Prague, to the development of science, research,

pedagogy and innovation, including work in the academic sector, was awarded by the evaluation committee to **doc. Ing. Eliška Vyskočilová, Ph.D.** (Department of Organic Technology, FCT).

In 2020, the **Julie Hamáčková Award** in category b) public acknowledgment of extraordinary contribution of women and men employees at UCT Prague to supporting and promoting equal opportunities in employment relationships and research was awarded by the evaluation committee to **Dr. Ing. Pavla Šmejkalová** (Department of Water Technology and Environmental Engineering, FET).

2020 Rector's Awards

The **2020 Rector's Awards** were presented untypically in Uhelna in building A. Rector Matějka, gave the award to six employees of UCT Prague. The Rector's Award for extraordinary contribution to science and research was given to **doc. Dr. Ing. Michaela Rumlová** (Department of Biotechnology, FFBT), the Rector's Award for extraordinary contribution to education was presented to **doc. Ing Petra Lipovová, Ph.D.** (Department of Biochemistry and Microbiology, FFBT), the Rector's Award for extraordinary achievements in science and research went to **Ing. Nguyen Hong Vu, Ph.D.** (Department of Metals and Corrosion Engineering, FCT), the Rector's Award for extraordinary results in research and successful promotion of science was handed over to **Ing. Vojtěch Šálek** (Department of Chemical Engineering, FCE) and **RNDr. Pavel Galář, Ph.D.** (Department of Physics and Measurements, FCE) and the Rector's Award for extraordinary contribution to the development of UCT Prague was given to **Ing. Milan Petrák** (Technopark Kralupy).

7 Development of effective international cooperation (Internationalization)

A new project of Czech-Egyptian cooperation

The Laboratory of Molecular Electronics and Intelligent Materials at the Department of Computing and Control Engineering (FCE) in cooperation with Tanta University and Egypt-Japan University of Science and Technology will be implementing a project under the **Erasmus+ International Credit Mobility**. The obtained funds will allow employees and workers at the abovementioned institutions do experiments in the laboratories of their foreign partners during long-term study and work stays. The three-year project is a follow-up to the previous successful cooperation between UCT Prague and Tanta University in the field of materials on the basis of electrically conductive polymers for catalysis and elimination of toxic substances in wastewater treatment.

The Laboratory of Molecular Electronics and Intelligent Materials will cooperate with the two universities in Egypt on issues that are crucial for the solution of current environmental problems

in Egypt – namely air and surface water pollution. The aim of this cooperation is to develop new materials and equipment for fast detection, absorption or decomposition of pollutants.

8 Optimization of internal and external communication

Presentation of UCT Prague experts in the media

Experts from UCT Prague are often invited by the media to present popular scientific contributions, comments, expert advice; they are invited to discussions and popular scientific programmes.

In July, UCT Prague hosted the Czech TV programme **Focus of Václav Moravec** on the topic of the **Age of Chemistry**. The guests in the programme were **Prof. Ing. František Štěpánek, Ph.D.** (Department of Chemical Engineering, FCE), cosmetics developer Ing. Lenka Průšová, biochemist RNDr. PhDr. Zdeněk Hostomský, CSc., chemistry teacher Mgr. Růžena Hlůšková, expert in environmental chemistry Prof. RNDr. Jana Klánová, Ph.D., and geologist RNDr. Václav Cílek, CSc. In several live streams, the guests talked about the following topics: Everything is – chemistry. When is it good and bad? When does it serve people? Why are we afraid of chemistry?

The **Department of Food Analysis and Nutrition, UCT Prague**, tested a new substance called "Oak Drops" for the new news channel CNN Prima News. The manufacturer of the product, which appeared on the Czech market, suggested that it might work against the coronavirus. However, the analysis done at UCT Prague showed that the product contained toxic and carcinogenic substances. *"The drops had toxins in them. They contained a number of beneficial natural substances, to which we have no objections whatsoever, but the risk presented by pyrrolizidine alkaloids is, in our opinion, unacceptable,"* said **Prof. Ing. Jana Hajšlová, CSc.** (FFBT).

A draft of a bill on food that imposes high fines for selling products that are sold in seemingly same packaging in different EU countries with different composition has been submitted to the Chamber of Deputies some time ago. **Ing. Jan Pivoňka, Ph.D.**, (Department of Food Preservation, FFBT) was invited to the **90' ČT24** programme in November to talk about tackling double standards of food quality. Ing. Pivoňka was a coordinator of a project of the Ministry of Agriculture. As part of the project, he participated in the preparation of several studies that compared the quality of food sold in different countries. The results of the studies

will be used in the assessment of the significance of the differences in quality of food and the possible political decision that would be reflected in legislation.

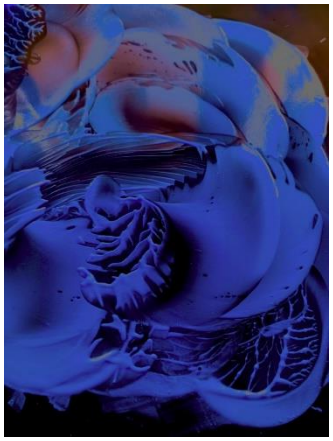
Prof. Ing. Václav Janda, CSc., (Department of Power Engineering, FET) talked to the **iDNES.cz** news server about the quality of drinking water in the Czech Republic, the limits and requirements on drinking water and its price. He explained why it is better to drink cold and not hot water, that hard water is very good for drinking, but not so good for washing, showering, flushing, etc. He also talked about the presence of drugs, hormones, about algae and cyanobacteria and microplastics in water from the point of view of waste water treatment.

Doc. RNDr. Martin Pumera, Ph.D., (Department of Inorganic Chemistry, FCT) was interviewed in the December issue of **FORBES**. In 2019, Pumera was appointed extraordinary professor at UCT Prague. He talked about coming back to the Czech Republic from Singapore and taking his advanced research of nanorobots with him, about the importance of a well composed and working research team, about the state of research into nanorobots in the Czech Republic. He also mentioned the current possibilities of how to use nanorobots, for example in medicine, and what he believes the future will hold for nanorobots and their use, which will be the result of research in nanorobotics in the next years.

Science Festival

Due to the coronavirus pandemic, the **8th year of the Science Festival** was held online instead of at Vítězné Square in Dejvice. The festival focused on Future Innovations opened on 3 September and offered more than 70 videos that were available until the end of November. The annual event is organized by the House of Children and Youth of Prague, CTU and UCT Prague in the Prague district of Dejvice. Virtual visitors were taken to Vítězné Square, where they could visit the exhibitions, and after answering questions prepared by the organizers of the festival, they could participate in the accompanying programme called “Smart Head”, compete for interesting prizes and win a 3D printer or a model of the human body. Winners were chosen by lot in two rounds. In the videos, visitors could learn about how the coronavirus is tested and how building structures are tested, how to work with economic data, what people have in common with animals, what is a microbiome, how plants respond to the climate change. Moreover, they were shown how to paint with light and how ticks can be useful. UCT Prague showed the visitors 7 experiments on, for example, how to make oak-apple ink or sourdough at home, a tested analyzer prototype FoodSmartPhone for the analysis of food using a mobile phone or the nitinol alloy, a shape memory material used in medicine.

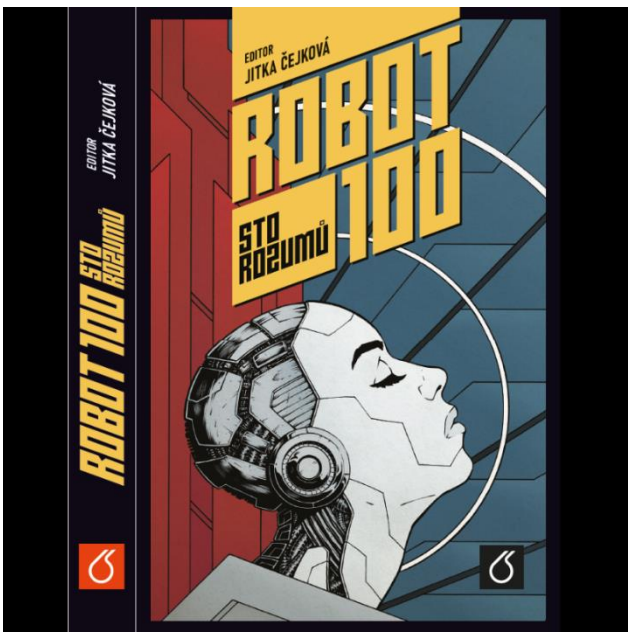
The World (Is) Chemistry! – 11th edition of the photography competition



Same as every year, **two rounds of the photography competition The World (Is) Chemistry** were held in 2020. Participants in two categories – under 18 and 18+ – explored and made photos of the world around them. They could have chosen a phenomenon, a reaction, a compound or any of the endless number of sophisticated chemical systems, either in the world of nature or civilization. The winning photographs were chosen based on Facebook voting. The winning photographs in the under 18 category called *Emulsifier* and *Ultramarine* were taken by Štěpánka Hlavatá and Eliška Hlavatá. In the 18+ category, the winners were Pavla Machová and Lukáš Kejla with their photographs called the *Water Fight* and *Baked Iron(III) Chloride*.

Robot 100: Sto rozumů (Robot 100: One Hundred Reasons)

In October, a new book called *Robot 100: Sto rozumů* (Robot 100: One Hundred Reasons) was published at the occasion of the centenary of the word "robot". The book includes the original edition of the play *R.U.R.* by Karel Čapek, where the word "robot" first appeared, as well as a hundred views, associations and comments on the play (and robotics in general) by Czech and foreign authors, scientists, artists and journalists. The book *Robot 100: Sto rozumů* was put together by editor doc. Ing. Jitka Čejková, Ph.D. (Department of Chemical Engineering, FCE). The contributors include British author Simon Mawer, top expert in robotics Rodney Brooks, vice-president of the International Society for Artificial Life, Susan Stepney, linguist Karel Oliva and singer-songwriter and poet Jiří Dědeček. The cover and illustrations were made by young artist Jonáš Ledecký.



"The final collection of texts is fascinating. It spans from serious scientific texts written in

the style of popular science, to sci-fi stories inspired by R.U.R., to light funny texts, to poems. There are also five drawings in the book," Jitka Čejková sums up.

The book, which has 448 pages, was published by the UCT Press, which focuses primarily on specialized chemistry books. The book is available online in the UCT Press e-shop and in Czech bookstores.

2020 Researchers' Night

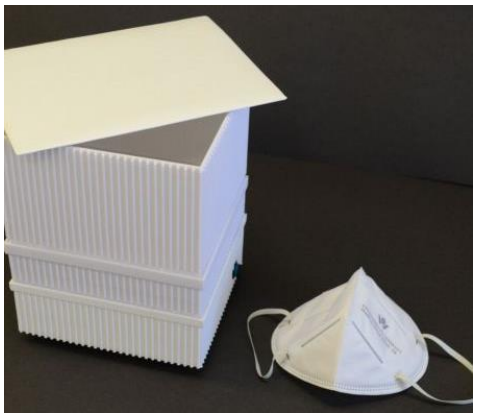
Due to the pandemic situation, the national popularization event, **Researchers' Night 2020**, the topic of which was "Humans and Robots", went fully online. The event was supported from the 2020 Centralized Development Programme for Higher Education Institutions. After the programme of the event was published on 15 November, the Researchers' Night website administered by UCT Prague welcomed 2,660 users by the end of the year. The users generated nearly 8,000 views (of which 6,000 were unique visitors) and they spent 2.5 minutes on the website on average. The UCT programme offered over 16 activities, in which students and employees of UCT tried to persuade the visitors of the Researchers' Night virtually that chemistry is not harmful and can actually be very helpful. Of the activities offered by UCT Prague, the cut-out model of a robot drew the most attention (nearly 800 unique impressions), followed by a video of microrobots made of gel (750 unique impressions). The visitors, mostly children, could print out the cut-out model of a robot and send a photo of the glued up robot to the Researchers' Night grand competition and win a prize.

Coronavirus – UCT Prague's involvement in the fight against the pandemic

In the spring, when there was a shortage of class FFP3 respirators that protect doctors, health care workers and other people at the frontline of the COVID-19 pandemic, researchers at UCT Prague **RNDr. Ivan Řehoř, Ph.D.**, and **Ing. Marek Šoltys** (both from the Department of Chemical Engineering, FCE) selected and experimentally tested the best way to **efficiently sterilize FFP3 respirators in the microwave oven** and use it repeatedly as an emergency solution when there are not enough new respirators. Based on the available specialized literature and the results of experiments conducted at UCT it was concluded that provided the correct method is followed, it is safe to use class FFP3 respirators after up to five sterilization cycles. The detailed method was presented in an infographic that can be downloaded from the website in Czech and English.

At the same time, researchers at the Laboratory of Low-Temperature Plasma led by **doc. Ing. Vladimír Scholtz, Ph.D.**, (Department of Physics and Measurements, FCE) developed a new **tool for repeated disinfection of objects** contaminated with the SARS-CoV-2 coronavirus or other

dangerous microorganisms – a low-temperature plasma generator that can be used to disinfect respirators in the time when they are unavailable. The method does not reduce their filtration efficiency.



The efficiency of disinfection was verified on three types of enveloped viruses – the *Influenza* H1N1 virus, California, a virus used to make vaccines against smallpox *Vaccinia virus,* the *Modified Vaccinia virus Ankara* (MVA), and the *SARS-CoV-2* coronavirus, which causes COVID-19.

"We used four negative corona discharges in the point-tube configuration that burn on needle tips opposite to ring electrodes, where a strong ion wind is created which carries active particles from the discharge area to the exposition chamber, where the disinfected objects are placed. The box was printed out on a 3D printer from PETG material," doc. Scholtz explains how the equipment works.

All documents for the construction of the apparatus were published by the authors for non-commercial use. The Laboratory of Low-Temperature Plasma cooperated on its development with the Centre of Clinical Laboratories of the Public Health Institute in Ostrava, the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, and AVEC CHEM in cooperation with the Faculty of Science, University of Hradec Králové.

In March, students and employees of UCT Prague formed a **volunteer group on Facebook**. Concrete information and instructions on who, where, when and how can help to fight the COVID-19 pandemic is shared in the group, from sowing facemasks to shopping service for senior citizens.

Technopark Kralupy prepared a mixing line for disinfectants that can produce up to 1,000 l/day, and got involved in the **manufacturing** and distribution of **disinfectants** in cooperation with the Fire Rescue Services of the Central Bohemian Region to where they were needed (emergency committees of cities, health care centres, fire fighters, schools and other institutions and non-profit organizations).

Students of UCT Prague offered **tutoring and teaching to students in the last year of high school and other students** in our core subjects.

For more on the how UCT Prague got involved in the fight against the coronavirus, see Part C, Chapters 11 and 12.

B. UCT Prague 2020 in numbers

Faculties	4
University institutes	1
Submitted applications to study	4,419
Students in accredited SP (number of studies)	3,823
Number of PhD students (number of studies)	810
Accredited study programmers	260
Joint/Double/Multiple Degree study programmes	25
International students	752
Academic failure in the 1st year of studies	34%
Participants in lifelong learning (incl. U3V)	813
Graduates (number of studies)	964
Number of experts from application sector participating in instruction	105
Students who receive scholarships (according to purpose of scholarship)	7,057
Number of employees (average converted numbers)	1,222.5
Academic and research workers – foreigners (average converted numbers)	99.8
Newly appointed associate professors	5
Newly appointed professors	4
Student mobility (number of stays)	124
Number of submitted applications for accommodation	1,895
Number of beds in dorms	1,650
Number of (co)organized conferences with international attendance	14
Number of contractual research contracts, consultations and advisory	3,423
Number of solved international R&D projects	30

C. Text appendix to the Annual Report on Activities of UCT Prague

1 Basic information about university

a) Full name of university, commonly used abbreviations, seat (incl. address) of university and all constituent parts (faculties, institutes, departments and branches)

The University of Chemistry and Technology in Prague uses the official abbreviation "UCT Prague". This abbreviation is used also in this Annual Report.

The official address of UCT Prague is Technická 5/1905, 166 28 Prague 6.

UCT Prague is divided into faculties, which are its constituent parts. The basic organizational units of faculties are departments; the dean's offices are the administrative departments. In addition, a university department that carries out scientific, research, development, innovation and other activity – Technopark Kralupy, UCT Prague – is also a constituent part of UCT Prague.

All faculties and the majority of other constituent parts of UCT Prague are located in the buildings in Prague Dejvice, at Technická 3/1903, Technická 5/1905 and Studentská 6/2031. The UCT Prague halls of residence have a different address: K Verneráku 950 (Volha Hall) and Chemická 952 (Sázava Hall), 148 28 Praha 4 – Kunratice. Technopark Kralupy, UCT Prague is headquartered at Náměstí G. Karse 7, 278 01 Kralupy nad Vltavou (effective from 1 October 2019, the municipal council of the city of Kralupy nad Vltavou decided to rename the street originally called Žižkova).

UCT Prague implements **bachelor, follow-up master and doctoral studies at the University Centre UCT Prague – Unipetrol in the Chempark compound in Litvínov Záluží (V Záluží 1, Litvínov 1, 436 01 Litvínov)**.

b) Organizational scheme of university

The internal organizational structure, rules of organization and management at UCT Prague are further specified and regulated in the internal standard of UCT Prague No. A/N/961/5/2019 "Organizační řád VŠCHT Praha" (Rules of Procedure of UCT Prague), effective from 14 November 2019.

The organizational structure of the faculties of UCT Prague is described in Diagram No. 1.

The organizational structure of the Rector's Office, university workplaces, university departments and the Administration of University Facilities is described in Diagram No. 2.

Diagram No. 1:

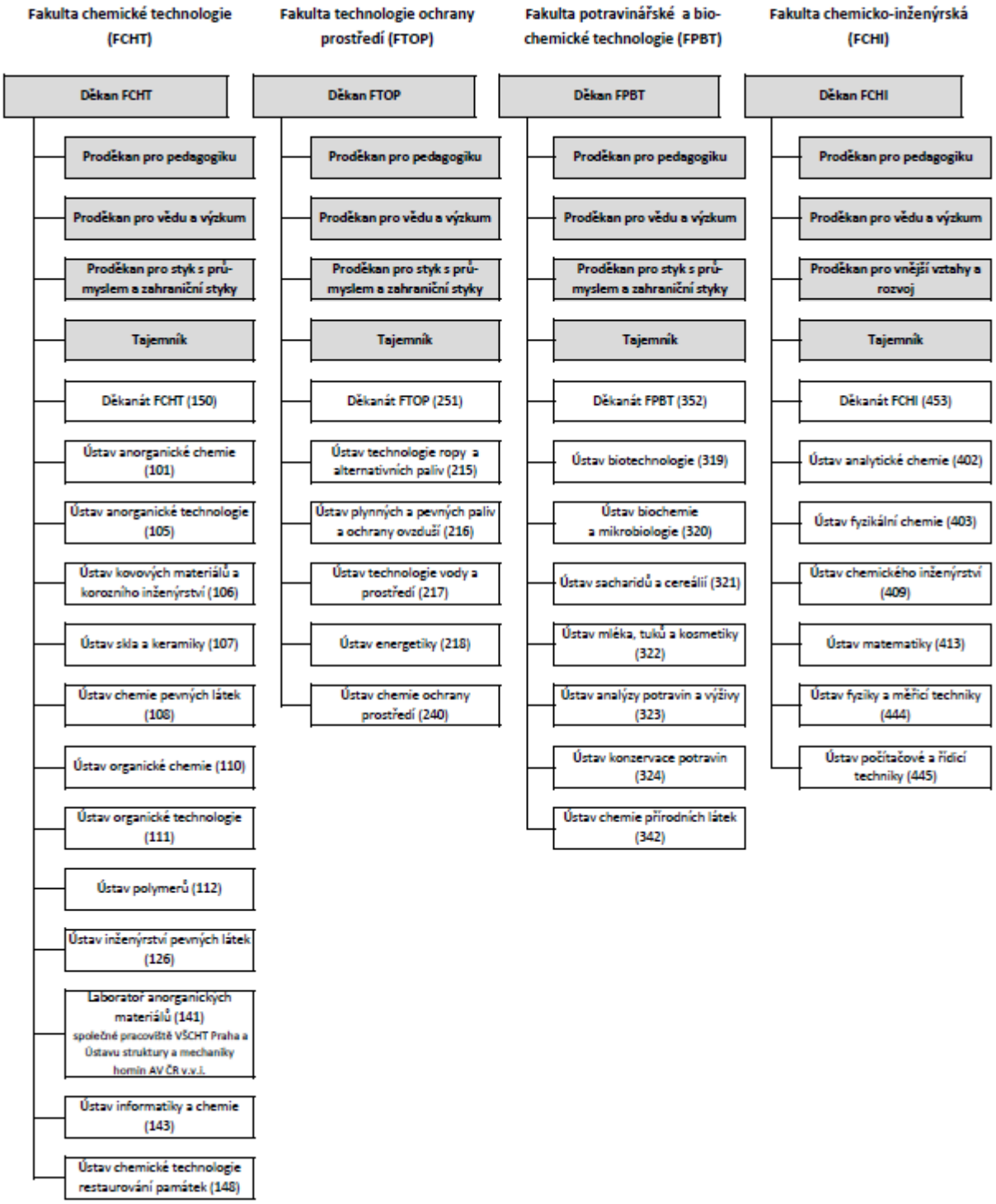
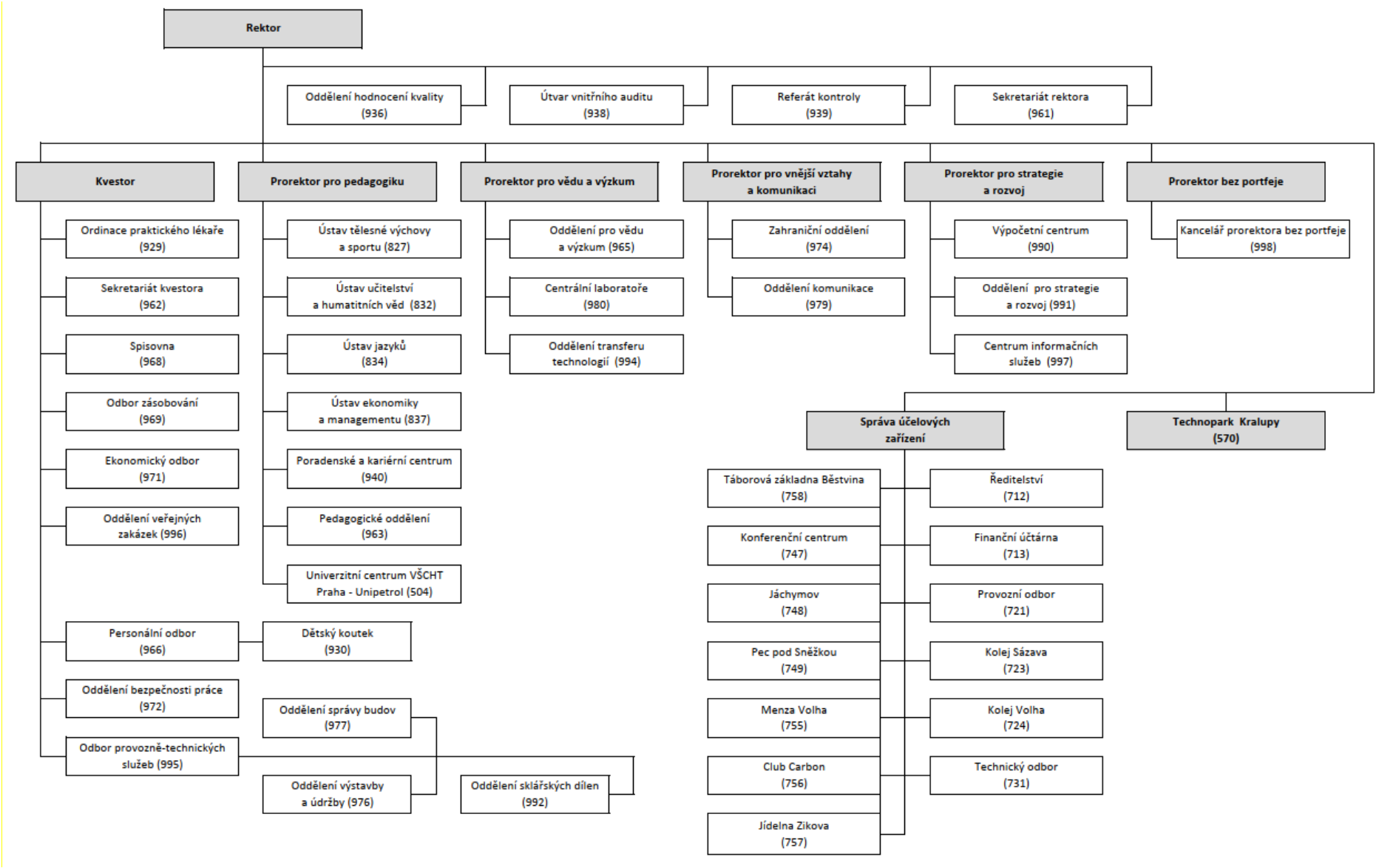

Fakulta chemické technologie (FCHT)
Děkan FCHT
Proděkan pro pedagogiku
Proděkan pro vědu a výzkum
Proděkan pro styk s průmyslem a zahraniční styky
Tajemník
Děkanát FCHT (150)
Ústav anorganické chemie (101)
Ústav anorganické technologie (105)
Ústav kovových materiálů a korozního inženýrství (106)
Ústav skla a keramiky (107)
Ústav chemie pevných látek (108)
Ústav organické chemie (110)
Ústav organické technologie (111)
Ústav polymerů (112)
Ústav inženýrství pevných látek (126)
Laboratoř anorganických materiálů (141) společné pracoviště VŠCHT Praha a Ústavu struktury a mechaniky hornin AV ČR v.v.i.
Ústav informatiky a chemie (143)
Ústav chemické technologie restaurování památek (148)
Fakulta technologie ochrany prostředí (FTOP)
Děkan FTOP
Proděkan pro pedagogiku
Proděkan pro vědu a výzkum
Proděkan pro styk s průmyslem a zahraniční styky
Tajemník
Děkanát FTOP (251)
Ústav technologie ropy a alternativních paliv (215)
Ústav plynných a pevných paliv a ochrany ovzduší (216)
Ústav technologie vody a prostředí (217)
Ústav energetiky (218)
Ústav chemie ochrany prostředí (240)
Fakulta potravinářské a biochemické technologie (FPBT)
Děkan FPBT
Proděkan pro pedagogiku
Proděkan pro vědu a výzkum
Proděkan pro styk s průmyslem a zahraniční styky
Tajemník
Děkanát FPBT (352)
Ústav biotechnologie (319)
Ústav biochemie a mikrobiologie (320)
Ústav sacharidů a cereálií (321)
Ústav mléka, tuků a kosmetiky (322)
Ústav analýzy potravin a výživy (323)
Ústav konzervace potravin (324)
Ústav chemie přírodních látek (342)
Fakulta chemicko-inženýrská (FCHI)
Děkan FCHI
Proděkan pro pedagogiku
Proděkan pro vědu a výzkum
Proděkan pro vnější vztahy a rozvoj
Tajemník
Děkanát FCHI (453)
Ústav analytické chemie (402)
Ústav fyzikální chemie (403)
Ústav chemického inženýrství (409)
Ústav matematiky (413)
Ústav fyziky a měřicí techniky (444)
Ústav počítačové a řídicí techniky (445)

Diagram No. 2:


Rektor
Oddělení hodnocení kvality (936)
Útvar vnitřního auditu (938)
Referát kontroly (939)
Sekretariát rektora (961)
Kvestor
Prorektor pro pedagogiku
Prorektor pro vědu a výzkum
Prorektor pro vnější vztahy a komunikaci
Prorektor pro strategie a rozvoj
Prorektor bez portfeje
Ordinace praktického lékaře (929)
Sekretariát kvestora (962)
Spisovna (968)
Odbor zásobování (969)
Ekonomický odbor (971)
Oddělení veřejných zakázek (996)
Personální odbor (966)
Oddělení bezpečnosti práce (972)
Odbor provozně-technických služeb (995)
Ústav tělesné výchovy a sportu (827)
Ústav učitelství a humatitních věd (832)
Ústav jazyků (834)
Ústav ekonomiky a managementu (837)
Poradenské a kariérní centrum (940)
Pedagogické oddělení (963)
Univerzitní centrum VŠCHT Praha - Unipetrol (504)
Dětský koutek (930)
Oddělení správy budov (977)
Oddělení výstavby a údržby (976)
Oddělení sklářských dílen (992)
Oddělení pro vědu a výzkum (965)
Centrální laboratoře (980)
Oddělení transferu technologií (994)
Zahraniční oddělení (974)
Oddělení komunikace (979)
Výpočetní centrum (990)
Oddělení pro strategie a rozvoj (991)
Centrum informačních služeb (997)
Kancelář prorektora bez portfeje (998)
Správa účelových zařízení
Technopark Kralupy (570)
Táborová základna Běstvina (758)
Konferenční centrum (747)
Jáchymov (748)
Pec pod Sněžkou (749)
Menza Volha (755)
Club Carbon (756)
Jídelna Zikova (757)
Ředitelství (712)
Finanční účtárna (713)
Provozní odbor (721)
Kolej Sázava (723)
Kolej Volha (724)
Technický odbor (731)

University research and educational workplaces of UCT Prague in 2020:

- A workplace of the National Competence Centre of Mechatronics and Smart Technologies for Mechanical Engineering at UCT Prague
- A workplace of the National Competence Centre of Personalized Medicine – Diagnostics and Therapy at UCT Prague
- A workplace of the National Competence Centre of Biorafination as Circular Technology at UCT Prague
- Centre of "Single-Site" Catalysis
- Department for the History of the Chemical Industry and Applied Chemistry
- BIOMEDREG
- Metrology and Testing Laboratory
- Prague University Analytical Centre
- Forensic Laboratory of Biologically Active Substances

University departments at UCT Prague in 2020

Technopark Kralupy of the University of Chemistry and Technology in Prague

The structure of the management of UCT Prague is described in Diagram No. 3:

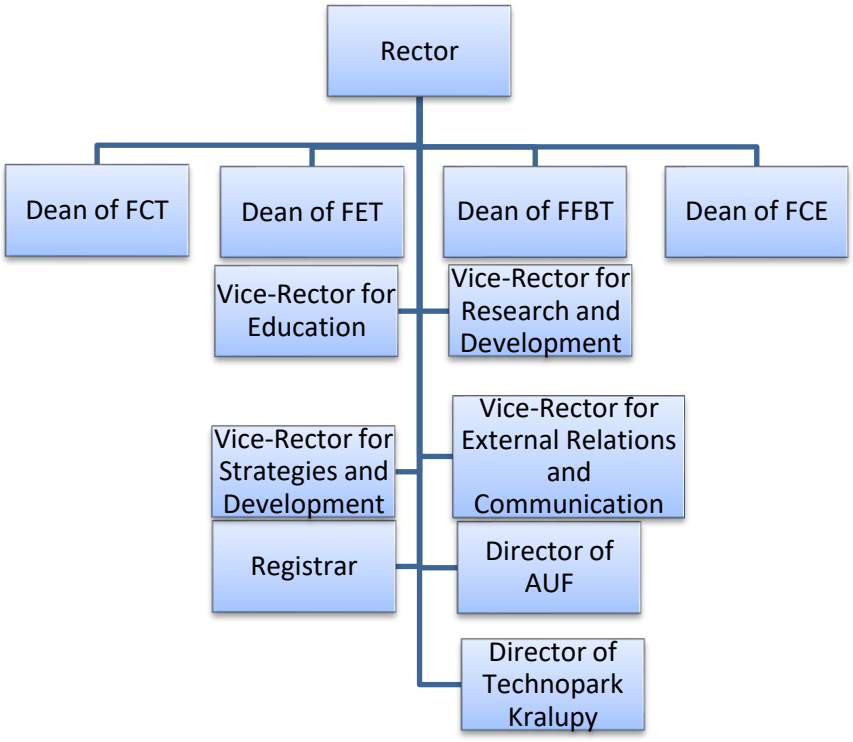
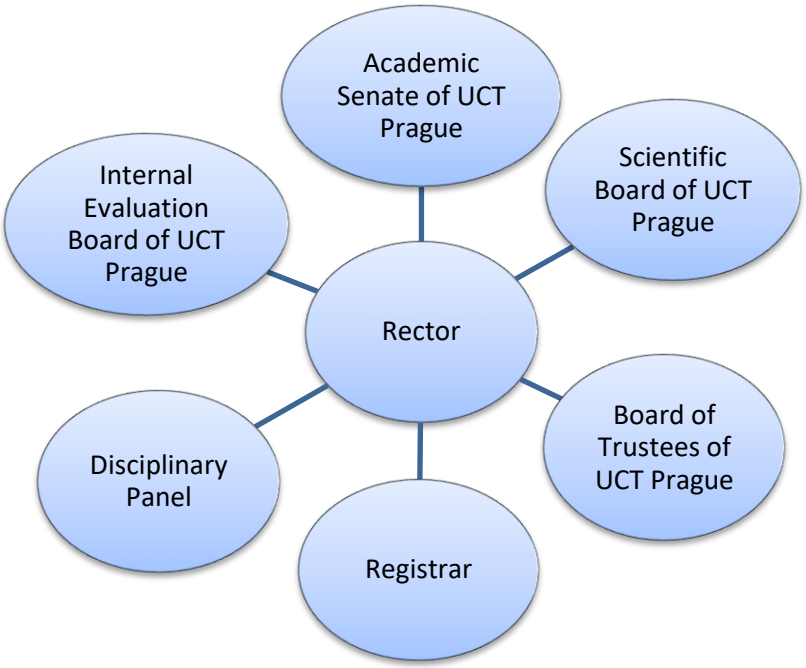


Diagram No. 4: Bodies of UCT Prague



UCT Prague management

prof. Dr. RNDr. Pavel Matějka	Rector (since 1 Jan 2020)
doc. Dr. Ing. Milan Jahoda	Vice-Rector for Education (since 1 Feb 2020)
prof. Dr. Ing. Dalibor Vojtěch	Vice-Rector for Research and Development (since 1 Feb 2020)
prof. Ing. Milan Pospíšil, CSc.	Vice-Rector for Strategies and Development (since 1 Feb 2020)
prof. Ing. Pavel Kotrba, Ph.D.	Vice-Rector for External Relations and Communication (since 1 Feb 2020)
Ing. Ivana Chválná	Registrar

Administration of University Facilities, UCT Prague

Ing. Stanislav Starý	Director of AUF, UCT Prague

Management of Technopark Kralupy, UCT Prague

Ing. Milan Petrák	Director of Technopark Kralupy, UCT Prague

Management of the Faculty of Chemical Technology

prof. Dr. Ing. Karel Bouzek	Dean
doc. Ing. Petr Zámostný, Ph.D.	Vice-Dean for Education

prof. Ing. Aleš Helebrant, CSc.	Vice-Dean for Science and Research
doc. Ing. Pavel Novák, Ph.D.	Vice-Dean for External Relations
Ing. Monika Šáchová	Secretary

Management of the Faculty of Environmental Technology

doc. Ing. Vladimír Kočí, Ph.D., MBA	Dean
doc. Ing. Vladimír Sýkora, CSc.	Vice-Dean for Education
doc. Ing. Tomáš Hlinčík, Ph.D.	Vice-Dean for Science and Research
Ing. Marek Šír, Ph.D.	Vice-Dean for External Relations
Ing. Kateřina Šritrová	Secretary

Management of the Faculty of Food and Biochemical Technology

prof. Ing. Jan Masák, CSc.	Dean (since 1 Jan 2020)
prof. Ing. Karel Melzoch, CSc.	Vice-Dean for Education (since 1 Feb 2020)
doc. Ing. Pavel Ulbrich, Ph.D.	Vice-Dean for Science and Research
Ing. Monika Tomaniová, Ph.D.	Vice-Dean for External Relations (since 1 Feb 2020)
Ing. Blanka Morchová	Secretary (since 1 Mar 2020)

Management of the Faculty of Chemical Engineering

prof. Ing. Michal Přibyl, Ph.D.	Dean
doc. Ing. Karel Řehák, CSc.	Vice-Dean for Education
doc. RNDr. Ing. Pavel Řezanka, Ph.D.	Vice-Dean for Science and Research
doc. Ing. Pavel Hrnčiřík, Ph.D.	Vice-Dean for External Relations
Ing. Kamila Klaudisová, Ph.D.	Secretary

Heads of departments at UCT Prague

prof. Dr. Ing. David Sedmidubský	Department of Inorganic Chemistry (101)
prof. Dr. Ing. Karel Bouzek	Department of Inorganic Technology (105)
prof. Dr. Ing. Dalibor Vojtěch	Department of Metals and Corrosion Engineering (106)
prof. Ing. Aleš Helebrant, CSc.	Department of Glass and Ceramics (107)
prof. Ing. František Kovanda, CSc.	Department of Solid State Chemistry (108)

prof. Ing. Radek Cibulka, Ph.D.	Department of Organic Chemistry (110)
doc. Ing. Pavel Čapek, CSc.	Department of Organic Technology (111)
prof. Ing. Petr Zámostný, Ph.D.	Department of Organic Technology (111), since 1 Sep 2020
prof. Ing. Jiří Brožek, CSc.	Department of Polymers (112)
prof. Ing. Václav Švorčík, DrSc.	Department of Solid State Engineering (126)
doc. Ing. Jaroslav Kloužek, CSc.	Laboratory of Inorganic Materials (141)
doc. Mgr. Daniel Svozil, Ph.D.	Department of Informatics and Chemistry (143)
doc. Dr. Ing. Michal Ďurovič	Department of Chemical Technology of Monument Conservation (148)
doc. Ing. Pavel Šimáček, Ph.D.	Department of Petroleum Technology and Alternative Fuels (215)
doc. Ing. Karel Ciahotný, CSc.	Department of Gaseous and Solid Fuels and Air Protection (216)
prof. Ing. Pavel Jeníček, CSc.	Department of Water Technology and Environmental Engineering (217)
doc. Ing. Jan Macák, CSc.	Department of Power Engineering (218)
doc. Dr. Ing. Martin Kubal	Department of Environmental Chemistry (240)
prof. Ing. Jan Masák, CSc.	Department of Biotechnology (319)
prof. Ing. Tomáš Ruml, CSc.	Department of Biochemistry and Microbiology (320)
prof. Ing. Ondřej Uhlík, Ph.D.	Department of Biochemistry and Microbiology (320), since 1 Sep 2020
doc. Ing. Marcela Sluková, Ph.D.	Department of Carbohydrates and Cereals (321
prof. Ing. Vladimír Filip, CSc.	Department of Milk, Fat and Cosmetics (322)
prof. Ing. Jana Pulkrabová, Ph.D.	Department of Food Analysis and Nutrition (323)
doc. Ing. Aleš Rajchl, Ph.D.	Department of Food Preservation (324)

prof. Dr. RNDr. Oldřich Lapčík	Department of Chemistry of Natural Compounds (342)
prof. Ing. Vladimír Setnička, Ph.D.	Department of Analytical Chemistry (402)
prof. RNDr. Bc. Petr Slavíček, Ph.D.	Department of Physical Chemistry (403)
prof. Ing. František Štěpánek, Ph.D.	Department of Chemical Engineering (409)
doc. Ing. Jan Mareš, Ph.D.	Department of Mathematics (413)
doc. Ing. Vladimír Scholtz, Ph.D.	Department of Physics and Measurements (444)
doc. Ing. Jan Mareš, Ph.D.	Department of Computing and Control Engineering (445)
Mgr. Martin Mašek	Department of Physical Education and Sport (827)
RNDr. Petr Holzhauser, Ph.D.	Department of Education and Human Sciences (832)
PhDr. Ivana Dolejšová	Department of Languages (834)
doc. Ing. Lenka Švecová, Ph.D.	Department of Economics and Management (837) – designated head

Heads of university workplaces at UCT Prague

Ing. Pavel Härtel	Computer Centre (990)
prof. Ing. Richard Hrabal, CSc.	Central Laboratories (980)
Ing. Eva Dibuzsová, Ph.D.	Centre for Information Services (997)
Ing. Zdeňka Pelešková	University Centre UCT Prague – Unipetrol (504)
(N/A)	Centre for “Single-Site” Catalysis (535)
prof. Ing. Jana Hajšlová, CSc.	Metrology and Testing Laboratory (558)
prof. Dr. Ing. Jan Poustka	Prague University Analytical Centre (559)
Ing. Martin Kuchař, Ph.D.	Forensic Laboratory of Biologically Active Substances (560)

c) Composition of the Scientific Board, the Board of Trustees, the Academic Senate and other bodies in accordance with internal regulations of university (with changes made in 2020)

Academic Senate of UCT Prague

Academic workers

All 16 seats of academic workers (4 from each of the 4 faculties) were taken in regular election in 2019 – the mandates are from 1 February 2020 until 31 January 2023.

prof. Ing. Radek Cibulka, Ph.D.	Chair
doc. Ing. Petra Lovecká, Ph.D.	Vice-Chair
RNDr. Pavel Pokorný, Ph.D.	Vice-Chair
doc. Ing. Milan Kouřil, Ph.D.	
doc. Ing. Kateřina Rubešová, Ph.D.	
Ing. Miloslav Lhotka, Ph.D.	
Ing. Daniel Maxa, Ph.D.	
doc. Ing. Jan Bartáček, Ph.D.	
Ing. Marek Staf, Ph.D.	
doc. Ing. Luděk Jelínek, Ph.D.	
doc. Ing. Petra Lipovová, Ph.D.	
doc. Ing. Helena Čížková, Ph.D.	
doc. Ing. Milena Stránská, Ph.D.	
doc. Ing. Jan Mareš, Ph.D.	
doc. Ing. Karel Friess, Ph.D.	
prof. Dr. Ing. Tomáš Moucha	

Students' Chamber

(the term in office of students elected to AS UCT is two years; each faculty is represented by 2 students)

Ing. Jakub Med	Vice-Chair
Bc. Anna Kloužková	
Ing. Lukáš Tůma	
Ing. Miroslav Dragoun	
Ing. Jaroslav Aubrecht	

Ing. Petr Kovář

Bc. Miroslav Hala

Ing. Markéta Nováková

Scientific Board of UCT Prague

The composition of the Scientific Board of UCT Prague was approved by the Academic Senate of UCT Prague on 17 February 2020.

Chair of SB

prof. Dr. RNDr. Pavel Matějka	Rector

Interní členové VR

prof. Dr. Ing. Dalibor Vojtěch	Vice-Rector for Research and Development
prof. Ing. Pavel Kotrba, Ph.D.	Vice-Rector for External Relations and Communication
doc. Dr. Ing. Milan Jahoda	Vice-Rector for Education
prof. Ing. Milan Pospíšil, CSc.	Vice-Rector for Strategies and Development
prof. Dr. Ing. Karel Bouzek	Dean of FCT
doc. Ing. Vladimír Kočí, Ph.D.	Dean of FET
prof. Ing. Jan Masák, CSc.	Dean of FFBT
prof. Ing. Michal Přibyl, Ph.D.	Dean of FCE
prof. Ing. Aleš Helebrant, CSc.	Department of Glass and Ceramics, FCT
prof. Dr. Ing. David Sedmidubský	Department of Inorganic Chemistry, FCT
prof. Ing. Václav Švorčík, DrSc.	Department of Solid State Engineering, FCT
prof. Ing. Radek Cibulka, Ph.D.	Department of Organic Chemistry, FCT
prof. Ing. Petr Zámostný, Ph.D.	Department of Organic Technology, FCT
prof. Ing. Pavel Jeníček, CSc.	Department of Water Technology and Environmental Engineering, FET
doc. Ing. Jan Bartáček, Ph.D.	Department of Water Technology and Environmental Engineering, FET
prof. Ing. Kateřina Demnerová, CSc.	Department of Biochemistry and Microbiology, FFBT

prof. Ing. Jana Hajšlová, CSc.	Department of Food Analysis and Nutrition, FFBT
prof. Ing. Karel Melzoch, CSc.	Department of Biotechnology, FFBT
prof. Ing. Tomáš Ruml, CSc.	Department of Biochemistry and Microbiology, FFBT
prof. Ing. František Štěpánek, Ph.D.	Department of Chemical Engineering, FCE
prof. RNDr. Petr Slavíček, Ph.D.	Department of Physical Chemistry, FCE
prof. Ing. Vladimír Setnička, Ph.D.	Department of Analytical Chemistry, FCE
External members of SB	
Ing. Libor Ansorge, Ph.D.	T. G. Masaryk Water Research Institute
RNDr. Martin Bilej, DrSc.	Institute of Microbiology of the Czech Academy of Sciences
prof. Ing. Tomáš Brányik, Ph.D.	Research Institute of Brewing and Malting
prof. Ing. Miroslav Fikar, DrSc.	Rector, STU Bratislava
prof. Ing. Martin Fusek, CSc.	Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences
prof. RNDr. Libor Grubhoffer, CSc.	Member of the NAB Board, Emeritus Rector
doc. Ing. Tomáš Herink, Ph.D.	Unipetrol, a.s.
prof. RNDr. Jan Konvalinka, CSc.	Vice-Rector, CU
prof. Ing. Petr Konvalinka, CSc.	Vice-Chair, TA ČR
Ing. Martin Kubů	Agrofert, a.s.
Mgr. Aleš Laciok, MBA, FEng.	ČEZ, a. s.
prof. Ing. Miroslav Ludwig, CSc.	Vice-Rector, Emeritus Rector, University of Pardubice
prof. MUDr. Pavel Martásek, DrSc.	Director, BIOCEV
prof. RNDr. Ivan Němec, Ph.D.	Vice-Rector, Faculty of Science, CU
prof. RNDr. Patrik Španěl, Dr. Rer. Nat.	J. Heyrovský Institute of Physical Chemistry of the Czech Academy of Sciences

Board of Trustees of UCT Prague

Mgr. Jan Duspěva	Chair of BT (since 6 April 2020)
Ing. Petr Knapp	Vice-Chair (since 6 April 2020)
doc. Ing. Jiří Krechl, CSc.	Vice-Chair (since 6 April 2020)
prof. RNDr. Eva Zažímalová, CSc.	
Ing. arch. Bohumil Beránek	
prof. Ing. Jiří Drahoš, DrSc.	
Ing. Milan Teplý	since June 2020
Ing. Josef Láska, MBA	since 5 June 2020
Ing. Jiří Michal	
Ing. Bohdan Wojnar	

Internal Evaluation Board of UCT Prague

prof. Dr. RNDr. Pavel Matějka	Chair of IEB
prof. Ing. Milan Pospíšil, CSc.	Vice-Chair of IEB
prof. Ing. Radek Cibulka, Ph.D.	Chair of AS UCT Prague
prof. Ing. Michal Přibyl, Ph.D.	Dean of FCE UCT Prague
doc. Ing. Vladimír Kočí, Ph.D.	Dean of FET UCT Prague
prof. Ing. Jan Masák, CSc.	Dean of FFBT UCT Prague
prof. Dr. Ing. Karel Bouzek	Dean of FCT UCT Prague
prof. RNDr. Marie Urbanová, CSc.	Department of Physics and Measurements, FCE
doc. Ing. Pavel Čapek, CSc.	Department of Organic Technology, FCE
prof. Ing. Jana Hajšlová, CSc.	Department of Food Analysis and Nutrition, FFBT
prof. Ing. Václav Janda, CSc.	Department of Power Engineering, FET
Ing. Stanislav Valtera	Representative of students of UCT Prague
doc. RNDr. Josef Cvačka, Ph.D.	Faculty of Science CU, Institute of Organic Chemistry and Biochemistry of the CAS
Ing. Veronika Kramaříková, MBA	Vice-Rector for Development and Strategy, CTU

Ing. Ivan Souček, Ph.D.	Director of the Association of Chemical Industry of the Czech Republic, member of the Board of the Institute of Chemical Process Fundamentals of the CAS

d) Representation of university in representation of universities

Czech Rectors Conference

prof. Dr. RNDr. Pavel Matějka	Member

Council of Higher Education Institutions

prof. Ing. Milan Pospíšil, CSc.	Chair of the Council of Higher Education Institutions
prof. Ing. Radek Cibulka, Ph.D.	
Ing. Svatopluk Henke, Ph.D.	
Ing. Daniel Maxa, Ph.D.	
prof. Ing. Oto Mestek, CSc.	
doc. Ing. Petr Sysel, CSc.	

Students' Chamber of CHEI

Ing. Mariana Hanková (delegate)

Bc. Matěj Malý (alternate member)

e) Mission, vision and strategic goals of university

The mission, vision and strategic priority goals of UCT Prague are stated in the Long-Term Plan for Educational and Scientific, Research and Development and Innovation, Artistic and Other Creative Activity of the University of Chemistry and Technology in Prague, 2016–2020.

UCT Prague and its current high quality and renown are based on the long tradition of teaching technical chemistry in the Czech Republic and in central Europe. Therefore, UCT Prague defines itself as a distinctly supraregional research technical university with high-quality basic and applied research in a wide range of chemical, technological, engineering, materials, biochemical, biotechnological, pharmaceutical and food disciplines.

The vision of UCT Prague is to maintain its leading position as a top research institution in the field of both basic and applied research in the Czech Republic and in central Europe.

The mission of UCT Prague is to train top university educated specialists for manufacturing practice, public and state administration as well as leading research and scientific workers who

contribute to increasing of the country's competitiveness and the development of economy based on knowledge and innovation. An indispensable part of the UCT Prague mission is the active promotion of technical and nature sciences among the public with a direct impact on the young generation as well as spreading the values of democracy, openness, education and culture in our society.

The 2016–2020 Long-Term Plan and its update (Plan for the Implementation of the Strategic Plan) for 2020 includes priority goals and activities aiming at the fulfilment of the vision formulated above. For every priority goal in the 2016–2020 Long-Term Plan fulfilment indicators are suggested the observation of which will ensure a full control over the fulfilment of key aspects of priority goals at UCT Prague. The priority goals (PG) are divided into the following 8 areas:

- PG1 Optimization of the system of education in order to increase the quality and efficiency of studies
- PG2 Development and sustainability of scientific and research activity, efficient cooperation with the practice, technology transfer
- PG3 Better employability of graduates and deepening of cooperation with partners from practice
- PG4 Development and renovation of infrastructure of the university
- PG5 Maintaining and developing the level of relationships with study applicants
- PG6 Support to staffing of main activities of university
- PG7 Development of efficient international cooperation (internationalization)
- PG8 Optimization of internal and external communication

All activities of the institution are aimed at defining the university as a research technical university with high-quality basic and applied research and international renown in the field of education, science and research.

In 2020, UCT Prague began with the preparation of the Strategic Plan for 2021 and beyond. Representatives of the academic community at the university were involved in the preparation of the Strategic Plan. The final text of the new Strategic Plan, including a newly formulated mission and vision of UCT, for the next years was completed at the beginning of 2021.

f) Changes to internal regulations registered by the Ministry of Education, Youth and Sports in 2020

In 2020, the following changes were made to internal regulations of UCT Prague:

- On 30 April 2020, the Ministry of Education, Youth and Sports registered the internal regulation *Study and Examination Rules of the University of Chemistry and Technology in Prague*.

- On 9 June 2020, the Ministry of Education, Youth and Sports registered the internal regulation *Jednací řád Vědecké rady Vysoké školy chemicko-technologické v Praze* (Rules of Procedure of the Scientific Board of the University of Chemistry and Technology in Prague).

g) Providing information pursuant to Section 18, Act No. 106/1999 Coll., on Free Access to Information

In order to enforce Act No. 106/1999 Coll., on Free Access to Information, as amended, an internal document has been prepared at UCT Prague that governs the process of submitting and processing requests for information. In 2020, the following number of requests were processed pursuant to the Act above:

- number of submitted requests for information: 6
- number of submitted decisions on rejecting of a request: 0
- number of submitted appeals from a decision to reject a request: 0
- list of provided exclusive licences: 0
- number of complaints lodged under Section §16a of the Act: 0