

Annual Report 2021



SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA





Oliver Moravčík
Rector

In 2021,

the STU along with the whole society experienced complicated and unprecedented situations and events. The University activities were marked by the restrictions associated with pandemic. However, thanks to the commitment of teachers, students and many other employees, we managed even in difficult conditions to handle the tasks regularly and with honour.

We also successfully managed the process of implementing a new internal quality system at STU. This is an important step and proof that this University places special emphasis on quality, which has been also confirmed by the current domestic and international rankings. Our graduates are the most preferred on the market, and STU is the only Slovak university among those 550 evaluated world universities in the QS Graduate Employability Rankings 2022.

Decline in the number of students in our University was halted mainly thanks to the growing number of foreign students. In a short time, we have managed to fully functional all University bodies, and the new University Management vigorously began to accelerate the processes towards a better, more efficient and more attractive STU. The modern teaching premises, state-of-the-art laboratories and renovated dormitories and sports grounds, which are gradually becoming a reality, will be part of the future top campus, built together with partners within the CEVIS project.



SLOVENSKA
TEHNIŠKA UNIV





KEY FIGURES

171 444

graduates

10 678

students

1 403

teaching and
research staff

904

research
projects

447

study
programmes

366

contractual
research
projects

103

framework
agreements with
foreign universities

48

international
projects

7+1

faculties (schools)
+ university institute





The Slovak University of Technology in Bratislava provides university education in engineering disciplines. Our education system is based on scientific research as well as artistic, engineering and other creative activities. Our faculties, departments, institutes and experts cooperate directly with industrial companies and social organisations, actively taking part in the international cooperation.

Vision

The Slovak University of Technology in Bratislava strives to be an internationally recognized, research-oriented technical university. It seeks to provide high quality and internationally comparable education to a wide spectrum of the young generation students in the promising fields, the education based on independent and critical thinking, entrepreneurship and creativity, targeted to practical application and success in life, while regarding the human aspects of education and technological progress. The University is also determined to contribute to the economic and social development of the Region.

Mission

As a research-oriented technical university, the STU's mission is to attain, apply and disseminate new knowledge through scientific research, engineering and other creative activities, and educate and enlighten the young generation in the spirit of the principles of humanism and goodwill. The STU develops harmony, knowledge, wisdom, philanthropy and creativity in a person, thus contributing to the development of education, science, culture and health for the progress and benefit of the knowledge-based society.

Rector:

Oliver Moravčík,
Dr. h.c., Prof.h.c., Prof. Dr. Ing.

Chair

of the Academic Senate:

Marián Peciar, Prof. Ing., PhD.

Chair

of the Administration Board:

Vladimír Slezák, Ing.





Faculties & Institutes

● FACULTY OF CIVIL ENGINEERING

www.svf.stuba.sk

Building structures, services and technologies; geodesy and cartography; land structures; transportation structures; mathematical-computational modelling; water structures and water systems

● FACULTY OF MECHANICAL ENGINEERING

www.sjf.stuba.sk

Applied mechanics & mechatronics; automation of machines; automobiles & mobile machines; chemical and food machinery; metrology & production quality systems; thermal, hydraulic and production machinery

● FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

www.fei.stuba.sk

Applied informatics & communication systems; cybernetics, robotics & smart technologies; electronics; electrical engineering; nuclear & physical engineering, power engineering

● FACULTY OF CHEMICAL AND FOOD TECHNOLOGY

www.fchpt.stuba.sk

Biotechnologies; chemical engineering; environmental engineering; food chemistry & technologies, fuels & polymers; inorganic & organic technologies; inorganic, organic, analytical & physical chemistry

● FACULTY OF ARCHITECTURE AND DESIGN

www.fa.stuba.sk

Architecture & urban development; product design

● FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY

www.mtf.stuba.sk

Automation & informatics in industry; industrial management; materials engineering; processing and application of non-metals; production machinery and systems; production technologies

● FACULTY OF INFORMATICS AND INFORMATION TECHNOLOGIES

www.fiiit.stuba.sk

Computer engineering; information security; information systems security; Internet technologies

● INSTITUTE OF MANAGEMENT

www.stuba.sk

Entrepreneurship; investment planning; spatial planning



Highlights of 2021

STU IN THE WORLD RANKINGS

The Slovak University of Technology is ranked in three important world rankings: QS World University Rankings®, THE (Times Higher Education) World University Rankings and U.S. News Best Global Universities.

STU is the only Slovak university among the 550 evaluated ones in the QS Graduate Employability Rankings.

In the QS World University Rankings®, STU ranked 801–1000 out of 1,300 evaluated universities, while, besides STU, five other Slovak universities were ranked.

In THE World University Rankings, STU was ranked 1201–1650 out of 2112 evaluated universities, while besides STU, seven other Slovak universities were ranked.

In the ranking of U.S. Pat. News Best Global Universities, which has been comparing American universities with the world ones for 30 years, four universities from Slovakia, including STU, were rated.

In all three rankings, STU is rated as the best university of technical focus in Slovakia. STU ranked second out of 32 evaluated universities in Slovakia in the UniRank which evaluates the quality, trustworthiness and popularity of university websites and profiles on social networks.

SIGNIFICANT RESULTS IN THE FIELD OF SCIENCE, TECHNOLOGY AND ART

In June 2021, the 2020 Scientist of the Year Award was granted in the category of **Technologist of the Year**.

The award was won by Prof. Ing. Marián Peciar, PhD. ● for his extraordinary contribution to the development in the fields of new non-traditional and unique technologies for processing the dry and wet powder and granular substances and the advanced materials to be deployed in Industry 4.0 systems, and also education of young technologists.

In May 2021, the Slovak Republic Ministry of Economy announced the 14th year of the competition for the **"Innovative Act of 2020"** Award of the Slovak Republic Minister of Economy. The 1st place in the Technological Innovation category was won by a unique waste-free technological line for processing the multicomponent fertilizers, using the patented flat matrix granulation technology. The project

was developed on the basis of the research at the STU Faculty of Mechanical Engineering in Bratislava.

The CE Award for AR 2021 for Restoration of a Farm Building/the Uhrovec Castle (the category of Architecture Phenomena) was won by the architects Martin Varga, Mgr. Art and Pavol Pauliny, Ing. Arch., PhD. ●.

The team of authors J. Šugárová, P. Šugár and B. Ludrovcová ● won the Excellence Innovation Award for Innovative advanced manufacturing processes for high complexity tooling at the **Inno Wings 2021** International Exhibition of technological innovations in October 2021 in Lublin (PL) in the category of Material Technologies, Production and Logistics Processes.

Michal Bogár, Ing. Arch. ● is one of the authors of the Victorious Design for the Pontifical Mass of Pope Francis in Šaštín in 2021.

Education

STU holds the **ECTS Label** certificates (as one of the three universities in the Slovak Republic) and the **DS Label** certificates (as one of the five universities in the Slovak Republic). It provides an attractive and high-quality university education, as evidenced by the high employment rate of its graduates, reaching almost 100 %, while their starting salaries being the highest in the economy of Slovakia. A long-term positive trend in education of the STU graduates is cooperation with practice, as evidenced by numerous awards of the STU students.

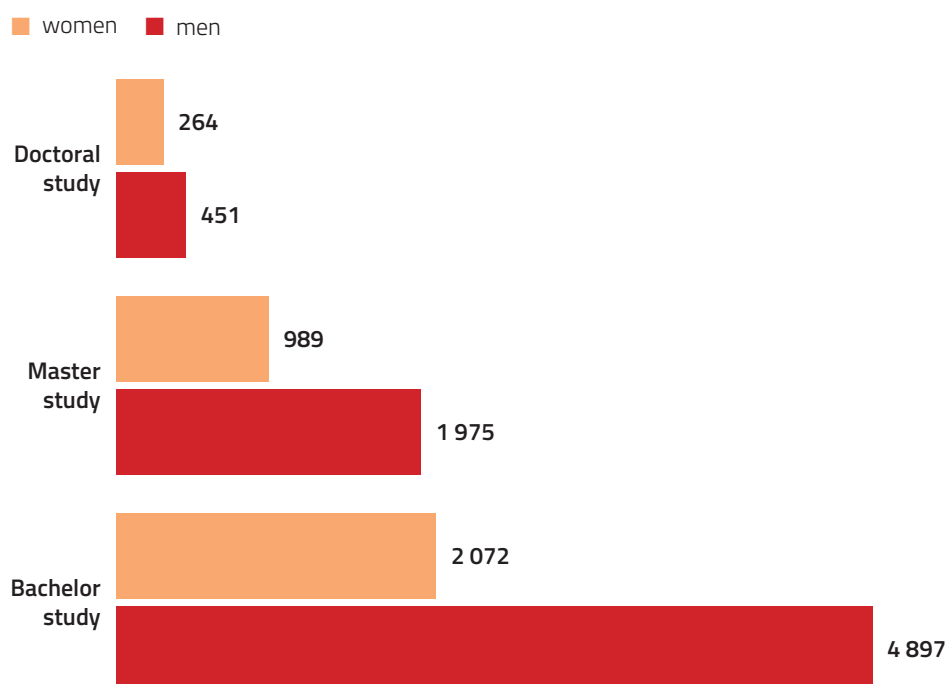
In the academic year 2020/2021, education was carried out within a total of 177 full-time study programmes in the Slovak language or in a combination of Slovak and English: 60 in the Bachelor, 61 within the Master and 56 within the Doctoral degrees of education.

Within the external form of study, education was carried out only in 57 Doctoral degree study programmes. Education in English language was performed in a total of 20 study programmes: four within the Bachelor, six within the Master and five within the Doctoral degrees of full-time study form, and five within the external form of study within the Doctoral degree.

STU also provides a professionally oriented Bachelor degree study programme of "Operations Technician of Transport and Production Technology" at the STU Faculty of Mechanical Engineering in cooperation with VOLKSWAGEN SLOVAKIA, a.s.

In the academic year 2020/2021, STU had a total of 10,678 students, of which 6,969 Bachelor, 2,964 Master and 745 Doctoral. As many as 579 doctoral students studied full-time and 166 doctoral students part-time.

STU students, in the academic year 2020/2021



On a nationwide scale, on average only 1/5 of STU students came from the Bratislava Region.

Of the total number of students, 6.9 % were foreign students, with the highest number of students from Ukraine.

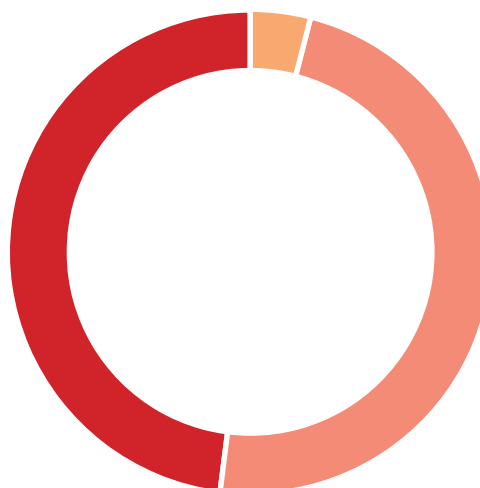
STU students won a total of 130 significant awards, of which 27 on the international and 103 on the national levels.

A total of 810 STU students participated in the student scientific professional activity/student creative scientific professional and artistic activities, while 734 projects were presented in 67 sections of the Student Scientific Conferences.

STU graduates in the academic year 2020/2021

- Bachelor study (1 396)
- Master study (1 371)
- Doctoral study (113)

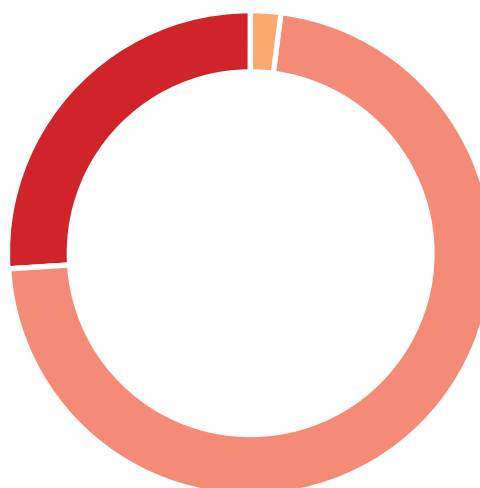
Source: STU



The total number of graduates since the University establishment up to the end of year 2021

- Bachelor study (43 708)
- Master study (123 736)
- Doctoral study (4 000)

Source: STU



INTERNATIONAL ACADEMIC MOBILITY

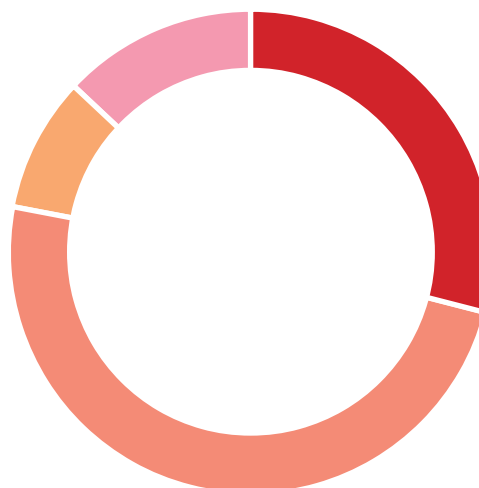
In the academic year 2020/2021, STU recorded a total number of 305 students involved in academic mobility, of which 153 outbound STU students and inbound 152 foreign students. The highest share of the STU international mobility was implemented through the Erasmus+ program.

Compared to the academic year 2019/2020, the number of the inbound students decreased by 25 % and those outbound by 34 %.

The Erasmus+ academic mobility was implemented in 27 participating countries.

Percentage of the outbound STU students/graduates within the Erasmus+ program according to study degree in the academic year 2020/2021

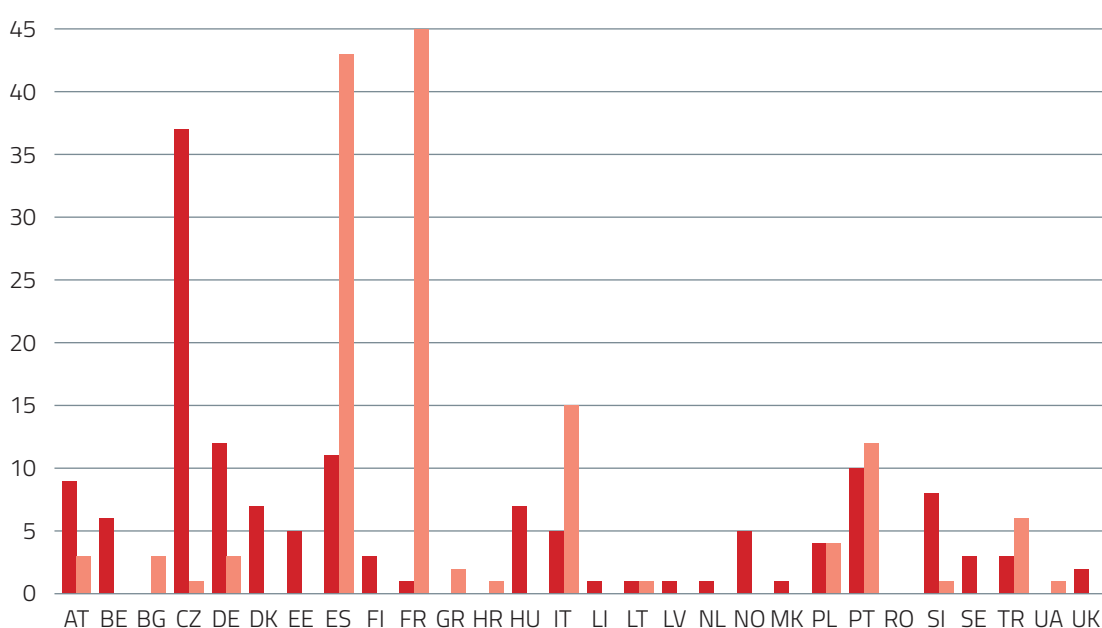
- Bachelor study (29%)
- Master study (49%)
- Doctoral study (9%)
- Graduates (13%)



Source: STU

Overview of the Erasmus+ outbound and inbound students in the academic year 2020/2021 according to country

- Erasmus+ out
- Erasmus+ in



Source: STU



FURTHER EDUCATION

STU provided 101 courses of further education programmes (including 22 accredited and 79 non-accredited) which were attended by 2,341 participants. The educational programmes were conducted mostly in a distance form.

Together with TU Wien (Vienna University of Technology), STU provides, the Professional MBA Automotive Industry study, an accredited e-learning 2-year combined distance training in English. More than 100 graduates of the training include managers of major manufacturing and non-manufacturing global companies from 29 countries in Asia, Europe, Africa and the Americas.

In the academic year 2020/2021, a total of 1,239 registered candidates (seniors) applied for studies within the **University of the Third Age** (UTV). Owing to the COVID-19 pandemic and the transition to distance learning, only 252 participants attended online training programmes.

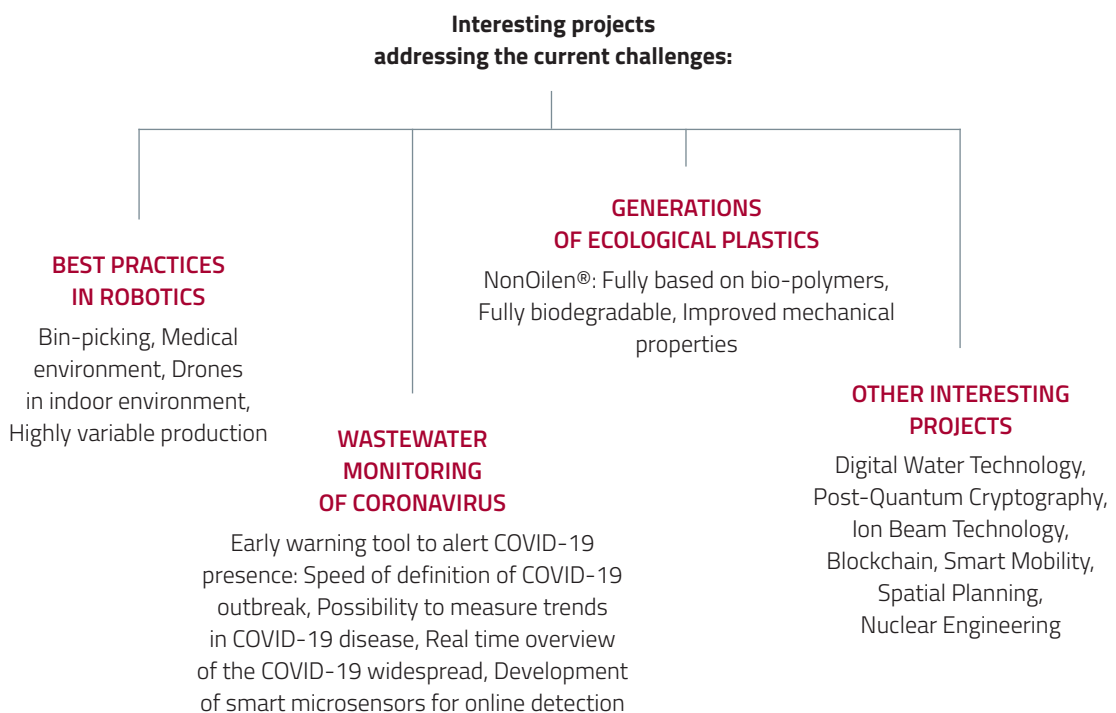
The Language Centre of the Institute of Lifelong Learning provides language training programmes to the foreigners interested in studying in the Slovak language. In the academic year 2020/2021, the Slovak language intensive module (levels A1 to B1) was attended by 45 foreign students interested in studying at STU in the Slovak language.





Research

Research plays the key role in education process. Thanks to the research, we are able to prepare well educated and highly trained experts. Our graduates work with the latest knowledge and receive hands-on experience with the most recent technologies, while discovering new knowledge and technical solutions. Current interesting projects include robotics, wastewater monitoring of coronavirus, development of ecological plastics, spatial planning etc.



GRANT SCHEMES

The basic prerequisites for implementation of scientific research are the funds obtained from the budget, based on the external factors determined by the University evaluation (comprehensive accreditation; the University share of the indicators determining the distribution of subsidies for the current calendar year).

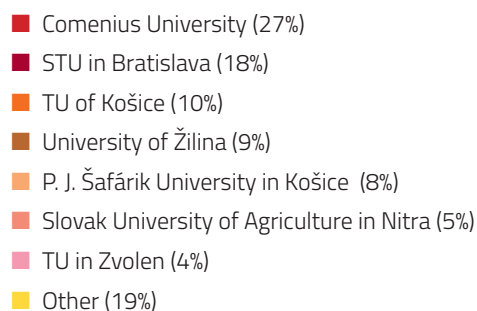
The above-mentioned internal factors show the existing research capacity of the University, its instrument pool and workplace infrastructure. Regarding those indicators, STU is one of the best universities in Slovakia.

Domestic Research Grants

Seven Slovak universities received 81 % of the funds.

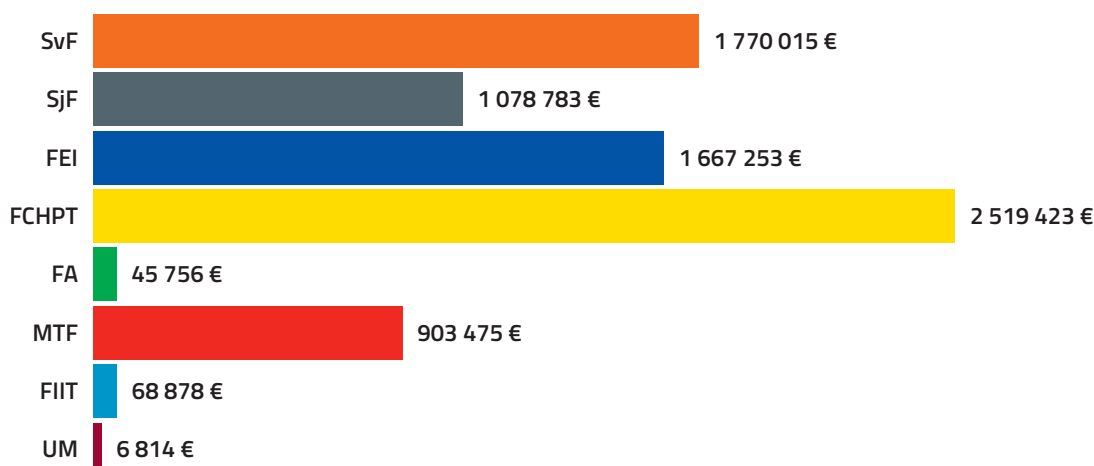
STU received 18 % out of the total volume of the above-mentioned funds.

Share of the public universities in domestic grants



Source: MŠVVaŠ SR

Financial means from the domestic grant agencies according to individual STU parts in the year 2021



Source: STU

Foreign Research Grants

Up to 83 % of funds were obtained by seven universities, while the share of STU represents 21 %.
In other foreign grants, STU is the second, and its share in the total volume of obtained funds represents 9 %.

Share of public universities in the foreign research grants



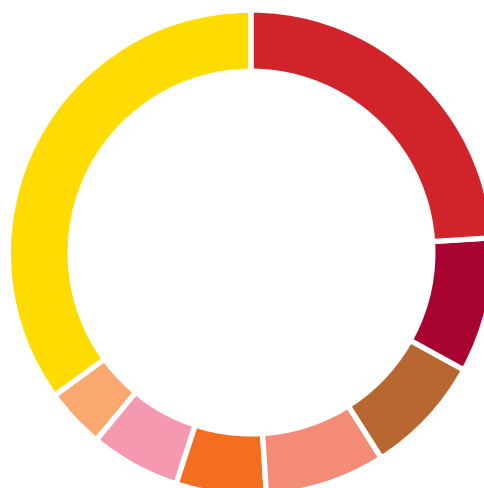
Source: MŠVVaŠ SR



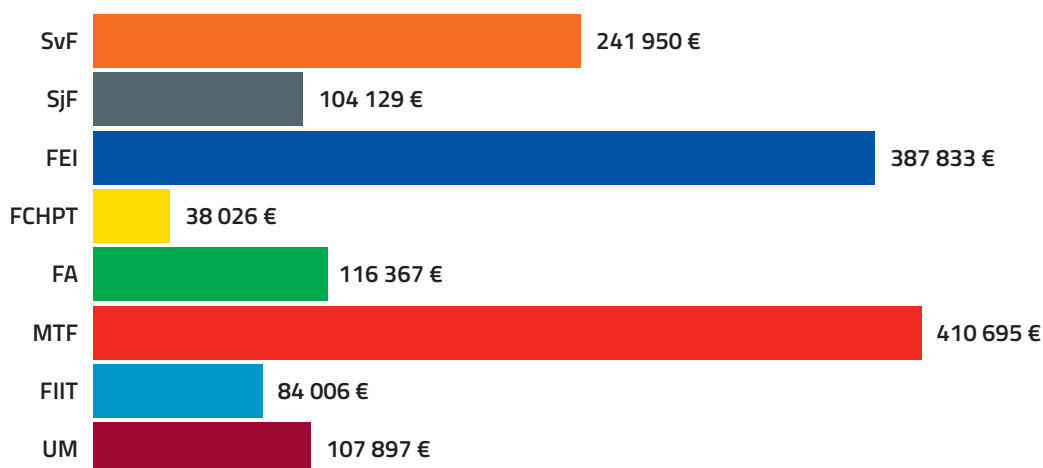
Share of the public universities in other foreign grants



Source: MŠVVaŠ SR



Share of the STU parts in foreign grants



Source: MŠVVaŠ SR

HORIZON EUROPE









STU has been involved in the international scientific research programmes for many years. STU has been involved in the HORIZON 2020 calls of the European Research and Innovation Framework Program since the beginning of 2014.

By 31 December 2021, STU staff have submitted a total of 307 applications under this programme, of which 41 project proposals were approved and intended for funding, while other 105 proposals exceeded the point threshold after the evaluation process.

In 2021, STU joined the final open calls of the Horizon 2020 programme, submitting the last six project applications.

STU staff submitted the first 20 projects to the new EU Research & Innovation Framework programme.

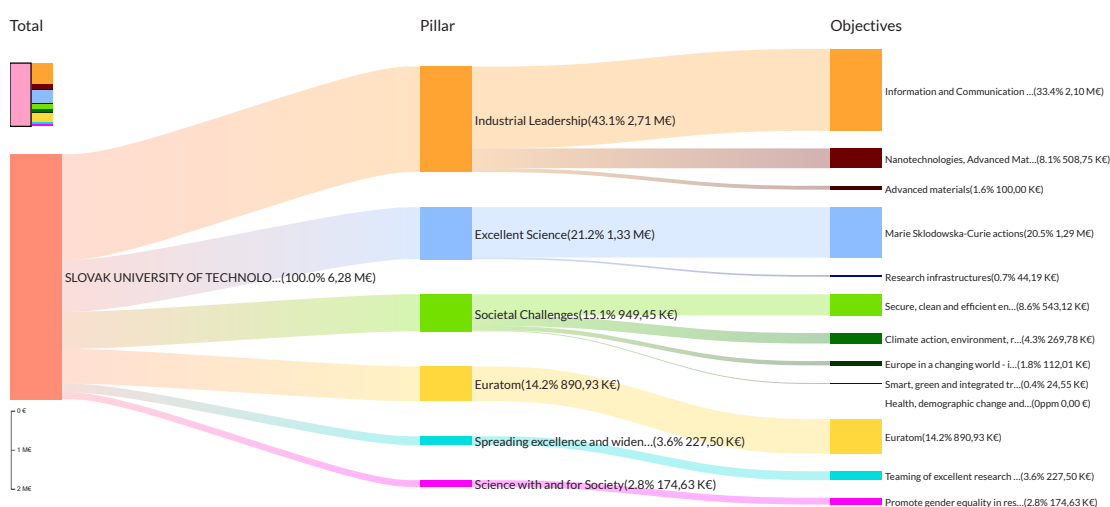
Project applications

									Σ
H 2020	1	1	/	1	1	1	/	1	6
Horizon Európa	1	/	11	3	/	3	2	/	20

Source: Funding & tender opportunities portal, Single Electronic Data Interchange Area (SEDIA)

STU belongs the best institutions in Slovakia in terms of both, the number of funded projects as well as the volume of contributions received from the European Commission. The European Commission included STU in the evaluation of the implementation of the Horizon 2020 framework programme to support research and innovation in the first 5 years of the programme existence among the TOP five participants from Slovakia. The H2020 projects implemented in 2021 are listed in the Table Appendix (Page 34).

Distribution of the funds contracted within H2020 projects at STU according to individual H2020 pillars and topics



Source: signed projects, eCORDA H2020 database, 2021-12-04 (h2020viz.vinnova.se)

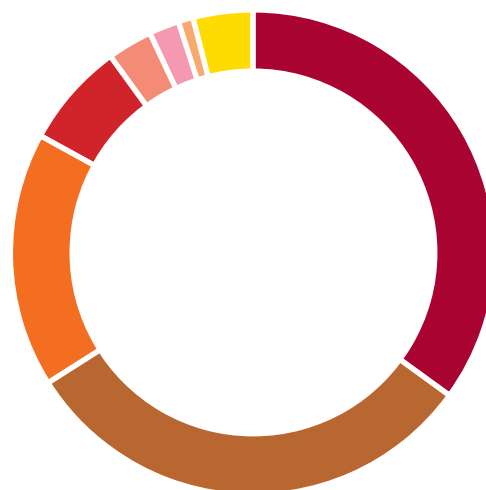
CONTRACTUAL RESEARCH

Departments of the STU faculties in Bratislava deal with the research projects for domestic and foreign economic entities in the form of contractual research, which is obtained in a competitive form with exactly defined subject of performance and form of output, and its results are usually handed over upon the review of the results. In 2021, 366 contractual research projects for industrial practice were solved at STU.

Share of the public universities in the research projects from other subjects



Source: MŠVVaŠ SR

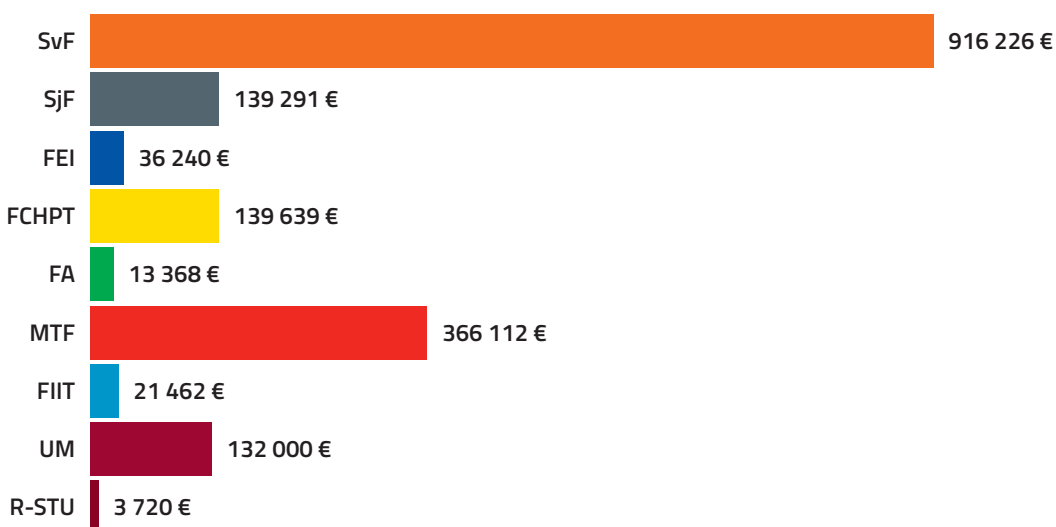


Contractual research projects

No. of projects	49	17	2	21	2	269	4	2	Σ

Source: STU

Research contracts for work



Source: STU

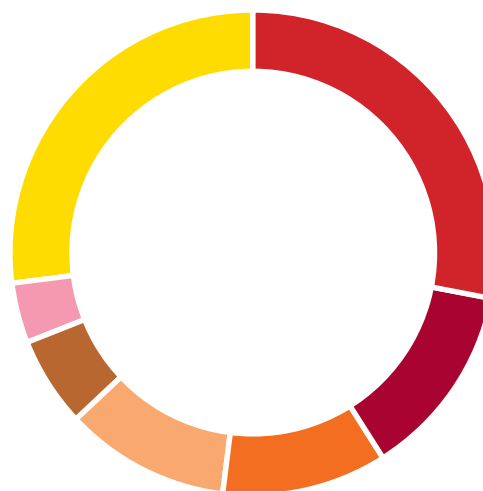
OUTPUT OF CREATIVE ACTIVITY

The level of creative output is a decisive factor in evaluating the quality of scientific and artistic activity in individual university. The STU share in the publication output of universities in Slovakia represents 13 %; STU thus ranks the second most productive university.

Share of the public universities in the total publication activity as a basis for funds division

- Comenius University (28%)
- STU in Bratislava (13%)
- TU of Košice (11%)
- P. J. Šafárik University in Košice (11%)
- University of Žilina (6%)
- TU in Zvolen (4%)
- Other (27%)

Source: MŠVVaŠ SR

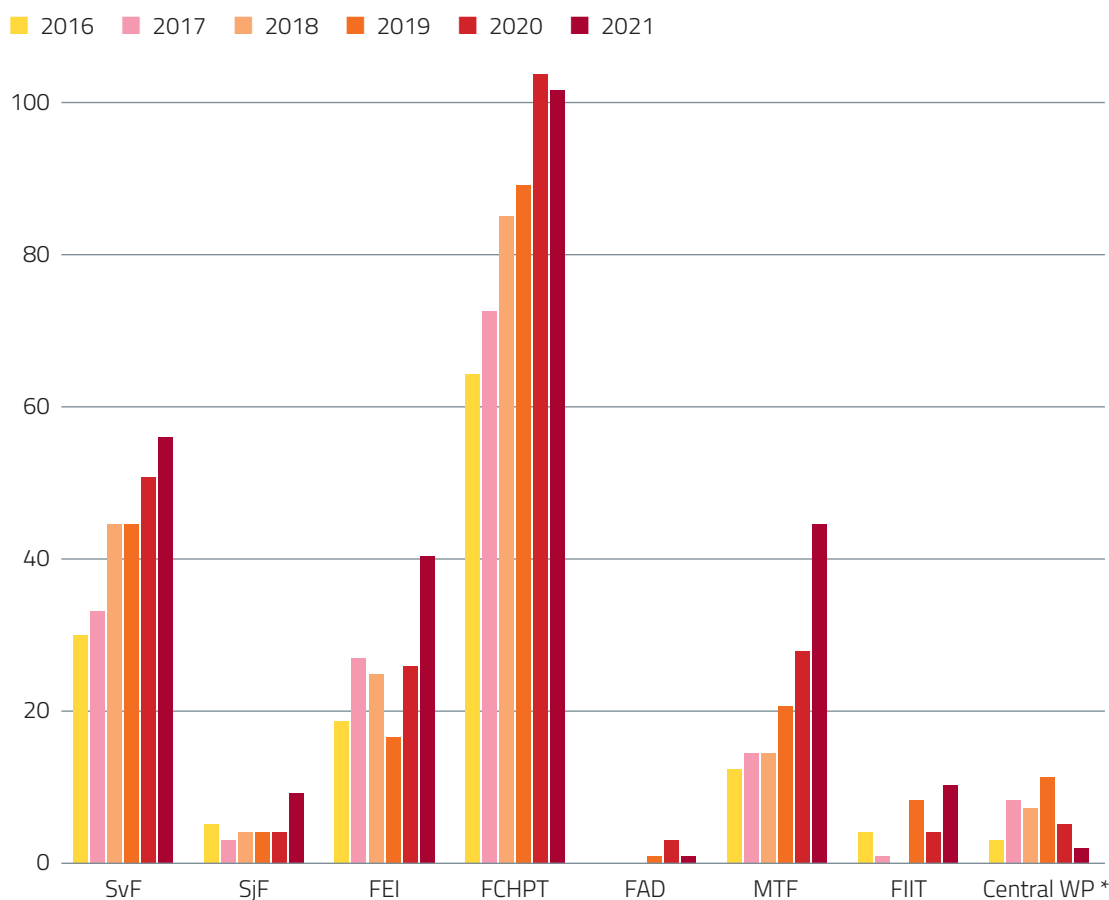


Compared to selected universities, STU shows more than 0.15 publications per a creative employee, while indicating a growing trend in the number of publications.

The development of the number of records of individual STU faculties indexed in the Web of Science in individual quartiles can be monitored since 2016, as shown in the Table Appendix (Page 33).

The number of publications of individual STU faculties indexed in the Web of Science in Q1 proves the highest number of indexed records with the growing trend since 2016 at the Faculty of Chemical and Food Technology. The second highest share is reported by the Faculty of Civil Engineering.

Number of publications of individual STU faculties in Web of Science v Q1



Source: ARL Library system / * Central workplaces

Number of publications of individual STU faculties in Scopus, registered in ARL

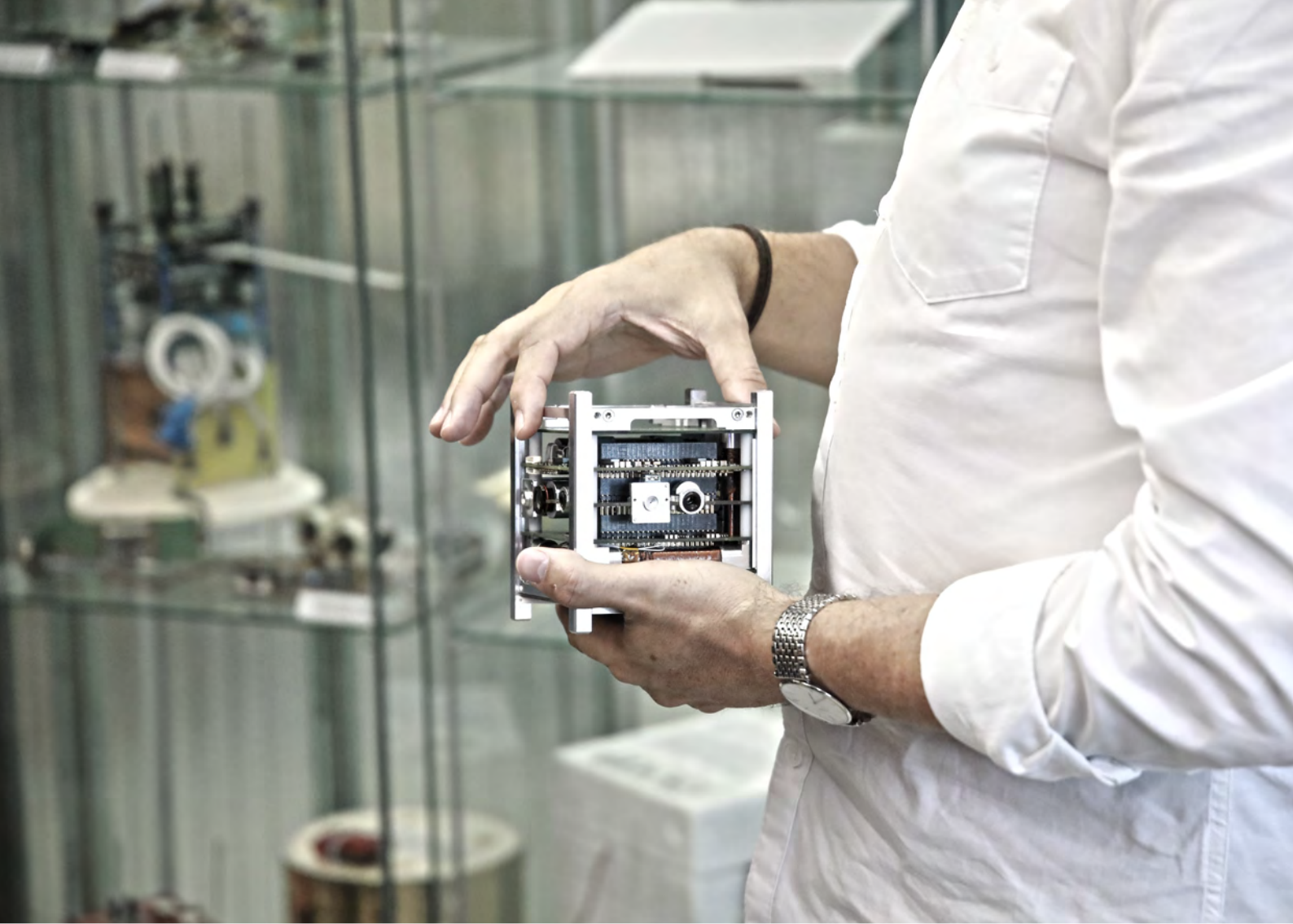
	●	●	●	●	●	●	●	●	Σ
2016	186	60	238	34	30	124	68	24	732
2017	275	87	191	15	22	163	59	27	816
2018	212	87	248	51	25	137	48	9	780
2019	302	86	231	138	43	180	78	31	1045
2020	274	65	224	210	23	180	43	15	1001
2021	150	36	191	189	24	145	23	11	737

Source: ARL Library system

EXCELLENT PUBLICATIONS OF THE STU AUTHORS

According to the InCites database, **Dagmar Cagánová** is the author of the publications with the highest number of citations in the Web of Science in 2021.

The publications published in the years 2019 to 2021 that obtained the attribute of the Highly Cited Papers in the database of WOS journals according to impact factors are those by the authors **Ján Szolgay** and **Silvia Kohnová**.



INTERNAL SCHEMES TO SUPPORT CREATIVE ACTIVITIES AT STU

STU continuously strives to identify and support both individuals and excellent research teams through a number of internal mechanisms. Those include the schemes to support excellent creative teams, young researchers, excellent teams of young researchers and the offer of postdoctoral positions.

Excellent creative teams at STU

The scheme identifies the teams with outputs at an internationally recognized level with potential of further growth. The identified teams receive the status of an excellent team along with the appropriate support for their activities for a period of two years. Currently, there are 16 teams at STU, whose activities are supported by the amount of € 300,000 during the first and second year.

- **New generation gravity field model of the Slovak Republic**

Team leader: Juraj JANÁK, Prof. Ing., PhD.

Numerical modeling and data analysis

Team leader: Karol MIKULA, Prof. RNDr., DrSc.

Advanced methods of evaluating the concrete structures and bridges

Team leader: Jaroslav HALVONÍK, Prof. Ing., PhD.

- **Excellent team for research of diagnostics and quality classification, and dimensional tolerances of energy beam cutting machines**

Team leader: Juraj BENIAK, doc. Ing. PhD.

Predictive control of mechatronic systems and industrial processes

Team leader: Boris ROHAL-ILKIV, Prof. Ing., CSc.

- **Application of nuclear-physical methods and techniques in nuclear engineering**

Team leader: Vladimír NEČAS, Prof. Ing., PhD.

Design of energy-autonomous electronic systems on a chip

Team leader: Viera STOPJAKOVÁ, Prof. Ing., PhD.

Virtual teleport

Team leader: Gregor ROZINAJ, Prof. Ing., PhD.

- **Analytical methods for the quality and safe food and environment**

Team leader: Ivan ŠPÁNIK, Prof. Ing., DrSc.

Optimal and predictive process control

Team leader: Michal KVASNICA, doc. Ing., PhD.

Polymer materials and technologies

Team leader: Ivan HUDEC, Prof. Ing., PhD.

Multilevel intensification of chemical processes and industrial clusters

Team leader: Ľudovít JELEMENSKÝ, Prof. Ing., DrSc.

- **Sustainable design of (human) environment**

Team leader: Robert ŠPAČEK, Prof. Ing. arch., CSc.

- **Excellent team of diagnostics and characterisation of materials**


Team leader: Peter JURČI, Prof. Ing., PhD.

Soldering

Team leader: Roman KOLEŇÁK, Prof. Ing., PhD.

- **SPECTRA, the Central Europe Excellence Research Centre in the field of space planning and Centre of Excellence for the development of residential infrastructure**

Team leader: Maroš FINKA, Prof. Ing. arch., PhD.



Projects to support young researchers

The programme to support young researchers is one of several STU motivational tools. In 2021, for the eleventh year in a row, the projects of young researchers succeeded in the competition within the scheme of the Programme for the Young Researchers Support and won grants from STU for their scientific research projects. In accordance with the current Directive, young staff (PhD students and staff under 30) submitted a total of 133 projects, while 51 projects were funded, of which 20 projects were submitted by women and 31 men.

Excellent teams of young researchers

Another support for young researchers is the Grant Scheme an extension of the youth programme, to support excellent teams of young researchers in the conditions of the Slovak University of Technology in Bratislava. The programme was joined by six faculties forming joint 15 teams.

The highest rated projects:

Additive production of advanced composite materials and their dimensional stability during high-temperature processing ●

Main researcher: Peter VETEŠKA, Ing., PhD.

Design of optimal controllers for industrial microprocessor platforms ●

Main researcher: Michaela HORVÁTHOVÁ, Ing.

Optimization of an innovative device for separation of volatile organic compounds formed by fermentation ●

Main researcher: Ľudmila GABRIŠOVÁ, Mgr., PhD.

Progressive sensory system for evaluating human body temperature based on modern organic materials in real time ●●

Main researcher: Juraj NEVŘELA, Ing., PhD.,

Light-activated magnetic materials ●●

Main researcher: Barbora BRACHŇÁKOVÁ, Ing., PhD.

Tertiary wastewater treatment study for possible re-use ●●

Main researcher: Ronald ZAKHAR, Ing., PhD.

Impact of climate change on urban drainage systems ●●

Main researcher: Réka WITTMANOVÁ, Ing.

Postdoctoral positions

Since 2016, two-year postdoctoral stays have been implemented at STU. Work stays for young workers under the age of 35 continued in 2021 with five postdocs who started in 2020:

- **Assessment of the impact of the parameterization of precipitation runoff models on the estimation of the climate change effects**
(Silvia KOHNOVÁ, Prof. Ing., PhD.; postdoc Zuzana NÉMETHOVÁ, Ing., PhD.)
- **Development of printing technology for flexible sensors based on organic electronics**
(Martin DONOVAL, doc. Ing., PhD.; postdoc Miroslav NOVOTA, PhD.)
- **Practical synthesis of antibiotics effective against the most dangerous bacterial pathogens**
(Pavol JAKUBEC, doc. Ing., PhD.; postdoc Tomáš MALATINSKÝ, Ing., PhD.)
- **Obtaining biologically active substances from the waste plant biomass, and their application in functional foods**
(Štefan SCHMIDT, Prof. Ing., PhD.; postdoc Zuzana BURČOVÁ, Ing., PhD.)
- **Sub-zero treatment of ledeburitic steels for cold work**
(Peter JURČI, Prof. Ing. PhD.; postdoc: Juraj ĎURICA, Ing., PhD.)

In 2021, STU participated in two calls announced under the SASPRO 2 programme. Its purpose is to motivate researchers within 15 years of graduation to apply for the position of a visiting researcher at a university. Out of the 21 applications submitted, eight researchers from different countries were selected and approved for funding. The SASPRO 2 programme is implemented within the EC Horizon 2020 MSCA-Cofund project. Researchers will be admitted to five STU faculties ●●●●●.

STU Doctoral School

The STU Doctoral School covers interdisciplinary educational activities for the development of scientific and research competencies of doctoral students and young researchers in the areas such as publication, presentation skills and communication, research funding and grant writing, career development, research ethics, intellectual property protection, etc.

In the winter semester of 2021/2022, the subject of Methodology of Scientific Work was presented to the doctoral degree students for the first time. In the summer semester 2020/2021, seminars of various topics were organized with the aim to prepare and introduce a programme for doctoral students, focused on soft skills.



Awards granted at STU

STU Plaque

Jozef JANOVEC, Prof. Ing., DrSc. ●

Ján MURGAŠ, Prof. Ing., PhD. ●

STU Medal

Radko MESIAR, Prof. RNDr., DrSc. ●

The best woman in science

Mariana DERZSI, doc. Mgr., PhD. ●

Ľudmila GABRIŠOVÁ, Mgr., PhD. ●

Xiaolu HOU, Bc., PhD. ●

Yvonna KOLEKOVÁ, doc. Ing., PhD. ●

Anna KOLEŠÁROVÁ, Prof. RNDr., CSc. ●

Katarína KRISTIÁNOVÁ, doc. Ing. Arch., PhD. ●

Tatiana KLUVÁNKOVÁ, Prof. Mgr., PhD. ●

Andrea ŠAGÁTOVÁ, doc. Ing., PhD. ●



Habilitation and inauguration procedure

In its meetings in 2021, the STU Scientific Board discussed and approved five nominations for the Professors who were subsequently appointed by the President of the Slovak Republic:

Vanda BENEŠOVÁ, Prof. Ing., CSc. (Applied Informatics) ●

Dagmar CAGÁŇOVÁ, Prof. Mgr., PhD. (Economics and Management of Enterprise) ●

Vladimír JANČÁRIK, Prof. Ing., PhD. (Theoretical Electrotechnics) ●

Miloslav KOPECKÝ, Prof. RNDr., PhD. (Engineering Structures and Transport Structures) ●

Michal MASARYK, Prof. Ing., PhD. (Power Machines and Devices) ●

Award of "doctor honoris causa"

On 29 October 2021, the STU Rector granted the title of "**doctor honoris causa**" (Dr.h.c.) to Professor **Günter BLÖSCHL** (TU Wlen), one of the world's most important scientists in the field of engineering hydrology and water management. The proposal was approved by the STU Scientific Board. The honorary title of "doctor honoris causa" was granted to G. Blöschl in recognition of his pioneering contribution to hydrological prediction, including the progress in flood estimation, linking patterns and processes in the river basins with a large regional scope, and as a recognition of benefits in long-term cooperation with STU in Bratislava in the fields of research and education.



Award of "Doctor of technical sciences"

In 2021, the STU Scientific Board approved proposals for granting the "Doctor of technical sciences" to **František KAČÍK, Prof. RNDr., PhD.** and **Lubomír ŠVORC, doc. Ing., PhD.**

The STU Scientific Board also discussed and approved nine proposals for the employing a university teacher as a "visiting professor":

Andrej ALEXÝ, Ing. Arch. ●

Juraj HERMANN, Ing. Arch. ●

Martin KUSÝ, Ing. Arch. ●

Michaela MUSILOVÁ, Dr. ●

Pavel PAŇÁK, Ing. Arch. ●

Štefan POLAKOVIČ, Ing. Arch. ●

Zenon Jan PUDŁOWSKI, Prof. Ing., PhD. ●

Lubomír ZÁVODNÝ, Ing. Arch. ●

Martin WOLLENSAK, Dipl. Ing. ●

Research Support Services

Access to databases of scientific knowledge is an essential part of the work of scientists in the current global and interdisciplinary connection of science and research. STU provides the conditions to support creative activities of employees and students in the form of services provided to the departments of science, and international scientific and technical cooperation, especially with the University Library.

Research Integrity, Open Science, Open Access, OA STU Institutional Repository

STU is committed to fulfilling the obligations defined in the national document of **Declaration on Strengthening Scientific Integrity in Slovakia**, which aims at compliance with the highest ethical standards in the field of research and education integrity, as well as the promotion of Scientific Integrity within the National Code of Ethics.

The concept of open science at STU

In 2021, STU implemented the conceptual material of "Implementation of Open Access Policy at STU", which is in line with the European Commission's Recommendation on Open Access to Scientific Information.

HR Excellence in Research

Following the intention to strengthen the international impact of the University, the STU Management decided on the implementation of the Human Resources Strategy for Researchers and the acquisition of the European HR Excellence in Research Award (HRS4R) in the conditions of STU.

The proposal to start the implementation process was approved in June 2019. In the period 2020 – 2021, the areas to be prioritized within the Human Resources Strategy for Researchers were identified. Simultaneously, the documents necessary to obtain the European HR Excellence in Research Award were prepared and sent to the European Commission in November 2021 for evaluation.

Utilisation of the creative activity results in practice

Protection of the STU industrial property is provided by the Office for Cooperation with Practice. The Office provides industrial property creators with expert advice in the field of industrial property protection, filing applications with the Industrial Property Office of the Slovak Republic, promoting research and development results applicable in practice, finding partners from industry and negotiating with them, etc.

17 Patent applications

15 Granted patents

24 Applications of utility models

56 Registered utility models

1 Trademark application

1 Applications of design

4 PCT applications

3 European patent applications

3 National patent applications

1 National application of a utility model



STU Technology Incubator

A total of 84 companies have been incubated in the University Technology Incubator since its inception (2005). The combined revenues of active companies in 2021 totalled 19.3 million euros. In 2021, 53 projects were incubated within the START programme, and nine startups within the INQB programme. In the autumn, the Incubator prepared a new educational programme in cooperation with its mentors, Grow with Google and other institutions.

On 21 May 2021, a cooperation agreement was signed with the Centre of Scientific and Technical Information (CVTI) of the Slovak Republic. Both parties undertook to organize two professional seminars a year, two "Brokerage events" with international participation and four internal events (mentoring) within the START and INQB programmes.







STU Scientific, s.r.o.

The mission of STU Scientific, s.r.o., is to support the economic valorisation and appreciation of the STU intellectual property, members of its academic community and its other partners in the business sphere. Currently, there are the following spin-off companies established on the University grounds and benefiting from the STU scientific research potential:








- **STUVITAL, s.r.o.**
Research and preparation of fortified cereal products, applying innovative technology of recovery of cereal by-products, and original recipe ingredients.
- **IVMA STU, s.r.o.**
Design of electrodes for spot resistance welding of galvanized sheets. The research was conducted in cooperation with Matador Vráble, a future user of the research results.
- **SMME – STU, s.r.o.**
Research and development in the field of mechatronic systems utilising the latest knowledge and trends in the information, communication and control technologies.
- **Hydrotechnika STU, s.r.o.**
Transfer of the research and development knowledge in the field of water structures into practice.
- **ENFEI s.r.o.**
Operation of the electricity system with a focus on optimizing the development and operation of electrical networks of all voltage levels, as well as the source base of the electricity system of the Slovak Republic. In the area of smart grids, it concerns mainly the preparation of pilot projects, technology designs as well as the testing and verification of systems.
- **B&J NUCLEAR, s.r.o.**
Research and development in the field of natural and technical sciences, nuclear energy sector.

Table Appendix

Awards of individual students or students teams won at the international level

						
Cena K. Štulíka				2		
Female Engineers MOL				1		
Chemistry is life 2020				1		
Jardin Porte aux Oies					1	
KUKA Innovation Award			1			
Silver medal of ZP Publisher						1
Inspireli Awards	1					
Lunawood Urban Challenge 2021	1					
ProHolz Student Trophy 2020	1					
Xella 2020					4	
Championships of Rumania in water polo (1st place)		1				
European Team Shooting Championships (1st place)						1
Indoor European Championships in athletics, men's sprint (3rd place)			1			
Σ	3	1	2	4	5	2

Statistics of appointed Associate Professors (docent)

								Σ
I./2021					3			3
III./2021	2		2			2	2	8
IV./2021			1	3	1	2		7
VI./2021	3	2	5	3	3	1	1	18
IX./2021			1	4				5
XI./2021	2	2				2		6
Σ	7	4	9	10	7	7	3	47

**Number of publications of individual STU faculties in Web of Science
v Q1, Q2, Q3 and Q4 registered in ARL**

	2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
●	29	22	13	6	32	13	19	8	43	18	5	10
●	5	3	1	4	3	4	2	9	4	2	5	6
●	18	21	19	25	26	22	39	34	24	18	28	32
●	62	51	47	23	70	81	45	39	82	62	51	22
●	0	0	0	0	0	1	1	0	0	0	0	1
●	12	11	15	8	14	11	17	14	14	8	23	13
●	4	3	3	4	1	0	0	7	0	2	6	3
●	3	4	3	0	8	5	6	3	7	2	2	1

	2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
●	43	21	14	6	49	28	16	5	54	32	7	5
●	4	1	3	10	4	6	5	5	9	12	1	1
●	16	25	16	28	25	24	16	40	39	43	22	20
●	86	73	44	22	105	73	52	23	102	77	25	10
●	1	0	0	0	3	0	0	0	1	2	0	0
●	20	32	17	11	27	28	14	12	43	37	7	9
●	8	5	3	4	4	3	5	1	10	1	2	1
●	11	12	1	0	5	7	2	2	2	8	0	2














Source: ARL Library system

The H2020 Project application submitted in 2014 – 2021

	●	●	●	●	●	●	●	● *	● **	● ***	Σ
Submitted	37	15.5	85.5	63	9	48	23	19	4	3	307
Funded	5	0	25	3	0	4	1	3	0	0	41
Above threshold/ non-funded	10	2.5	24.5	34	3	18	8	4	1	0	105
Unsuccessful	21	10	26	24	4	15	14	11	0	0	125
NA evaluation	1	3	10	2	2	11	0	1	3	0	36

* Department of Management / ** Rector's Office, Centre for Nanodiagnostics / *** Unidentified

Project solved in the year 2021

	Project title	Acronym	Principle investigator	Faculty	Call identifier	Finance scheme
1	Training European Experts in Multilevel Bioimaging, Analysis and Modelling of Vertebrate Development and Disease	ImageInLife	Karol Mikula, Prof. RNDr., DrSc.		H2020-MSCA-ITN-2016	MSCA-ITN-ETN
2	European Human Biomonitoring Initiative	EHBMI	Ivan Špáňik, Prof. Ing., DrSc.		H2020-SC1-2016-RTD	COFUND-EJP
3	Mitigating Environmentally Assisted Cracking Through Optimisation of Surface Condition	MEACTOS	Vladimír Slugeň, Prof. Ing., DrSc.		EURATOM FISSION NFRP-2016-2017-1	RIA
4	Energy efficient pathway for the city transformation: enabling a positive future	MAKING-CITY	Maroš Finka, Prof. Ing. arch., PhD.		H2020-LC-SC3-2018-ES-SCC	IA
5	European Nuclear Experimental Educational Platform	ENEEP	Ján Haščík, doc. Ing., PhD. Branislav Vrbán, Ing., PhD. - koordinátor		NFRP-2018	CSA
6	European Joint Programme on Radioactive Waste Management	EURAD	Vladimír Slugeň, Prof. Ing., DrSc.		NFRP-2018	COFUND-EJP
7	Directional Composites through Manufacturing Innovation	DiCoMI	Ladislav Morovič, doc. Ing., PhD.		H2020-MSCA-RISE-2017	MSCA - RISE
8	The CALIPER project: Linking research and innovation for gender equality	CALIPER	Dagmar Cagáňová, doc., Mgr., PhD.		H2020-SwafS-2019-1	CSA
9	Joint European Canadian Chinese development of Small Modular Reactor Technology	ECC-SMART	Jarmila Degmová, Ing., PhD.		NFRP-2019-2020	RIA
10	Fracture mechanics testing of irradiated RPV steels by means of sub-sized specimens	FRACTESUS	Vladimír Slugeň, Prof. Ing., DrSc.		NFRP-2019-2020	IA
11	Safety of GFR through innovative materials, technologies and processes	SafeG	Vladimír Slugeň, Prof. Ing., DrSc.		NFRP-2019-2020	RIA
12	STRUctural MATerials research for safe Long Term Operation of LWR NPPs	STRUMAT-LTO	Jarmila Degmová, Ing., PhD.		NFRP-2019-2020	RIA
13	Targeting Real chemical accuracy at the Exascale	TREX	Matúš Dubecký, Ing., PhD.		H2020-INFRAEDI-2019-1	RIA
14	DIH-World - Accelerating deployment and maturity of DIHs for the benefit of Digitisation of European SMEs	DIH-World	František Duchoň, Prof. Ing., PhD.		H2020-DT-2019-2	IA
15	Boost Of Organic Solar Technology for European Radiance	BOOSTER	Martin Weis, Prof. Ing., DrSc.		H2020-LC-SC3-2020-RES-IA-CSA	IA
16	Training European Experts in Inflammation: from the molecular players to animal models and the bedside	INFLANET	Karol Mikula, Prof. RNDr., DrSc.		H2020-MSCA-ITN-2020	MSCA-ITN-ETN

	Project title	Acronym	Principle investigator	Faculty	Call identifier	Finance scheme
17	Promotion of rural museums and heritage sites in the vicinity of European pilgrimage routes	rurALLURE	Andrea Hrčková, Mgr., PhD. Valentino Vranič, doc. Ing., PhD.	●	H2020-SC6-TRANS- FORMATIONS-2020	CSA
18	Biodiversity and Iodiversity and Infrastructure Synergies and Opportunities for European Transport Networks	BISON	Maroš Finka, prof. Ing. arch., PhD.	●	H2020-MG-2020- SingleStage-INEA	CSA
19	Innovation Fostering in Accelerator Science and Technology	I.FAST	Andrea Šagátová, doc. Ing., PhD.	●	H2020- INFRAINNOV-2020-2	RIA
20	Sustainable EnErgy Skills in construction: Visible, Validated, Valuable	SEETheSkills	Tomáš Funtík, Ing., PhD.	●	H2020-LC-SC3- EE-2020-2	CSA
21	Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid	CONNECT	Viera Stopjaková, prof. Ing., PhD.	●	H2020-ECSEL- 2016-1-RIA-two- stage	ECSEL- RIA
22	300mm Pilot Line for Smart Power and Power Discretes	R3- PowerUP	Daniel Donoval, Prof. Ing., DrSc.	●	H2020-ECSEL- 2016-2-IA-two- stage	ECSEL-IA
23	Advanced RF Transceivers for 5G base stations based on GaN Technology	5G_GaN2	Daniel Donoval, Prof. Ing., DrSc.	●	H2020-ECSEL-2017- 2-RIA-two-stage	ECSEL- RIA
24	High performant Wide Band Gap Power Electronics for Reliable, energy efficient drivetrains and Optimization through Multi-physics simulation	HIPERFORM	Juraj Marek, Ing., PhD.	●	H2020-ECSEL-2017- 2-RIA-two-stage	ECSEL- RIA
25	first and euRoPEAn siC eigTh Inches piOt liNe	REACTION	Daniel Donoval, Prof. Ing., DrSc.	●	H2020-ECSEL-2017- 1-IA-two-stage	ECSEL-IA
26	The next-generation silicon-based power solutions in mobility, industry and grid for sustainable decarbonisation in the next decade	Power2- Power	Daniel Donoval, Prof. Ing., DrSc.	●	H2020-ECSEL-2018- 1-IA-two-stage	ECSEL-IA
27	Research for GaN technologies, devices, packages and applications to address the challenges of the future GaN roadmap	Ultimate- GaN	Daniel Donoval, Prof. Ing., DrSc. Juraj Marek, Ing. PhD.	●	H2020-ECSEL-2018- 2-RIA-two-stage-1	ECSEL- RIA
28	Intelligent Reliability 4.0	iRel40	Alexander Šatka, Prof. Ing., CSc. Daniel Donoval, Prof. Ing., DrSc.	●	H2020-ECSEL-2019- 1-IA	ECSEL-IA
29	Highly efficient and trustworthy components and systems for the next generation energy supply infrastructure	Progressus	Viera Stopjaková, Prof. Ing., PhD.	●	H2020-ECSEL-2019- 2-RIA	ECSEL- RIA
30	Highly EFFICIENT and reliable electric drivetrains based on modular, intelligent and highly integrated wide band gap power electronics modules	HiEFFICIENT	Juraj Marek, Ing., PhD.	●	H2020-ECSEL-2020- 2-RIA-two-stage	ECSEL- RIA



Slovak University of Technology in Bratislava
Vazovova 5, 812 43 Bratislava, Slovak Republic

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