

EXPERIENCE

SCIENCE

TECHNOLOGY

FUTURE

THE BULLETIN

OF THE SILESIAAN UNIVERSITY OF TECHNOLOGY

ISSN 2956-7475

No. 3 (003) 2023

**MODEL
TECHNOLOGY
TRANSFER**

p. 4

**WHAT CAN YOU SEE
FROM THE ROOF
OF EUROPE?**

p. 28

**5G CONNECTS SCIENCE
WITH BUSINESS**

p. 18





Gliwice campus



Katowice campus



Zabrze campus



Rybnik campus

JOIN US!

FROM THE EDITOR



Although the student holidays are still in progress, the Silesian University of Technology is already preparing to welcome the new academic year. This will certainly be a year of great changes, even greater challenges and the popularization of science on an unprecedented scale. Details of these events will appear in subsequent issues of our magazine. In the September issue, we would like to draw the readers' attention to a breakthrough event. The Silesian University of Technology is the first academic university in the country to launch an ultra-fast 5G campus network. It will be used to create and test cutting-edge solutions for Industry 4.0. You will read in this issue how much this technology will revolutionize knowledge transfer. It will also be about who is on top of the region's transformation and how to shine at one of the world's most important sports events as an academic athlete.

In a word, the September issue of the Silesian University of Technology Bulletin praises perseverance, consistency and good know-how.

On behalf of the Editorial Board,
I wish you interesting reading,
Iwona Flanczewska-Rogalska

THE BULLETIN OF THE SILESIAN UNIVERSITY OF TECHNOLOGY

No. 3 (003) 2023
SEPTEMBER

Editorial address: The Promotion and Communication Centre,
2A, Akademicka Street, 44 -100 Gliwice
Tel. 32 237 18 62; e-mail: RI2-CPIK@polsl.pl

Printing: Columbus Printing House. Chorzow

Editorial office: **Iwona Flanczewska-Rogalska** (editor-in-chief),
Katarzyna Siwczyk, Anna Świdorska,
Jolanta Skwaradowska, Martin Huć

Graphic design, cover design and layout: **Maciej Mutwil**

Translation: **Roman Gardeta**

Editing and proofreading: **Agnieszka Górecka**

On the cover: Students of the Silesian University of Technology

Author of the photo: **Karolina Marszał**

The editors reserve the right to make changes and shorten texts as well as change their titles. The transfer of materials is tantamount to consent to the dissemination of texts, photos and graphic materials, in paper and electronic versions. Photographs and graphic materials in the submitted texts are placed under the responsibility of the author.

The editors are not responsible for the content of advertisements and announcements. Reprinting and use in any other form without written permission is prohibited.



CONTENTS

Model technology transfer	4
Awards to outstanding young scientists	8
Great start	10
A vision of an effective Energy Transformation	12
One needs to be on top of things.	14
5G connects science with business	18
The first field of study at the Silesian University of Technology with the prestigious American ABET accreditation	21
Trends and challenges. Universities in times of change	22
How to communicate with a pet, or on dog and dog-human communication	24
Traveling without a ticket	27
What can you see from the roof of Europe?.	28
This is where his journey for medal began	30
In brief: Events	34
In brief: Successes	37
In brief: Projects.	39
Positions, degrees and academic titles	41
What's on in October in the student culture centre „Mrowisko”	41
Publishing news	42

MODEL TECHNOLOGY TRANSFER

text: Iwona Flanczewska-Rogalska

photos: Maciej Mutwil, Grupa Azoty S.A. Zakłady Azotowe Puławy, prof. Anna Chrobok's private archive

GRUPA AZOTY IS WORKING ON OBTAINING ϵ -CAPROLACTONE ON AN INDUSTRIAL SCALE. THIS ORGANIC COMPOUND IS AN EXTREMELY VALUABLE RAW MATERIAL WIDELY USED IN THE CHEMICAL INDUSTRY. SO FAR, IT HAS NOT BEEN PRODUCED IN POLAND. NOW, THANKS TO INNOVATIVE TECHNOLOGY DEVELOPED AT THE SILESIA UNIVERSITY OF TECHNOLOGY, THIS WILL BE POSSIBLE. THE TECHNOLOGY IS LOW-WASTE, ENERGY-SAVING AND CONSISTENT WITH THE PRINCIPLES OF THE CIRCULAR ECONOMY.

A LUCKY BREAK?

It all started with research for habilitation. Anna Chrobok, a young doctor of chemistry fascinated with the application of scientific results to industry, worked, among others, on the reaction in which organic chemical compounds - lactones - are obtained, including one of the most valued lactones used by the chemical industry: ϵ -caprolactone. The importance of this compound for the modern chemical industry is enormous.

ϵ -caprolactone is a monomer that is a raw material for the production of a high-margin product in the form of biodegradable polycaprolactone for medical applications, such as coatings in drug capsules with controlled, gradual release of the active substance in the body, bioresorbable surgical threads, degradable implants, or "scaffolds" for tissues. Additionally, polycaprolactone is used to improve the elasticity of plastics and influences their biodegradability. Combined with starch, this compound creates

a product used to produce disposable plates or cups that can be disposed of by composting, which is of great importance for the protection of the natural environment.

In her further research, prof. Anna Chrobok did not abandon her interest in lactones and managed to develop several methods for producing these organic compounds, but the level of their technological readiness was low and amounted to only TRL 3. The further development of scientific research depended on the industry's interest in financing the work. Chance, or perhaps rather a coincidence resulting from consistently developed scientific interests, helped. There appeared an opportunity to pursue a joint doctorate with "Fluor" company from Gliwice. It turned out that the topic proposed by Professor Chrobok had a great implementation potential. It was a chemo-enzymatic method of obtaining ϵ -caprolactone. The idea turned out to be a hit, because Fluor not only financed a scholarship for a PhD student, but in 2015 decided

to present the PhD topic at the Polish Chemistry Congress. The presentation was watched by the then director of the Technology and Development Division of Grupa Azoty SA Zakłady Azotowe "Puławy". It turned out that the company was diversifying its products and was looking for new applications for cyclohexanone - a raw material used to obtain ϵ -caprolactone.

Today, after many years, prof. Anna Chrobok comments on those events: "I found myself at the right time and in the right place with a developed method (not yet technology) of production." After the congress, things moved quickly.

FROM IDEA TO INDUSTRY

In 2016, prof. Anna Chrobok has established formal cooperation with Grupa Azoty Zakłady Azotowe "Puławy" S.A. Its goal was to increase the implementation potential developed by the team of prof. Chrobok of the solution included in the patent application (currently patent PL 233370; ZDI/2017/073). Af-

ter completing the scientific research agreement and achieving promising results by the team led by prof. Anna Chrobok, the company decided to make further investments. A consortium was established, consisting of Grupa Azoty Zakłady Azotowe "Puławy" S.A., the Silesian University of Technology and the Łukasiewicz Research Network - Institute of Heavy Organic Synthesis "Blachownia". The consortium took part in the NCBiR INNOCHEM competition and obtained financing for subsequent projects (POIR.01.02.00-00-0042/16). 5 patents regarding detailed process solutions were developed. Finally, a design for the ϵ -caprolactone production installation was created, which was carried out by Losentech S.A. for Grupa Azoty Zakłady Azotowe "Puławy". Prof. Anna Chrobok cooperated with the company at every stage of the installation. It is a glass installation consisting of several process devices, including three 100 L reactors and an approximately six-meter-long distillation column, a raw material dosing system and a product reception system. The installation is also equipped with systems supporting the ϵ -caprolactone production process.

ATTEMPT AT FULL SCALE PRODUCTION

In 2022, the installation was launched on a semi-technical scale. Work is currently underway to obtain ϵ -caprolactone on an industrial scale. Grupa Azoty is working on implementing the developed technology into its own operations, continuing the process and building a production installation with a capacity

prof. Anna Chrobok

of 5,000 t/year. The developed technology is low-waste, energy-saving and related to the principle of the circular economy. Sustainable production technology fits into the UN Sustainable Development Goal 12: Responsible consumption and production.

In retrospect, prof. Anna Chrobok estimates that this cooperation is an almost exemplary cooperation between entities from the R&D sector and a successful model of technology transfer to industry.

DIFFICULTIES GIVE STRENGTH

However, despite excellent cooperation, the implementation of this project was not free from difficulties. When the prices of one of the key components of the catalyst for the production of



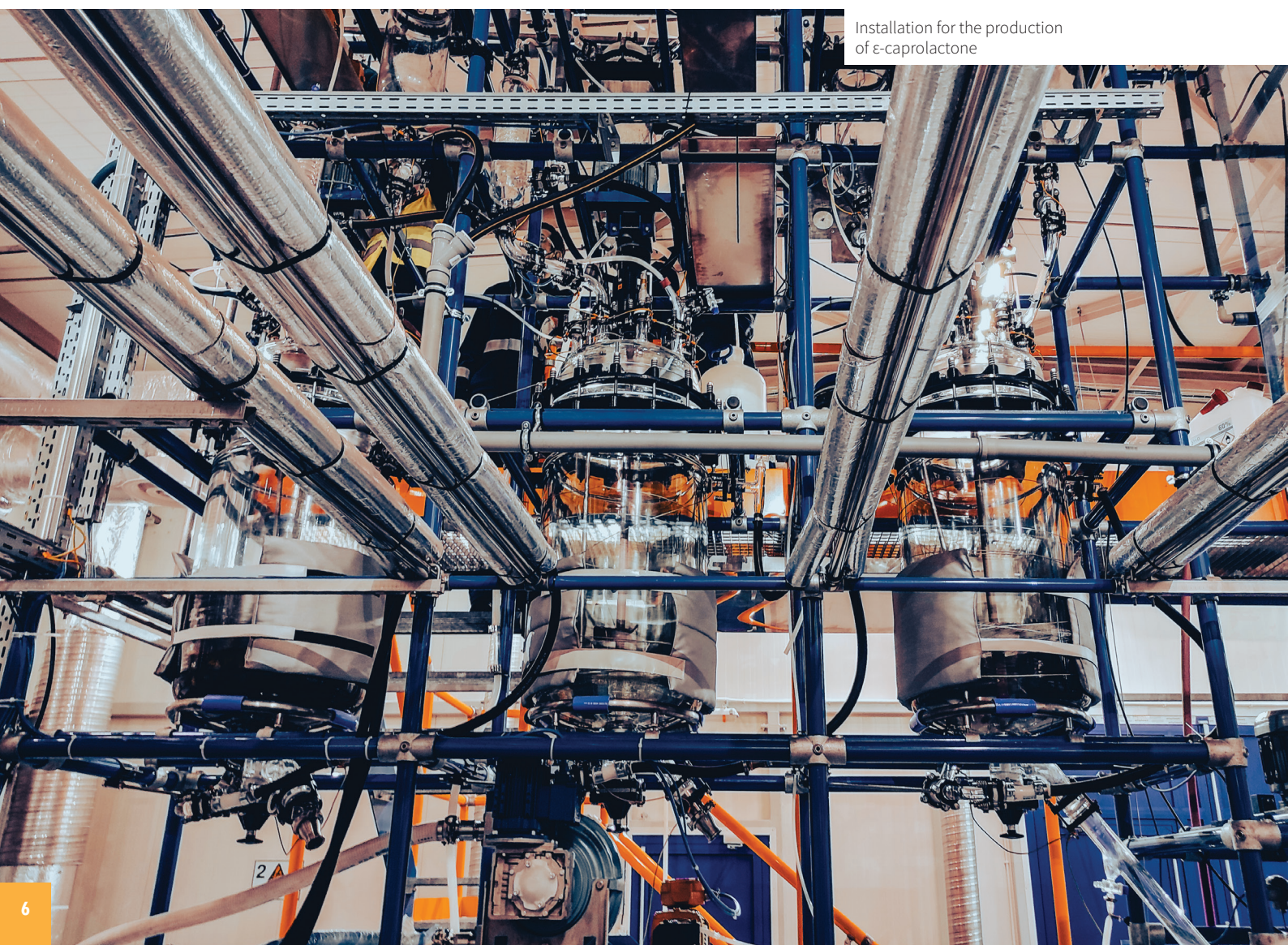
ϵ -caprolactone skyrocketed, the profitability of industrial production of the compound came into question. There were nerves and sleepless nights, because finding another innovative solution and obtaining a patent for a new idea was a huge challenge, considering the patent-protected solutions already available on the market. For Grupa Azoty, it was important to have the rights to its own technology, and not to acquire a license to produce the compound. Fortunately, as prof. Anna Chrobok recalls today, a solution was quickly found. Scientists must be prepared for such situations, the professor adds. During implementation work, various difficulties are encountered, the number of which may increase as the project develops. Many of them concern

raw material prices and result from the changing market situation. It is necessary to take into account the final price of the product, which is of great importance for the profitability of the investment. Therefore, economic analyses carried out at each stage of implementation are extremely important, she adds.

TRANSFER OF IDEAS

Cooperation with the Azoty Group is for prof. Anna Chrobok a perfect example of a scientist's professional career path. For as long as she remembers, she has always wanted to combine research with work for industry. "It's an amazing experience to participate in the commissioning of the installation, being, as a chemical technologist,

responsible for the implementation of my own idea," she admits, looking at the working installation in the nitrogen plant. Why did she focus on the topic of lactones production? From the beginning of her scientific career, she travelled a lot; for internships, scientific conferences, scholarships. She is convinced that contacts, especially international ones, help in development, both professional and personal. A person broadens one's perspective, learns and experiences possibilities that he/she was not aware of before. She became more familiar with the topic of lactones at international scientific conferences, where the latest results of research on these compounds were presented. She was also inspired by conversations with



Installation for the production of ϵ -caprolactone

representatives of global giants in the chemical industry, Merck and BASF. They provided knowledge about trends and needs of modern industry. They allowed her to confront scientific goals and aspirations with reality, which is invaluable knowledge. Prof. Anna Chrobok knows that without cooperation, also at the university level, it is impossible to achieve satisfactory results. That's why she cares very much about young researchers. She created a strong, supportive research group. "My team inspires me a lot, young people are creative, they don't see obstacles and barriers, that's why they often have bold ideas," adds the head of the College of Studies of the Silesian University of Technology. This is another role in which she fulfils herself.

PRAISE FOR PERSEVERANCE

When asked about the recipe for successful application of scientific solutions to industry, prof. Anna Chrobok states without hesitation that introducing new technology into industrial production is not easy and involves high risk. The transition from an idea to industry requires a highly innovative solution and well-established expert knowledge, as well as great determination, diligence and resistance to adversity - she adds.

Success is not always full of victories. Sometimes there are failures and doubts on this path, which could be discouraging if one wants to achieve the expected results - she sums up when asked about difficult moments in the project implementation.

The leading producers of ϵ -caprolactone in the world are BASF and Ingevity. The product has not been produced on the Polish market so far, so the technology developed by prof. Anna Chrobok from the Department of Chemical Organic Technology and Petrochemistry of the Faculty of Chemistry at the Silesian University of Technology is of groundbreaking importance for the Polish chemical industry. It will allow to effectively compete on the international chemicals production market. For her innovative solution, prof. Anna Chrobok received the title of Innovation Leader of the Silesian University of Technology. ■



prof. Anna Chrobok with her team, Industrial Catalysis Laboratory

AWARDS TO OUTSTANDING YOUNG SCIENTISTS

text: Jolanta Skwaradowska

photo: istock

DR ENG. MAŁGORZATA SAFUTA FROM THE FACULTY OF CIVIL ENGINEERING, DR HAB. ENG. STANISŁAW WRONA, PROF. SUT AND DR ENG. MAREK KOKOT FROM THE FACULTY OF AUTOMATIC CONTROL, ELECTRONICS AND COMPUTER SCIENCE RECEIVED SCHOLARSHIPS FROM THE MINISTER OF EDUCATION AND SCIENCE FOR OUTSTANDING YOUNG SCIENTISTS.

The scholarship is awarded to young scientists who demonstrate significant achievements in scientific activity, such as authorship or co-authorship of a scientific monograph, a scientific article published in a scientific journal, managing a research project with a high level of innovation and practical application of the results of scientific research or development work.

The winners included three scientists from the Silesian University of Technology: dr Eng. Małgorzata Safuta from the Faculty of Civil Engineering, dr hab. Eng. Stanisław Wrona, prof. SUT and dr Eng. Marek Kokot from the Faculty of Automatic Control, Electronics and Computer Science. Dr Eng. Małgorzata Safuta received the scholarship in the scientific discipline of civil engineering, geodesy and transport. – Awarding of such a prestig-

ious scholarship is of particular importance for a young scientist. Being among the winners is, on the one hand, an extraordinary distinction for our achievements and scientific activities, but on the other hand, it brings with it a huge dose of motivation for further research and scientific work, said the scientist.

Dr Eng. Safuta's research interests include nanotechnology of cement composites. – I am conducting research on the use of graphene and its derivatives in such composites. I am currently implementing a research project financed by the National Science Centre, the aim of which is to create a new generation of self-monitoring cement composites with graphene - added dr Eng. Małgorzata Safuta.

Dr hab. Eng. Stanisław Wrona, prof. SUT received the award in the field of engineering

and technical sciences. – The scholarship is not only an appreciation of my many years of involvement in research. This award will also allow me to focus on further scientific work for the next three years – the professor emphasized.

The advisory team assessing the applications appreciated the professor's scientific achievements in the field of active noise reduction methods, publications and implemented research projects. An important element of the achievements is the implementation of the MSCA Doctoral Network project under the Horizon Europe program. Project titled "Active reduction of noise transmitted into and from enclosures through encapsulated structures" has been ongoing since October 2022.

– Research conducted as part of this project concerns ac-

tive and semi-active noise reduction methods. This method involves surrounding noise-generating devices with thin-walled casings (in the case of some types of devices - using their own casings) to acoustically isolate the device, i.e., block sound from escaping from the outside of the casing. This method has high potential for practical applications. This is confirmed by the fact that leading manufacturers of household appliances have expressed interest in its implementation - the scientist noted.

A scholarship from the Ministry of Education and Science for outstanding young scientists was also obtained by dr Eng. Marek Kokot. The award was granted in the field of engineering and technical sciences, in the discipline of technical computer science and telecommunications.

- Receiving such a scholarship is of great importance for a young scientist. First of all, it makes you feel that the amount of work you put in is appreciated by experts and that the work you actually do matters. Of course, the financial aspect is also extremely im-

portant. The sense of financial security allows you to focus more on further research - the researcher emphasized.

In his scientific work, dr Eng. Marek Kokot mainly deals with processing data from genome sequencing experiments. - Such data are usually large in size (often in hundreds of gigabytes or even terabytes for a single experiment). They are also subject to errors resulting from imperfections in the sequencing process, which is why processing such data is a big challenge. My work focuses on developing efficient algorithms and their implementation that can be used as elements of larger bioinformatics pipelines, which can lead to biological and medical discoveries - explained the scientist. Scholarships from the Minister of Education and Science for outstanding young scientists have been awarded for the eighteenth time. Awarded scientists will receive them for 3 years. The amount of the scholarship is PLN 5 390, - per month. ■

GREAT START

text: Jolanta Skwaradowska
photo: Agnieszka Droździok

DR ENG. ZUZANNA MİODOŃSKA FROM THE FACULTY OF BIOMEDICAL ENGINEERING OF THE SILESIAŃ UNIVERSITY OF TECHNOLOGY IS THE LAUREATE OF THE START 2023 PROGRAM OF THE FOUNDATION FOR POLISH SCIENCE. SHE RECEIVED THE AWARD FOR DEVELOPING IT SOLUTIONS SUPPORTING THE EXAMINATION OF CHILDREN'S SPEECH, ESPECIALLY IMPAIRED SPEECH. THE RESEARCH RESULTS MAY BE USED IN SPEECH THERAPY AND SPEECH THERAPY DIAGNOSTICS.

The Foundation awarded 100 young scientists from all over the country, out of 660 submitted in this edition, of which seven people were additionally honoured. One of the distinctions – Scholarship named after Barbara Skarga for scientific works distinguished by crossing the boundaries between various fields of science - went to dr Eng. Zuzanna Miodońska from the Department of Medical Informatics and Artificial Intelligence of the Silesian University of Technology. The awarded research concerns the development of IT solutions dedicated to the analysis of children's speech, in particular disturbed speech, using analytical and computational techniques and acoustic phonetics tools.

– The research conducted by our team concerns the use of new technologies - in particular signal processing and artificial intelligence - to develop tools supporting speech diagnostics and therapy. For several years, we have been focusing on analysing the speech signal and video image of the faces of

preschool children in order to examine how they pronounce sibilants - in Polish, these are sounds marked in the spelling with the letters "s, z, c, dz, sz, ź, cz, ś, ż, ć, dź". I received the START 2023 scholarship from the Foundation for Polish Science for my work on acoustic differences between the correct and incorrect pronunciation of selected sibilants - said the researcher.

Research conducted in this area could be used in tools supporting speech therapy diagnostics. Once implemented, the developed measurement methods could support the work of speech therapists on many levels: accelerating screening tests, supporting novice diagnosticians, objectifying and visualizing the diagnosis, and enabling tracking of therapy progress.

– A more precise diagnosis allows for more effective therapy, which is a direct benefit for patients, usually children of preschool and early school age, who are most often diagnosed with speech defects – adds dr Eng. Zuzanna Miodońska.

Similar research is carried out in various countries, but there are still no implemented and verified solutions. The basic problem is the availability of databases of children's speech, especially speech with commentary or speech therapy description. – The time-consuming process of obtaining this type of databases (obtaining appropriate consents, many months of data registration) means that the work is often based on small research groups or is carried out on the basis of the speech of adults. To our knowledge, the research we conduct is one of the few in the world and the only one in Poland carried out with the participation of a larger group of preschool children (a total of over 300 speakers in various research protocols) - says the researcher.

Although we know more and more about the processes of improving pronunciation in children, as well as about the acoustic features of articulation, there are still no clinical solutions allowing speech ther-

apists to determine numerical indicators or parameters of pronunciation that would be diagnostically useful. – Finding such parameters and preparing appropriate tools enabling the recording of speech and facial images in the appropriate quality, automatic or semi-automatic analysis of signals, would provide speech therapy with measurement methods to objectify the diagnosis – explains dr Eng. Zuzanna Miodońska.

Innovation of the research conducted by dr Eng. Zuzanna Miodońska's was appreciated by the jury of the START 2023 competition of the Foundation for Polish Science. She was awarded a scholarship named after Barbara Skarga. It can be awarded to a person whose research is distinguished by boldly crossing the boundaries between various fields of science, opening new research perspectives and creating new values in science. These scholarships are one of the most important distinctions awarded in Poland to young scientists, confirming the quality of research achievements to date, as well as encouragement and financial support to continue scientific work. Being among the distinguished ones is of great importance in the field of the researcher's personal development, but also helps in disseminating the results of work in the scientific community and is a confirmation that the research problem being undertaken is important and translates into the development of the entire discipline - sums up the scientist. ■



A VISION OF AN EFFECTIVE ENERGY TRANSFORMATION

text: Joanna Mehlich

photo: Joanna Mehlich

THE INTERNATIONAL SUMMER SCHOOL “CIRCULAR ECONOMY AND ENERGY TRANSITION LEADERS” (CEET) WAS HELD AT THE FACULTY OF ENERGY AND ENVIRONMENTAL ENGINEERING OF THE SILESIAN UNIVERSITY OF TECHNOLOGY. THE EVENT GATHERED 40 ENGINEERS AND MASTER'S STUDENTS FROM 10 COUNTRIES.



PROGRAM SPINAKEK

During the intensive course, students had a unique opportunity to discover and deepen issues in the field of sustainable development, energy transformation and circular economy. They also met with experienced scientists from Poland and abroad, gaining first-hand knowledge and developing skills necessary

to build a clean, effective and sustainable future. In addition, the participants had a chance to learn about Polish culture and the achievements of Polish scientists and technicians. The CEET International Summer School has attracted the interest of students from all over the world, creating a dynamic and inspiring environment for the

exchange of ideas and cooperation.

Energy transformation and circularity are some of the most important challenges facing the world, which sets ambitious goals for reducing greenhouse gas emissions and increasing the share of renewable sources in the energy mix. Therefore, many legal and financial





solutions are being introduced to encourage investments in renewable energy sources and reduce greenhouse gas emissions. Circularity aims to increase the more efficient use of raw materials and reduce the amount of waste.

The main challenges in this area include the implementation of circular economy solutions through energy and material recovery technologies. We strive to create a system in which waste will become a valuable raw material, thanks to which it will be possible to optimize energy consumption and search for new energy sources. Another challenge is the transition to low-carbon energy technologies. We want to reduce our dependence on fossil fuels and replace them with greener energy sources. Diversification of energy sources and creating an optimal energy mix is another important challenge that our civilization will have to face in the future.

The long list of challenges certainly also includes the resilience and flexibility of the energy system. The introduction of energy storage options will help balance fluctuations in en-

ergy supply and demand, which is crucial for the stability of the energy system. Along with this comes an increase in the degree of decentralization of the energy system. Moving energy production closer to where it is used will reduce energy losses and increase energy efficiency.

Last but not least, the challenge is to provide solutions that are cost-effective and accessible to all, so that sustainable development is possible for all communities, regardless of their economic status.

All these challenges were part of the International Summer School program "Circular Economy and Energy Transition Leaders". Its aim was to deepen and update knowledge on the latest scientific and technological achievements that lead us towards a sustainable and low-emission future. The Silesian University of Technology is a place where students, researchers, competent scientists and practitioners meet to share knowledge and experience in the field of circular economy and energy technologies. Summer school participants learned about the latest generation of methods and technologies con-

tributing to the energy transformation and climate protection, as well as the protection of our planet's natural resources.

– We are glad that the CEET International Summer School had an impact on raising the level of awareness and knowledge about key issues related to the circular economy and renewable energy. Thanks to this event, students had the opportunity to learn about the latest trends and technologies, as well as to be inspired by the teaching and culture of Poland. It was an extremely important initiative that will help us jointly strive to achieve a sustainable future - said the chairman of the Organizing Committee, prof. dr hab. Krzysztof Pikon.

Students assessed their participation in the program very positively, giving an overall score of 4.8 on a scale from 0 to 5. They highly appreciated the work of lecturers and the quality of educational materials. An additional advantage was the opportunity to establish contacts and exchange experiences with other participants. An important element was also learning about the achievements of Polish scientists and technicians. ■

ONE NEEDS TO BE ON TOP OF THINGS

text: Iwona Flanczewska-Rogalska
photos: Bartosz Kowal, Dawid Rudy

A LOT IS HAPPENING TODAY, WE ARE IN THE PROCESS OF A DEEP TRANSFORMATION OF THE REGION, AND THE NEW FINANCIAL PERSPECTIVE IS ALSO ACCELERATING. THE SILESIAN UNIVERSITY OF TECHNOLOGY HAS A LOT TO OFFER, BUT WE NEED TO TALK ABOUT IT LOUDLY, WE NEED TO POINT OUT THE AREAS IN WHICH WE ARE REALLY STRONG - SAYS PROF. MAREK GZIK, DIRECTOR OF THE EUROPEAN HEALTHTECH INNOVATION CENTRE (EHTIC) IN ZABRZE. ABOUT THE ROLE AND POSITION OF THE UNIVERSITY, THE ADVANTAGES OF UNCONVENTIONAL THINKING AND ACTION, AND THE PATH TO INSTITUTIONAL AND PERSONAL SUCCESS IN AN INTERVIEW WITH IWONA FLANCZEWSKA-ROGALSKA.

The Silesian University of Technology joined one of Europe's leading public-private partnerships related to innovations in medicine. The university is represented by the unit that you have managed for years, the European HealthTech Innovation Centre (EHTIC). What does being among those who create innovations give us?

In fact, we have been building research potential very consistently from the very begin-



ning. We have qualified staff on our side and a very strong potential in terms of equipment and research capabilities. However, now we need to go as wide as possible with the EHTIC offer. We are very well recognized in the country, but our goals are broader. We want to enter the European and global business ecosystem. This allows us, among other things, to participate in EIT Health, an institution that is close to the European Parliament and the entire EU health policy. By joining this group, we have become a partner: we discuss possibilities of cooperation, areas of common interests, we talk about joint projects. One of them is a cooperation project with Ukraine regarding the training of

personnel for the diagnosis, treatment and rehabilitation of people injured in war operations. It is important to use the dramatic experiences of our eastern neighbours, if possible, to develop better methods of helping war victims.

We talk a lot about medicine. Perhaps our readers are wondering why, since the Silesian University of Technology educates engineers?

Modern medicine does not exist without technology. Today's treatment rooms, operating rooms and even hospital rooms are saturated with technology. In this respect, the Silesian University of Technology has a lot to offer. Both in the area of biomedical engineering and biotechnology, as well as prevention and support in general, including sports. That's why we named our centre the European HealthTech Innovation Centre (EHTIC), because not only treatment is important - also prevention and prophylaxis. What we do in Zabrze arouses not only curiosity, but also trust - even among the best. At EHTIC, we examined, among others, Robert Lewandowski. We are talking to Piast Gliwice and Górnik Zabrze. We also talk to volleyball and handball players. We cooperate very well with the Jerzy Kukuczka Academy of Physical Education in Katowice and with rehabilitation centres such as the famous Repty. In addition, we are constantly working on the development of technologies, including those that are used in interventional cardiology.

The Silesian University of Technology cooperates extensively with many institutions, including universities, in various fields.

That's true. Since I am the chairman of the University Council of the Medical University of Silesia, it is even easier for me to convince my medical colleagues of the need for technological development in medicine. To tell you the truth, I don't have to intensively persuade them to invest in technological innovations, because they are aware of it, using technological achievements to diagnose and treat patients, but it is easier for us to outline common areas of many activities. One of them is teaching. The Silesian University of Technology and the Medical University of Silesia will cooperate even closer and better. The letter of intent in this matter was signed by the rectors, prof. Arkadiusz Mężyk and prof. dr hab. in med. sciences Tomasz Szczepański. Both students and lecturers will benefit from this. The cooperation I initiated is to concern scientific activities as part of scientific and research projects, including joint publications, participation in scientific conferences and expert panels. The plans also include joint training, workshops and exercises, as well as supporting each other in the organization of seminars, competitions and Open Days. Ultimately, we want to mutually develop our fields of study. We can also offer medical education based on biomedical engineering, which is extremely important.

...important, because very often there is no correct diagnosis without technological support. And if there is no proper diagnosis, there is no effective treatment...

Exactly. The cooperation goes in two directions. There is inspiration and signalling of needs from doctors and the medical community. Our task is to create technologies that we later verify in cooperation with doctors. This is a symbiosis, a kind of training ground where we test questions and answers. Professor Marian Zembala once said that only humble cooperation between doctors and engineers can result in technology that will be used in medicine and bring tangible benefits to patients.

The development of medical technologies is one of the region's smart specializations. To what extent can the Silesian University of Technology be a creator of change and transformation of the regional economy? And not only in the area we are discussing today?

We are currently in the midst of such profound economic changes. We are slowly moving away from coal. Of course, mining will still be important for our voivodeship, but in the long run we are trying to look for a new idea for the development of our region. This idea applies to several areas related to smart specializations. Medicine is one of them. After all, we have the country's leading, very strong centres here: Sile-

sian Centre for Heart Diseases in Zabrze, Institute of Oncology in Gliwice, Upper Silesian Rehabilitation Centre "Repty", "burn centre" in Siemianowice and the Independent Public Provincial Hospital for Trauma Surgery in Piekary Śląskie. These institutions are absolute leaders in their specialties. Therefore, for us, one of the largest technical universities in the country (the Silesian University of Technology is also one of 10 research universities in Poland), this medical "field" is extremely important and promising, and it is worth supporting, both in terms of staff development and the development of facilities and technology. Personally, I have been trying to do this for many, many years. Despite social functions, such



as councillor of the regional assembly for two terms or chairman of the Silesian Voivodeship Assembly, I am still and feel like a scientist associated with the Silesian University of Technology, and this will not change. This involvement in extra-university activities helps me promote our University and fight for its best position in a strong, competitive environment. To tell the truth, for years I have perceived my role as a kind of ambassador of the Silesian University of Technology at the level of regional authorities of the voivodeship self-government. A lot is happening today, we are in the process of a deep transformation of the region, a new perspective is accelerating. It is true that we are still waiting for these funds,

but certain programs are already being launched with a guarantee of financing from the state budget and Silesian science should take advantage of these opportunities. The Silesian University of Technology has a lot to offer, but we need to talk about it loudly, we need to point out the areas in which we are really strong. And it is also my role to talk openly about the University's strengths and its enormous potential, which is worth using. After all, we have excellent scientists, skills, experience and knowledge that allow us to substantively support the development strategy of the Silesian Voivodeship. Honestly, who else would do this? The Silesian University of Technology is the largest regional technical university, located next to the Katowice Special Economic Zone, the most dynamically developing area on the entire continent. The synergy of science and industry has always been important for the University, from the first months of the establishment of the Silesian University of Technology.

Is this principle also important to you personally? What I mean is the transfer of scientific achievements to industry.

I owe everything I have achieved so far to the Silesian University of Technology and the people I meet here. My entire professional career to date has been associated with the University. By engaging in activities outside the university, on the one hand, I am repaying some of the debt to my Alma Mater, with which I have been associated since 1991, and on the other, I am trying to take advantage

of the development opportunities that the socio-economic environment can provide to the University. We must realize that even such a renowned university as the Silesian University of Technology does not operate in a vacuum but is subject to the laws of the free market. And the competition doesn't sleep. In my opinion, the University has a very important role to play in the new financial perspective, but for this to happen we must not miss this time. One needs to be active, look for development opportunities, establish as many contacts as possible and try to show the University's potential. This attitude is very close to me. Due to my positions in the provincial government, I know that there is no shortage of such players. I also know how much depends on proper cooperation with the environment. As an academic community, we are a bit closed in our own circle. We work hard, but we are not always aware of the processes that determine the success of many efforts. Therefore, I am convinced that universities should invest more in representing their own bodies in decision-making environments. Only then will we be able to fully use our research and scientific potential. If we look at the Silesian University of Technology in the context of smart specializations of the region, a topic already discussed in this conversation, please note that our University has specialists in virtually every field: from health, through energy, logistics, process automation and IT. The key to success is cooperation and a flexible approach to current market requirements. ■



5G CONNECTS SCIENCE WITH BUSINESS

text: Jolanta Skwaradowska
photos: Jan Szady, iStock

THE SILESIA UNIVERSITY OF TECHNOLOGY IS THE FIRST UNIVERSITY IN POLAND TO LAUNCH AN INTERNAL 5G CAMPUS NETWORK. IT WILL BE USED TO CREATE AND TEST CUTTING-EDGE SOLUTIONS FOR INDUSTRY 4.0. THE ULTRAFAST 5G NETWORK WAS LAUNCHED AT THE INDUSTRY 4.0 TECHNOLOGY TESTING CENTRE AT THE SILESIA UNIVERSITY OF TECHNOLOGY.

The network was put into operation thanks to the cooperation of the University, Orange Polska and APA Group, within the framework of which a unique technology showroom was created. There, one can practically test innovations at the intersection of science and industry 4.0.

– We are finalizing the letter of intent signed in February this

year regarding the creation of an industrial 5G network at the Silesian University of Technology. This allows us to move to the next, higher level when it comes to the development of manufacturing technology. We have already become accustomed to robots and transporters carrying various elements on the technological line, but the most interesting thing is what we cannot see, what is

happening in the network, i.e., sending information, ensuring high bandwidth and stability of connections. Thanks to the 5G network, we will be able to develop the Internet of Things technology and move to the next levels, also using artificial intelligence - said the Rector of the Silesian University of Technology, prof. Arkadiusz Mężyk. Students, lecturers and industry representatives can now



conduct projects at the Centre using 5G technology based on the latest 3.6 GHz band, made available for testing by the regulator - the Office of Electronic Communications.

– The launch of the campus 5G network at the Silesian University of Technology is a breakthrough and important event – emphasized Małgorzata Ciechomska, director of Smart City solutions at Orange Polska. This is the fourth campus network implemented in Poland, including the first at the University. This is a test network, specially designated by UKE (Office of Electronic Communications), which operates at the highest and best parameters. This is very important because everything created here, all projects, will be able to be implemented in business and industry - emphasizes Małgorzata Ciechomska.

– 5G technology is undoubtedly a breakthrough in communication and data transmission – emphasizes dr Andrzej Soldaty, director of the Industry 4.0 Centre of the Silesian University of Technology. – We are dealing here with a spiral of mutually driving innovations. The 5G network tested at the Silesian University of Technology will enable the development of new models and a new way of functioning. This is a perfect synergy of those who provide solutions and those who want to use them - emphasizes the director.

For now, the 5G network has been launched at the Industry 4.0 Technology Testing Centre of the Silesian University of Technology. It is a place where students and scientists can

learn how modern technologies work in practice. – What is important is that students may make mistakes while learning here. Sometimes they are even intentionally triggered to check the functioning of devices, as well as human reaction to such errors. The 5G network is our future, and our students will graduate with skills that their peers from other universities may not have - emphasizes dr hab. Eng. Anna Timofiejczuk, prof. SUT, the Dean of the Faculty of Mechanical Engineering.

– It is important that during our studies we can gain not only theoretical, but also practical knowledge – adds Kacper Jurasz, a fourth-year student of Teleinformatics at the Silesian University of Technology. – Students often lack professional experience, which they are asked about during a job interview. At the Silesian University of Technology, we have such a mini-industrial plant, and thanks to the launch of the 5G network, we can now learn what will be implemented in the industry - adds the student.

The 5G network is undoubtedly the future. This technology significantly accelerates data transmission, reduces transmission delays to almost zero and at the same time radically increases the number of devices that can be connected to the network.

– Launching a 5G network in an enterprise is not just a step forward, it is a technological leap that opens the door to unlimited possibilities in communication, processing and data analysis. In the context of smart factories, this technology enables almost immedi-

ate communication between machines, which significantly increases the level of efficiency and safety - says dr Eng. Artur Pollak, President of the Management Board of APA Group. – We also cannot forget about the impact of technology on the quality of life in cities. Thanks to the use of 5G in urban infrastructure, we can count on more effective traffic management, which translates into fewer traffic jams and better air quality. I see the incredible potential of the 5G network for Polish enterprises and society as a whole - adds the president.

The 5G network also aims to provide fast and reliable connectivity without kilometres of cables for many IoT (Internet of Things) devices, such as sensors.

– This is another version of the mobile network. The previous versions are 4G, 3G, 2G and 1G respectively. However, the 5G version is fundamentally different from its predecessors. Firstly, it is focused on super-fast data transmission using new frequency bands (700MHz, 3.6 GHz, 26 GHz), which significantly affects its range and capacity. Secondly, the 5G network, unlike its predecessors, was designed mainly for machines, not for people - explains dr Eng. Jarosław Homa from the Centre for Cybersecurity at the Silesian University of Technology.

The 5G network, with low transmission delays, may be of key importance in many industries and industrial automation (e.g., digital twin).

– In the case of implementing a campus (private) version of the network, however, there is a need to manage also the

radio part, and not only the network infrastructure, as in a traditional company network - adds dr Eng. Jarosław Homa. 5G technology can be used in industrial control systems and as support for sensor networks, while the campus version can be used by hospitals,

business centres, university campuses, railway stations and shopping malls. - This technology will bring tangible benefits to the economy, industry and business. By accelerating data transmission, it will enable quick access to specific resources and will also increase cybersecurity - explains the scientist.

5G will increasingly enter our lives, in virtually all areas, from industry to medical diagnostics, education, defence, security and entertainment. - Telecommunications operators, such as Orange, have already announced the exclusion of older transmission technologies in the mobile network, i.e., 3G. People are slowly starting to talk about the 6G network, which is expected to enter the market in 2030-2035. To sum up, it can be said that in the case of the 5G network, we are

not dealing with an evolution of the network to a new standard, but with a revolution in all sectors using this technology - emphasizes dr Eng. Jarosław Homa.

Importantly, 5G technology is safe for humans, although it raises concerns among some

social groups. - The telecommunications industry, including 5G technology, must comply with rigorous electromagnetic safety standards set by organizations such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the United States Environmental Protection Agency (EPA). These standards are intended to minimize human exposure to electromagnetic radiation within a range that is considered safe - explains dr Eng. Jarosław Homa.

- Many scientists and institutions have conducted research on the impact of electromagnetic radiation, including radiation emitted by 5G masts, on human health. There is no evidence of negative health effects resulting from the use of this technology, the scientist adds. - Although research in this area is still ongoing, current evidence does not suggest that it is more dangerous than earlier generations of mobile networks. People who have concerns about this topic should follow information from relevant agencies and scientific institutions and avoid disseminating unconfirmed theories - emphasizes dr Eng. Jarosław Homa.

It is worth emphasizing that the 5G network brings not only benefits for the economy, industry and business, but also for the environment. Thanks to it, companies can reduce media consumption and, as a result, reduce carbon dioxide emissions into the atmosphere. ■



THE FIRST FIELD OF STUDY AT THE SILESIAN UNIVERSITY OF TECHNOLOGY WITH THE PRESTIGIOUS AMERICAN ABET ACCREDITATION

text: Anna Świdwerska

photo: Dawid Rudy

FIRST-CYCLE STUDY PROGRAM IN ENGLISH – INTERDISCIPLINARY STUDIES: CONTROL, ELECTRONIC AND INFORMATION ENGINEERING, IMPLEMENTED AT THE FACULTY OF AUTOMATION, ELECTRONICS AND COMPUTER SCIENCE, RECEIVED THE PRESTIGIOUS ACCREDITATION OF THE AMERICAN ORGANIZATION ABET - ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY, GRANTED BY THE ENGINEERING ACCREDITATION COMMISSION (EAC).

ABET is an ISO 9001:2015 certified accreditation organization for higher education programs in applied sciences, computer science, engineering and engineering technologies. It is a non-profit organization based in the United States and registered in New York that assesses the quality of education through accreditation of curricula, which currently has 4,564 programs conducted by 895 institutions in 40 countries.

ABET accreditation confirms compliance with standards that guarantee future employers high competences of graduates starting professional practice in the area of innovation, implementation of new technologies and identifying social needs aimed at improving safety and development.

The process of obtaining ABET accreditation for the Interdisciplinary studies major: Control, Electronic and Information Engineering lasted 2 years. In the first step, the so-called Readiness Review was developed, on the basis of which ABET

recommended undertaking the accreditation process and submitting an application for accreditation, the so-called RFE (Request for Evaluation), as a result of which ABET appointed an evaluation committee chaired by prof. Noshir Langrana currently affiliated with the Rutgers School of Engineering at New Jersey State University. In October 2022, the university and the accredited field of study were subjected to a three-day, very detailed audit, which ended with the issuance of a preliminary, high assessment of both the Silesian University of Technology and the evaluated

study program. Final decision on granting accreditation - valid until 2029 - for the field of Interdisciplinary Studies: Control, Electronic and Information Engineering was issued on August 31, based on the results of a vote at the Engineering Accreditation Commission (AEC) meeting.

Obtaining ABET accreditation was financed from funds obtained under the "Excellence Initiative - Research University" program.

More information about ABET, including the accreditation criteria used to evaluate programs, can be found at: www.abet.org. ■



TRENDS AND CHALLENGES. UNIVERSITIES IN TIMES OF CHANGE

text: Bartłomiej Knosala
photo: Bartłomiej Knosala

UNIVERSITIES WILL PLAY MORE AND MORE IMPORTANT ROLE IN A RAPIDLY CHANGING WORLD. THE INCREASING COMPLEXITY OF MODERN SOCIETIES, WHICH IS BASED ON NEW DIGITAL TECHNOLOGIES, THE MULTILATERAL IMPACT OF THE CLIMATE CRISIS, THE STILL FELT EFFECTS OF THE COVID-19 PANDEMIC AND THE WAR IN UKRAINE, CAUSES A DRAMATIC INCREASE IN SOCIAL DEMAND NOT ONLY FOR HIGH-QUALITY KNOWLEDGE, BUT ALSO FOR LEADERSHIP BASED ON EUROPEAN VALUES. THERE IS NO DOUBT THAT IN SUCH A WORLD UNIVERSITIES WILL BE THE KEY CHANGE AGENTS.



THE Europe Universities Summit, an event devoted to the role of higher education in a changing world, took place in Warsaw on July 3-5. The main organizer was Times Higher Education - an organization with an international reputation and a long tradition in measuring the value of universities by creating global rankings. This year's main topic was the role of higher education in dealing with challenges such as the effects of the pandemic, climate change and the aggression of the Russian Federation against Ukraine. The Silesian

University of Technology was represented by the rector, prof. dr hab. Eng Arkadiusz Mężyk and dr Bartłomiej Knosala (Department of Applied Social Sciences, Faculty of Organization and Management).

TRENDS AND CHALLENGES

The session devoted to university management in times of unexpected and rapid changes attracted a lot of attention. Gabriela Allmi from Harvard Business Publishing, based on interviews with leading business schools, presented the most

important trends in higher education that may determine the future shape of university teaching. So, what does the future of higher education look like?

Firstly, there is no doubt that online teaching in various forms will still be strongly present at universities. However, an important role will also be played by the so-called non-linear forms of teaching. This mainly concerns the use of games, simulations, scenarios and other new forms of engaging students in the teaching process. Traditional education based on lectures and workshops is clearly losing

its leading role, while the process of searching for alternative forms of transmitting and acquiring knowledge is gaining momentum.

The second important topic discussed during THE Europe Universities Summit were issues related to the creation of new higher education programs. In this context, attention is drawn to the growing importance of an interdisciplinary approach. Recognizing the importance of integrating knowledge from various fields of science is related to the dramatic increase in the complexity of the modern world. More and more problems faced by the scientific community are the so-called wicked problems - extremely complex situations in which there are both strictly scientific and technical challenges, but also social and ethical ones. Solving such problems requires a comprehensive approach that goes beyond the narrow framework of modern scientific disciplines. Hence, the presence of an interdisciplinary approach in higher education curricula will increase in the future.

Gabriela Allami also drew attention to the pressure that new digital technologies exert on higher education.

The rapid development of generative artificial intelligence also affects the expectations of the business environment towards university graduates. Employers are primarily looking for employees with the skills to use information and communication technologies proficiently. However, it is worth emphasizing that soft skills will also be valued. The

challenge will be to integrate soft skills with skills in the advanced use of information and communication technologies. We know that the world's best universities offer programs in which programming is combined with courses in social psychology and sociology. The rapid development of social media and streaming platforms in recent years is related to the development of the concept of persuasive technologies - i.e., technologies in which technologies are designed in such a way that they include the ability to influence social behaviour. It is worth noting that in Poland only the Silesian University of Technology offers a field of study that meets this challenge. Since 2020, the Faculty of Organization and Management has offered the cognitive technologies major, in which programming and social sciences constitute an integrated academic curriculum.

PARTNERSHIP IN SCIENTIFIC RESEARCH

Modern science is increasingly based on cooperation between various research centres. We already know quite well that such cooperation is most fruitful when it is of an "organic" nature - i.e., when scientists have their own network of contacts within which they conduct research with partners from various research centres. However, nowadays, when the scale of scientific mobility is so high, these scientific contact networks "follow" moving scientists. The question that arises is: can such scientific partnerships be designed at the university level?

In the panel, which was devoted to the problem of building scientific partnerships, prof. Arkadiusz Mężyk drew attention to the impact of EU programs, such as Horizon 2020, which obliges international cooperation not only within research centres, but also between universities and industry. Establishing this type of partnerships not only allows to gain new experiences and exchange skills, but also allows to talk about mistakes made. This last aspect seems to be extremely important because it allows institutions to benefit from the transfer of organizational experience and thus protects them against costly mistakes.

Prof. Arkadiusz Mężyk also drew attention to the importance of initiatives such as the Eureka-Pro program, which, in addition to supporting the internationalization of universities, connects institutions guided by similar values and sharing a common vision of the world. The Silesian University of Technology is one of nine universities that are creating a joint research program on sustainable production and consumption in the context of combating global warming and supporting the circular economy. The importance of such initiatives cannot be overestimated. Inter-university partnerships and cooperation with industry are increasingly becoming the paradigm of a networked world in which the growing level of complexity must be stabilized by the increasing ability to cooperate between key actors. Universities should play a fundamental role in this process. ■

HOW TO COMMUNICATE WITH A PET, OR ON DOG AND DOG-HUMAN COMMUNICATION

text: Aleksandra Szewczuk
photos: author's private archive

WHEN THE WORD "COMMUNICATION" RINGS IN OUR EARS, WE MOST OFTEN SIMPLY THINK OF A CONVERSATION, I.E., VERBAL COMMUNICATION. NO WONDER, BECAUSE IT IS THE MOST NATURAL FORM OF EXPRESSION FOR HUMANS. HOWEVER, WE FORGET THAT IN ADDITION TO THIS, WE ALSO USE NON-VERBAL MEANS OF COMMUNICATION, WHICH INCLUDES, AMONG OTHERS: TONE OF VOICE, BODY LANGUAGE, FACIAL EXPRESSIONS. FOR A DOG, NON-VERBAL COMMUNICATION IS THE BASIC CARRIER OF INFORMATION. UNDERSTANDING THIS IS CRUCIAL IN THE PROCESS OF BUILDING A RELATIONSHIP WITH OUR PET.

Dogs communicate through four main channels: tactile, olfactory, visual and vocal-auditory. Touch appears at the earliest, around the 45th day of the foetus's life. Most sensory receptors are located in the paw pads and in the dog's whiskers. Thanks to the whiskers, the dog can cope better in difficult ter-

rain and in the dark. Dog whiskers are also associated with an unconditioned reflex, which involves closing the eye and turning the head after contact with a foreign body. Its purpose is to protect the animal from potential danger.

Smell is definitely the best developed dog sense. It is estimated that dogs have approximately

300 million olfactory receptors (in humans, there are only approximately 5 million!). The area of the brain responsible for analysing smells is 40 times larger in dogs than in humans. For olfactory communication, dogs use saliva, urine, faeces and secretions from glands located throughout their bodies. To ensure that the scent reaches the nose continuously, dogs inhale through the wider part of their nostrils and exhale through the narrower parts at the sides. This allows to simultaneously analyse odours already smelt and collect new ones from the surroundings. Dogs are also characterized by olfactory memory, thanks to which once they learn the smell of an object, animal or place, it stays with them for the rest of their lives. Jacobson's organ, which occurs on both sides of the nasal cavity is worth mentioning. It is used to capture the scent of pheromones

„ABOUT SCIENCE IN A HUMAN WAY - ALO MINIATURES”

The competition "About science in a human way - ALO miniatures" was held for the third time. It is addressed to students of Academic Secondary Schools of the Silesian University of Technology. Secondary school students participating in the competition passionately describe issues from the fields of interest to them. The works are assessed by jurors who take into account not only the substantive value, but also the popularizing value of the articles. We will present the three winning works in the next three issues. In the September issue of the Bulletin, we will present the work of Aleksandra Szewczuk, entitled "How to communicate with a pet" for which the secondary school pupil won third place.

and is connected to the hypothalamus, which is responsible for social and sexual behaviour in dogs.

Dogs develop vision relatively late. Puppies open their eyes around 8-10 days of age. Due to the large number of rods in the eyes, dogs have a well-developed ability to see in the dark. However, colour discrimination is limited to blue and yellow. Dogs can see moving objects from a distance of up to 900 meters, but static objects only from 500 meters. Some hunting breeds, such as greyhounds and sheepdogs, have developed eyes that are particularly sensitive to movement.

Originally, dogs used vocalizations much less frequently than they do today. This results from the process of domestication and many years of breeding selection. The range of frequencies a dog can hear is from 16,000 Hz to 65,000 Hz, which is much higher than that of humans, whose range is from 16,000 Hz to 20,000 Hz. For sound communication, dogs use a whole range of vocal signals, such as squealing, whining, growling, moaning, sighing, as well as non-vocal signals - snapping their teeth, panting. The frequency, length and tone of the sound are also important. Short, high-pitched barks indicate high emotional tension, but depending on the situation, they can be a sign of fear or excitement. In contrast, lower sounds are produced consciously. Because the dog's vocal communication system is very complex, its interpretation is also not the easiest and can only be understood by humans through patient observation and analysis.

Postural signals are those received through the visual channel, which are often supported by others. We divide them into two categories: affiliate signals, i.e., encouraging, and agonistic signals, i.e., discouraging. The latter are divided into yet another way: into calming signals and aggressive ones. Calming signals were discovered and described by Norwegian trainer Turid Rugaas in her book *Calming Signals*. She described 30 types of distancing behaviours, including: turning the head, licking, yawning, standing sideways, sniffing, walking in an arc, blinking, lifting a paw and licking. Dogs sending these messages to each other are most effective at the right distance and at the right time. By doing so, they want to show the other dog or person that they are not a threat and calm themselves, the owner and the surroundings. In order for the guardian to correctly interpret the dog's behaviour, he or she must know the causes of stress. Uncomfortable, stressful factors include, for example, aggression and negative emotions of the owner, inability to meet physiological needs, pain, new, unclear situations, unknown places, too many stimuli (noise, a large number of people and animals, chaos), unclear messages from the guide, aversive tools (spike collars, electric collars, leash jerking), lack of daily routine, loneliness and lack of social contacts within their species.

Aggressive signals, on the other hand, are very clear - the dog's posture stiffens, the



The dog yawns to calm down its emotions



The Labrador's silhouette is tense; the weight rests on the front of the body, the tail is raised stiffly up; the dog is clearly scared.



On the other hand, affiliative signals indicate the dog's positive attitude and encourage contact. They can be an encouragement to play or a willingness to stay in a common space. The most important affiliation signals include: a relaxed silhouette, a smiling face, relaxed ears and tail, and soft eyes.



centre of gravity of the body is moved forward, both the head and tail are raised high, the lips are lifted and piloerection, i.e., hair standing on end, may occur. Depending on the type of aggression, the ears are erect (attack-oriented aggression) or flattened (fearful aggression). An aggressive dog will keep its eyes fixed on the object and will growl. Other behaviours that indicate a dog is highly stressed include: scratching, licking paws and tail biting, hyperactivity or apathy, panting, vocalization, sudden hair loss, and diarrhoea. These behaviours are expressed through all of the previously mentioned channels.

A mother has the first and primary influence on a dog's communication skills. With her, puppies have a chance to learn to control emotions, respect the space of another dog, express their needs in a clear and legible way, but also inhibit biting strength. The longer the puppy is under its mother's care, the better, but normally the puppy goes to its new family around 8-9 weeks of age. The breed and appearance of the dog also have a huge impact on the effectiveness of communication. Dogs with perky ears (including German Shepherds, Belgian Shepherds, West Highland Terriers), high tails (including

Beagles, Basenjis, Foxhunts) or spiky fur (including Ridgebacks) may be perceived by others as more self-confident. However, dogs of brachycephalic breeds (including pugs, bulldogs, boxers) have a set of features called neotenic, i.e., they look like puppies and therefore can be treated with greater leniency. Primitive dog breeds (including Husky, Samoyed, Akita Inu) have the widest range of communication possibilities. Therefore, it can be said that the more genetically distant a dog is from a grey wolf, the weaker its ability to communicate with the environment is.

Communication between two dogs is important because it prevents conflict and aggression through signals sent from a considerable distance. This is the best source of knowledge for us, from which we can draw endlessly. It should also be remembered that each dog behaviour is an individual situation requiring a separate interpretation. Communication between a dog and a human involves understanding the dog, the dog's needs and the signals it sends us. It is equally important to understand what signals we send to the dog. Thanks to this, we can build a strong bond with our pet. ■

Sources:

McConnell P. 2008: Drugi koniec smyczy. Jak kształtować więź z psem. Galaktyka Publishing House.

Rugaas T., 2012: Sygnały uspokajające. Jak psy unikają konfliktów. Galaktyka Publishing House.

<https://piesologia.pl/sygnały-uspokajające/>

TRAVELING WITHOUT A TICKET

text: Katarzyna Siwczyk

photos: Przemysław Bratkowski

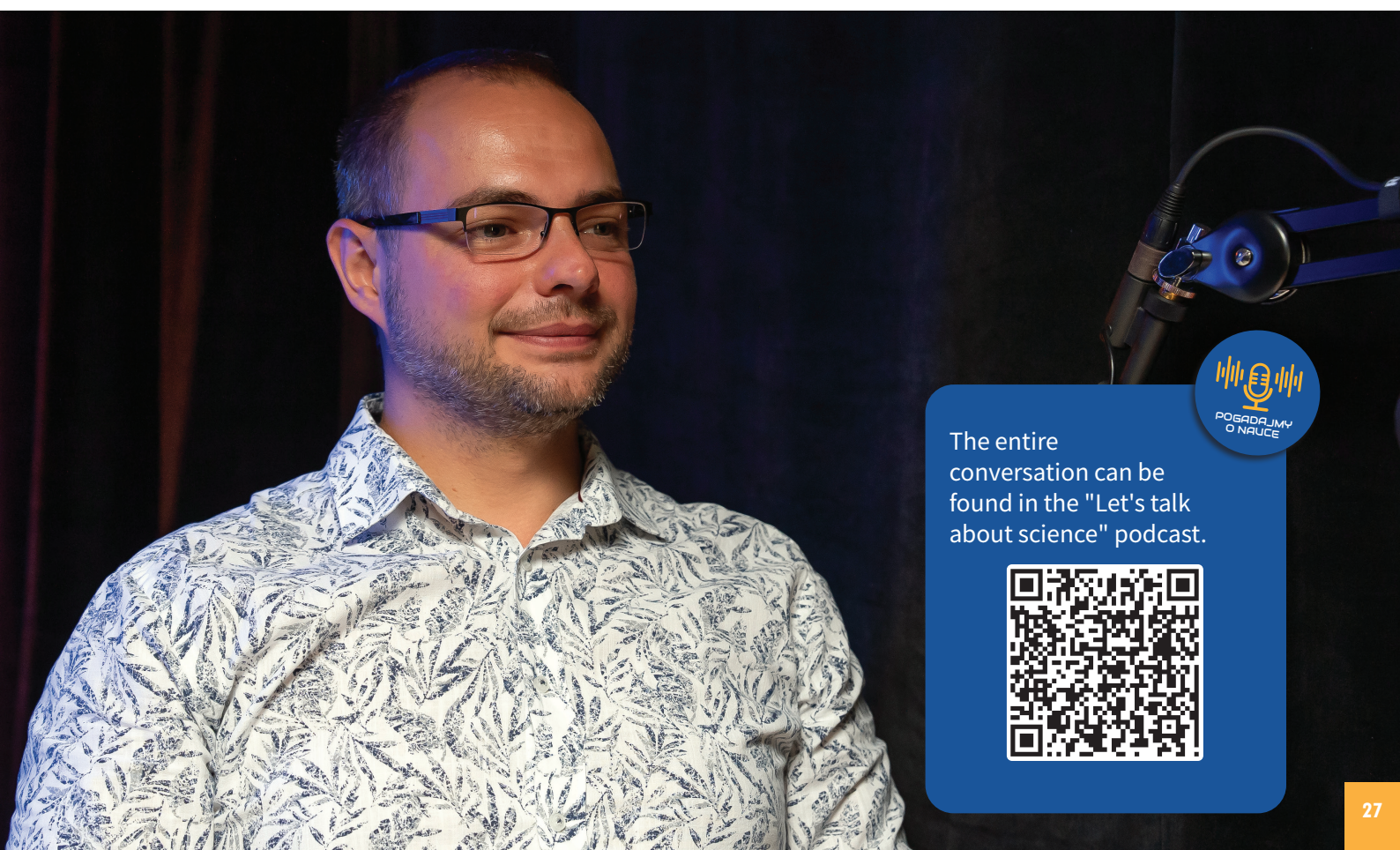
WE ARE STILL IN A HOLIDAY ATMOSPHERE, SO WE INVITE YOU TO LISTEN TO ONE OF THE LATEST EPISODES OF THE SILESIAAN UNIVERSITY OF TECHNOLOGY PODCAST, WHICH IS DEVOTED TO TRAVEL, AND NOT JUST ANY KIND! THESE ARE VIRTUAL JOURNEYS.

Will it soon be possible to visit the most interesting corners of the world without buying a ticket and leaving home? It turns out that yes. Everything was explained by dr Eng. Piotr Wodarski, supervisor of the Virtual Reality Technology Laboratory at the Silesian University of Technology. – This is already happening, and it will happen on an even larger scale – admitted the scientist. – Virtual reality

technology is at a very advanced stage. There are already many tools on the market that help us move to another dimension, including 3D projection glasses. Going further, we can also enter this 3D world and interact with it, explained Piotr Wodarski.

Examples of such activities can be found at the Silesian University of Technology. Students create applications that make it possible to move for a mo-

ment to another reality, e.g., to a cave or outer space. The latest technologies will soon allow not only to admire the landscapes, but also to touch the attractions and smell the smells of a given place. Special systems also allow to feel the humidity, temperature and wind in a given place. You can listen about the possibilities offered by research in VR technology laboratories in the podcast "Let's talk about science". ■



The entire conversation can be found in the "Let's talk about science" podcast.



WHAT CAN YOU SEE FROM THE ROOF OF EUROPE?

text: Jolanta Skwaradowska
photo: Vadym Gapko

ANNA MIGAS, AN EMPLOYEE OF THE SILESIA UNIVERSITY OF TECHNOLOGY, CONQUERS THE HIGHEST PEAKS IN EUROPE. SHE HAS JUST RETURNED FROM AN EXPEDITION DURING WHICH SHE CLIMBED MONT BLANC AND THREE OTHER FOUR-THOUSANDERS. HER GOAL IS TO CONQUER THE CROWN OF THE MOUNTAINS OF EUROPE. BUT THIS IS NOT ANNA'S ONLY PASSION - SHE ALSO TAKES PART IN MARATHONS AND COVERS HUNDREDS OF KILOMETRES BY BIKE.

Anna Migas climbed the highest peak in Europe, Mont Blanc, located in France (4,808 m above sea level) on July 7, 2023. This is another peak of the Crown of the Mountains of Europe that she managed to reach. In 2022, Anna climbed Śnieżka (1,603 m above sea level) – the highest peak of the Czech Republic and Rysy (2,499 m above sea level) – the highest peak in Poland, as well as Gerlach (2,655 m above sea level) in Slovakia.

The passion for mountain hiking began in the primary school in Anna's hometown of Rudziniec. – Trips to the mountains were organized by my geography teacher. First there were the Beskidy Mountains, then the Tatra Mountains. Already in the fourth grade, we went to Zakopane for a school trip, and when I was eleven, I climbed Giewont with my class, she says.

In secondary school, the mountains were put aside because Anna started to train athletics.

But after a few years, when she started her family, her mountain passion came back to life. – When my son was one and a half years old, we went with him to Piłsko and to Babia Góra – she recalls. However, most of the time she reaches the peaks alone. – Sometimes I am accompanied by friends, but when the route is difficult and long or I go to the mountains in winter, I hike alone – she adds.

Anna conquered the most peaks when the pandemic began. In 2020, she conquered 28 peaks of the Crown of Polish Mountains in three months. – Then my friends started to encourage me to climb the Crown of the Mountains of Europe. I started with Śnieżka in the Czech Republic, which I climbed in July 2022. In August I climbed Rysy again and in October I was on Gerlach in Slovakia – explains Anna.

To get to Gerlach our climber had to hire a guide. – In Slovakia, the attempt to climb to this peak is allowed only with a cer-

tified guide. This is how I met Vadym Gapko, who after the Gerlach expedition suggested that we climb Mont Blanc together – she adds.

As the result, Anna started preparations for this trip. – I booked accommodation in shelters in advance because many people want to conquer Mont Blanc and accommodation must be booked well in advance. It happens that people enter the shelter at an altitude of 3,800 m above sea level and do not get accommodation, because all the places are occupied - the climber points out.

In order not to lose shape before reaching the highest peak in Europe, our mountaineer made two winter ascents in the Slovak Tatras to Kežmarski Szczyt and Łomnica. She left for Chamonix, France on July 1, 2023. There, she was supposed to meet her guide Vadym and begin acclimatization. Unfortunately, the trip didn't start well. First, the flight from Warsaw to



Geneva was delayed by a few hours, then I lost my phone on the train from Geneva, and I couldn't contact the guide waiting for me in Chamonix because I didn't remember his number. In Chamonix I was looking for an office where I could use the Internet and find Vadym's contact. I man-

aged to find the number, called and we met - says Anna.

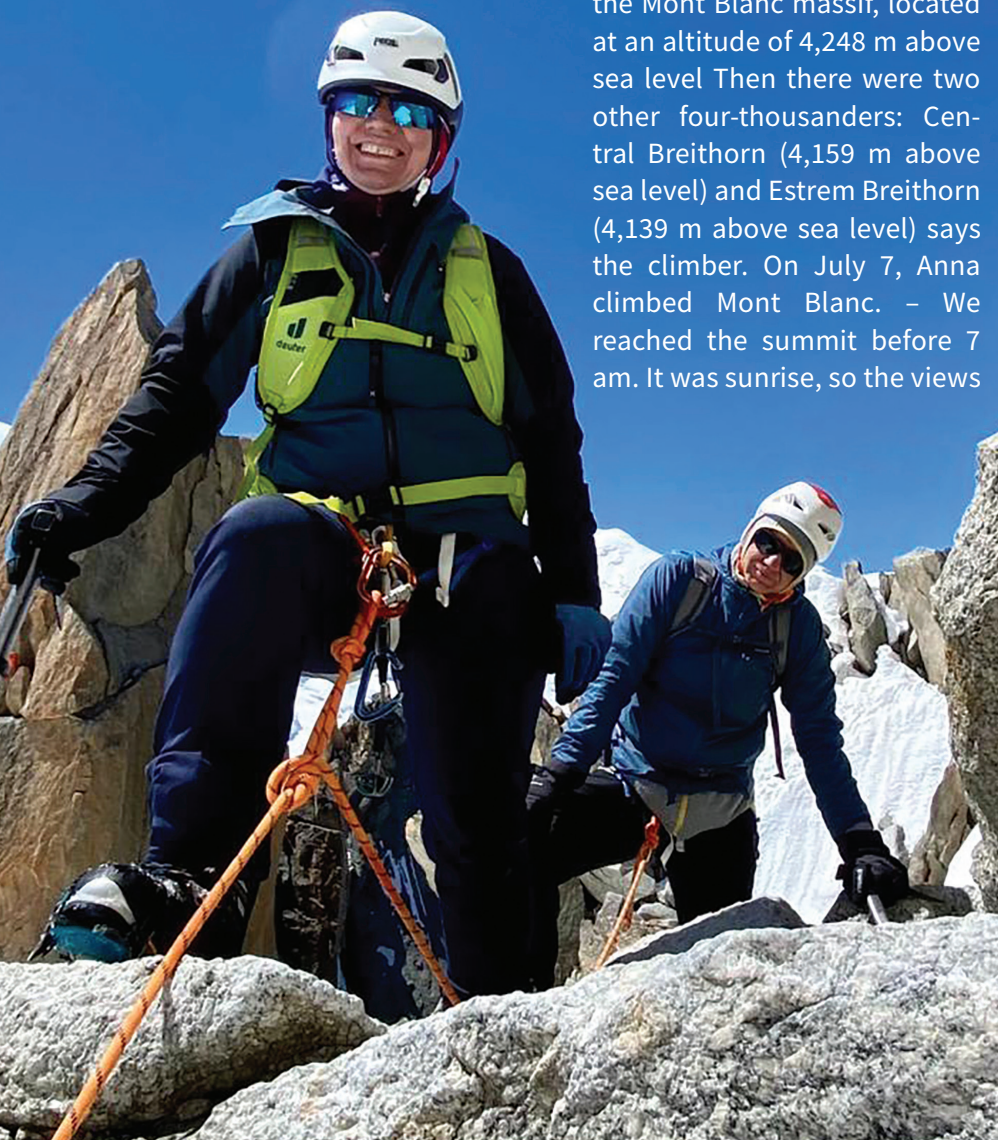
Before Anna climbed Mount Blanc, as part of acclimatization, on July 2, she climbed Aiguille du Midi (3,842m above sea level). – When I saw that my body responds well to the conditions in the high mountains, on July 3 we climbed Mont Blanc du Tacul - a peak in the Mont Blanc massif, located at an altitude of 4,248 m above sea level Then there were two other four-thousanders: Central Breithorn (4,159 m above sea level) and Estrem Breithorn (4,139 m above sea level) says the climber. On July 7, Anna climbed Mont Blanc. – We reached the summit before 7 am. It was sunrise, so the views

very expensive. Just for hiring a guide on Mont Blanc, which is advisable if you don't have the right permissions, I had to pay over 1700 euros. In addition, accommodation, meals, transport - emphasizes the climber.

In the spring of 2024, Anna Migas plans to conquer three more peaks as part of the Crown of the Mountains of Europe: Vaalserberg (322 m above sea level) in the Netherlands, Kneiff (560 m above sea level) in Luxembourg and Signal de Botrange (694 m above sea level) in Belgium. – Since these are not very high peaks, I plan to climb them... by bike – announces Mrs. Anna. – If I manage to raise funds, I would like to climb the highest peak in Germany or Switzerland in the same year. To complete the Crown of Mountains in Europe, I have to conquer 46 peaks scattered in all countries of the continent - he adds.

Mountains are not Anna's only sports passion. Our employee rides a bike and takes part in running marathons. - In 2022, I cycled along the entire Polish Baltic Coast, I also took part in the 100-kilometre Peace Run of the Children of the Zamość Region and in a bicycle rally around Dresden - 260 km in 3 days - lists Anna.

Anna Migas has been working in the administrative department of the Faculty of Civil Engineering of the Silesian University of Technology since 2007. As she says, she successfully combines her sports passions with professional work and can count on the support of the employees of the Faculty of Civil Engineering where she is employed. ■



were amazing. And although it was July, the temperature at the summit was minus 16 degrees Celsius- she adds.

Anna plans to climb other summits of the Crown of the European Mountains, for which goal she collects funds. – Mountain passion is unfortunately

THIS IS WHERE HIS JOURNEY FOR MEDAL BEGAN

text: Martin Huć

photos: Kacper Szczurowski's private archive

KACPER SZCZUROWSKI, AN ATHLETE OF KŚ AZS OF THE SILESIAN UNIVERSITY OF TECHNOLOGY, WON THE BRONZE MEDAL IN JUDO AT THE 31ST UNIVERSIADE IN CHENGDU, CHINA. THIS IS A HUGE SUCCESS FOR THE REPRESENTATIVE OF OUR UNIVERSITY AND THE ENTIRE SECTION, IN WHICH OVER 100 PEOPLE CURRENTLY TRAIN.

Kacper Szczurowski will probably remember July 31 for the rest of his life. In Chengdu, China, over seven thousand kilometres away, he fought four extremely exciting fights at the largest academic sports event - the Summer World University Games. By winning the bronze medal, he achieved the greatest success in his career, which began in Gliwice, in the judo section of our University.

FROM THE AGE OF SIX

Kacper Szczurowski was born in Gliwice. It was here that, at the age of six, he joined the AZS Gli-

wice Environmental Club of the Silesian University of Technology and began training in the judo section. An inconspicuous childhood decision, interrupted several times by injuries and moments of doubt, became an extraordinary passion and the beginning of a promising career and countless trips around the world. And a great success in the form of a bronze medal at the Universiade.

- My mother signed me up for training - recalls Kacper Szczurowski. - I started my judo

adventure in Łabędy. Only later did I move to the sports hall at Akademicka Street, where our section trains to this day.

Nowadays, judo is his whole life.

- I focused on this sport; I devote most of my free time to it - says the bronze medallist of the 31st edition of Summer World University Games. - I wouldn't be able to reconcile it with professional work or studies. However, I am glad that, among other things, thanks to many years of training at AZS Gliwice, I was able to reach the current level. I recommend it





to everyone. AZS offers training in sections of many sports disciplines, so it is worth signing up. First of all, I encourage you not to get discouraged quickly. Patience is very important these days. Many people give up after a month of classes, for example after the first failure or doubt. You have to endure difficult stages. This is when we shape our character the most. I also had moments of crisis, but it mattered to me and I quickly got to work. Judo teaches humility, order, systematicity... Besides, you can get to know the world and languages. It is really worth it.

JUDO FOR EVERYONE

Kacper's coach in the judo section in Gliwice is Bronisław Wołkowicz, a participant of the Olympic Games in Atlanta in 1996. He spent almost his entire life in AZS Gliwice. He started training at the age of nine, and at the age of twelve he even had the opportunity to help build a hall on Akademicka Street.

– I handed out some boards, simple things like that – recalls Bronisław Wołkowicz. – Of course, I was one of the athletes in our team, and now I'm a coach. Our club is over sixty years old. It was founded by Czesław Garncarz, who was also the director of the Sports Centre at the University. We currently train over a hundred children and juniors. The youngest are four years old. Of course, at this age, training is completely different - we focus on gymnastics, motor coordination, and training through play. There are also adult competitors and even masters, i.e., competitors over forty years of age who take part in old-boy competitions. Among them is Jacek Gemza, who has already won the world and European championships, which is a great success for our club.

Of course, there is also a judo section for students.

– Students train under my supervision twice a week during the academic year, every Tues-

day and Thursday – says coach Wołkowicz. – And if someone decides that they are passionate enough about this sport, we encourage them to test themselves in the judo sports section. We train there every day, and sometimes even on Saturday. Of course, there are also competitions and sparring fights with players from other clubs.

Last year, both girls and boys from the student section of the Silesian University of Technology took third place in the Silesian Academic Championships.

KACPER FACES A FIGHT FOR PARIS

Kacper Szczurowski, already as a junior, stood out among his peers practicing judo in our country. He is a multiple champion and medallist of the Polish Championships in all age categories. He also won, among other things, a bronze medal at the European Youth Championships. His extraordinary talent was finally noticed and the athlete joined the national team, with which he competed in the World Cups and the European Games held this year in Poland, from which our judo team was quickly eliminated, but Kacper was the only one to win his fight.

Our player spends September mainly outside the country. He trained in Japan at a camp for over two weeks, and then went straight to Azerbaijan. Kacper is preparing solidly for numerous events, the points collected from which will determine who will qualify for next year's Olympic Games in Paris. Only one competitor from each country in a given category will go to the Olympics.

He trains twice a day. These include judo, motor, strength and technical training, training fights, and more.

– Concentration is very important – says the Gliwice resident. – This is one of the key elements in judo. I have the pleasure of working with Paweł Habrat, a sports psychologist who once also worked with the Polish national football team. The mental aspect is very important, often crucial. A fighter's psyche can decide on this single action that decides the outcome of the fight. One mistake can make you lose everything in this sport. Sometimes we travel all over the world, prepare for many months, and then at the event we realize that due to a mistake in the first fight, we can end the

participation we have worked so hard for. We have to face this thought. It's a quick game of chess. You need to prepare for it from every angle.

– Concentration and focus are very important in this discipline – says coach Wołkowicz. – This may later result in learning and everyday life. That's why I recommend this discipline to everyone, including students. Judo comes from Japan. There, sports education is closely related to personal education. The whole environment around this sport makes it possible to learn a lot. Discipline, hierarchy in the team, gathering and bowing before the fight, respect for teammates and the rival, concentration, focus. We try to transfer this to our team as well.

WORK IS THE MOST IMPORTANT THING

“Work in silence, let success make noise” - this is Kacper Szczurowski's life motto.

– I have always focused on hard work – says the 26-year-old from Gliwice. – I like to quietly pursue my goals and not flaunt every achievement, although the scale of interest in me after my last success was very large. I received a lot of calls and messages with congratulations, and many websites quoted my statements. It was very nice.

In China, Kacper Szczurowski represented not only our country, but also AZS Gliwice of the Silesian University of Technology. This is an extraordinary distinction and a great success for our University and the entire academic sport in Poland.

– This is an extremely prestigious event, well attended, I had the opportunity to participate in it myself, which is why I respect Kacper's success even more – says Bronisław Wołkowicz. – I was secretly counting on his medal. This is a huge distinction, especially for him, but also for our club. I think the change in category helped him a lot. Back in October, Kacper fought in the Polish Championships in the up to one hundred kilograms category. Later, after a discussion with the team coach Rashad Hasanov, we decided that it would be worth changing the category to over one hundred kilograms. This brought results quickly. Kacper gained freshness and progressed in form.

And it was in this category that he took part in the Universiade. In Chengdu, Kacper was seeded, so he was given a free ticket in the first round. In the



second round he faced Brazilian Guilherme Oliveira Cabral, whom he defeated after just 10 seconds. Later, fate brought him together with the Japanese Yuta Nakamura, who later became the gold medallist of the competition, but lost to him after a minor mistake.

– Only one mistake resulted in defeat – Kacper recalls. – Unfortunately, in judo this is unforgivable and costs a win.

So, the Pole went to the repechage. These in martial arts mean additional eliminations to the decisive final rounds. However, the Pole did not lose again that day. He first defeated the French Amadou Meite, and then, after a fantastic fight for the bronze medal, the experienced Hungarian Richard Sipocz. One can find this fight on YouTube, on the pasjaAZS channel.

It was a killer day. Within a few hours, our representative fought four fights. However, it was worth it because at the end he could take part in the medal presentation ceremony. He stepped onto the podium, leaned down, and the bronze medal of the most important competition in academic sports hung on his neck.

– I was extremely surprised, but also happy – says Kacper. – The joy was incredible. I didn't set myself any goal. I thought about every next fight and opponent. The fight for the bronze medal was very difficult, especially since the loser was left with nothing, being so close to the goal. But I did it, it's a very nice feeling.

HE WILL FIGHT FOR ANOTHER DREAM

It was, among other things, thanks to the medal won by our

athlete that the Polish team improved its record for the number of medals won at the summer Universiade. In Chengdu, Poles won it 43 times, which gave them fifth place in the medal classification. The next

stage was huge. There was nothing missing in it. Good living conditions, meals from all over the world in the canteen, lots of volunteers to help. Of course, we also had the opportunity to go outside the village and go sight-



two Universiades will be held in Europe in two years. Winter one in Turin, and summer one in Germany, in the Ruhr area. Adventure is open to everyone.

– The entire stay in China made a huge impression on me – says the medallist. – Starting with the opening ceremony of the Universiade, which was modelled on the one from the Olympic Games. We had the opportunity to walk around the stadium, there were artistic performances, and heads of many countries appeared. Some of the competitors who attended the last Olympic Games in Tokyo mentioned that the ceremony from China was even better, even more refined. The Chinese really made an effort. The Olympic Vil-

seeing. There were also training facilities in the village itself, so we could practice there. It was a great time and an amazing adventure.

Kacper liked it so much that now he wants to compete for the Olympic Games - the most important sports event in the world. Every athlete's dream. He is preparing for this, among others, under the supervision of Paweł Nastula, gold medalist of the Olympic Games in Atlanta in 1996.

– I've always wanted to feel the atmosphere of such an event, and now I want even more and I'm already preparing hard for the fight for Paris. ■

EVENTS

Inauguration of the Academic Year at the Silesian University of Technology

For the 79th time the Silesian University of Technology will inaugurate the academic year. The ceremony will take place on October 4, 2023, at the Education and Congress Centre.

The program of the ceremony includes the inaugural speech of the Rector of the Silesian University of Technology, prof. Arkadiusz Mężyk, matriculation of first-year students, speeches by guests from Ukraine, as well as the inaugural lecture of the rector of the Jagiellonian University, vice-president of CRASP, prof. Jacek Popiel entitled "Can a new Copernicus appear in our education system"? The ceremony will end with a short concert performed by the Academic Music Ensemble.

The inauguration of the new academic year will take place on October 4, 2023, at 11:00 am at the Education and Congress Centre of the Silesian University of Technology at 18 B, Konarskiego Street in Gliwice. ■



Ceremony of inter-university inauguration of the academic year 2023/2024

A joint inauguration of the academic year organized by state universities forming the Academic Consortium Katowice City of Science will take place for the second time.

The name of the ceremony "Inter-university Inauguration of the Academic Year 2023/2024- The Year of Science in the Silesian Voivodeship" refers to the announcement by the Silesian Voivodship Assembly of 2024 as the Year of Science in the Śląskie Voivodeship.

The ceremony will take place on September 29, 2023, at 4.00 p.m. in the concert hall of the Polish National Radio Symphony Orchestra in Katowice. It will be preceded by a ceremonial march of the rectors' processions through the streets of the city accompanied by folklore groups and will be crowned with a concert. ■



XII International Scientific Conference "HealthTech Innovation Conference"

On October 10, 2023, the 12th International Scientific Conference "HealthTech Innovation Conference" will be held at the European HealthTech Innovation Centre (EHTIC). The event is a continuation of the conference "Innovations in Biomedical Engineering" organized since 2016.

The "HealthTech Innovation Conference" is an event that gathers over two hundred participants every year and is a place of integration and closer cooperation between biomedical engineers and representatives of medical centres in the field of innovative technologies applicable in medicine and sports. The conference topics include areas related to biomedical engineering, bioinformatics, biomechatronics, bioelectronics, biomaterials, medical robots, military technologies, engineering support for medical

procedures, planning of sports training and rehabilitation. As part of the event, there are planned, among others, commissioned papers, presented by speakers of high international authority.

The organiser of the conference is the European HealthTech Innovation Centre (EHTIC).

The partner of the event is the Silesian Voivodeship. ■



5th Polish Congress of Mechanics combined with the 25th International Conference of Computer Methods in Mechanics at the Silesian University of Technology

Several hundred specialists dealing with the issues of mechanics and mechanical engineering visited the Silesian University of Technology, which co-organized the most important scientific events in the field of classical and quantum mechanics: The 5th Polish Congress of Mechanics combined with the 25th International Conference on Computer Methods (PCM-CMM). The meetings were held from September 4th to 7th at the Educational and Congress Centre of the Silesian University of Technology.

During the 4-day congress, scientists presented the current state of research in all disciplines of classical and quantum mechanics, mechanics of solids and fluids, computational mechanics, applied mechanics and physics, as well as mechanics and structural engineering. This was the 5th Polish Congress of Mechanics. The event maintains the tradition of scientific meetings in the field of mechanics, initiated approximately 16 years ago during the 1st PCM in Warsaw in 2007.

In turn, the XXV International Conference on Computer Methods in Mechanics continues the 50-year-old series of conferences devoted to numerical methods

and their applications in mechanical problems. Scientific meetings, organized every two years since 1973, provide a forum for the presentation and discussion of new ideas relating to the theoretical foundations and practical applications of computational mechanics. ■



photo: Jan Szady

Agreement between the Silesian University of Technology and OBRUM

The Silesian University of Technology and OBRUM signed a cooperation agreement. Both entities will cooperate in developing innovative solutions for the security and defence of the state.

The agreement was signed by the Rector of the Silesian University of Technology, prof. Arkadiusz Mężyk and Tomasz Kurczek – President of the Management Board of OBRUM. Thanks to the signed agreement,

the Silesian University of Technology received the opportunity to participate in solving the real needs of the Polish Armed Forces and the Polish defence industry. The concluded agreement will allow for fuller use of the synergy effect of the scientific potential, research methods and research tools of the Silesian University of Technology for the security and defence of the state. ■

Students from Ukraine on training at EHTIC

On Monday, September 11, a group of 15 students from Ukraine arrived at the European HealthTech Innovation Centre (EHTIC) of the Silesian University of Technology and took part in rehabilitation workshops. The classes were conducted by experts from the Faculty of Biomedical Engineering.

The Silesian University of Technology hosted students and employees of the Volyn State University in Lutsk, with which we have been cooperating since May. The purpose of this visit is for students to participate in special workshops on practical aspects in various areas of medical rehabilitation.

- We have prepared a series of training courses for a group of physiotherapists who came to us to improve their competences in the area of broadly understood rehabilitation. In this case, we focus on the rehabilitation of war victims, because these are the needs there in Ukraine- explained prof. Marek Gzik, director of EHTIC.

The co-organizers of the visit of Ukrainian students are the Jerzy Kukuczka Academy of Physical Education in Katowice and the Upper Silesian Rehabilitation Centre "Repty" in Tarnowskie Góry. ■



photo: Krzysztof Gronowicz

Human University of Humanities, Science and Technology delegation at the Silesian University of Technology

On July 27, 2023, the Silesian University of Technology hosted a delegation of representatives of the Hunan University of Humanities, Science and Technology from the People's Republic of China. The guests met with the University authorities and visited the laboratories of the Faculty of Chemistry.

The main purpose of the visit was to establish didactic cooperation between the Chinese university and the Faculty of Chemistry of the Silesian University of Technology. During the meeting, both parties presented the potential of their universities and discussed the assumptions of the joint didactic program being developed. Possibilities of developing cooperation in the future were also considered. ■

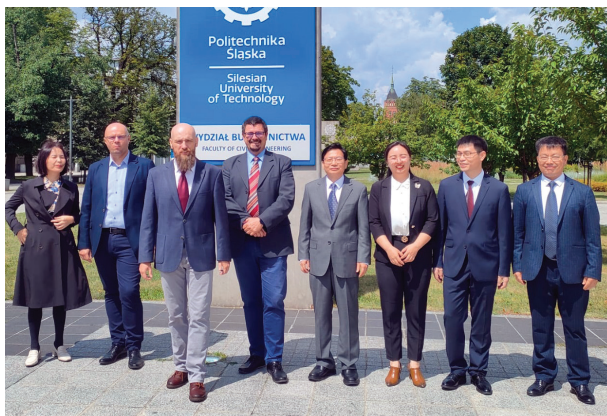


photo: Marcin Lemanowicz

“Science is the business of tomorrow” game to celebrate the 15th anniversary of CITT

The team of the Centre for Incubation and Technology Transfer of the Silesian University of Technology has developed a board game "Science is the business of tomorrow". The game was created to celebrate the 15th anniversary of CITT. Its aim is to present the activities of the Centre, whose role is to connect the world of science and business.

The game consists of a board, pawns, special cards and CITTons, which act as the game's currency. The player takes on the role of a scientist from the Silesian University of Technology and learns what stages accompany the technology implementation process.

– Technology transfer at the University plays an increasingly important role. In recent years, universities have been carrying out intensive activities aimed at creating an environment offering technological support for scientists - says dr Eng. Magdalena Letun-Łątka, director of the Centre for Incubation and Technology Transfer of the Silesian University of Technology.

The game allows you to understand the steps taken related to technology transfer, thus encouraging you to find the optimal path from university to business. ■



photo: author's archive

“Outstanding Graduate of the Silesian University of Technology” competition

After a break of several years, the competition titled "Outstanding Graduate of the Silesian University of Technology" is back. This title is awarded for outstanding achievements after graduation, in professional, scientific, social, cultural and sports activities, as well as in the development and management of own enterprises in the country and abroad.

The competition was established by the Management Board of the Association of Alumni of the Silesian University of Technology on the occasion of the 75th anniversary of the establishment of the Silesian University of Technology. It will be awarded annually through a competition organized under the patronage of the Rector of the Silesian University of Technology in two categories: Outstanding Graduate of the Silesian University of Technology and Outstanding Junior Graduate of the Silesian University of Technology (covers the period of the graduate's activity up to 10 years after graduation). Current employees of the Silesian University of Technology cannot be among the nominees.

If you know any graduates of the University of Technology who, in your opinion, have achieved outstanding professional achievements, please submit your candidate along with a written justification of their achievements after completing their studies at the Silesian University of Technology. Applications should be sent to: Main Board of the Association of Alumni of the Silesian University of Technology 44-100 Gliwice, Pszczyńska 85/14 or by e-mail to: zg.stow_wych@polsl.pl

Details and regulations of the competition can be found on the website of the Association of Alumni of the Silesian University of Technology. ■



photo: archive of the Association of Alumni of the SUT

SUCCESSSES

The success of the Silesian University of Technology in the Webometrics ranking

In the latest edition of the Webometrics ranking, among 2,730 assessed institutions, in the group of Central and Eastern European countries, the Silesian University of Technology was ranked 32nd.

Among the 6,000 institutions assessed in the Webometrics ranking from Europe, the Silesian University of Technology took 331st place, and among all 11,989 institutions assessed in the world, this gives it 824th place. In Poland, only the Jagiellonian University in Krakow, the Stanisław Staszic AGH University of Science and Technology in Krakow, Adam Mickiewicz University in Poznań, Nicolaus Copernicus University in Toruń, Warsaw University of Technology, University of Warsaw were ranked higher.

The Web of Universities (Webometrics) ranking evaluates the activities of universities and scientists not only on the basis of publications in professional journals, but also on the basis of promotion in other so-

urces, e.g., online. The list of universities from around the world has been prepared on the basis of a comprehensive assessment of the activities of scientific and research institutions. Therefore, the ranking evaluates not only formal activity related to publishing in scientific e-journals or repositories, but also informal scientific communication. In this aspect, the Silesian University of Technology is gaining an increasing reputation and recognition on the international arena. ■



photo: Maciej Mutwil

A great discovery by scientists from the Department of Organic Chemistry, Bioorganic Chemistry and Biotechnology

A team of scientists from the Department of Organic Chemistry, Bioorganic Chemistry and Biotechnology at the Faculty of Chemistry of the Silesian University of Technology has made an extraordinary discovery. Researchers have synthesized polymers that until recently were very expensive. This will help to facilitate research in many scientific disciplines, including nanomedicine and telecommunications.

Dr hab. Eng. Dawid Janas, prof. of the Silesian University of Technology leads a team that, thanks to grants from the National Science Centre and NAWA, conducts research on polymers and nanotubes. The results of the research turned out to be groundbreaking.

– Thanks to the synergistic combination of competences in the field of polymer chemistry and nanomaterials, we have achieved a breakthrough in the purification of single-wall carbon nanotubes, which opens the way to the use of these very promising materials in many branches of the economy, such as nanomedicine, telecommunications and microelectronics – explains dr hab. Eng. Dawid Janas, prof. SUT

The complicated procedure has led to important conclusions, thanks to which scientists from around the world will be able to use this solution in their own research. The achievement is interdisciplinary in nature, as carbon nanotubes have a wide range of potential applications affecting many areas of science.

A great advantage of this achievement is also the fact

that using innovative synthesis techniques developed by a group of researchers from the Silesian University of Technology in recent years, it is possible to obtain polymers for research in a relatively inexpensive way, even ten times cheaper than before. ■

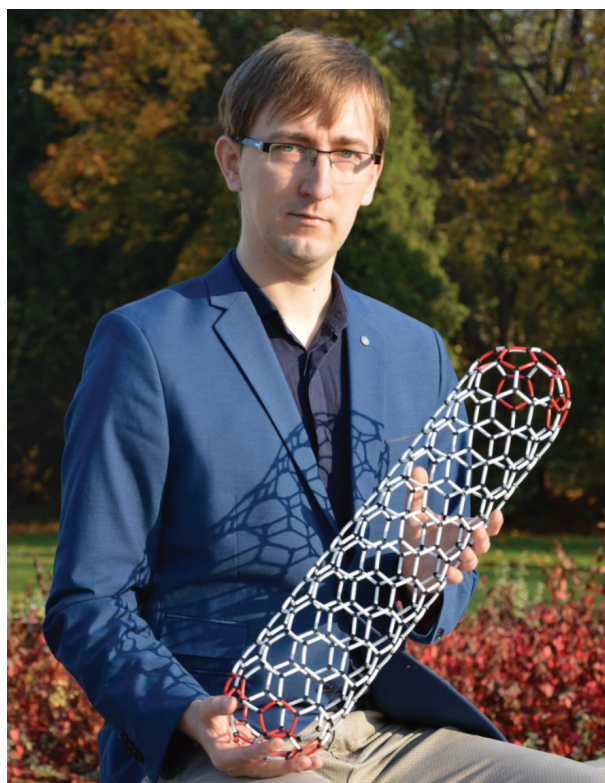


photo: Marek Gabzdyl

Dr hab. Denis-Didier Rousseau, prof. SUT received a medal for outstanding merits

Dr hab. Denis-Didier Rousseau, professor of the Silesian University of Technology from the Institute of Physics of the Silesian University of Technology, has been awarded a prestigious award. The scientist received the Liu Tungsheng Medal for outstanding contributions to the international community in Quaternary science. He received the award during the 21st INQUA Congress in Rome

The award honours the memory of Professor Liu, a former member of the Chinese Academy of Sciences and research professor at the Institute of Geology and Geophysics in Beijing, China. This scientist made outstanding contributions to the study of the Quaternary paleoenvironment, particularly with regard to the Chinese loess sequences.

The Liu Tungsheng Medal for Distinguished Career has been awarded since 2011 to scientists who have made outstanding and significant research contributions and have clearly contributed to the development of Quaternary science by promoting the discipline internationally. ■

Silesian University of Technology awarded in the Marka Śląskie competition

The Academic Aviation Training Centre of the Silesian University of Technology and the Biotechnology Centre of the Silesian University of Technology awarded with the Marka Śląskie (Śląskie Brand) statuette. The competition is organized by the Regional Chamber of Commerce and Industry in Gliwice.

The aim of the competition is to promote the best enterprises, institutions, local governments, products, services and people, as well as to increase the economic, cultural and social attractiveness of the Silesian Voivodeship.

The Academic Aviation Training Centre of the Silesian University of Technology was awarded in the Service category. The competition jury appreciated the overall activities of the centre. The Biotechnology Centre of the Silesian University of Technology was awarded in the Science category. The award was granted for scientific achievements and cooperation with research centres and business entities. ■

Women team of AZS Politechnika Śląska basketball players is getting closer to the start in the league

In the fall, the basketball players of AZS Politechnika Śląska will take part in the second Silesian league. The club is gradually preparing for this in terms of sports and organization.

Let us remind you that in recent years, the representatives of the Silesian University of Technology performed great at both the Silesian Academic Championships and the Polish Academic Basketball Championships, from where they even brought home bronze medals. This is a great success that showed their potential. This is how the initiative to create this team was born.

- I must admit that the atmosphere around the reactivation of this team is very positive - says coach Patryk Niczke, an academic teacher from the Sports Centre of the Silesian University of Technology. - We are met with a friendly reception and increasing interest in the women's basketball community in Gliwice and beyond. ■



photo: Maciej Mutwil

PROJECTS

An autonomous bicycle station on the campus of the Silesian University of Technology

An autonomous bicycle service station was established on the campus of the Silesian University of Technology. The station is located in the green belt between the building of the Faculty of Energy and Environmental Engineering and the 1st Secondary Comprehensive School in Gliwice.

Work related to the construction of an autonomous emergency bicycle service station powered by photovoltaic panels has been completed. The station is equipped with the necessary set of tools useful when servicing a bicycle. Its main advantage is the possibility to inflate the bicycle wheels with stored compressed air. During the bike service, it is also possible to charge small electronic devices such as a mobile phone, power bank, wireless headphones or a flashlight.

The station is the result of the PBL project, which received funding in the 9th competition of the "Excellence Initiative - Research University" program carried out at the Silesian University of Technology, in the field of project-oriented education - Project Based Learning. ■



photo: Mariola Jureczko

They are working on a project to use a humanoid robot

For several months, an educational project called Robo-Coop has been implemented at the Faculty of Organization and Management of the Silesian University of Technology. Partners from Turkey, Spain and Germany take part in it. On August 24-25, another meeting of partners implementing this project took place in Gliwice.

The aim of the project (implemented as part of the European Erasmus+ program) is to develop a comprehensive educational program allowing the use of the

Pepper humanoid robot in the education process.

In August, a meeting of partners implementing the Robot Cooperation project financed under the European Erasmus+ program took place. Scientists discussed the project's results so far and decided on further work. The decisions made were significantly influenced by the results of the survey conducted in spring. The survey was developed to improve the software for future humanoid robot. ■



photo: Magda Palacz

TalentOn, a competition for young scientists

The Silesian University of Technology is part of the consortium of organizers of the European City of Science Katowice 2024. On this occasion, many events for students and scientists will be held in our region. Young scientists and researchers are already being invited to prepare special projects that they will be able to present during such events. One of the initiatives is TalentOn - a competition for young scientists.

TalentOn is an event organized under the auspices of the European Commission, intended for scientists aged 21 to 35 who are studying or preparing for a PhD in European research centres.

Although recruitment for participation in the competition will be announced only in the spring of 2024, young scientists can already work on their projects that will help change the world. From among the applications, experts will select approximately 100 participants of the TalentOn competition, which will be held during the international scientific conference EuroScience Open Forum (ESOF) scheduled for June 12-15, 2024, as part of the celebration of the European City of Science Katowice 2024. ■

Thematic paths of the European City of Science Katowice 2024

Health and quality of life, climate and environment, industries of the future, social innovations, industrial and cultural heritage as well as creation and criticism - these are the issues of six thematic paths that will be discussed as part of the celebration of the European City of Science Katowice 2024. In 2021, this title was awarded to Katowice. In addition to the City of Katowice, seven Silesian universities, including the Silesian University of Technology, are involved in organizing the celebrations.

The 21st century is a time of many opportunities, but also numerous challenges related to the progress of science and technology. As part of the European City of Science Katowice 2024 and the planned 50 thematic weeks, events will focus on the most important topics of interest to modern society. For 6 thematic paths, science will look for answers and solutions. These are: health and quality of life, climate and environment, industries of the future, social innovation, industrial and cultural heritage, creation and criticism. ■

YOU WILL FIND THE BULLETIN OF THE SILESIAN UNIVERSITY OF TECHNOLOGY HERE:

1. Cechownia/Engineering Training Centre EMT Systems Sp. z o. o 44-100 Gliwice 35A, Bojkowska Street
2. Municipal Theatre 44-100 Gliwice 55/57 Nowy Świat
3. Katowice International Airport in Pyrzowice 42-625 Pyrzowice 90, Wolności Street, Departures terminal
4. Project Management Centre 44-100 Gliwice 10, Banacha Street
5. NZOZ Academic Clinic 44-100 Gliwice 5, Łużycka Street
6. Faculty of Automatic Control, Electronics and Computer Science 44-100 Gliwice 16, Akademicka Street
7. Faculty of Mechanical Engineering 44-100 Gliwice 18A, Konarskiego Street
8. Institute of Physics - Centre for Science and Education of the Silesian University of Technology 44-100 Gliwice 22B, Konarskiego Street
9. Faculty of Materials Engineering 40-019 Katowice 8, Krasieńskiego Street
10. Faculty of Mining, Safety Engineering and Industrial Automation 44-100 Gliwice 2, Akademicka Street
11. Faculty of Organization and Management 41-800 Zabrze 26-28 Roosevelta Street
12. Faculty of Biomedical Engineering 41-800 Zabrze 40, Roosevelta Street
13. Faculty of Transport and Aviation Engineering 40-019 Katowice 8, Krasieńskiego Street
14. Faculty of Civil Engineering 44-100 Gliwice 5, Akademicka Street
15. International Centre for Interdisciplinary Research 44-100 Gliwice 18B, Konarskiego Street, room 202
16. Zabrze City Hall - Customer Service Point 41-800 Zabrze, 5 - 7, Powstańców Śląskich Street
17. Faculty of Applied Mathematics 44-100 Gliwice 23, Kaszubska Street
18. Faculty of Energy and Environmental Engineering 44-100 Gliwice 18, Konarskiego Street
19. Faculty of Electrical Engineering 44-100 Gliwice 2, Bolesława Krzywoustego Street

POSITIONS, DEGREES AND ACADEMIC TITLES

AWARDS OF THE ACADEMIC TITLE OF PROFESSOR:

Prof. dr hab. Eng. Mohamed ALWAEI

A graduate of the Faculty of Mining and Geology of the Silesian University of Technology. Dr – October 14, 2002, Dr hab. – March 22, 2013. Position of university professor from May 1, 2019. Employment at the Silesian University of Technology from October 1, 2002. Title of professor of engineering and technical sciences – July 24, 2023.

Prof. dr hab. Eng. Ewa FELIS

A graduate of the Faculty of Energy and Environmental Engineering of the Silesian University of Technology. Dr – No-

vember 17, 2006, Dr hab. – January 24, 2014. Position of university professor from May 1, 2019. Employment at the Silesian University of Technology from December 1, 2006. Title of professor of engineering and technical sciences – July 24, 2023.

Prof. dr hab. Eng. Mariusz JAŚNIOK

Graduate of the Faculty of Civil Engineering of the Silesian University of Technology Dr – March 20, 2002. Dr hab. – May 7, 2014. Position of university professor from December 1, 2016. Employment at the Silesian University of Technology from December 1, 1995. Title of professor of engineering and technical sciences – July 24, 2023.

Prof. dr hab. Eng. Robert MICHNIK

Graduate of the Faculty of Mechanical Engineering of the Silesian University of Technology. Dr - May 29, 2002, Dr hab. – March 9, 2016. Position of university professor from September 1, 2016. Title of professor of engineering and technical sciences – August 4, 2023.

Prof. dr hab. Eng. Wojciech WOLAŃSKI

Graduate of the Faculty of Mechanical Engineering of the Silesian University of Technology. Dr – 08 December 2004, Dr hab. – June 15, 2016. Position of university professor from September 1, 2016. Title of professor of engineering and technical sciences - August 4, 2023.

Prepared by: Katarzyna Owoc

ONLINE STORE OF THE SILESIAN UNIVERSITY OF TECHNOLOGY



Personal collection: Promotion and Communication Centre, 2A, Akademicka Street, 44 -100 Gliwice 296 1st floor (Rector's Office)
Possible shipping to an InPost parcel locker

WHAT'S ON IN OCTOBER IN THE STUDENT CULTURE CENTRE "MROWISKO"

3.10 at 11:00

Science with Culture – Space

5.10 at 19:00

Performance: A Fat One

7.10 at 22:15 (KS Spirala)

percussion workshops run by Dariusz Gola entitled "FROM CHANDLER TO MILLER"

8.10 at 19:00

Daniel Midas (Stand Up)

10.10 at 19:00 (KS Spirala)

Board games

11.10 at 19:00

Performance: Fredo in a manly way (MrOFFisko)

12.10 at 19:00

Concert by Andrzej Dąbrowski

13.10 at 20:00 (KS Spirala)

Good Evening with a vinyl record

20.10 at 21:00

Spirala AEGGEE integration event

20.10 at 19:00

Concert by Sonia Bohosiewicz with her band "10 Secrets of Marilyn Monroe"

21.10 at 17:30 (KS Spirala)

Punk Generation Festival

27.10 at 20:00 (KS Spirala)

Shanty evening

27.10 at 11:00 and at 18:00

Upper Silesian Comic Book Party and Science with Culture lecture "About architecture in comics" by prof. Matylda Sęk-Iwanek and "Nordic Myths" Mateusz K. Sawczyn

28.10 at 12:00

Upper Silesian Comic Book Party

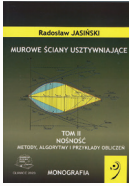
28.10 at 14:00

workshops; at 16:00 concerts: Enchanted Microphone, Rytm Gliwice Foundation

31.10 at 21:00 (KS Spirala)

HALLOWEEN – rockotheque

PUBLISHING NEWS

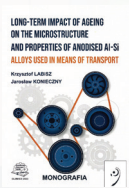


Murowe ściany usztywniające. Tom II. Nośność, metody, algorytmy i przykłady obliczeń.

Radosław JASIŃSKI

Ed. I, 2023, PLN 77.70, p. 558

The monograph presents the issue of checking the load-bearing capacity of unreinforced and reinforced masonry stiffening walls in buildings with traditional wall construction, in buildings with frame and trussed structures. The main aim of the work was to present coherent design algorithms compliant with Eurocode 6.

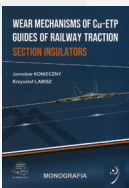


Long-term impact of ageing on the microstructure and properties of anodised Al-Si.

Krzysztof LABISZ, Jarosław KONIECZNY

Ed. I, 2023, PLN 14.70, p. 94

The aim of the publication was to improve the surface properties and, consequently, to extend the life cycle of the surfaces of aluminium parts used in the structures of various means of transport. An aluminium pulley was used for testing. The monograph is an extensive research work on the development of light metal alloys in the field of surface treatment, crystallization kinetics of aluminium alloys, shaping the functional properties of elements manufactured from aluminium alloys by hard anodizing.



Wear mechanisms of Cu-ETP guides of railway traction.

Jarosław KONIECZNY, Krzysztof LABISZ

Ed. I, 2023, PLN 18.90, p. 138

The monograph presents the results of tests on operational damage to section insulator guides made of hard electrolytic copper Cu-ETP (Electrolytic Tough Pitch Copper). The presented simulation results make it possible to estimate the impact of selected factors on the temperature generated at the point of contact between the contact wire and the current collector. Based on the simulations, it is possible to predict the impact of the considered parameters on the temperature increase and its possible impact on the degradation of the contact wire material.



Stropy Teriva Panel i Konbet S-Panel. Koncepcja, kształtowanie, obliczanie, wykonawstwo.

Łukasz DROBIEC, Artur KISIOŁEK, Jakub ZAJĄĆ

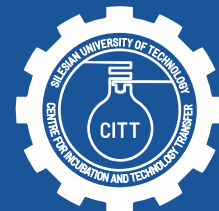
Ed. I, 2023, PLN 35.70, p. 273

The monograph describes prestressed composite ceilings available in Poland under the trade names Teriva Panel and Konbet S-Panel. The work includes their concept, describes the basic features, provides design methods and construction principles, and discusses the results of experimental tests on ceilings and market research. Issues related to the design of a ceiling composed of prefabricated elements and concrete topping were discussed. The publication is addressed to students of civil engineering and architecture as well as engineers involved in the design and construction of ceilings. Due to the broad approach to the topic, it may also be useful to traders and manufacturers of ceiling systems.

Prepared by: Małgorzata Mizera

Entrepreneur

Do you want to commission research work or a service?



BUSINESS PROCESSING OFFICE
guarantees efficient and effective
cooperation between science and business.

- send inquiry to biznes@polsl.pl
- we will find scientists
- we will prepare an offer
- we will realize the order

Check and contact us at the
Business Processing Office
biznes@polsl.pl



100
INNOVATIONS

Discover the best intellectual property
of the Silesian University of Technology



Do you need more information?

Contact the Centre for Incubation and Technology Transfer of the Silesian University of Technology at the Business Processing Office: biznes@polsl.pl



Centre for Incubation and Technology Transfer
Silesian University of Technology
7, Stefana Banacha Street
44-100 Gliwice
+48 32 400 34 00
biznes@polsl.pl
<https://www.polsl.pl/rj04-citt/>



Silesian University
of Technology



Pioneering and unique study format at the Silesian University of Technology!



Sign up for studies!

I, II cycle and postgraduate studies

Study in Gliwice, Katowice, Zabrze and Rybnik

www.rekrutacja.polsl.pl



Silesian
University
of Technology



RESEARCH
UNIVERSITY
EXCELLENCE INITIATIVE