EXPERIENCE SCIENCE TECHNOLOGY FUTURE

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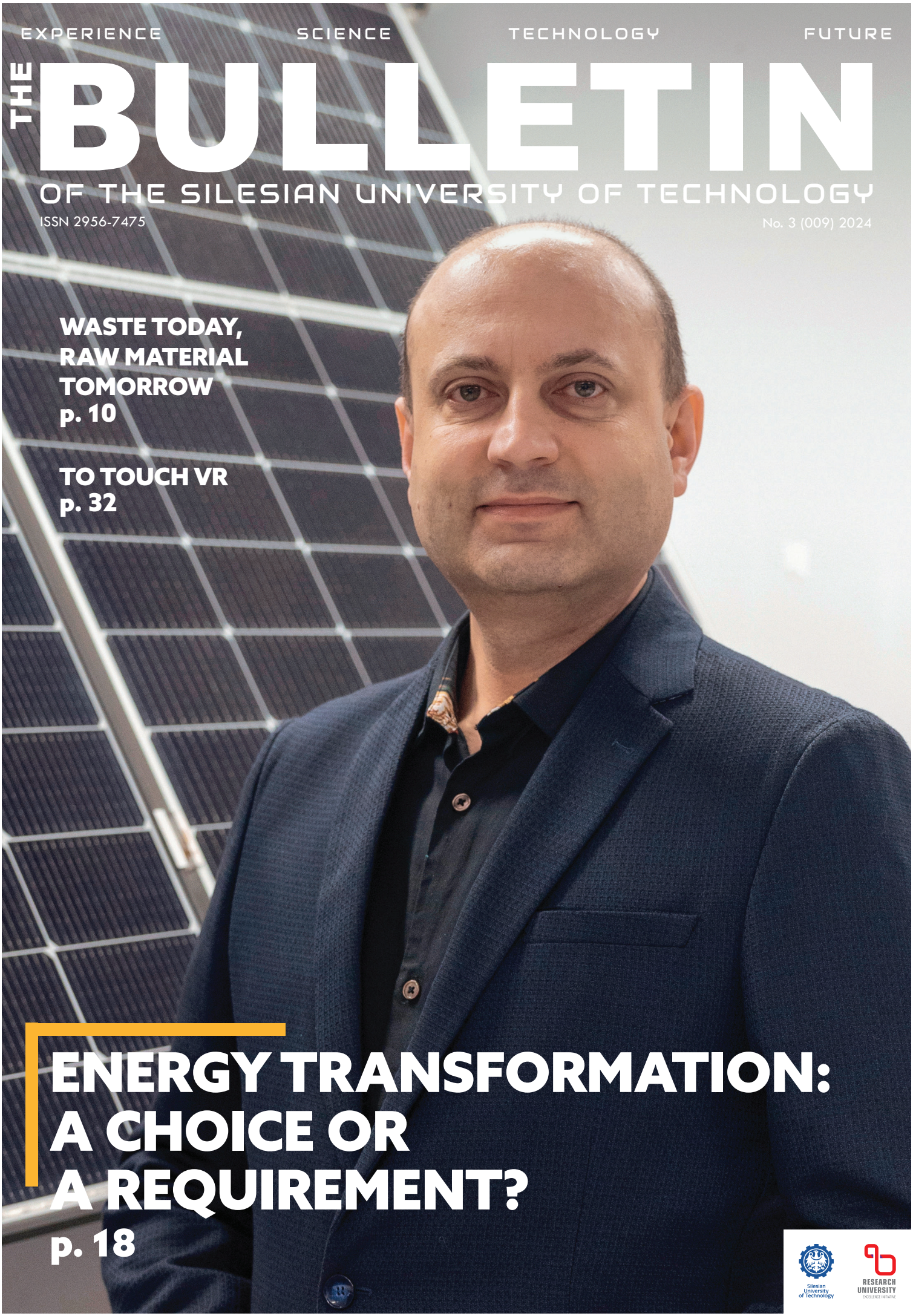
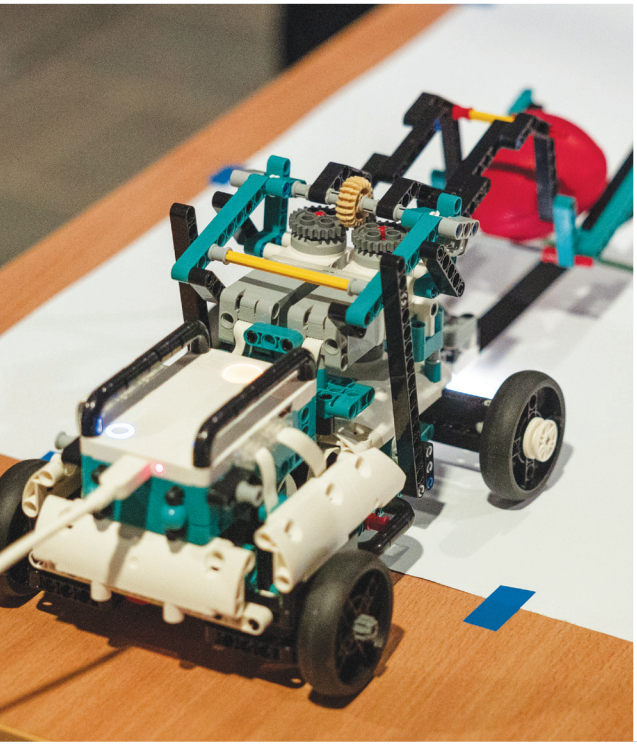
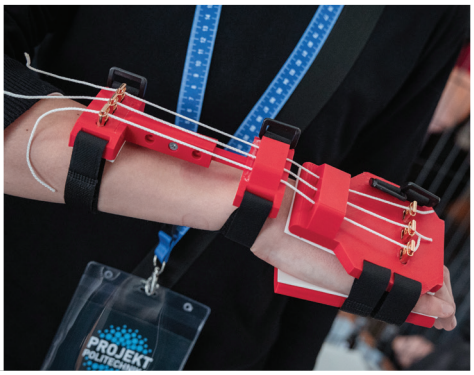


ENERGY TRANSFORMATION: A CHOICE OR A REQUIREMENT?

Silesian University of Technology

RESEARCH UNIVERSITY EXCELLENCE INITIATIVE





THE GREAT "POLITECHNIKA" PROJECT

Photos: *Maciej Mutwil*

FROM THE EDITOR

More and more often we find ourselves living in a world where the only constant is variability. The Silesian Voivodeship has been undergoing restructuring processes for over 30 years. Today, the most industrialized region of Europe is entering a stage of energy transformation that will change the social culture of the region, built on the landscape of mining shafts. If Poland remains passive, it will become an open-air museum of Europe with expensive energy, and thus an uncompetitive industry. The march toward green energy became the topic of the March issue of our Bulletin. Scientists of the Silesian University of Technology openly say that if we continue to delay the transformation, as a result, global corporations will carry it out for us, and profits, instead of supporting domestic innovation, will go abroad.

I cordially invite you to read articles about this difficult and often unpopular perspective of the changes that await us. The galloping development of technology forces the development of new competences and skills. It is good to learn having fun. The idea of incorporating more senses into the virtual world came from students of the Silesian University of Technology, who developed a tactical glove that allows users to feel virtual elements. Now the young people have gone a step further and created an engineering VR game.

These and other possibilities offered by technology are widely discussed in the pages of this issue. The March edition will feature the history of students who decided to develop their unique talents and knowledge at the Silesian University of Technology. Did the university meet their expectations?

Wishing you an interesting reading
on behalf of the Editorial Board
Iwona Flanczewska-Rogalska

THE BULLETIN OF THE SILESIAN UNIVERSITY OF TECHNOLOGY

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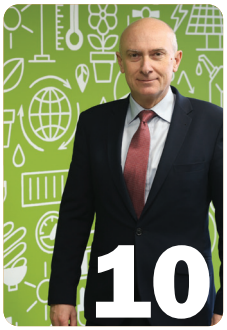

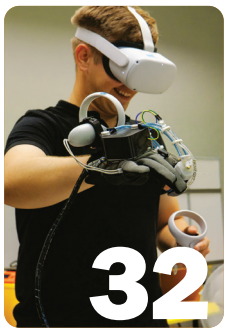

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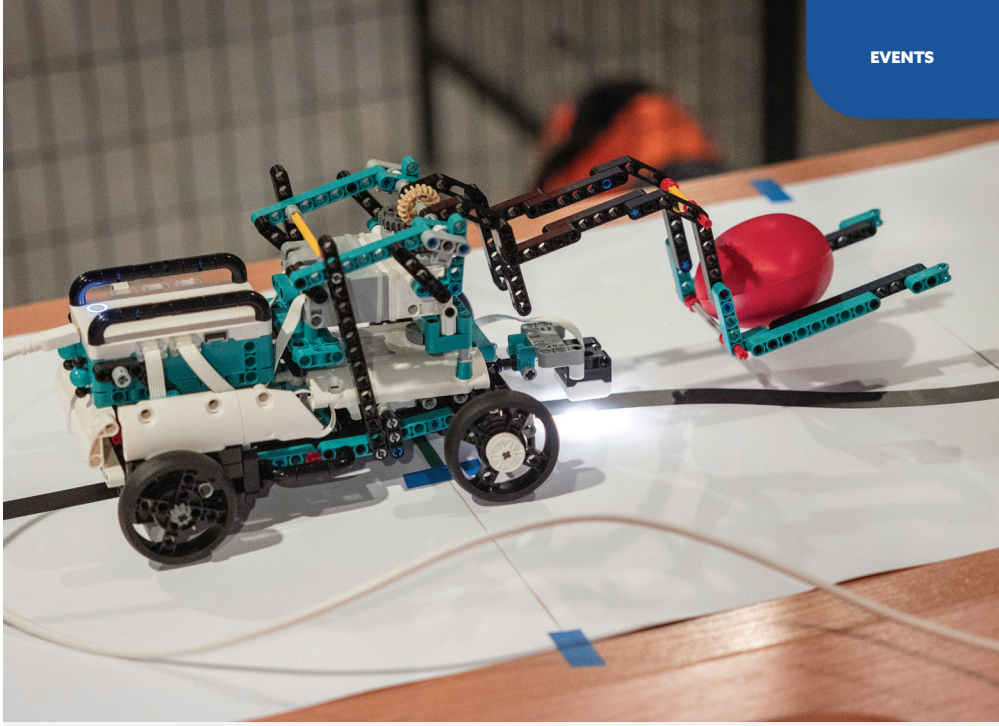
THE GREAT "POLITECHNIKA" PROJECT

prepared by: **Editorial Board**
Photos: **Maciej Mutwil**

THE SECOND EDITION OF A SERIES OF RESEARCH PROJECTS CARRIED OUT AT THE SILESIAN UNIVERSITY OF TECHNOLOGY WITH SECONDARY SCHOOL PUPILS AS PART OF THE EXCELLENCE INITIATIVE - RESEARCH UNIVERSITY PROGRAM HAS ENDED. THE BOARD HAS CHOSEN 61 PROJECTS WHICH WERE PRESENTED IN THE FORM OF POSTERS ON MARCH 1ST, DURING THE CONFERENCE: "THE GREAT "POLITECHNIKA" PROJECT."

The interest in the second edition of the Silesian University of Technology program was huge. Pupils from 27 secondary schools from Gliwice, Rybnik, Katowice, Zabrze, Pyskowice, Siemianowice Śląskie, Dąbrowa Górnicza, Mikołów, Mysłowice, Ruda Śląska, Radzionków, Wodzisław Śląski, Tychy, Lędziny, Czerwionka-Leszczyny, and even from Krakow and Wolsztyn took part in the implementation of the projects.



The project teams consisted of 2-3 pupils from the second or third grades of comprehensive secondary schools or technical vocational schools from the Silesian Voivodeship, and were supervised by academic teachers, often supported by Ph. D. students or students. This year, forty-two main and forty-three assistant tutors took part in the project, providing substantive supervision over 159 pupils. The program also enabled financing the purchase of necessary materials, equipment, and services.

The first competition for financing projects implemented with secondary school pupils, as part of the Excellence Initiative - Research University program, was announced in January 2024. Applying for projects, their financing and settlement were carried out in accordance with the rules set out in the Regulations on financing projects implemented with secondary school pupils, as part of the Excellence Initiative - Research University program.

On March 1st, 2024, at the Education and Congress Centre of the Silesian University of Technology during the conference: “The Great “POLITECHNIKA” Project”, project teams presented the results of their work in the form of posters, the topics of which covered all pri-

ority research areas of the University. While implementing research topics in cooperation with the Silesian University of Technology, pupils develop many valuable skills thanks to the use of the project-oriented education method (PBL - Project-Based Learning). Classes allow not only to acquire knowledge and skills in each area, but also serve to develop pupils' creativity, act as an inspiration, teach teamwork skills and shape organizational skills.

The Silesian University of Technology issued" Micro-credentials" to all students implementing the projects, in accordance with the Rector's Order No. 40/2024 of 23 February 2024

The "Micro-credential" is a digital document confirming the acquisition of knowledge, skills, qualifications, and professional competences that a learner has acquired with little learning. It is an innovative tool in lifelong learning and professional development in the European Higher Education Area.

At the conference, a team of experts selected 6 teams - competition winners:

- Detector - obstacle detector for blind people– III Secondary Comprehensive School in Katowice. Project supervisor Dr Eng. Iwona Chuchnowska. Project participants: Błażej Dzwonkowicz, Katarzyna Czop, Maria Supernak. Dr Eng. Iwona Chuchnowska. Assistant scientific supervisor: M.Sc. Andrzej Michnik, M.Sc. Marek Ples.
- Functional ceramic-metal structural composites for applications in aviation and automotive industry - ZST in Mikołów. Project supervisor dr hab. Eng. Klaudiusz Gołombek, prof. of Silesian University of Technology. Project participants: Adrian Brożek, Kacper Kurpas, Kamil Wilczek. Assistant scientific supervisor: dr Eng. Piotr Sakiewicz, assistant professor, MSc Eng. Mateusz Lis, doctoral student.
- Interactive ROBO-Pot– ZSTI in Gliwice. Project supervisor: Dr Eng. Mariola Jureczko. Project participants: Borys Rogowski, Jakub Frąsiak, Stanisław Januszek.
- Design and manufacture of a sensory book with interchangeable panels with 3D printing technology - ZST in Mikołów. Project supervisor: Dr Eng. Agnieszka J. Nowak. Project participants: Krzysztof Statnik, Zacharias Chrzanowski.
- The impact of lifestyle on the physical fitness of secondary school students - Generation Z - 1st Secondary Comprehensive School in Chorzów. Project supervisor: prof. dr hab. Eng. Robert Michnik. Project participants: Iga Szaflik, Filip Rusinowicz. Assistant scientific supervisor: M.Sc. Hanna Zadoń, MSc. Eng. Piotr Szaflik.
- Automated object identification– I Secondary Comprehensive School in Chorzów. Project supervisor: Dr

We have great students and PhD students with heads full of ideas, acting as support tutors. We have a modern infrastructure, allowing implementing the boldest ideas – said the Vice-Rector for Science and Development Prof. Dr Hab. Eng. Marek Pawełczyk.

Eng. Elizabeth Milewska. Project participants: Filip Gołąbek, Patryk Kotłowski, Konrad Książek. Assistant Scientist: Robert Kasprowski.

Members of the awarded teams, if they become students of the Silesian University of Technology, will receive a scholarship of PLN 700 per month in the first year of their studies.

The Eureka Pro Award:

Secondary use of waste materials in the process of 3D printing using the FDM method - ZST in Mikołów. Project supervisor: dr hab. Eng. Grzegorz Matula, prof. of Silesian University of Technology. Project participants: Damian Gajda, Jakub Skapczyk, Kamil Herman. Assistant Scientist: MSc Eng. Michał Gocki, PhD student.

– The Silesian University of Technology has what is the most valuable to offer young people who plan to invest well in their future. First of all, we have an excellent staff, with rich experience and passion, real mentors who willingly engage as project group supervisors. We have great students and PhD students with heads full of ideas, acting as support tutors. We have a modern infrastructure, giving the opportunity to implement the wildest ideas. Finally, we have a well-developed and well-verified modern approach to education in a project-oriented form, which is what other universities envy us – said the Vice-Rector for Science and Development Prof. Dr Hab. Eng. Marek Pawełczyk, who developed the principles and promoted the modern method of project-oriented education (PBL - Project Based Learning) at the Silesian University of Technology. The experience gained from its pilot implementation several years ago in the field of Automation and Robotics has been dynamically developed throughout the University, where over 200 PBL projects are currently implemented each year and used by students and employees of all faculties. Based on this experience, he proposed a program for involving secondary school pupils in scientific research by implementing projects in a formula similar to PBL.

During the conference summarizing "The Great "POLITECHNIKA" Project," young people could get acquainted with the educational offer of the Silesian University of Technology, which was presented by the Vice-Rector for Student Affairs and Education, Prof. Dr Hab. Eng. Wojciech Szkliniarz.

– Silesian University of Technology focuses on education in the PBL formula. We spend more than 3 million PLN per year for this purpose. We strive to make the most of the practical classes that take place in this formula. – said Prof. Wojciech Szkliniarz.

As emphasized by Prof. Anna Chrobok, Director of the College of Studies, secondary school pupils implementing projects at the Silesian University of Technology, under the supervision of academic teachers, learn about the latest research trends, conduct research using modern research infrastructure and learn to work in a group. – They build a bond with the university, thanks to which they have a chance to plan their future education at the Silesian University of Technology. Students, like young researchers, learn not only how to acquire knowledge, but also how to disseminate it. During the poster session, pupils had the opportunity to familiarize themselves with the research presented by their colleagues, conducted interesting and inspiring discussions – added Professor Anna Chrobok

To sum up, in the last two editions of a series of research projects carried out at the Silesian University of Technology, more than three hundred pupils from thirty-five different schools from Gliwice and the region took part. A monograph summarising the first edition has also been published, in which all the poster works presented at last year's conference "The Great "POLITECHNIKA" Project." were presented. The monograph is also available in the RePolis collection. ■

REMOTELY DOES NOT MEAN WORSE

text and photo: **Mariusz Stępień**

DEVELOPMENT OF DIDACTIC LABORATORIES IN THE FIELD OF ELECTRICAL ENGINEERING, AUTOMATION AND MECHATRONICS ENABLING THE IMPLEMENTATION OF LABORATORY WORKSHOPS REMOTELY, TRAINING WORKSHOPS FOR STUDENTS AND STUDY VISITS – THESE ARE THE RESULTS OF AN INTERNATIONAL EDUCATIONAL PROJECT CARRIED OUT BY A CONSORTIUM OF 7 INSTITUTIONS AND COORDINATED BY THE SILESIAN UNIVERSITY OF TECHNOLOGY.

In February this year, the evaluation of the international educational project entitled “Digital platform supporting remote laboratory workshops in electrical engineering, mechatronics and automation” with the acronym RELABEMA. It was implemented in the form of partnerships for Preparedness for Digital Education in the Higher Education sector under the Erasmus+ program. The evaluation was conducted by the Foundation for the Development of the Education System – the National Agency of the Erasmus+ Program. As a result of this evaluation, the project was recognized as an example of good practices in education, i.e. distinguished in terms of results and method of implementation from among projects coordinated by the National Agency.

RELABEMA project was implemented in a consortium of 7 institutions, including 6 universities and coordinated by the Silesian University of Technology. The project was implemented in the years 2021-2023. At the Silesian University of Technology, the leading unit was the Department of Power Electronics, Electric Drives and Robotics (Faculty of Electrical Engineering), and the leader of the whole project was Dr Hab. Eng. Mariusz Stępień, prof. of Silesian University of Technology. Most of the partner universities were institutions

cooperating within the CUCEE network (Cooperation of Universities in Central and Eastern Europe), of which the Silesian University of Technology has been a partner since 2012. Among the partner universities of the project were, among others: Tallinn University of Technology (Estonia), THM University of applied Sciences (Germany), West Bohemia University (Czech Republic).

The project was devoted to the development of a group of didactic laboratories in the field of electrical engineering, automation and mechatronics enabling the implementation of laboratory workshops remotely. As part of the project, four large functional didactic laboratories were created: automation laboratory (Tallinn University of Technology), power electronics laboratory (Silesian University of Technology), measurement and sensor laboratory (Zielona Góra University) and virtual reality laboratory in electrical engineering (Vilnius Gedyminas Technical University). The laboratories enable the implementation of on-site classes for students of universities in which they are located, and the implementation of remote classes to all other students, in particular from a partner university.

The project also carried out a series of educational activities. These were study visits of project participants at partner universities. Such visits took place, among others, at Vilnius Gedyminas Technical University in Vilnius, and at THM University of applied Sciences in Giessen. Ten-day long training workshops organized twice for students at partner universities were very important educational activities. The first one took place in Estonia and was organized by Tallinn University of Technology, while the second one took place in Poland and was organized by the Silesian University of Technology. The workshops were attended by over 50 students from 6 countries and several researchers from partner universities, including the Silesian University of Technology. During the first workshops, the participants from Poland (Silesian University of Technology, University of Zielona Góra, Technical Schools Complex), were welcomed by the Ambassador of the Republic of Poland to Estonia, Grzegorz Kozłowski.

More information about the project can be found on the dedicated website http://www.relabema.eu/. ■

WASTE TODAY, RAW MATERIAL TOMORROW

text: Anna Świderska
photo: Jan Szady, www.circon.plgbc.org.pl

THERE ARE MORE THAN 8 BILLION PEOPLE IN THE WORLD, AND ACCORDING TO THE UN, THIS NUMBER WILL INCREASE TO 9 BILLION IN THE NEXT 15 YEARS. MEETING THE NEEDS OF A HUGE POPULATION, ESPECIALLY IN THE CONSTRUCTION SECTOR, IS A CHALLENGE FOR THE ENVIRONMENT. WORSE STILL, A LINEAR ECONOMIC MODEL IS DOMINANT, WHICH EXACERBATES NEGATIVE ENVIRONMENTAL IMPACTS – THE DEMAND FOR NON-RENEWABLE RAW MATERIALS IS GROWING, AND ADEQUATE NATURAL RESOURCE MANAGEMENT POLICIES ARE LACKING. THE SOLUTION IS CIRCULAR ECONOMY.

THERE WILL BE NO RAW MATERIALS

In the European Union, the construction sector is responsible for the consumption of about half of all extracted raw materials and nearly 35% of generated waste, so the need to take measures to limit the excessive exploitation of our planet's resources, especially in the case of the construction industry, is very urgent.

Being aware of the huge challenge of implementing circular economy in construction industry, scientists from the Silesian University of Technology in cooperation with the Polish Green Building Council (PLGBC) and the Green Building Council Iceland undertook the implementation of the CIRCON project: "Circular Economy in Construction: Eco-design of Circular Buildings.

"We had two goals. The first one was to create a compendium of knowledge about designing buildings in accordance with the circular economy, that is, among other things, to develop an assessment mechanism – how to design buildings and how to assess whether what we designed is in line with the objectives of the circular economy" – explains Prof Krzysztof Pikoń from the Department of Technologies and Installations for Waste Management at the Faculty of Energy and Environmental Engineering, head of the project team at the Silesian University of Technology. – "The second goal was to disseminate knowledge about design among key stakeholders in construction."

The concept of circular construction involves minimizing the use of mineral resources, reducing energy consumption, not using toxic materials and, above all, knowing that materials and raw materials are limited. This is supported not only by social interest, care for the environment, but also by economic factors. Such a look at the circular business model in construction allows to treat buildings and structures as banks of materials.

SCIENCE WITH BUSINESS

In order to avoid a purely academic approach to the subject, an advisory group consisting of

Prof. Dr Hab. Eng Krzysztof Pikoń, Head of the Department of Technologies and Installations for Waste Management at the Faculty of Energy and Environmental Engineering

representatives of sustainable companies from the Polish and Icelandic construction industry, as well as scientific institutions involved in the development of circularity in construction was invited to cooperate. Thanks to this, the CIRCON project is a model example of combining science with business. The results of scientific research, under the influence of consultations with representatives from the construction industry, are prepared in a way that is understandable and easy to apply in practice. The publication is a kind of know-how for architects, builders, or developers, a solution that is innovative, practical and – most importantly – has gained acceptance of the business environment. The compendium is available at www.circon.plgbc.org.pl

– "Natural resources are beginning to be scarce, and their consumption is huge, to imagine the scale - take sand as an example. Every year around the world we consume about 10 billion tons of sand, which can be compared to a trench depth of 15 meters and a width of also 15 meters, which would be about 40 thousand kilometres long! These are gigantic quantities. It is certain that sand will eventually run out, so the answer is a circular economy, which is a holistic concept covering the entire life cycle of buildings "- emphasizes Prof. Pikoń.

CIRCULAR WAY OF LIFE

Circular economy is a model of the economy of the future, which strives for rational use of resources and reduces the negative impact of manufactured products on the environment. Unlike the linear model, the end of a product's life means the beginning of a new one. There is no waste in the circular economy model (GOZ), it becomes raw materials and circulates in a closed circuit for as long as possible.

– "In the case of construction, the role of the architect is crucial. The compendium contains a whole chapter devoted to the principles of design in accordance with the objectives of the GOZ, which are complementary to the UN climate goals. The buildings of the future must be designed in such a way that their functionality can be easily transformed, reused, and recycled. A building that is 100% circular, has not yet been built, that is the goal we are aiming for. In the publication we give a number of examples of very

interesting buildings that can be easily adapted for other purposes" – says Prof. Pikoń.

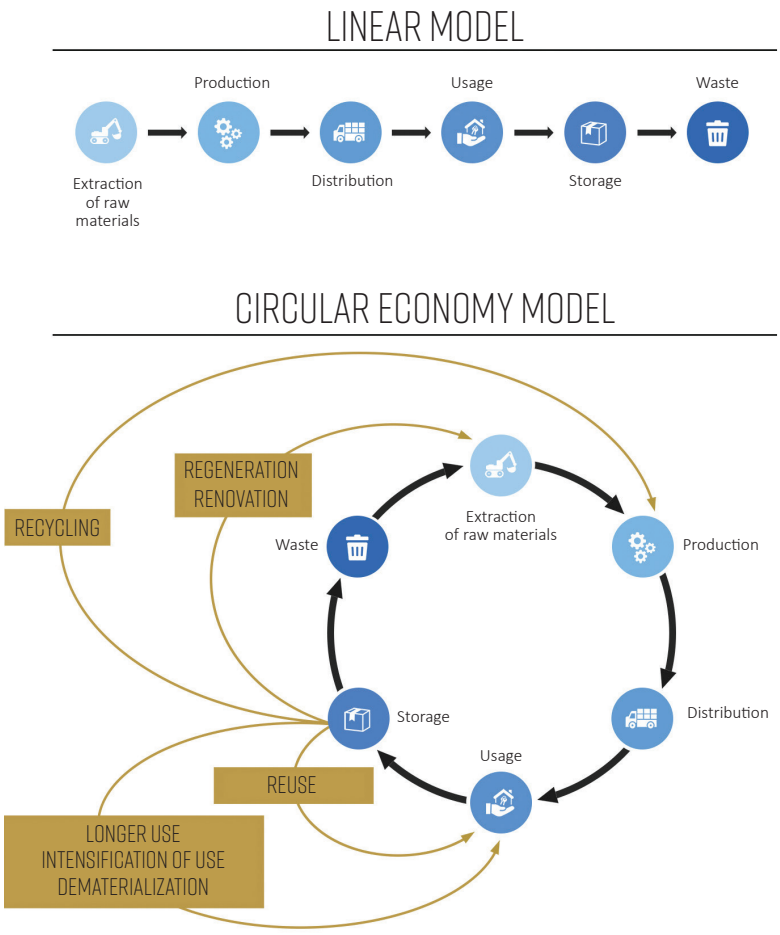
EVALUATE YOURSELF

The compendium identifies four areas for which indicators for assessing the circularity of buildings were developed: use of secondary raw materials related to the construction process, sharing potential and spatial reversibility – related to the use of the building, as well as the potential for re-use of materials, related to the post-life stage, with a view to dismantling or moving the object in whole or in part to another location. They cover the entire life cycle of buildings.

– "We have developed an assessment method, a tool to measure the achieved level of circularity. Each investor can be tempted to calculate these indicators, they can also contact us, we will be happy to provide support" - emphasizes the professor.

The concept of circular construction involves minimizing the use of mineral resources, reducing energy consumption, not using toxic materials and, above all, knowing that materials and raw materials are limited. This is supported not only by social interest, care for the environment, but also by economic factors. Such a look at the circular business model in construction allows to treat buildings and structures as banks of materials.

Implementation of the circular economy concept is a long and complicated process, coordinated by the Ministry of Economic Development and Technology in Poland. Circularity in the economy is the subject of many research works at the Faculty of Energy and Environmental Engineering of the Silesian University of Technology, as well as is an important element of student education. ■



The concept of a linear model and a circular economy model
Source: www.circon.plgbc.org.pl Kompendium GOZ in construction industry

Compendium of Circular Economy in Construction Industry

WE WORK TOGETHER FOR A GREEN EUROPE

The CIRCON Project "Circular economy in construction: Eco-design of circular buildings" benefits from co-financing of PLN 1 345 205.79 received from Iceland, Liechtenstein, and Norway under the Financial Mechanism of the European Economic Area (EEA MF) and co-financing of PLN 237 389.26 from the state budget. The aim of the project is to strengthen the implementation of circular economy in the construction sector.

THE VOICE OF THE STUDENT COUNCIL

MEETING WITH THE MINISTER OF SCIENCE AND HIGHER EDUCATION

photo Szymon Łakomy

On 29th February, the Sejm of the Republic of Poland hosted a meeting of Dariusz Wieczorek, Minister of Science and Higher Education with the presidents of student self-governments of all universities in Poland. On behalf of the Silesian University of Technology, the meeting was attended by the chairman of the University Board of Student Self-Government Dawid Mordarski.

The topics discussed at the meeting concerned the renovation of dormitories, the material situation of students, and changes in the Law on Higher Education and Science, such as modification of the ratio of the rector's scholarship to the social scholarship, change of the period of receiving benefits (from 12 semesters of studying to 12 semesters of receiving benefits) or increase of the threshold entitling to receiving a social scholarship (linked to the minimum wage).

THE STUDENT MARATHON

In the first week of March, as part of the inauguration of the summer semester, an extraordinary Student Marathon took place. During the five-day event, students had the opportunity to participate in interesting events, providing both entertainment and education.

On the first day of the event, on 4th March, Hubert Jarczak's performance entitled "Sex, drugs and rock &roll" took place. The performance was not only an excellent opportunity to immerse oneself in the world of theatre art, but also an inspiring story about the contemporary world.

On the next day, a basketball tournament was planned in the hall of the "Nowa" Sports Centre of the Silesian University of Technology. The turnout was impressive, and the competition was extremely fierce. There were 14 teams in the tournament, and the winner was the "Cleaning Team". Congratulations also to the "Amigos" and "Kopernik Bricks" team for taking second and third place, respectively.

Wednesday evening was one of the students' favourite events – a thematic event at the Spiral Student Club. The "pyjamas party" enjoyed great interest, creating an unforgettable atmosphere.

On Thursday evening, also in the Spiral Student Club, karaoke took place. The great interest of the students and their hidden vocal talents made the atmosphere of the evening unique.

At the end of the week, on Friday, on the occasion of Women's Day, we invited everyone to the Film Evening. The participants had already decided on what category of videos to be shown in a survey conducted on social media. Comedy and animated film won, and during the screening you could feel the unique atmosphere of the cinema, where popcorn and entrance were completely free.

Thank you all for participating in the Student Marathon. It was an unforgettable event full of joy, emotions, and integration. We are looking forward to the next meetings and events.

photo Błażej Brudny

University Board of Student Self-Government; CKS Mrowisko, Pszczyńska 85/8, 44-100 Gliwice; biuro@samorzad.polsl.pl

We are on Facebook and Instagram

text: **Błażej Brudny**

SUSTAINABLE DEVELOPMENT, WHICH IS WHAT?

text: Katarzyna Siwczyk
photo: archive of Aleksandry Kuzior

IN RESPONSE TO GLOBAL NEEDS, CITIES SHOULD CHANGE AND PURSUE SUSTAINABLE DEVELOPMENT POLICIES. SCIENTISTS FROM THE SILESIAN UNIVERSITY OF TECHNOLOGY, WHO NOT ONLY CONDUCT SCIENTIFIC RESEARCH IN ORDER TO IMPROVE THE FUNCTIONING OF THE SO-CALLED CITIES OF THE FUTURE, BUT ALSO SHARE THEIR KNOWLEDGE WITHIN THE FRAMEWORK OF A NEW SPECIALTY OF STUDIES – "SUSTAINABLE CONSUMPTION AND PRODUCTION" COME TO THE AID IN CONDUCTING THIS PROCESS.

In 2015, representatives of the 193 member states of the United Nations signed common demands for improving the quality of the environment. The result of this agreement is a document of the Agenda for Sustainable Development – 2030. The resolution contains 17 Sustainable Development Goals (SDGs), which are intended to contribute to increasing action for humanity and the planet in three key aspects: economic, social, and environmental.

These regulations have led to the introduction of sustainable development through smaller communities and regions around the world, within the Smart City and Smart Sustainable City concepts. However, many urban residents still do not understand the slogans related to "smart city" and sustainable development. What is the meaning of this idea?

"The idea of Smart City is usually associated with intelligent technologies based on artificial intelligence algorithms. But cities are intelligent not because of artificial intelligence, but because of their inhabitants, that is, the natural intelligence of people. Modern technologies only support the various processes of the functioning of the city. Smart cities should not only be associated with artificial intelligence and information and communication technologies, although this is also important, but rather with human intelligence. The residents of the "smart city" are to actively communicate about the needs related to the improvement of the quality of life, among others in terms of safety, air quality, transport, etc. – explains Dr Hab. Aleksandra Kuzior, prof. of Silesian University of Technology – "The assumptions of this concept have changed over the years. The Smart Sustainable City concept not only respects the needs and care for the high quality of life of the present generation, but also takes into account the responsibility for future generations. Shaping the attitude of responsibility is a challenge for schools and universities, which should educate in this area from an early age" – adds Prof. Kuzior, at the same time stressing the fact that the Silesian University of Technology undertakes such activities, including offering ecological education as part of projects for the local community, as well as a new specialty "Sustainable Consumption and Production", implemented as part of the European consortium EURECA-PRO. This will allow for the extension of education to the international aspect and the exchange of experiences by students and researchers in other scientific units in Europe. The specialization will be implemented in the field of Management and Production Engineering. As a result, the Silesian University of Technology will educate specialists in the field of Sustainable Development, sought after on the market.

"The program content of this specialization covers the issues of circular economy, product life

cycle, eco-innovation management, sustainability reporting, which is important in the context of global climate policy and changes that are coming soon," explains Prof. Kuzior. Following these challenges, elements of sustainability teaching have also been introduced into the curriculum of doctoral students at the Doctoral School.

Sustainable urban development is no longer just an idea, but a concrete action plan that all organizations must follow, from small businesses to local government units to national ones. Silesian University of Technology met these needs a few years ago, creating the Silesian Centre for Business Ethics and Sustainable Development. The main task of the Centre is to develop and popularize the assumptions of sustainable development and corporate social responsibility, as well as to disseminate the principles of rational, sustainable management based on modern management methods and the use of environmentally friendly technologies. The Centre operates at the Faculty of Organization and Management. ■

More about the activities of the Silesian University of Technology in the field of sustainable development can be heard in the podcast "Let's talk about science."

COGNITIVE TECHNOLOGIES AT THE SILESIAN SCIENCE FESTIVAL

text: **Bartłomiej Knosala**
photo: **iStock**

The employees of the Department of Applied Social Sciences at the Faculty of Organization and Management organized workshops on cognitive technologies and communication. They were held at the International Congress Centre in Katowice, as part of last year's Silesian Science Festival.

The workshop was opened by Dr Hab. Aleksandra Kuzior, prof. SUT, who drew attention to the ubiquity of cognitive technologies and stressed at the same time that this ubiquity means both an opportunity to improve people's functioning, but it can also carry specific threats, such as disinformation, technological unemployment or problems with cybersecurity. "To avoid these dangers, it becomes necessary to educate on cognitive technologies. Learning about the possibilities of algorithms is already a necessary element of the modern educational landscape "– adds Prof. Kuzior.

As part of the workshop Dr Hab. Eng. Józef Ober, prof SUT presented the cognitive basis of communication. In turn, dr Katarzyna Postrzednik-Lotko conducted a workshop on digital transformation of natural language. The workshop organized by Dr Eng. Paweł Wawrzała, who, based on the tradition of Design Thinking, showed how one can design a channel on one of the social networks using language models currently functioning on the market, was of a different nature.

At the end of the workshop, Dr Bartłomiej Knosala referred to the future of cognitive technologies. "In the current atmosphere of conflicting emotions, focused on artificial intelligence, we should look for positive visions of technological development, in which there will be room not only for increasingly sophisticated technical tools, but also for the world of humanistic values. For all those aspects of our being that make it possible to create a better world for us all" – concluded the scientist. ■

TOGETHER TOWARD GREEN ENERGY

A NEW FIELD OF STUDY AT THE SILESIAN UNIVERSITY OF TECHNOLOGY AND THE WEST POMERANIAN UNIVERSITY OF TECHNOLOGY

edited by **Jolanta Skwaradowska**
photos: **Jolanta Skwaradowska**

THE SILESIAN UNIVERSITY OF TECHNOLOGY, THE WEST POMERANIAN UNIVERSITY OF TECHNOLOGY IN SZCZECIN, AND THE COMPANY ENERGO-COMPLEX FROM PIEKARY ŚLĄSKIE HAVE JOINTLY CREATED A NEW FIELD OF STUDY – "ENERGY TRANSFORMATION". THIS IS THE FIRST CONSORTIUM OF TWO UNIVERSITIES AND AN ENERGY-INDEPENDENT COMPANY IN POLAND IN THE FIELD OF POSTGRADUATE STUDIES IN ENERGY TRANSFORMATION.

The energy transformation is not only a necessity but also an opportunity for economic, social, and technological development. The key to this is the education and competence of professionals who will be able to design, implement and manage a sustainable energy system. That is why, from the new academic year, postgraduate studies in energy transformation are starting. The new field of studies was jointly established by the Silesian University of Technology, West Pomeranian University of Technology in Szczecin, and ENERGO-complex company from Piekary Śląskie.

The cooperation agreement was signed by: Prof. Marian Kampik, Dean of the Faculty of Electrical Engineering of the Silesian University of Technology, Dr hab. Eng. Krzysztof Okarma Dean of the Faculty of Electrical Engineering of the West Pomeranian University of Technology and dr Eng. Marek Szrot, the President of ENERGO-complex Sp. Z o.o.

– The study program will be in line with the latest trends and challenges in the field of energy

Signing the contract: from the left Prof. Marian Kampik, Dean of the Faculty of Electrical Engineering of the Silesian University of Technology, dr Eng. Marek Szrot, Chairman of the Board ENERGO-complex Sp. z o.o. and Dr Hab. Eng. Krzysztof Okarma, prof. ZUT (West Pomeranian University of Technology in Szczecin), Dean of the Faculty of Electrical Engineering at ZUT.

transformation. It will cover issues such as: renewable energy, energy efficiency, energy storage, smart grids, electromobility, energy policy, economics and financing of the energy transition, legal and social aspects of the energy transition, project management and change in the energy transition – says Prof. Marian Kampik, Dean of the Faculty of Electrical Engineering of the Silesian University of Technology

Postgraduate studies in the field of energy transformation will allow to gain competence in the electrical engineering market. It is also an opportunity for even more effective education of personnel who will carry out a complex process of energy transformation.

"Adverse atmospheric phenomena caused by climate change are so large that we are beginning to lack the scale and way of describing their effects and their impact on humanity. Climate change is not just making the quality of our lives worse. It is also real losses caused by natural disasters. In the European Union, the losses caused by climate change in the last 40 years are estimated at 487 billion €, in Poland it was estimated at 70 billion PLN" – said Dr Eng. Krzysztof Bodzek from the Department of Power Electronics, Electric Drives and Robotics at the Silesian University of Technology.

The studies are also a response to the growing demand for highly qualified staff in the field of energy transformation.

Without specialists, the energy transformation will not succeed. We need to build competences in this area, because not only the way of generating energy is changing, but also the entire economy – adds Dr Eng. Krzysztof Bodzek.

The study program will be in line with the latest trends and challenges in the field of energy transformation, encompassing knowledge of the issue from a technical, economic, legal, and social perspective. It is part of a larger project – the Academy of Energy Transformation, which aims to build competences and solve real problems.

– These will be studies under a common banner, with common learning outcomes, but differing in details and some subjects. The specificity of energy transformation in Silesia and Western Pomerania is completely different. We are closer to offshore wind farms, and further to old mines and shafts, which can be energy storage. Therefore, these differences will be inevitable, although the effects and goals are the same. I hope that together, although largely independently, we will be a forge of staff educating specialists in the field of energy transformation. Clean energy is the future of Europe and the world. There is no escape and retreat from this, and care for the natural environment is our common commitment for future generations – emphasized Dr Eng. Krzysztof Okarma, prof. ZUT (West Pomeranian University of Technology in Szczecin), Dean of the Faculty of Electrical Engineering at ZUT.

The study program will be in line with the latest trends and challenges in the field of energy transformation – says Prof. Marian Kampik, Dean of the Faculty of Electrical Engineering of the Silesian University of Technology

The Energy Transformation studies will last two semesters. 220 hours of theoretical and practical classes are planned, conducted by lecturers from the Silesian University of Technology, West Pomeranian University of Technology and ENERGO-complex Sp. Z o.o., a company that is an example of energy independence.

"We want to be a kind of competence hub, and, above all, we want to transfer to the consortium our practical knowledge, which we have gained during over 25 years of activity. For several years we have been operating in the field of energy transformation, implementing modern solutions in the field of modernization and extension of life of transformers. Our company is an example of an energy-independent company. Most of the energy is obtained from renewable sources, while the rest is obtained from a generator in our company. At any time, we can work on our own power supply, disconnecting from the grid - said Dr Eng. Marek Szrot, President of the Management Board of ENERGO-complex Sp. z o.o.

Postgraduate studies in Energy Transformation will start from October 2024 at the Silesian University of Technology and the West Pomeranian University of Technology. They are aimed at all people who want to expand their knowledge and skills in this field, regardless of whether they work in the energy industry or in other sectors of the economy.

I used the materials of the Academy of Energy Transformation. ■

ENERGY RANSFORMATION: A CHOICE OR A REQUIREMENT?

text: Jolanta Skwaradowska
photos: Maciej Mutwil

THE ENERGY TRANSFORMATION IS A NECESSITY, IT IS ALSO AN OPPORTUNITY FOR ECONOMIC, SOCIAL, AND TECHNOLOGICAL DEVELOPMENT. WE TALK WITH DR ENG. KRZYSZTOF BODZEK FROM THE DEPARTMENT OF POWER ELECTRONICS, ELECTRIC DRIVES AND ROBOTICS AT THE SILESIAN UNIVERSITY OF TECHNOLOGY ABOUT WHAT SPECIFIC BENEFITS IT CAN BRING US, WHAT WE NEED TO DO TO CARRY IT OUT, AT WHAT STAGE POLAND IS AND WHAT ROLE EDUCATION PLAYS IN THIS RESPECT.

Everyone knows that energy transformation is necessary. Please tell me why we have to carry it out?

The issue of the energy transformation appeared relatively recently in public space. It is true that for many years there has been talk about climate change, about reducing CO2 emissions and its impact on the environment. For a long time, however, there was no technology that would allow to meet the intended goals in a real way. Of course, some actions were undertaken, the efficiency of energy sources, mainly coal-fired power plants was increased, and better filters were used, limiting the emission of pollutants. However, these actions concerned large power plants and combined heat and power plants, and the problem of so-called low emissions remained, which can be observed perfectly in the winter months, especially in the south of Poland.

It was only the development of technology that allowed everyone to join the transformation process by becoming a prosumer and in the future an electro-prosumer. The concept of prosumer is known, while electro-prosumer and the associated electroprosumerism are concepts promoted by Professor Jan Popczyk, a long-time lecturer at the Silesian University of Technology. The basis of these concepts is the use of electricity in all areas of the economy, due to its very high energy efficiency.

Electroprosumerism can be the basis for successful transformation and lead to a reduction in primary energy

consumption, i.e. the demand for energy raw materials in the form of fossil fuels and critical raw materials, which are necessary for the proper functioning of the economy. Currently, the European Union has identified thirty-four such raw materials, of which seventeen were included in the list of strategic raw materials. These include lithium, cobalt, manganese, or copper. Therefore, the energy transformation cannot be limited as a global trend to a change in energy sources. It is necessary to change the way in which all needs are met.

Renewable energy and its sources have become cheaper than fossil fuels, so sooner or later the transformation will happen anyway. If Poland remains passive, it will become an open-air museum of Europe with expensive energy, and thus an uncompetitive industry, often without the possibility of exporting products, because they will be additionally burdened with a high carbon footprint.

There is another very important danger. If we continue to delay the transformation, then eventually there will be global corporations that will carry it out for us, and profits, instead of supporting domestic innovation, will go abroad.

Why must we transform? Because we can actually reduce the impact of CO2 emissions on the environment and improve the quality of life, create modern jobs, reduce dependence on fossil fuel imports and increase the competitiveness of Polish products.

What stage is Poland at? Our energy is primarily based on coal.

Unfortunately, that is true. Poland is just beginning its transformation, which causes many problems, and instead of being at the forefront of innovation, we are following the rest of Europe and the World. Fortunately, this is slowly changing, and we can say that transformation is possible, as

exemplified by the increasing number of photovoltaic installations. Investments in this area, supported, for example, by the "My Electric Current" program, have allowed to reach over 17 GW of power in photovoltaic installations. Moreover, 95% of installations are independent of professional energy, and almost 60% are prosumer micro-installations.

The last year was also exceptional, as the share of coal in electricity production compared to 2022 fell by 9 percentage points and amounted to less than 64%. These data show that despite the initial slowness, the transformation has begun and is gaining momentum.

How should the energy transformation take place? What sources of energy should it be based on and to what extent?

This is one of the very difficult questions. There are currently two models of transformation. The first is the central model, i.e. one in which energy production is based on large-scale RES sources, replacing current coal-fired power plants. The second is the distributed energy model, in particular the concept of electroprosumerism, in which sources tailored to local needs prevail.

The central model has the advantage that it is easier to organize and manage. We have a relatively small number of generating sources here, mainly photovoltaic farms and wind farms. However, such a concentration requires a very large expansion of transmission and distribution networks. It also limits the role of energy consumers – I do not intentionally use the term prosumers here – in shaping energy markets. It is a model in which, in a very simple way, energy flows from large power plants to each customer.

In the electro-prosumer model, the current way of functioning of the power system is reversed, i.e., self-consumption (the use of electricity produced in own sources and for own needs) is maximized at every level. However, this model requires a change of law. These types of regulations are already being created. In the Act on Renewable Energy Sources, the concept of energy clusters and cooperatives appeared first, and in the last amendment, also energy communities, whose aim is to maximize the use of local resources, build energy sources as close as possi-

ble to consumers, and as a result, develop cooperatives.

The basic sources of electricity will be photovoltaic sources, wind power plants, both on land and at sea, and biogas plants, supported by warehouses. However, I leave the detailed contribution of individual technologies open, although there are many publications on this subject. It can be assumed that it is the market and needs that should shape the production structure.

If we were to rely on renewable energy, how to ensure energy at different times, e.g., when there is no sun or wind?

Before answering this question, let me remind you of the situation two years ago. Due to Poland's dependence on the import of energy resources and the geopolitical situation, we had to face rising energy prices and the fact that it may simply run out. Does the current system guarantee energy security?

So, how do you get energy during different weather periods? This is a very common so-called cognitive error, especially if you try to provide for energy needs only with electricity, coming from photovoltaic or wind power plants. If we focus on only these two technologies, there will indeed be moments when we will have a large surplus of production and moments when we will face the deficit.

However, the transformation involves a number of activities, including energy efficiency, both in electricity and heat demand, the use of biogas plants to provide local balancing, electricity storage, hydrogen, heat, energy management systems, etc. It is also Poland's active participation in the European single electricity market. This "cornucopia" gives the opportunity, not only to balance the entire power system at every hour. There are articles, reports and studies that clearly show that not only Poland, but the whole of Europe can be powered only by electricity from RES sources, taking into account the demand for electricity for heat pumps and electric cars.

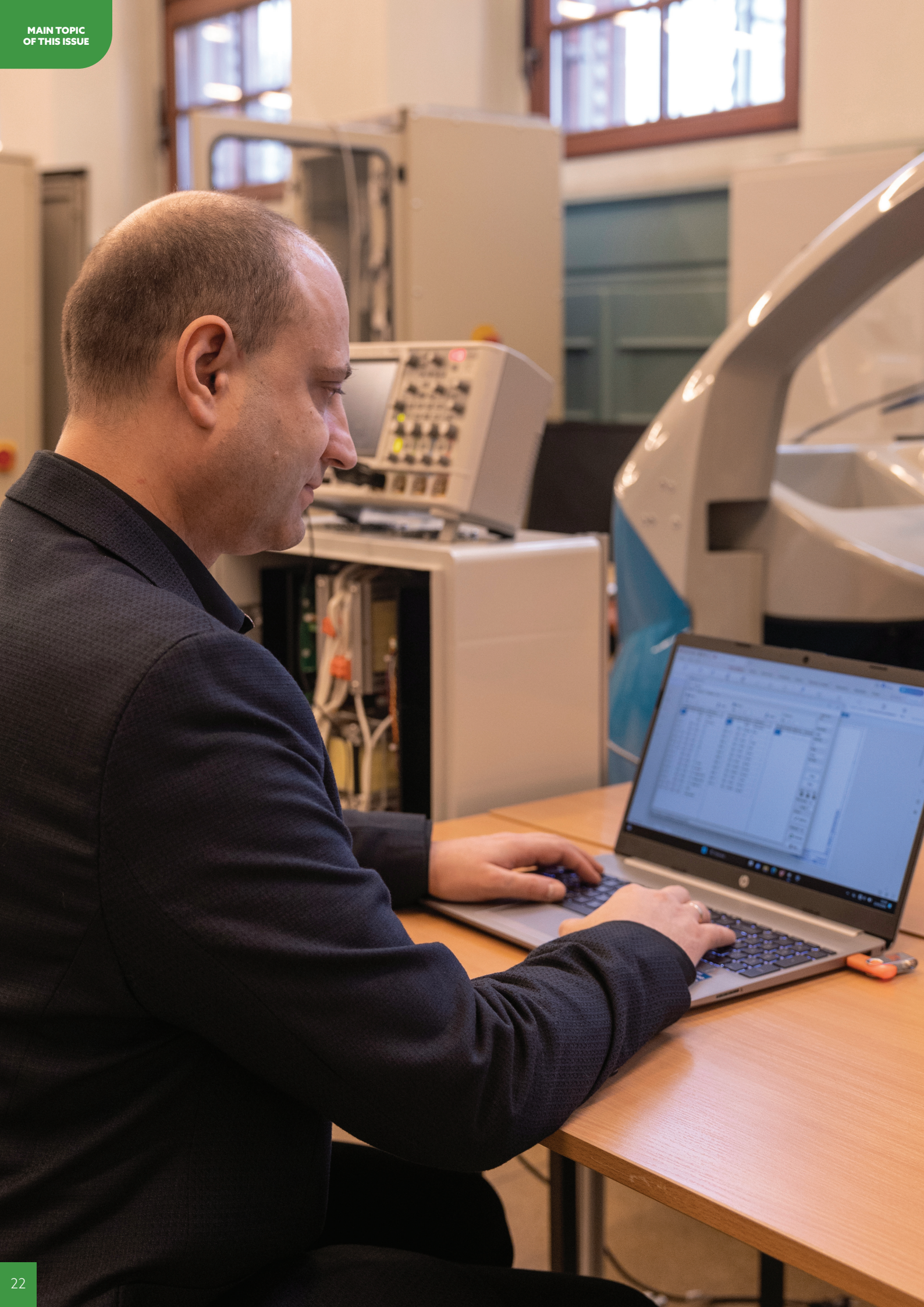
In the electro-prosumer model, the current way of functioning of the power system is reversed, i.e., self-consumption is maximized at every level.

The energy transformation is not only a change in the economy, but also a change in lifestyle. What needs to change?

First of all, the awareness of the whole society needs to be increased. A similar process took place a few years ago and it was related to the climate transformation. Today, the awareness of the human impact on the environment is quite high. However, its construction took many years, and initiatives such as, for example, the anti-smog alarm contributed to the fact that climate change is already discussed at every stage of education. The acquired knowledge and habits translate into actual actions.

The energy transformation is not yet so firmly rooted in the consciousness of society. The lack of long-term plans, the information chaos, often resulting from residual knowledge, have caused that there is a conviction that this transformation is necessary, but there is a lack of general knowledge on how to do it.

After all, changes are coming. Dynamic tariffs are planned, energy storage is cheaper, energy management systems are being developed. There is also a growing awareness of



the public that a poorly chosen photovoltaic installation or heat pump will not allow for effective work and may additionally cause problems with the power grid. A good motivator to change the thinking about energy is also the rising price of energy. If the way of thinking changes, it is the first step to creating new solutions and shaping markets for devices and services, and consequently a lifestyle change.

To carry out the transformation, it is necessary to educate staff: - what are the needs in this area?

The needs are enormous, as the energy transformation leads to the creation of new labour markets and covers the entire economy. We need engineers, economists, lawyers, but also sociologists. It is only the interdisciplinarity of activities that allows the transformation to be used as an opportunity to reduce the human impact on the environment. Estimates vary, but there is a need for at least five hundred new jobs in Poland.

Jobs that are crucial for transformation are now identified. The foundations of the so-called "green competences" are being created, which will allow for the orientation of the entire education system. However, this is a process that will last several years and people with high competences are needed now.

Universities should play a very important role in building competences. They can train staff now. One of the ways of gaining knowledge is postgraduate studies, which are very often also focused on gaining practical skills. The Silesian University of Technology, as part of a consortium with the West Pomeranian University of Technology and ENERGO-complex, will promote good practices and solutions dedicated to people who want to acquire competences from the broadly understood energy transformation. The consortium, under the name "Academy of Energy Transformation," brings together the scientific and industrial community. One of its objectives is to create postgraduate studies: Energy Transformation. The studies will be carried out simultaneously at the Silesian University of Technology and the West Pomeranian University of Technology, with the substantive support of people from industry.

A good motivator to change the thinking about energy is also the rising price of energy. If thinking changes, it is the first step to creating new solutions and shaping markets for devices and services, and consequently a lifestyle change.

What would be the cost of the energy transformation? And at what time should it be carried out?

It is estimated that the cost of transformation may reach up to PLN 2 trillion in the next 30 years This amount may seem unrealistic, but it should be confronted with the figures on fossil fuel imports. In 2022, Poland spent over PLN 200 billion on fossil fuel imports, or 10% of the budget planned for total transformation and independence from imports.

Over the years, fossil fuels have been said to be the guarantor of energy security and independence. However, this "independence" costs each of us extremely much, and the profits go not to Polish companies, but to foreign corporations.

The question is: Can we afford to postpone the transformation and spend huge amounts on fossil fuel imports? Is it worth, to a large extent, supporting countries that are not democratic without ensuring continuity of supply?

The transformation should be carried out as soon as possible. Each year of delays costs a lot, but these are "only" costs. Much more dangerous is the fact that the Polish industry ceases to be competitive, and this may cause the collapse of the entire domestic economy. ■

LEADERS READY FOR CHALLENGES

Edited by **Katarzyna Siwczyk**
photo: **Maciej Mutwil, istock**

THE BUSINESS SCHOOL OF THE SILESIAN UNIVERSITY OF TECHNOLOGY RESPONDS TO THE MARKET DEMAND IN THE FIELD OF EDUCATING LEADERS OF THE FUTURE, AND THUS LAUNCHES A NEW COURSE OF EDUCATION – MBA ENERGY AND DIGITAL TRANSFORMATION.

Poland – and in particular the Silesian Voivodeship – is entering the most important stage of the energy transformation. This process is a response to the world's climate challenges and an adaptation to the demands of international organizations in the field of sustainable development. One of the steps countries need to take to address these challenges is to move away from heavy industry and coal-based energy. The next one will be the implementation of modern technologies in the field of the functioning of enterprises. In order to meet these expectations, the Business School of the Silesian University of Technology launches a new course of education in which it wants to teach leaders of the future.

"The current program – Hydrogen Technologies and Energy Transformation – and the new MBA Energy and Digital Transformation launched in March 2024, are based on three values: the implementation of future technologies, the use of innovation and global trends in management, and strong and responsible leadership," explains Dr Hab. Małgorzata Dobrowolska, prof. SUT, the director of the Business School of the Silesian University of Technology, the head of MBA Hydrogen Technologies and Energy Transformation studies.

The studies are based on the standards of one of the three most prestigious global accreditations of AMBA (Association of Master of Business Administration). The profiled MBA program provides an interdisciplinary package of knowledge and the development of key competences for managers, such as: management, economics, law, marketing, and psychology, taking into account the specialist knowledge of the energy industry – industrial technologies 4.0, cybernetics, big data management and artificial intelligence.

What is important is that in addition to the theoretical package, MBA students take part in plenary trips and trainings with practitioners implementing, already now, modern technologies in their facilities. The curriculum is constantly adapted to the changing trends and needs of the market, thus offering flexibility and timeliness of the acquired knowledge. Based on these assumptions, currently there are studies in the field of energy – MBA Energy and Digital Transformation, the strategic partners of which are: Veolia Poland and foreign partner Nyerode Business University.

"The presence of Veolia's experts as lecturers or mentors in studies is a guarantee that students have access to current knowledge and experience first-hand," says Dr hab. Krzysztof Zamasz, Prof. SUT, Commercial Director and Member of the Board of Veolia Group in Poland. "MBA studies are also a platform for developing competencies that are timely and valued in today's changing and competitive business world. The program is largely based on teamwork, giving participants the chance to put their skills into practice, practice collaborative techniques, exchange experiences, and combine different points of view. It is a real professional "toolbox," which we give the students, and which they can implement from the very beginning of their studies" – adds Professor Krzysztof Zamasz.

The studies are conducted in a hybrid formula and enjoy great interest, and the participants themselves confirm that they receive a package of valuable knowledge.

– "I consider taking studies in the field of MBA as one of the best investments in my development. In addition to classes conducted by highly qualified staff with extensive experience, both in business and university practice, I could establish new business relations and thus benefit from the mutual exchange of experiences. An exemplary program of classes allows to achieve new skills, as well as systematize the knowledge and experience acquired during my professional work. I strongly recommend taking studies in this field, especially for people who want to develop professionally in managerial positions in the energy industry "– emphasizes Piotr Andrusiewicz – a student of the MBA Hydrogen Technologies and Energy Transformation.

– "The study program also takes into account the use of digitization and work on big data in more effective implementation and management of solutions in the energy sector "– adds Robert Żmuda, commercial director of Veolia in Lodz, also a student of these studies.

MBA studies bring together a group of managers from various industries, entities, and professional profiles, creating a strong network of contacts and opportunities for exchange of experience. They also enrich the professional structure of the listeners and help them to go beyond the schemes and open to new perspectives and practices.

"The formula of study, like the work of managers, is flexible. The studies take place on weekends and are conducted in a hybrid formula, in Polish and English with the option of translation. The teaching staff consists of top-class national and international experts. The studies offer innovative methods of education, such as managerial games, learning by doing, design thinking, case study, management simulations and team projects" - explains Małgorzata Dobrowolska.

People interested in education at the Business School of the Silesian University of Technology can get more information on: mba.polsl.pl or by calling 885 951 905. ■

SILESIAN UNIVERSITY OF TECHNOLOGY? GREAT CHOICE!

text: **Martin Huć**
photos: **Maciej Mutwil**

SILESIAN UNIVERSITY OF TECHNOLOGY MEETS THE EXPECTATIONS OF THE MOST TALENTED STUDENTS. THEY, IN TURN, SIGN UP HERE WITH FULL AWARENESS OF THE PRESTIGE AND THE LEVEL OF THE UNIVERSITY, AND TAKE ADVANTAGE OF ADDITIONAL DEVELOPMENT OPPORTUNITIES AND FORMS OF SUPPORT.

On October 4, 2023, during the inauguration of the 2023/2024 academic year, Patrycja Sztwiertnia, Justyna Jaroch and Jakub Lubski were among those who took part the matriculation of the first-year students. Today, all three, who are among the most talented in their year, are after the first exam session, having a baggage of new experiences as students. They had to face the new challenges that studying at the University brings. They admit

Patrycja Sztwiertnia, Justyna Jaroch and Jakub Lubski are some of the most talented first-year students at the Silesian University of Technology.

that although this is a big change, it came quite easily to them, also because of the help offered by the Silesian University of Technology and lecturers.

BEGINNING WAS EASY

Patrycja Sztwiertnia comes from Rybnik, from where she travels to the Faculty of Chemistry of the Silesian University of Technology, where she studies chemistry. She likes the climate of "red chemistry," as the department building is commonly called, as well as the renovated laboratories. The choice of university was decided in the secondary school.

– I wanted to study chemistry and I chose to study at the Silesian University of Technology, not at the university. I preferred to study engineering. In addition, I knew that our university is high in rankings, and guarantees a high level, which convinced me – says Patrycja Sztwiertnia, for whom the transition from secondary school was associated with several changes. – Of course, I had to find my place – get to know the University's buildings, adapt to commuting to Gliwice. It was definitely a change to a different form of education than in a secondary school. The amount of material to be acquired at one time during the session is certainly greater. However, I have a passion for science subjects, so the level of studies at the University of Technology did not discourage me - quite the opposite - it was full of curiosity and motivation. In the beginning, I was helped by the approach of lecturers who tried to start a given subject in a way that was accessible to all students. Later we started more serious topics. It was very helpful. The classes look very different here than in a secondary school. You don't have to worry that the lecturer will ask us questions we do not have answers to. Teachers have a very good approach. They will explain everything if someone does not understand. They want us to learn. It is very important. It is also motivating to take advantage of consultations with the lecturers, for example, when someone has overdue work to catch up. As far as I know, this has been

Jakub Lubski

introduced recently and I think it is a very good idea.

Patrycja Sztwiertnia attended the same secondary school as Justyna Jaroch, who chose to study mathematics at the Faculty of Applied Mathematics.

For me, the change was huge. It is completely different than in a secondary school – recalls Justyna Jaroch. – I was not aware of the student topics, the way things were called here... Thanks to my colleagues, I was able to "fit in" quickly. In addition, at the beginning we received information booklets from the university, in which there was a lot of useful information. It helped me a lot.

– Studying here gives me a reason to be proud – says Jakub Lubski from Ćwiklice in the Pszczyna district, who is studying materials engineering at the Faculty of Materials Engineering.

"I was impressed by the laboratories, and I am glad that we can use them often. A change for commuting by bike to commuting by train was a big change because I live quite far away. At the beginning, you have to deal with finding lecture rooms, getting used to different numbering in the University buildings, as well as breaks between classes.

CAMPUS IS A GREAT PLUS

Studying is not only attending classes, and exams, but also free time and the opportunity to make new friends. Students think not only about studying. There is a lot going on at the University's campus, in the "Mrowisko" Student Culture Centre with the Spiral Club, which hosts cultural life, a student canteen, a library, an active Student Government and an academic dance ensemble, choir or orchestra.

The campus is very nice. I am happy that everything is in one place – the department buildings, the library, the canteen... Thanks to this, between classes we can find time for a snack, integrate with other students. Moreover, you do not have to travel anywhere by public transport, just take a walk to get to the next classes – says Patrycja Sztwiertnia. I was surprised how many foreigners there are here. However, it is very cool, because you

Justyna Jaroch

can talk to them in English, learn new culture, etc.

"It's a great thing that everything is in one place, as well as the fact that it's close to the city centre to go out with friends. The location of the campus is the great plus – adds Justyna Jaroch. – It is also worth following the University's social media, including Instagram and Facebook, where we can learn about current activities, such as the Student Government account, which organises cool actions. In addition, I like the fact that departments or other university units have their own separate profiles there, thanks to which it is easier to find the necessary information.

Silesian University of Technology also offers students additional activities, such as scientific clubs, there are nearly 190 of them, and they are so diverse that everyone will find something for themselves. As the graduates of our university emphasize, scientific clubs facilitate finding a job in a given industry, establishing important scientific or business contacts and the opportunity to participate successfully in national and international conferences and tournaments.

– We immediately learned what scientific clubs are here and that you can freely join them, so I joined the Mater-Tech Student Scientific Club to develop my interests – says Jakub Lubski.

The SUT Sports Centre offers classes in a well-equipped sports base in as many as 20 sports sections – from traditional ones, such as football, tennis, table tennis – to alpine skiing and even sailing. This is an additional opportunity not only to participate in academic sports competitions played all over the country, but above all to achieve success. The athletes of our University in the last year were the winners of the general classification and the medal classification of the Academic Silesian Championships, and the University was chosen the most successful in the 50-year history of the Academic Silesian Championships.

I took advantage of the opportunity thanks to which I participate in the mentoring program of the Silesian University of Technology "Spread your wings." I have been assigned a mentor with whom I have individual classes, which gives me a great opportunity to develop. This university is a good choice on the way to your dream job.

I am a member of the women's football section. I recently had the opportunity to represent the University in the Academic Polish Championships – says Patrycja Sztwiertnia. – It is a big event, well organized, there is a lot going on. We are also taking part in the Academic Silesian Championships. Participating in such competitions is a very interesting experience.

THE UNIVERSITY INVITES FUTURE STUDENTS

For a secondary school pupil, choosing a university and a course is a key decision. Our interlocutors admit that their choice was very well thought over. They emphasize that previous visits to the Silesian University of Technology helped them to make the right choice. In its calendar, our university has many events during which it "introduces" itself to all potential candidates and gives the opportunity to get to know lecturers and buildings of individual faculties. These include Open Days, Researchers' Night, and LabOpen Day.

– Open Days reassured me that the Silesian University of Technology is a good choice, that this is where I want to study. I wanted to see how the University presents itself, get to know its surroundings because I have never been here before, and it was a great opportunity.

That is why I applied only to this University and my field of studies – says Justyna Jaroch.

– Such events certainly allow you to learn more than what you can find on the Internet, thanks to conversations with people representing the University, as well as from leaflets. Surely everyone will find something for themselves here, because there is a very wide range of fields to study – adds Jakub Lubski.

– Open Days helped a lot, also when it comes to moving between buildings, and halls, because a guided tour was also on offer. It was certainly easier for me to find my faculty later and get to a specific place – says Patrycja Sztwiertnia.

After the inauguration of the academic year, however, you must face the science and the new challenges that the beginning of studies brings.

The first examination session in my life was stressful. This is a different form of education than in a secondary school. This system simply needs to be adapted. The next sessions should be easier because I will be able to prepare for them differently. However, the professors who had previously tried to explain the issue of credits, examinations, helped a lot. In addition, it is worth mentioning that – with a few exceptions – in my field I am learning practically only what interests me – says Patrycja Sztwiertnia. – In the beginning, it also takes some time to find and understand the operation of the mailbox, USOS, Remote Education Platform, although of course it is very useful. For example, on the platform we have access to materials provided by lecturers. Besides, it is valuable that we have good email contact with them.

The key to success is regularity. There is no chance to learn all the material covered in a few months during the examination session only. It is also worth being active in classes because thanks to this you can improve the final score – says Justyna Jaroch. – I also took advantage of the opportunity, thanks to which I can participate in the mentoring program of the Silesian University of Technology "Spread your wings." I have been assigned a mentor with whom I have individual classes, which gives me a great opportunity to develop. This university is a good choice on the way to your dream job. ■

Patrycja Sztwiertnia

FOR THE MOST TALENTED STUDENTS, THE SILESIAN UNIVERSITY OF TECHNOLOGY OFFERS THE FOLLOWING FORMS OF SUPPORT:

MENTORING PROGRAM "SPREAD YOUR WINGS"

Its aim is to develop the intellectual potential and to support the personal development of the best students of secondary schools, undertaking first-cycle studies at the Silesian University of Technology, with the help and participation of employees of the Silesian University of Technology acting as mentors. The mentoring program includes primarily an individual study program for each participant, taking into account the interests and special talents of the student. In addition, participants of the program receive a mentoring scholarship and can count, among others, on paid research and development internships in companies cooperating with the University or a trip abroad to a partner university.

SCHOLARSHIP FOR QUALITY

The best students starting full-time studies of the first or second cycle, as part of the Excellence Initiative-Research University program, the participants representing Poland at the international Olympic Games, also those who received 100% points in the recruitment process for the first cycle studies, or winners and finalists of the central-degree Olympics in Poland, are rewarded. These people have a chance, among others, to receive a scholarship of up to PLN 1500 a month or to finance accommodation in the student house of the Silesian University of Technology in full amount, for 10 months during the first year of study.

RECTOR'S SCHOLARSHIP

They can be awarded to a student who pursues the course of studies on an ongoing basis, has obtained outstanding academic results, scientific achievements, artistic achievements, or sports achievements in competition at least at the national level. The Rector's scholarship may also be granted to a student admitted to the first year of studies, in the year of taking the matriculation exam, who is, among others, a laureate of the international Olympics or a laureate, e.g. a medallist, in at least a sports competition for the title of Polish Champion in a given sport. All achievements are scored, in accordance with the detailed rules for awarding the Rector's scholarship set out in the regulations.

TO TOUCH VR

text: **Anna Świderska**
photos: **author's archive**

VR GOGGLES ALLOW US TO EXPERIENCE VIRTUAL REALITY USING SIGHT, HEARING, AND SENSE OF BALANCE, BUT HOW TO IMMERSE OURSELVES EVEN DEEPER INTO THE VIRTUAL WORLD BY COMPLEMENTING THESE SENSES WITH TOUCH? THIS QUESTION WAS ASKED BY STUDENTS OF THE SILESIAN UNIVERSITY OF TECHNOLOGY, WHO DEVELOPED A TACTICAL GLOVE THAT ALLOWS USERS TO FEEL VIRTUAL ELEMENTS. ANOTHER GROUP WORKING ON THIS PROJECT WENT A STEP FURTHER AND CREATED AN ENGINEERING VR GAME.

You are a member of a crew that flies to Mars. Unfortunately, your ship suffers an accident and in order to get out of the oppression you have to fix it – this is an outline of the game plot created entirely by students of Mechatronics at the Silesian University of Technology. The players must show off not only their dexterity but also basic engineering knowledge to properly fix all the broken spacecraft systems. On the head - VR goggles, on the hand - a special tactical glove, a prototype, which was created thanks to the work of two teams of students, as part of two editions of Project Based Learning projects.

– I did not expect that the effect would be so impressive – Dr Eng. Paweł Kowol from the Department of Mechatronics of the Faculty of Electrical Engineering, the supervisor and originator of the first project cannot stop praising his pupils. – This is the third PBL project on this topic. The first team developed the tactical part of the glove, the second translated the movement of fingers into contact with VR – these were the beginnings of a virtual environment. The current team focused on developing aspects related to virtual reality.

The students began with a brainstorming session, during which they agreed that by controlling the tactical glove they would lay mechatronic blocks in a virtual world, which would allow to present the operation of the glove and the fact that thanks to it one can feel individual virtual elements. However, the ambitious group quickly came to the conclusion that their idea would be enriched by the story layer and thus the idea of a mission to Mars was born.

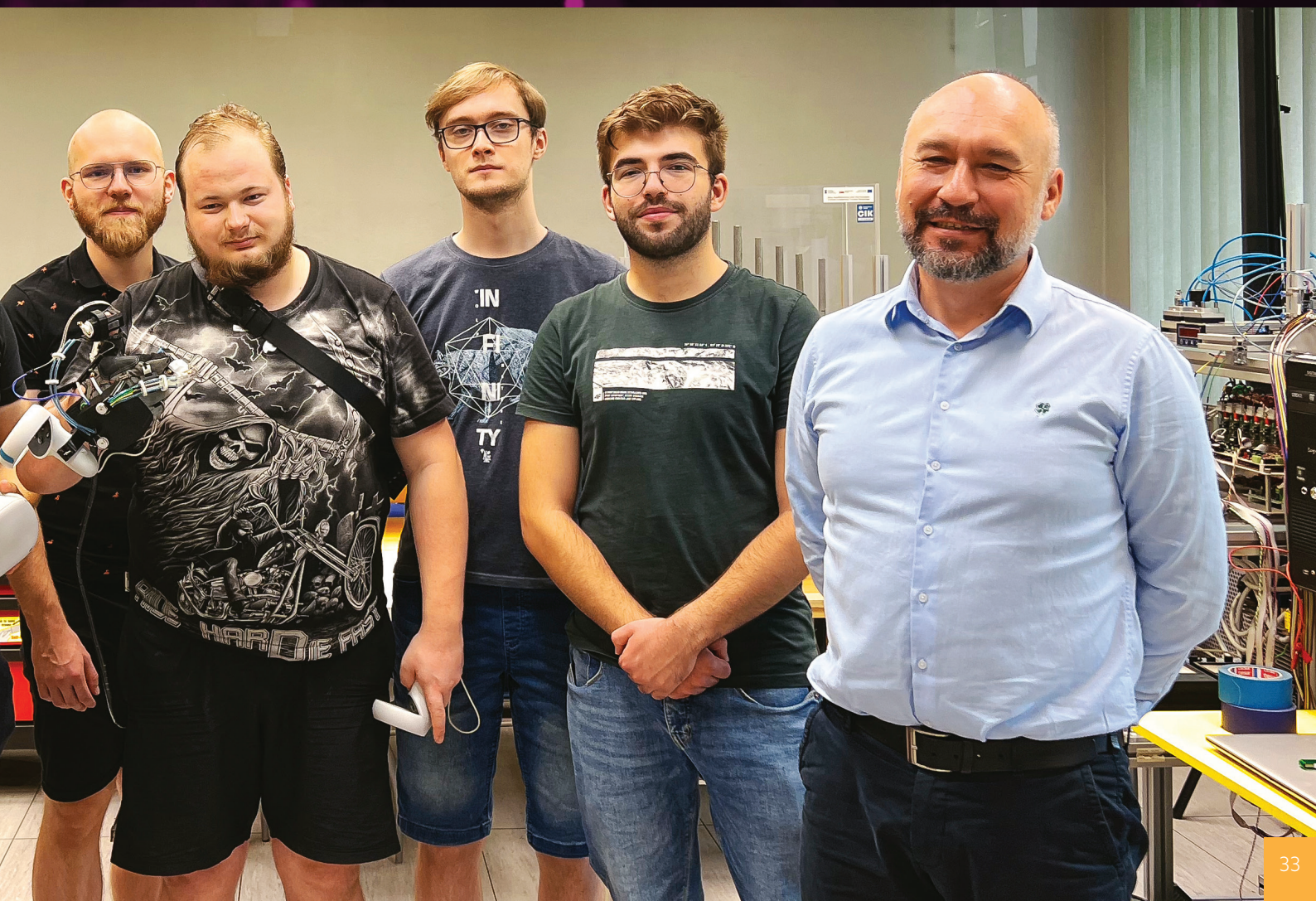
Young people began to create their own game, using not only theoretical knowledge but also developing their previous interests.

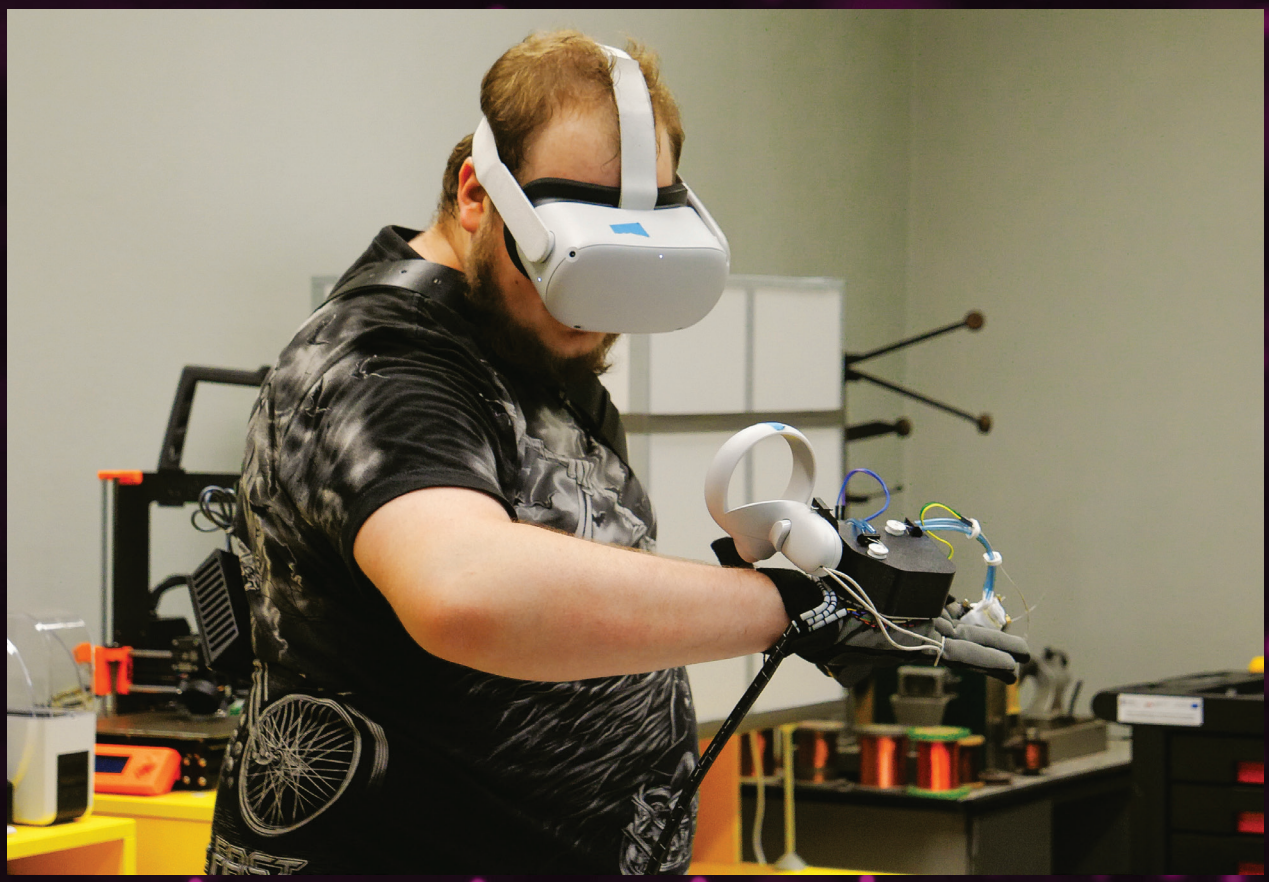
– I have been interested in how games are made for a long time, so the tool we used, the Unity engine, was already quite well known to me – says Paweł Misztal in the game design team. “We decided to use the Low poly style, which is quite simple, and what’s more, some ready-made models can be purchased online. We used one such set to build our spacecraft. We expanded the game ourselves by adding new elements and mechanics that we wanted to implement in the game.

The result of the students’ work is a full-fledged VR game, which could be successfully placed, for example on a Steam service. To control the game, instead of a pad, a tactical glove is used, that is, engaging touch in the perception of virtual reality.

– The glove allows you to touch virtual reality, the elements of which are not only observable but become tangible – explains dr Eng. Pawel Kowol. “When we grab something in virtual reality, the locking system in the tweezer grip blocks the index finger and thumb at some point and we feel resistance. Under the fingertips there are cushions with magnetorheological liquid, changing its viscosity in the magnetic field, thanks to which we feel this change in hardness when gripping. The combination of the finger stop system with the magnetorheological fluid activation system is an innovative solution.

– I am very happy with the results of our work, I was also relieved to some extent that it was successful because it was a really big project – says Mateusz Soboniak, responsible for the electrical part related to the VR glove. “We are the third team to work on the glove. We wanted to improve the comfort of using our prototype, and in addition to creating a game with an educational aspect, we also





added a research aspect – we can check the influence of the magnetic field on the force measurement sensors.

The work of the team took place under the watchful eye of lecturers from various faculties of the university, as well as with the help of an expert from outside, advising young people on how to deal with issues related to VR. Such a teaching model is a challenge not only for students but also for lecturers.

– Practical knowledge cannot be fully communicated during lectures or workshops – emphasizes Dr Eng. Wacław Banaś from the Faculty of Mechanical Engineering, tutor of students during the project implementation. – During the course of conducting the classes, nothing surprises me, everything is developed, while the work on this project was associated with a kind of mystery. Sometimes students surprised me with a question, and I had to make an effort to answer them. However, in this way classes are conducted much better because the sight of students enjoying learning gives the lecturer a great pleasure. During lectures I sometimes have the impression that some people listen, some do not, but here the information was absorbed easily – he adds.

Students also confirm their enthusiasm for work. As part of the PBL project, they spent incomparably more time in order to earn 15 ECTS credits than if they had attended regular classes.

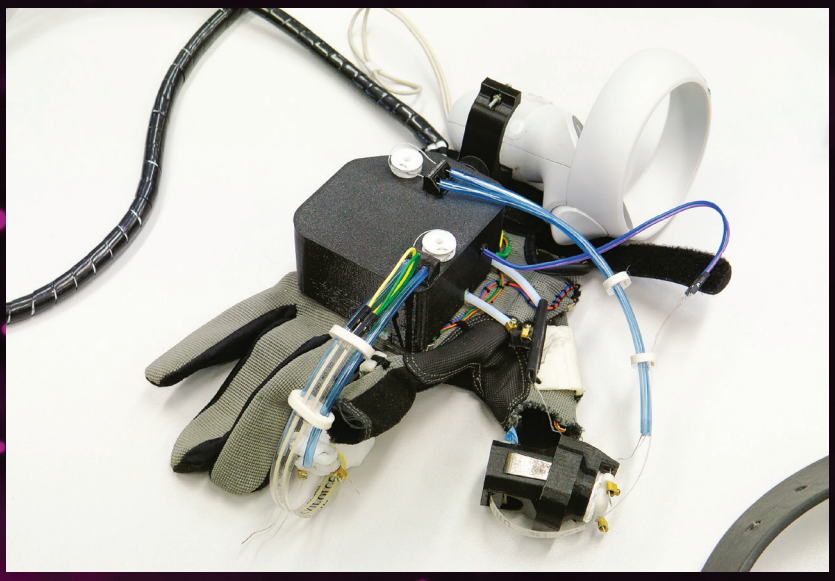
– That's right, I often worked on a project at home, even when I didn't have to, I just couldn't wait to solve a problem – Paweł Misztal confirms the lecturer's comments. "The result gives incredible satisfaction; I am proud to have taken part in this project.

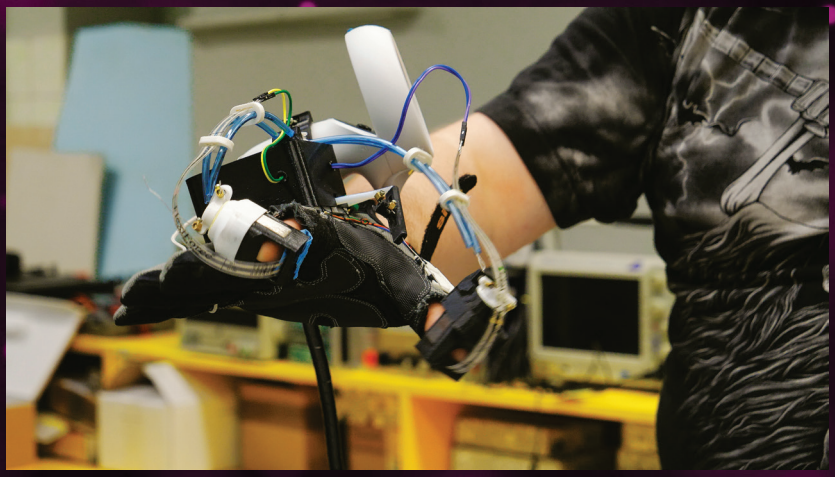
– The impressions are shocking, especially the amount of work that students put into this interdisciplinary project – says Dr Eng. Dariusz Buchczik from the Faculty of Automatic Control, Electronics and Computer Science. "PBL projects are based on interdisciplinarity and student-oriented teaching, unlike the way in which a teacher transmits knowledge ex-cathedra. Here students learn to solve problems themselves, and the teacher helps them get through them.

The result of this way of teaching, or rather scientific cooperation, is not only an engineering game with a tactical glove but also valuable experience gained by the participants of the PBL project.

"I was pleased to see them come across some technical nuances that they would not have encountered in class, how they learned to solve them. The acquired skills, such as working in a group, adapting to time constraints, are values that they will not gain in the framework of traditional education, and this will certainly pay off in the future – adds Dr Eng. Kowol.

The lecturer encourages students to brag about the effects of their work, especially as ambitious as this one. In turn, students see further opportunities for the development of the project, such as expanding the game. It is therefore likely that work on the project will continue in the future. ■





EVENTS

A NEW PRO-QUALITY PROGRAM WITHIN THE IDUB REWARDING PARTICIPATION IN THE IMPLEMENTATION OF SCIENCE -RESEARCH AND SERVICE--RESEARCH WORKS.

A new program of pro-quality financing for participation in the implementation of scientific and research works and services provided to external entities has been launched.

Employees, doctoral students, and students of the Silesian University of Technology may apply for funding, in the amount of 10% of the net value of the work, after settling the work or the stage/stages of work. In the case of phase-settled works, the amount of co--financing is calculated from the net value of the stage or stages of work.

Applications for funding may be submitted to the Research Office continuously, after settlement of work or stage/stages of work. The details of the program are regulated by Regulation No 41/2024. ■

EUROPEAN CITY OF SCIENCE IN THE EUROPEAN PARLIAMENT

Representatives of the consortium forming the European City of Science Katowice 2024 visited the European Parliament in Brussels for several days. The Silesian University of Technology was represented by, among others, Prof. Dr Hab. Eng. Marek Pawełczyk, Vice-Rector for Science and Development.

The visit to the European Parliament was an excellent opportunity to present the achievements of Silesian universities. During the Polish Science Days in Brussels, numerous debates with the participation of EMNK 2024 (European City of Science Katowice 2024) scientists and the exhibition presentation took place. ■

photo: Piotr Kaszuba

Financed by the EU. The views and opinions expressed are those of the author or authors only and do not necessarily reflect the views and opinions of the European Union or the European Executive Agency Scientific Research (REA). The European Union and the REA are not responsible for them. The event is co-financed by the Silesian Voivodeship - Co-organizer of the European City of Science Katowice 2024.

THE SILESIAN UNIVERSITY OF TECHNOLOGY HAS CONCLUDED A COOPERATION AGREEMENT WITH THE CHIEF SURVEYOR OF POLAND.

The Silesian University of Technology has concluded a cooperation agreement with the Chief Surveyor of Poland. Our University was represented by: Prof. Dr Hab. Eng. Wojciech Szkliniarz, Vice-Rector for Student Affairs and Education.

The agreement is to result in cooperation in the scientific field, joint participation in research and development projects, as well as support, from the Chief Surveyor of Poland. The didactic process carried out in the field of Geodesy and Cartography, conducted at the Faculty of Mining, Safety Engineering and Industrial Automation. Students of Geodesy and Cartography will implement the topics of diploma theses, combined with an internship at the Head Office of Geodesy and Cartography. The person authorized to contact in matters of agreement is Dr Hab. Eng. Violetta Sokoła-Szewioła, prof. of Silesian University of Technology

THE EXHIBITION AS THE RESULT OF INTERNATIONAL COOPERATION

photo: Martin Huć

In the main hall of the Faculty of Mining, Safety Engineering and Industrial Automation of the Silesian University of Technology, the vernissage of the exhibition "Architecture & Landscape in Conservation Design: Cassino-Folcara, Gaeta, Vigancice-Visnova" took place.

The works on the subject "Conservation design" were presented within the framework of the full-time master's studies of the current academic year and were concluded as part of international cooperation in the Department of Theory, Design and History of Architecture at the Faculty of Architecture. This exhibition concerns cooperation with the

University of Cassino and Southern Lazio and the Technical University of Liberec, the Czech municipality of Visnova and the foundation "Kołodziej House" from Zgorzelec. ■

THE EASTER CARD CONTEST HAS BEEN DECIDED

The Office of the Rector of the Silesian University of Technology announced the results of the contest for the design of a card for Easter. The winner is Marta Kraszewska from the Academic Secondary Comprehensive School of the Silesian University of Technology in Rybnik. The winning competition entry will be the Rector's official Easter card, sent in traditional and electronic form to representatives of local government units, administrative bodies, and employees of the Silesian University of Technology. ■

YOUNG PEOPLE INTERESTED IN STUDYING AT THE FACULTY OF BIOMEDICAL ENGINEERING OF THE SILESIAN UNIVERSITY OF TECHNOLOGY

More than 200 candidates for studying at the Silesian University of Technology, from Silesian Voivodship and even from outside the region, took part in the Open Day of the Faculty of Biomedical Engineering of the Silesian University of Technology. The event allowed secondary school pupils to get acquainted with the offer of studies, as well as talk with current students of the Faculty.

photo Anita Kajzer

However, the visits to modern laboratories of European HealthTech Innovation Centre (EHTIC) located in the building adjacent to the faculty were most popular among candidates for studies. The young people saw, among others, a laboratory in the field of anthropometry, biomechatronics, technologies used in dental prosthetics, as well as biomorphic materials. The Open Day at the Faculty of Biomedical Engineering was an excellent opportunity to encourage secondary school pupils to study at the Faculty.

INTERNATIONAL EXHIBITION ON THE OCCASION OF THE WORLD ART DAY

On the occasion of the World Art Day, the Faculty of Architecture of the Silesian University of Technology is preparing a unique exhibition in the Gallery X of the Silesian University of Technology from April 12th to May 6th, 2024. The vernissage is scheduled for 15th April 2024 at 17:00.

The Faculty of Architecture of the Silesian University of Technology wants to unite different creative environments in Poland and abroad, which is why it is preparing an exhibition. Visual artists associated with the environment of the Faculty of Architecture of the Silesian University of Technology in Gliwice, the Academy of Fine Arts in Krakow and the Association of Polish Artists, the Gliwice-Zabrze District, the Katowice District, the Krakow District, as well as artists from Poland USA, India, Costa Rica, Germany, Japan, Togo, Mongolia, Canada, Turkey, Romanians, Slovakia and the Czech Republic were invited to present their works. ■

"METRO-ROWER" ON THE CAMPUSES OF THE SILESIAN UNIVERSITY OF TECHNOLOGY

The largest city bike rental system in Poland and the third in Europe is now available. Characteristic yellow bicycles can be rented at the campuses of the Silesian University of Technology.

"Metro-rower" is a work of the Upper Silesian-Zagłębie Metropolis and Nextbike company. On the streets of Silesian and Zagłębie towns appeared 1860 bicycles and 267 bicycle rental stations. Bicycle stations were also located on the campuses of the Silesian University of Technology – in Gliwice, at the building of the Faculty of Electrical Engineering, in Katowice, at the Faculties of Transport and Aviation Engineering and Materials Engineering, while in Zabrze near the building of the Faculty of Organization and Management. ■

SCIENTISTS FROM THE SILESIAN UNIVERSITY OF TECHNOLOGY VISIT THE PHILIPPINES

photo: private archives

At the turn of January and February scientists from the Faculty of Mining, Safety Engineering and Industrial Automation and the College of Studies of the Silesian University of Technology stayed in the Philippines at Xavier University– Ateneo de Cagayan (XU PH). The visit took place as part of the Erasmus+ project "Geomatics for Disaster Risk Reduction" (GeoDRR) - "GeoDRR Educational

Workshops & Transnational Meeting Xavier University - Ateneo de Cagayan"), and the short--term scientific and academic internship "Academic Internship at Xavier University".

Silesian University of Technology is the leader of the project, the aim of which is to create a new specialization of the second-cycle studies "Geomatics for Disaster Risk Reduction" with the necessary laboratory facilities at six Asian universities. A course will be created to train specialists in forecasting, monitoring, and analysing the course of natural disasters. The main coordinator of the project is Dr Eng. Krzysztof Tomiczek from the Department of Geoengineering and Resource Exploitation. ■

HOW TO LIMIT NATURAL DISASTERS?

On 13th February, the 1st International Student Conference "Geomatics in Reducing the Effects of Natural Disasters took place. Selected Issues Cambodia — Malaysia — Philippines.' 17 papers were delivered in the form of presentations, which were prepared by 35 authors from the Philippines, Malaysia, Cambodia and China.

Issues related to the Erasmus+ project "Geomatics for Disaster Risk Reduction" were presented, including geomechanical, geotechnical, seismic, hydrogeological, geodesy and broadly understood security phenomena in the context of natural disasters. ■

YOUTH ENTREPRENEURSHIP GALA IN RYBNIK: AN INSPIRING JOURNEY INTO THE WORLD OF ENTREPRENEURSHIP

On 26th February, the Youth Entrepreneurship Gala took place at the Continuing Education Centre – a branch of the Silesian University of Technology in Rybnik. This event allowed young people to explore the secrets of entrepreneurship and to hear about inspiring success stories from experienced entrepreneurs from the region. Winners were also selected, and awards were given in the competition for the best business project.

photo Marta Leśniak

Its continuation was the meeting "Focus on Entrepreneurship," which took place in cooperation with the Voluntary Labour Force in Rybnik. The aim of this event was to introduce young people to job offers of entrepreneurs from Rybnik and the surrounding area, as well as to present a rich educational offer of the Academic Secondary Comprehensive School in Rybnik.

The event was held under the patronage of the Rector of the Silesian University of Technology - dr Eng. Arkadiusz Mężyk, as well as the Marshal of the Silesian Voivodeship – Jakub Chełstowski. ■

X FINAL OF THE DAYS OF GLIWICE YOUNG SCIENTISTS

For the tenth time at the Silesian University of Technology, the Final of the Days of Young Scientists from Gliwice was held. It is an initiative that aims to develop interest in science among pupils and even preschoolers, motivate them to learn mathematical and natural subjects, as well as improve their self-presentation skills. It consists of taking part in competitions organized by Gliwice schools.

The jubilee edition gathered primary school pupils, secondary school pupils, teachers, and representatives of the Silesian University of Technology in the auditorium of the Education and Congress Centre. The competition took place within the Academy of the Youngest Scientist, addressed to pre--school groups and competitions for Primary Schools. ■

SAFETY FIRST

Learning through play– in accordance with this principle, the Faculty of Mining, Safety Engineering, and Industrial Automation provides the youngest with the necessary knowledge about safety. During the "Safety First" workshop, attended by children from the School and Preschool Complex in Żernica, issues such as: what is personal protective equipment, how to behave in an emergency situation, what is a defibrillator and how to use it? were discussed.

The initiator and leader of the classes is Dr Eng. Aneta Grodzicka, recently appointed Director of the Centre for Student Activity, who has developed workshops programs addressed to four age groups: from pre-school children to secondary school graduates. Classes have been held free of charge for willing institutions since 2019 with the support of the university authorities, and management of the Department of Safety Engineering and the Department of Geoengineering and Resource Exploitation. ■

photo Przemyslaw Bratkowski

SUCCESSES

SILESIAN UNIVERSITY OF TECHNOLOGY AWARDED WITH THE KATOWICE AIRPORT STATUETTE

photo: The Upper Silesian Aviation Group (GTL SA)

On February 29th, 2024, at the International Congress Centre in Katowice, a gala of The Upper Silesian Aviation Group (GTL SA) took place, during which symbolic statuettes were awarded to people and institutions involved in the operation of the Katowice airport. Among the winners was Silesian University of Technology, with which Katowice Airport has been cooperating closely for many years. On behalf of the University, the statue was received by Prof. Bogusław Łazarz, Vice-Rector for General Affairs, and Dr Hab. Eng. Jarosław Kozuba, prof. of Silesian University of Technology – Director of the Civil Aviation Personnel Training Centre of Central and Eastern Europe at the Silesian University of Technology. ■

SCIENTISTS OF THE SILESIAN UNIVERSITY OF TECHNOLOGY AWARDED BY THE MINISTER

photo: Ministry of Science and Higher Education

During the gala on the occasion of the Day of Polish Science, Minister of Science Dariusz Wieczorek presented the awards to the most distinguished representatives of the scientific and academic community.

The Minister's award for significant achievements in the field of implementation activities was granted to Prof. Anna Chrobok from the Department of Chemical Organic Technology and Petrochemistry at the Faculty of Chemistry, as well as the director of the College of Studies at the Silesian University of Technology. In turn, Prof. Janusz Kotowicz, Vice-Rector for Cooperation with Civic and Economic Environment as well as Deputy Head of the Department of Power Engineering and Turbomachinery of the Faculty of Energy and Environmental Engineering was honoured for his lifetime achievements. The Minister's Award for significant achievements in the field of scientific activity was awarded to prof. Marcin Woźniak from the Department of Mathematics Applications and Methods for Artificial Intelligence at the Faculty of Applied Mathematics. ■

PROJECTS

RECRUITMENT FOR FULBRIGHT SCHOLARSHIP PROGRAMS

Another recruitment for six Fulbright Poland scholarship programs has started. The Fulbright Program is the largest scientific and cultural exchange program in the United States. It has been operating in Poland for 65 years and has over 5000 graduates, who often emphasize that it is a program that simply changes lives. More information about programs and planned webinars: www.fulbright.edu.pl/stypendia-do-usa and Facebook profile: International Mobility Office – Silesian University of Technology. ■

PHYSICS COMPETITION "YOUNG EINSTEIN" AT THE SILESIAN UNIVERSITY OF TECHNOLOGY

The Institute of Physics - Centre for Science and Education, invites all to participate in the Young Einstein competition. It is addressed to pupils of secondary schools interested in physics in practical and ex-

perimental terms. The competition work – in the field of physics or on the border of physics and other fields – can be prepared in the form of a model, mock-up, demonstration, experiment, etc. , an electrical device, a mechanical device, a research project, or a combination of these components. Applications are open until April 15th. The final of the competition will take place on April 24th in the online formula.

Details and regulations on the website: www.polsl.pl/rif/aktualnosci/63014/konkurs-fizyczny-mlody-einstein-dla-uczniow-szkol-ponadpodstawowych ■

YOUNG INVENTOR 2024 COMPETITION

Until April 19th, 2024, you can submit works for the 19th edition of the national competition "Young Inventor 2024". The competition is open to learners under the age of 22. Its aim is to motivate young people to pro-innovation activities and to promote young inventors on the international arena.

Entries must be submitted by 19th April to the following e-mail address: a.skoczylas@haller.pl: They may be: an invention, industrial design, industrial product, idea, new concept, innovative technical solution, new solution applied in management, trade, services, communication and transport, teaching, an innovative educational program, an innovative diploma thesis that can be applied in practice and other innovative achievements. ■

SUMMER SCHOOL IN CHINA

Beijing Institute of Technology in China announces the call for summer programs for students. Two programs were prepared: ON-Campus (1-27 July 2024 – 10 places for students of the Silesian University of Technology) and ONLINE (5-16 August 2024). Application deadlines: First round – 30th April and second round – 15th May.

Interested persons are invited to contact the Erasmus coordinators at the respective faculties. As part of the program, students are provided with tuition, on-campus accommodation, teaching materials, insurance, transportation, and tickets for cultural tours. All you have to do is pay for travel and food during your stay in China. ■

PLAY IN THE WOMEN BASKETBALL TEAM OF THE SILESIAN UNIVERSITY OF TECHNOLOGY

Women's Basketball Section AZS Silesian University of Technology announces recruitment to its teams. Coach Patryk Niczke invites all interested students – athletes with experience related to league basketball – to trainings, which take place every Tuesday, Thursday, and Friday in the sports hall of the Silesian University of Technology, at 26, Akademicka Street in Gliwice. For more information, please call: 601 092 567 and on the fan page of the team on Facebook: Women's Basketball Section AZS Silesian University of Technology. ■

photo Martin Huć

APRIL REPERTOIRE OF THE STUDENT CULTURE CENTER "MROWISKO"

04.04 at 19:00
Review of Student Bands

06.04 at 20:00
Concert Funky Blast with the group ASFORMATION

07.04 at 19:00
The performance "Good Evening to you, Krzysztof Materna, Olga Bołądź

09.04 at 19:00
Board games in Spiral Club

13.04 at 19:00
The Tree - 10th Anniversary Concert [Warhlack / Gentlemen / Rockoteka with the Hybrid Conspiracy]

16.04 at 18:00
Drum Workshops

17.04 at 19:00
The "Expensive Romance"

18.04, at 19:00
Review of Student Bands

19.04 at 20:00
Good Evening with a Vinyl Record

20.04 at 19:00
Concert of Venta Quemada / N!C / Drum Circle

21.04 at 09:00-13:00
Gliwice Record Exchange

27.04 at 19:00
Stand-up Karol Modzalewski

27.04 at 20:00
GardenBeat / atmosphere Night & Birthday Celebration Cure Start

POSITIONS, DEGREES AND ACADEMIC TITLES

AWARDED DOCTORAL DEGREES

Dr Eng. Natalia BARTECZKO
Silesian University of Technology – PhD student. Supervisor: prof. dr hab. Eng Anna Chrobok Auxiliary supervisor - dr Eng. Mirosława Grymel. Thesis topic: 'Research on the use of alternative catalytic systems in olefin metathesis'. Conferring the degree of Doctor of Engineering and Technical Sciences with distinction. Discipline– chemical engineering. Resolution of the Chemical Engineering Discipline Council of February 7th,2024

Dr Eng. Maciej FERDYN
Magna Casting Poland sp. Z o.o. Supervisor: dr hab. Eng Jarosław Piątkowski, prof. of Silesian University of Technology Thesis topic: "Influence of heat treatment parameters on selected mechanical properties of structural aluminium alloy pressure castings". Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - materials engineering. Resolution of the Materials Engineering Discipline Council of February 20th, 2024

Dr Eng. Jakub KRZĄKAŁA
Silesian University of Technology – PhD student. Supervisor: prof. dr hab. Eng Mark Salamak. Auxiliary supervisor - dr Eng. Piotr Łaziński. Thesis topic: 'Determination of the concrete modulus in the construction of compressed bridge structures. Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline – civil engineering, geodesy and transport. Resolution of the Civil Engineering, Geodesy and Transport Discipline Council of January 25th, 2024.

Dr Eng. Katarzyna NOWAK
Silesian University of Technology – PhD student. Supervisor: prof. dr hab. Eng Leszek Szojda. Auxiliary supervisor - dr Eng. Adam Marek. Thesis topic: "Developing the theoretical basis for a new method of rectification of buildings subject to mining influences, which allows for minimization of associated costs." Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline – civil engineering, geodesy and transport. Resolution of the Civil Engineering, Geodesy and Transport Discipline Council of January 25th, 2024.

Dr Eng. Szymon PLUTA
LOGSTOR International. Supervisor: prof. dr hab. Eng Barbara Białecka. Thesis topic: "The influence of brine on the thermal carbon distribution of the carbon tracks of the Upper Silesian Coal Basin". Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - environmental engineering, mining and energy. Resolution of the Environmental Engineering, Mining and Energy Discipline Council 2024.

Dr Eng. Fabian SCHODEN
Bielefeld University. Supervisor: prof. dr hab. Eng. Tomasz Błachowicz, Prof. Dr.-Ing. Eva Schwenzfeier-Hellkamp. Thesis topic: Investigation of non-toxic dye-sensitized solar cell materials for circular design approaches. Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - materials engineering. Resolution of the Materials Engineering Discipline Council of February 20th, 2024

Dr Eng. Józef SCHWIETZ
SZAR SA Częstochowa. Supervisor: dr hab. Eng Bogdan Panic, prof of Silesian University of Technology Thesis topic: 'Use of the sound emitted by the electric furnace in operation and the variation in the active power consumption to determine the optimum starting point for the foamer to be fed into the furnace'. Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - materials engineering. Resolution of the Materials Engineering Discipline Council of February 20th, 2024

Dr Eng. Grzegorz ŚWIACZNY
ENDEGO Sp. z o.o. Supervisor: dr hab. Eng Marek Wyleżoł, prof. SUT of Silesian University of Technology Thesis topic: "Methodology for optimizing the structure of associative CAD models". Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - mechanical engineering. Resolution of the Mechanical Engineering Discipline Council of February 21st, 2024.

Dr Eng. Mateusz TOMCZYK
Silesian University of Technology Faculty of Chemistry – assistant. Supervisor: prof. dr hab. Eng Krzysztof Walczak. Thesis topic: "Synthesis and biological properties of modified intercalators and macrocycles". Conferring the degree of doctor of exact and natural sciences. Discipline – chemical sciences. Resolution of the Chemical Sciences Discipline Council of February 14th, 2024.

Dr Eng. Grzegorz WÓJCIK
DIP DRAXLMAIER. Supervisor: dr hab. Eng Piotr Przystałka, prof. of Silesian University of Technology Thesis topic: Electric car battery leak detection system. Conferring the degree of Doctor of Engineering and Technical Sciences. Discipline - mechanical engineering. Resolution of the Mechanical Engineering Discipline Council of February 21st, 2024.

AWARDED DEGREES OF HABILITATED DOCTOR

Dr Hab. Eng. arch. Małgorzata BALCER-ZGRAJA
Silesian University of Technology Faculty of Architecture – assistant professor. Discipline - architecture and urban planning. Resolution of the Architecture and Urban Planning Discipline Council of February 19th, 2024.

Dr Hab. Eng. Krzysztof MUSIOŁ
Silesian University of Technology Faculty of Electrical Engineering – assistant professor. Discipline – automation, electronics, electrical engineering and space technologies. Resolution of the Automation, Electronics, Electrical Engineering and Space Technologies Discipline Council of February 20th, 2024.

Dr Hab. Michał SOBOTA
The Centre of Polymer and Carbon Materials PAS in Zabrze. Discipline - biomedical engineering. Resolution of the Biomedical Engineering Discipline Council of February 15th, 2024.

AWARDING THE ACADEMIC TITLE OF PROFESSOR

Prof. Dr Hab. Eng Agnieszka KUDELKO
Graduate of the Faculty of Chemistry of the Silesian University of Technology. Dr – 16 May 2001, Dr hab. – 07.11.2012 the position of professor of the university since 01.10.2013. Employment at the Silesian University of Technology since 01.10.1993. Title of professor of science and natural sciences 02.02.2024.

Edited by **Katarzyna Mryka**

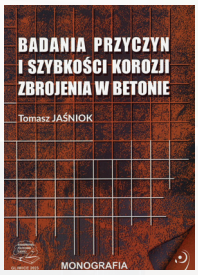
PUBLISHING NEWS

Climate and Environment Protection. Modern energy. Selected Issues

Collective work edited by Sebastian Werle and Joanna Ferdyn-Grygierek

Ed. I, 2023, PLN 48.30, p. 337

The monograph presents selected problems regarding sustainable production and consumption in the environmental aspect. Topics discussed include sustainable soil management, the growing problem of lack of water availability, modern technologies and processes related to municipal sewage treatment and the quality of atmospheric air. One of the chapters is also devoted to the issues of the internal environment and sustainable buildings.

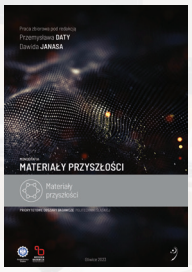


Investigation of the causes and rate of corrosion of reinforcement in concrete

Tomasz JAŚNIOK

Ed. I, 2023, PLN 24.15, p. 259

The monograph deals with the issues of corrosion diagnostics of steel reinforcement in concrete in the scope of both the assessment of the protective properties of concrete against steel and the corrosion destruction of reinforcement itself. The work also presents the results of long-term studies of test elements, in which the influence of climate change on corrosion rate was analysed, with particular emphasis on the method of measuring the conductivity of concrete.



The materials of the future

Collective work edited by Przemysław DATA and Dawid JANAS

Ed. I, 2023, PLN 32.55, p. 222

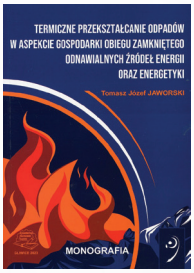
The monograph summarizes the research potential of the third Priority Research Area of the Silesian University of Technology, which concerns "Materials of the future." The work is divided into six chapters that summarize R&D activities in the indicated areas: Organic and inorganic materials for applications in electronics; ultralight and high-resistance materials in automotive and aerospace structures; modern materials for applications in construction; modern materials for medical applications; advanced methods of surface modification of materials; modelling and testing of physicochemical properties of materials.

Managing the portfolio of projects in a service company in the mining industry

Jarosław JAMROZY, Krzysztof WODARSKI

Ed. I, 2023, PLN 28.35, p. 209

In Poland, there are service companies operating in the mining industry, whose activities are focused on cooperation, on the outsourcing principle. Most of these companies' services are delivered in the form of projects, which results in them operating in a multi-project environment. This, in turn, involves the need to manage a portfolio of projects, which poses challenges for the management of these companies resulting from many problems. The most important are the rational selection of projects for the portfolio and its evaluation. The monograph presents the results of research on this problem, aimed at solving it.



Thermal waste treatment in the aspect of circular economy of renewable energy sources and energy

Tomasz Józef JAWORSKI

Ed. I, 2023, PLN 23.10, p. 150

The monograph includes the analysis of waste as a source of renewable energy and a future resource and energy in accordance with the guidelines of the idea of the GOZ. The study was created mainly because of scarce information on the possibility of managing waste in a way other than raw material recycling.

Edited by **Małgorzata Mizera**

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