



REPUBLIC OF SERBIA
GOVERNMENT

Ministry of Science,
Technological Development
and Innovation

Ministry
of Information and
Telecommunications

Ministry of
Education

Ministry of
Sports

Ministry of
Tourism and Youth

PLAY FOR HUMANITY! SCIENCE FOR ALL

STEP INTO A SUSTAINABLE FUTURE

Inspired by
BIO4

EXHIBITION CATALOG

66TH INTERNATIONAL FAIR OF TECHNICS AND TECHNICAL ACHIEVEMENTS

Play for Humanity!
SCIENCE FOR ALL
Step into a Sustainable Future

EXHIBITION CATALOG

66th INTERNATIONAL FAIR OF TECHNICS AND TECHNICAL ACHIEVEMENTS

Step into a Sustainable Future!

For the 66th consecutive year, from 21 to 24 May, the Belgrade Fair hosted the most relevant business and tech event in the region. An indispensable part of this year's International Fair of Technics and Technical Achievements was an exhibition organized by the Government of the Republic of Serbia under the title *Play for Humanity! Science for All—Step into a Sustainable Future*.

The exhibition, which spread over two levels and covered 6000 square meters in Halls 2B and 2C of the Belgrade Fair, was made possible thanks to the joint efforts of the Ministry of Science, Technological Development and Innovation, the Ministry of Education, the Ministry of Information and Telecommunications, the Ministry of Sports, and the Ministry of Tourism and Youth. The exhibition brought together 63 exhibitors with 114 individual displays divided into eight sections: Agriculture, Biotechnology, Funds, Science and Technology Parks, Urban Systems, Artificial Intelligence, Historical Heritage, and Space. Visitors had a chance to see original solutions and innovations developed within Serbia's scientific and research community and innovation ecosystem.

The People's Republic of China also participated in the Fair as the partner country so the exhibition showcased the innovations and achievements of 22 Chinese high-tech companies in the fields of space technology, artificial intelligence, biomedicine, and autonomous vehicles.

This year's International Fair of Technics and Technical Achievements was declared open by Serbian Parliament Speaker Ana Brnabić. Serbian Minister of Science, Technological Development and Innovation Dr. Jelena Begović and Chinese Deputy Minister of Science and Technology Chen Jiachang also addressed the present.

In the Minglarium conference space in Hall 2C of the Belgrade Fair, visitors could also attend a rich four-day program, including panel discussions, inspiring speeches, and lectures. The topics ranged from ideas for a sustainable future, the construction of the BIO4 science and research complex, upgrades to Serbia's innovation and startup system, the application of innovative technologies and AI tools in sports, technology transfer from the academic community to industries, to future skills needs and socially engaged practices, like women in the IT sector. More than 19,000 people, including numerous foreign delegations, came to see the Government of the Republic of Serbia's exhibition.

The expert jury of the 66th International Fair of Technics and Technical Achievements presented awards to the best exhibitors, and many recognitions ended in the hands of participants of the Government of the Republic of Serbia's exhibition *Play for Humanity! Science for All*. The prestigious Step into the Future award for the most remarkable exhibit went to the Institute for Testing of Materials in Belgrade and the Lola Institute. Finally, the special recognition of the International Fair of Technics and Technical Achievements for exhibits contributing to technological development was granted to the Science and Technology Park Niš, the Institute for Medical Research in Belgrade, the Faculty of Medicine in Belgrade, the Vinča Institute of Nuclear Sciences, the Science and Technology Park Čačak, the Faculty of Technology and Metallurgy in Belgrade, and the Faculty of Agriculture in Belgrade.







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PHOTO: Zoran Petrović

Dear readers,

It is with great pleasure that we present to you this catalog of innovations that were put on view at the Republic of Serbia's exhibition as part of the 66th International Fair of Technics and Technical Achievements held under the slogan *Play for Humanity! Science for All—Step into a Sustainable Future*. This year, five ministries of the Government of the Republic of Serbia joined forces to bring the exhibition to life: the Ministry of Science, Technological Development and Innovation, the Ministry of Education, the Ministry of Information and Telecommunications, the Ministry of Tourism and Youth, and the Ministry of Sports—with the People's Republic of China as the partner.

The event, which once more brought together the most prominent Serbian innovators, scientists, experts, and entrepreneurs, saw a 30 percent spike in the number of visitors compared to the previous year. And this only confirms—to my great pride and joy—that interest in science and technology is on the rise in our society.

The catalog provides an overview of Serbia's latest advancements in the world of science, technology, and innovation. Here you will find uplifting stories about ideas that have turned out to be a success, as well as excellent projects illustrating all that our society could gain from science and innovation. As was the case last year, we made sure to list innovations that could serve as inspiration, thus honoring the perseverance and relentless research of our scientists and entrepreneurs. They are the main drivers of our social, technological, and economic development.

The catalog showcases innovations from various fields, from biosciences and medicine to energy, archaeology, robotics, and new information technologies, including artificial intelligence. Our inventors' exceptional talent and expertise are essential for overcoming today's global challenges and creating a better world for us all. That is why we need to back them!

Until next year and a fresh exhibition, we invite you to explore this collection and draw inspiration from a world of possibilities unlocked by science and technological development. I believe these examples and success stories will motivate you to further explore, think, and make; and thus help drive innovation and creation that direct our lives and shape the world around us.

We would like to thank all participants, exhibitors, innovators, and visitors who turned this exceptional event into our shared success and made the Republic of Serbia proud. May this collection of innovations serve as an incentive for future endeavors and big steps that we will take together!

Dr. Jelena Begović
Minister of Science, Technological Development and Innovation

Exhibits





РЕПУБЛИКА СРБИЈА
ВЛАДА

Министарство науке,
технолошког развоја
и иновација

Министарство
информисања
и телекомуникација

Министарство
просвете

Министарство
спорта

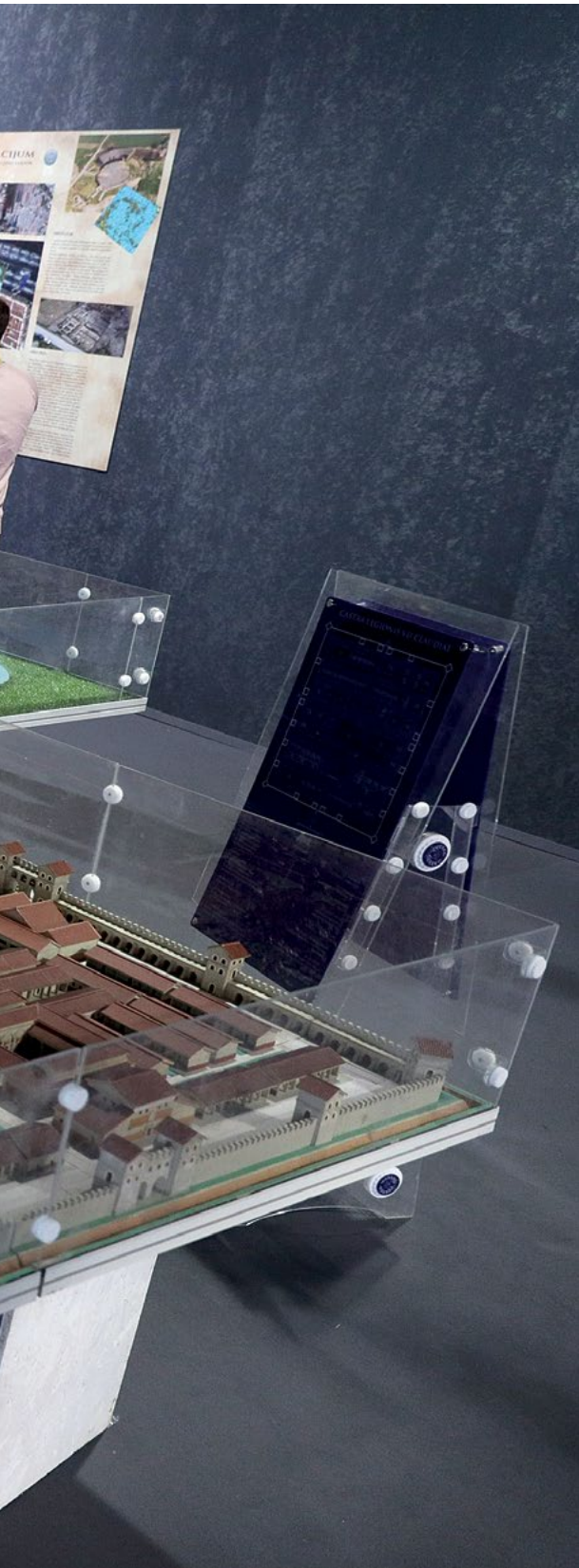
Министарство
туризма
и омладине

ИГРАЈ ЗА ЧОВЕЧАНСТВО! НАУКА ЗА СВЕ Закорачи у одрживу будућност

66. МЕЂУНАРОДНИ САЈАМ ТЕХНИКЕ И ТЕХНИЧКИХ ДОСТИГЊУЋА
21 - 24. МАЈ 2024. • БЕОГРАДСКИ САЈАМ • ХАЛА 26 / 2Ц







Journey to the Past—Itinerarium Romanum Serbiae—Viminacium

Institute of Archaeology, University of Belgrade

An exhibition entitled *Journey to the Past—Itinerarium Romanum Serbiae—Viminacium* provided a glimpse into Serbia's rich cultural heritage. Over the last five years, this traveling exhibition, which was put up by the Institute of Archeology in Belgrade with support from the Serbian Ministry of Foreign Affairs, spread Serbian scientists' findings across the world. Alongside promoting Serbia's heritage, the Institute shed light on Roman emperors' birthplaces, thus developing a scientific product that now forms part of the country's cultural and archeological offer.

The exhibit was developed as part of the project: IRS—Viminacium, a Roman City and Legionary Camp—the Research of Material and Spiritual Culture and the Population Using the Most Advanced Technologies of Remote Sensing, Geophysics, GIS, Digitization, and 3D Visualization—47018. Archaeological Site: Viminacium.

Funding sources: the Ministry of Science, Technological Development and Innovation; the Ministry of Culture; the Ministry of Foreign Affairs of the Republic of Serbia.

Authors: Sonja Petrović, Vuk Đuričković, Professor Dragomir Petrović, and Professor Zvonko Petković.

Full-scale satellite model and MOSAIC satellite module

Astronomical Observatory of Belgrade

The Astronomical Observatory of Belgrade put on show a 1:1 model of the entire satellite set to be built and sent into orbit around the Earth in 2026. This will be Serbia's first scientific satellite tasked with three missions: to observe the Sun in the X-ray spectrum, and the Earth in the optical spectrum, and to popularize science in Serbia.

Also on display was a fully functional life-size satellite module made by the Mihajlo Pupin Institute. The module showed the workings of the gyroscope and accelerometer with the satellite's orbit displayed on the screen.

This exhibit was developed as part of the project: MOSAIC (Multi-purpOSE Academic Cubesat).

Funding sources: the Astronomical Observatory of Belgrade with support from the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: the Astronomical Observatory of Belgrade and the Tehno Art Vocational High School.



Exhibition panel showing Urban Observatory of Belgrade

Astronomical Observatory of Belgrade

This panel showed the Urban Observatory of Belgrade, a new observing station within the Astronomical Observatory of Belgrade. One of its main objectives would be to measure and study light pollution, one of the least understood forms of pollution on the Earth. It also contained information on the hyperspectral sensor, whose case was 3D-printed, and a Raspberry Pi computer.

The exhibit was developed as part of the project: the Urban Observatory of Belgrade—UrbObsBel.

Funding source: the PRISMA Program of the Science Fund of the Republic of Serbia.

Authors: Dr. Srđan Samurović, Principal Research Fellow, the Astronomical Observatory of Belgrade, PI; Dr. Zorica Cvetković, Principal Research Fellow, the Institute of Physics Belgrade, Dr. Rade Pavlović, Principal Research Fellow, the Institute of Physics Belgrade, Dr. Goran Damljanović, Principal Research Fellow, the Astronomical Observatory of Belgrade, Dr. Zoran Simić, Principal Research Fellow, the Astronomical Observatory of Belgrade, Dr. Dragan Lukić, Research Associate, the Institute of Physics Belgrade, Dr. Branislav Rovčanin, Assistant Professor, the Faculty of Medicine, the University of Belgrade, and Dr. Dajana Bjelajac, Assistant Professor, the Faculty of Sciences, the University of Novi Sad.



MOBY—Modeling Binary Systems That End in Stellar Mergers and Give Rise to Gravitational Waves

Astronomical Observatory of Belgrade

The exhibition panel showed the scientific contribution of the project entitled Modeling Binary Systems That End in Stellar Mergers and Give Rise to Gravitational Waves—MOBY. The project's main scientific aim is to model binary star systems that can produce gravitational waves by using the MESA evolutionary code.

The exhibit was developed as part of the project: Modeling Binary Systems That End in Stellar Mergers and Give Rise to Gravitational Waves—MOBY.

Funding source: the PRISMA Program of the Science Fund of the Republic of Serbia.

Authors: Dr. Jelena Petrović, Professor Bojan Arbutina, Dr. Monika Jurković, and Dr. Atila Čeki.



From big data to big discoveries of the universe—Serbian scientists in Rubin Observatory's LSST project

University of Belgrade—Faculty of Mathematics, Astronomical Observatory of Belgrade

The Chile-based Rubin Observatory will use an 8.4m telescope equipped with the world's largest digital camera to conduct a 10-year survey called the Legacy Survey of Space and Time (LSST). Starting in 2025, the LSST will rely on a 3200-megapixel camera and six different optical filters to take hundreds of sky images every night. Astronomers around the world, including scientists from the

Astronomy Department of the Faculty of Mathematics and the Astronomical Observatory of Belgrade, will use data from these images to make incredible discoveries about the universe.

Each image covers an area as big as 40 full moons, and the giant 8.4-meter telescope can move between different positions in less than five seconds. In this way, the telescope will image the entire

visible sky every three or four nights. This makes the Rubin Observatory particularly good at detecting objects that have changed in brightness, like supernovae, or in position, like asteroids. Additionally, the Rubin Observatory's light-collecting power and sensitive camera will help us discover around 17 billion stars and 20 billion galaxies we have never seen before.



Asteroid hunters

Astronomical Society "Eureka" Kruševac

This is a citizen science project implemented in Serbia since 2016 under the name All Serbian Asteroid Search Campaign. The project has strived to engage astronomy enthusiasts in analyzing photographs obtained from world observatories to discover new or confirm existing asteroids in our solar system. The project relied on the free ASTROMETRICA software package capable of analyzing a series of four

images. The reporting takes place on the project website <http://iasc.cosmosearch.org/>.

The exhibit was developed as part of the global project entitled International Asteroid Search Collaboration, where the Astronomical Society "Eureka" coordinated the activities in Serbia.

Authors: Zoran Tomić, Miloš Stanković, and Jovan Aleksić.

To ensure the efficient analysis of big data acquired through the survey, part of the SER-SAG team at the Faculty of Mathematics developed advanced software for analyzing light curves of astronomical objects. Using machine learning methods and neural networks, the software can identify and catalog periodic signals in the light curves of stars, galaxies, and other cosmic objects.

The panel showed the Rubin Observatory and the world's largest digital camera. Audiovisual media and computer simulations illustrated Serbian scientists' contributions. Particular emphasis was placed on the sonification of astronomical data and scientific phenomena, which is the presentation of scientific data and results only with sound. This aligns with the Rubin principle of equity, diversity, and inclusion.

The exhibit was developed as part of the project: SER-SAG (Serbian Active Galaxies), an in-kind contribution to the Rubin-LSST.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Dragana Ilić, Anđelka Kovačević, and Tijana Prodanović.



Plant-O-Meter

Bitgear Wireless Design Services Ltd.

The Plant-O-Meter is a multispectral optical sensor for precision agriculture. The device relies on more than 30 vegetation indices to provide a unique

insight into the current health status of the observed plant and enable the targeted application of adequate care.

The exhibit was developed as part of the project: the Matching Grants Program of the Innovation Fund of the Republic of Serbia.

Funding sources: own funds and the Innovation Fund of the Republic of Serbia.

Authors: Dejan Dramićanin, Marko Mihailović, Bojan Vesić, and Marija Nikolić.



Beeamond

Golden Bee Ltd.

The Beeamond System is an innovative product specifically designed to collect all types of bee products indoors. Elements are used to collect bee products (honey, pollen, and propolis) and services (beehive air inhalation and bee venom therapy). The entire system is made of highly transparent, durable organic glass and is perfectly safe for contactless beekeeping indoors.

Funding source: the StarTech program of support for digital transformation in Serbia, implemented by the National Alliance for Local Economic Development (NALED) and financed by the Philip Morris company.

Authors: Dr. Slobodan Dolašević and Marijana Dolašević.

Industrial heritage and new technologies

Alliance for Education

The exhibits constitute a combination of creativity and technological skills, illustrating how high school students can rely on modern technologies to solve everyday challenges and improve the quality of life. The list of items includes LEGO robots that demonstrate various applications of automation and robotics, systems for smart agriculture, a plum drying solution, a biopesticide that allows for the maintenance of organic produc-

tion standards, as well as the preservation of cultural heritage.

The exhibits were developed as part of the project: the Makers Lab, implemented by the Alliance for Education comprising the Center for the Promotion of Science, the Nordeus Foundation, Junior Achievement Serbia and the Digital Serbia initiative.

Authors: teachers and students from the Zaječar Gymnasium, the Petar Kuzmjak High School, the Sixth Belgrade Gymnasium, the Mija Stanimirović Electrical Engineering High School, the First Belgrade Gymnasium, the Nikola Tesla School Center, the Rade Metalac Technical School, and the First Kragujevac Gymnasium.



Step into the Future Award

Hot plate for testing thermal conductivity of building materials
Institute for Testing of Materials (IMS),
Belgrade

*Find out more about this exhibit
on page 41*



**BEOGRADSKI
SAJAM**

Povodom 66. Međunarodnog sajma
TEHNIKE I TEHNIČKIH DOSTIGNUĆA
dodeljuje se

**VELIKA NAGRADA
„KORAK U BUDUĆNOST“**

**INSTITUT ZA ISPITIVANJE MATERIJALA a.d.
Beograd**

Za
**GREJNA PLOČA ZA MERENJE TOPLOTNE PROVOĐLJIVOSTI
GRAĐEVINSKIH MATERIJALA**

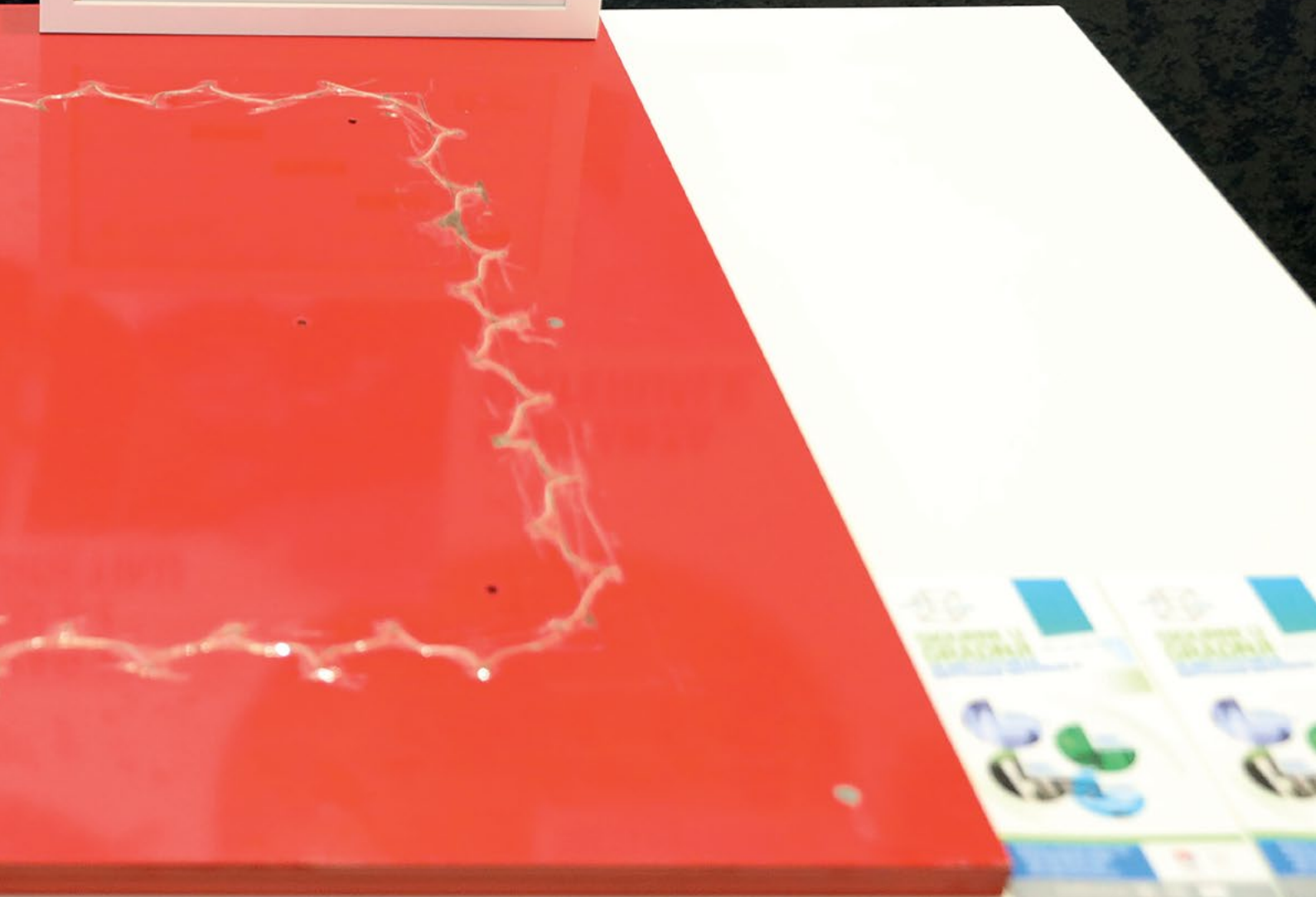
Beograd, 23.05.2024.

66. MEĐUNARODNI
SAJAM TEHNIKE

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Vukobratović's Days of Robotics

Children's Innovation Center

Vukobratović's Days of Robotics are dedicated to one of the brightest minds in the world of robotics, Serbian scientist Miomir Vukobratović. He was a pioneer in humanoid robotics, and his legacy remains fundamental to this day. For the second time in a row, the event will take place at the School of Electrical Engineering in Belgrade in December 2024.

The exhibit was developed as part of the event Vukobratović's Days of Robotics.

Funding sources: the Ministry of Tourism and Youth and the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia.

Authors: the Children's Innovation Center.



Hrana koja leči!



DIA solution

Novi probiotski napitak

Ispoljava jedinstven
protektivni efekat na ćelije
pankreasne koje proizvode insulin

@diasolutionserbia

www.diasolution.rs

DiaSolution probiotic for easing diabetes symptoms

DiaSolution Ltd.

This innovative probiotic helps ease diabetes symptoms and prevent complications associated with the disease, thus effectively contributing to improving the quality of life of patients with diabetes and prediabetes. Preclinical and clinical studies confirmed the product's beneficial effects and safety.

The exhibit was developed as part of the projects: New Probiotic for Easing Diabetes and Prediabetes Symptoms, and Innovative Probiotic for the Alleviation of Symptoms of Diabetes.

Funding sources: the StarTech program implemented by the National Alliance for Local Economic Development (NALED), and Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE).

Authors: Dr. Nataša Golić, Dr. Milica Živković, Dr. Maja Tolinački, and Dr. Damjan Damjanović.



Oil & gas VR education system

Faculty of Electronic Engineering,
University of Niš

Representatives of the oil and gas company Naftna industrija Srbije (NIS) wanted to apply gamification as an innovative approach to illustrating the oil exploration process. This traditionally complex and expensive sector required a VR application that would be presented at trade fairs and conferences. The most interesting part of designing the app was the actual processing of open-source seismic data, in an effort to transpose them to the VR environment in the form of thousands of cubes, with the interaction mode similar to that in the popular video game Minecraft.

Authors: Dr. Nikola Stojanović,
Dr. Aleksandar Milosavljević, M.Sc.
Vladimir Jakšić, M.Sc. Svetlana Šešum.

Lab platform for training in process regulation

Faculty of Electronic Engineering,
University of Niš, Laboratory
for Electric Drives

This is a platform for providing training in water pumping facilities, the electrical efficiency of electric drives, and process control. Through the most advanced and common communication protocols, a specially designed SCADA system establishes full control of a pump facility. The SCADA software solution provides



insight into all process, mechanical, and electrical parameters and leaves room for the development of custom control algorithms.

The exhibit was developed as part of a regular update of teaching methods in the field of electric drives.

Funding source: the Faculty's funds and donations.

Authors: M.Sc. Filip Filipović and Professor Nebojša Mitrović.

Electronic dice for board games

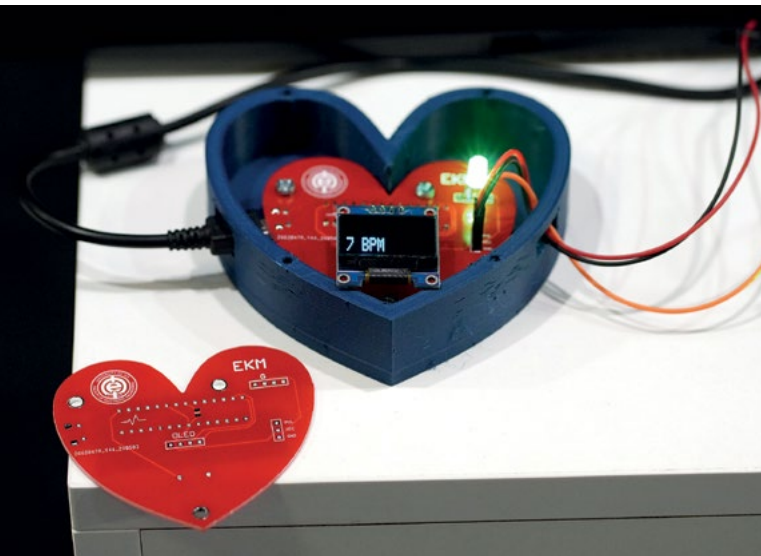
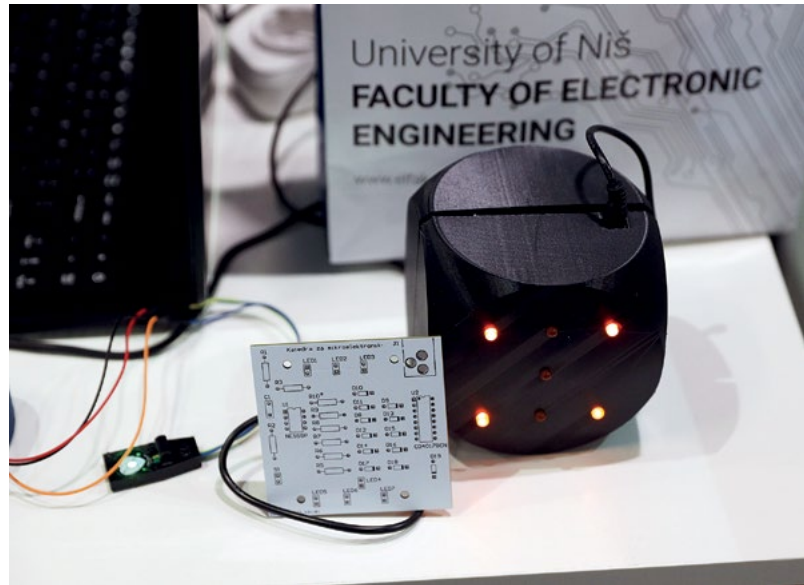
Faculty of Electronic Engineering, University of Niš

During the previous semester, teaching assistants of the Department of Microelectronics carried out a demonstration project entitled Electronic Dice for Board Games. In a series of exams held as part of the Electronic Components and Microsystems module, this project aimed to show it would be possible to make a fully functional device starting from the circuit diagram, the selection of components based on the relevant technical documentation, the development of the prototype, the setup of the printed circuit board, all the way to the 3D printing of the housing itself.

The exhibit was developed as part of the regular activities of teaching assistants at the Department of Microelectronics.

Funding sources: the Faculty of Electronic Engineering and the IEEE association.

Authors: the Department of Microelectronics.



Heart rate monitor

Faculty of Electronic Engineering, University of Niš

To measure the heart rate, the user needs to position a finger on a sensitive membrane capable of amplifying the pulse. The detected signals are processed, and results are made visible to the user on the OLED display. The user can see the heart rate and a small cardiograph that shows the heart rate. The team also designed a suitable box for this device and produced it with 3D printing technology, thus ensuring its mobility and flexibility of use.

The exhibit was developed as part of the regular activities of teaching assistants at the Department of Microelectronics.

Funding sources: the Faculty of Electronic Engineering and the IEEE association.

Authors: the Department of Microelectronics Team.

Sound arrival direction localization system

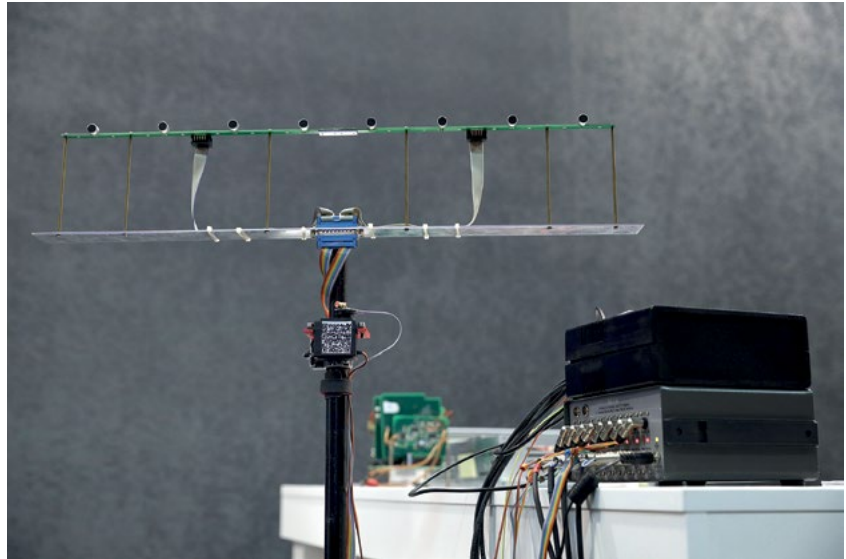
School of Electrical Engineering, University of Belgrade, Acoustics Laboratory

This sound arrival direction localization system on a microphone array is based on the wide-band CAPON method (1500-5000Hz) for assessing sound arrival directions. The system is implemented on open-source hardware and operates in real time. The hardware communicates sound direction information to a motor-driven laser device that tracks the sound source.

The project was developed as part of doctoral research at the Acoustics Laboratory.

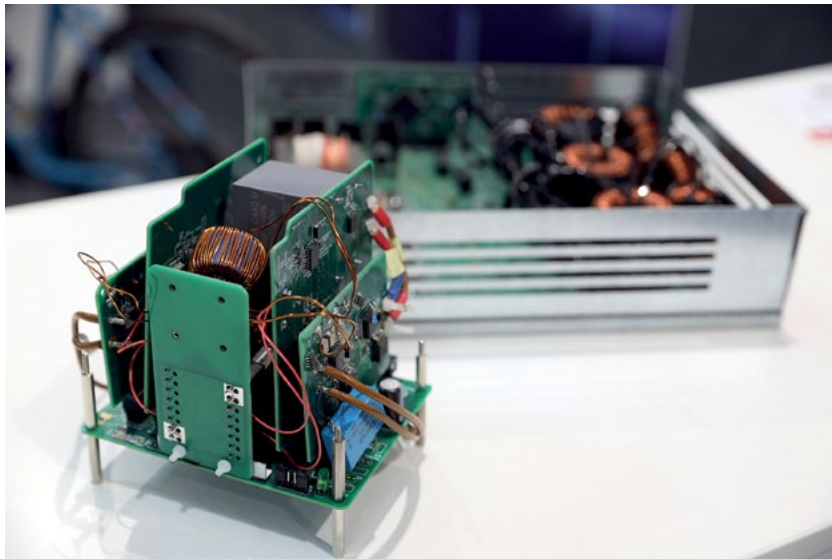
Funding sources: the Acoustics Laboratory's own funds.

Authors: the Acoustics Laboratory Team.



Solid State Transformer

School of Electrical Engineering, University of Belgrade



This single-phase solid-state transformer adjusts voltage levels and manages electrical energy. It uses power converters instead of heavy metals, reducing weight up to 10 times compared to a conventional transformer of the same nominal power (1200 VA). The bidirectional solution's efficiency is over 94 percent. Harmonic distortions are under 4.5 percent (current) and 1.5 percent (current). Tested with voltages up to 2 kV and 100 percent load, it offers real-time monitoring and diagnostics.

The exhibit was developed as part of a task for the 2023 IEEE International Future Energy Challenge.

Funding sources: donations and sponsorships from H-Bridges Team's partners.

Authors: H-Bridges 2022/23.

E-bike drive system

School of Electrical Engineering, University of Belgrade

This integrated drive system for an electric bicycle includes all electronic components in one device. The drive's nominal power is 1500 W, and the bicycle's maximum speed 50 km/h. The solution provides a high efficiency of 97 percent, high peak values of traction force, with a response time below 0.1 ms, and a user application that provides information on current speed, remaining battery capacity, average speed, energy consumption, total distance traveled, and other data.

The exhibit was developed as part of a task for the 2019 IEEE International Future Energy Challenge.

Funding sources: donations and sponsorships from H-Bridges Team's partners.

Authors: H-Bridges 2018/19.



Stereo audio amplifier

School of Electrical Engineering, University of Belgrade

This stereo audio amplifier with switching mode constitutes a solution for sound systems where the main requirements are efficiency, size, and digital audio inputs. The device aims to provide the highest sound reproduction quality, comparable to conventional amplifiers, through a compact and energy-efficient solution. Specifications: input voltage: 50V DC; output power: 135W per channel; output channels: 3; digital inputs: WAV and MP3.

The exhibit was developed as part of the project: the 2024 IEEE International Future Energy Challenge.

Funding sources: donations and sponsorships from H-Bridges Team's partners.

Authors: H-Bridges 2023/24.

Microgrid inverter (solar inverter)

School of Electrical Engineering, University of Belgrade

This microgrid inverter is designed to adequately transfer the electrical energy produced by solar panels to the power grid. The developed solution can operate both on-grid and in island mode, with a power capacity of 1.5kW. The inverter is digitally controlled in real time. It provides galvanic isolation, low harmonic distortion of electrical quantities (below 5 percent), and a high energy efficiency coefficient (over 96 percent). It operates without requiring any additional user intervention.

The exhibit was developed as part of the project: the IEEE International Future Energy Challenge 2022.

Funding sources: donations and sponsorships from H-Bridges Team's partners.

Authors: H-Bridges 2021/22.



System for testing centralized protection within digital substations

Faculty of Electrical Engineering, University of Belgrade

The setup consists of a Typhoon HIL 404 real-time simulator, a Siemens Siprotec 5

7UT85 microprocessor relay for the protection of digital substations, and a touchscreen computer with a Siemens SCADA system SIMATIC WinCC.

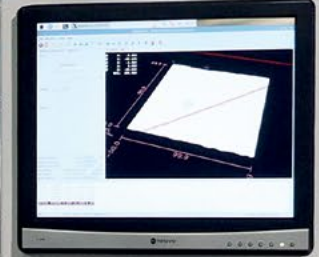
The exhibit was developed as part of a project of the Relay Protection Laboratory.

Funding source: donation.

Authors: Zoran Stojanović, Aleksandar Marjanović, Uroš Njegovan, and Simiša Simić.



LOLA VMC4

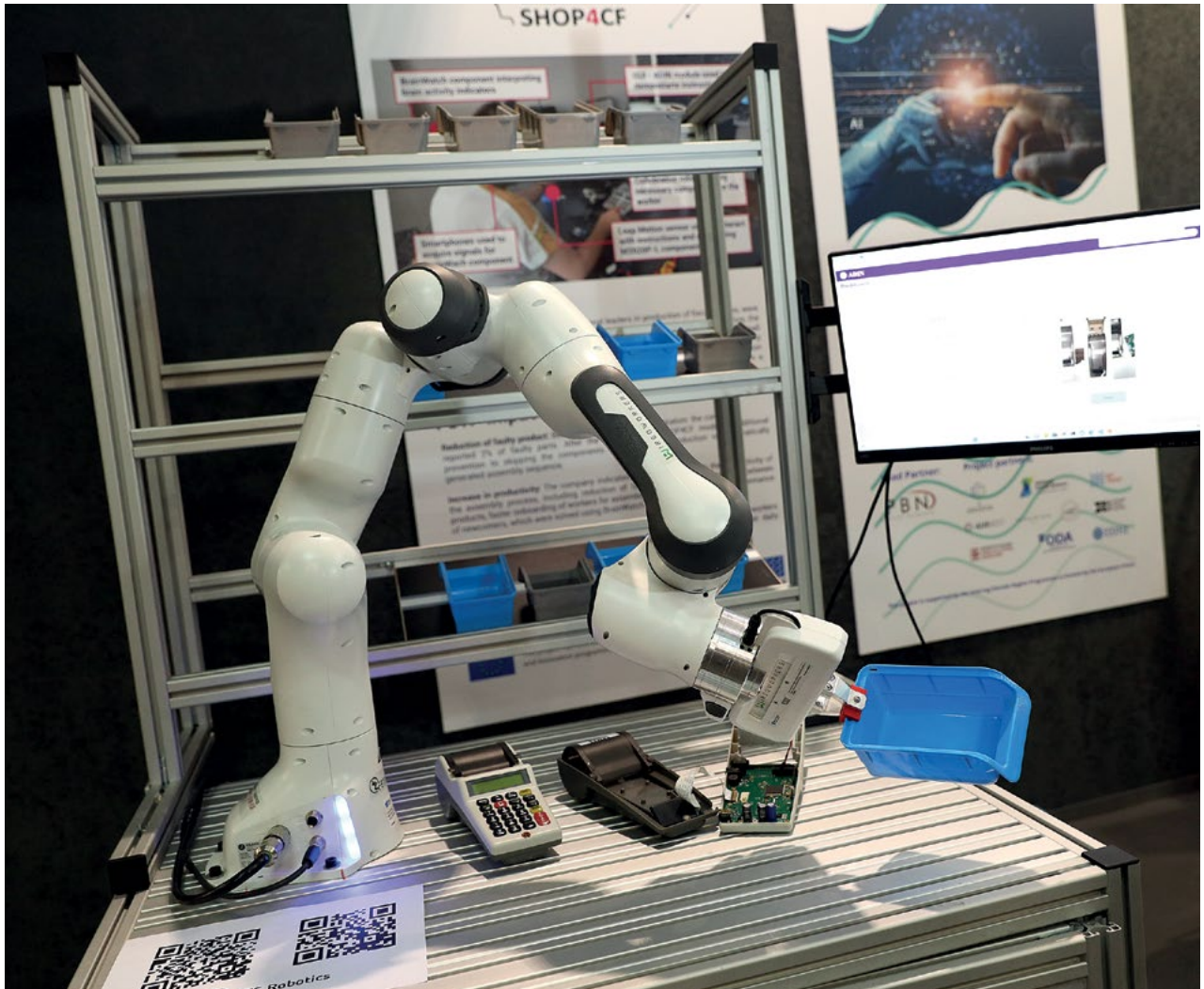


Step into the Future Award

LOLA VMC4 vertical machining center

Lola Institute, Belgrade

Find out more about this exhibit on page 65



Neuroergonomic workstation for assembly process

School of Electrical Engineering, University of Belgrade

The neuroergonomic workstation is designed to provide the worker with optimal working conditions. Intuitive visual instructions with a list of parts and necessary tools give the worker confidence and reduce mental fatigue. The collaborative robot, controlled by contactless hand movement detection sensors, brings the parts needed for each step of the assembly process to an

ergonomically selected position, reducing fatigue and the possibility of errors. During the assembly process, smart headphones with dry electrodes monitor brain activity parameters in a non-invasive way. In case of a drop in concentration or fatigue, the system recommends that the worker be allowed a refresh break or be assigned a new work task.

The exhibit was developed as part of the project: Smart Human-Oriented Platform for Connected Factories (SHOP4CF).

Funding source: Horizon 2020.

Authors: Kosta Jovanović, Andrej Savić, Zaviša Gordić, and Nikola Knežević.

Electric vehicle FSRA2022

Formula Student Team dubbed Road Arrow—Student Technical Competitions Association—University of Belgrade

The Road Arrow is now electric! During the 2022 season, the team dedicated itself to developing its first electric vehicle. This high-performance car features an asymmetric monocoque chassis made of carbon fiber, four electric motors, each integrated into a wheel with a planetary gearbox, and a battery with a maximum voltage of 588V. Owing to the knowledge and skills of

team members, we qualified for three competitions in Europe. The Road Arrow team proudly represented Serbia at competitions in Croatia, Hungary, and the Netherlands with our first electric race car.

The exhibit was developed as part of the project: Formula Student Road Arrow.

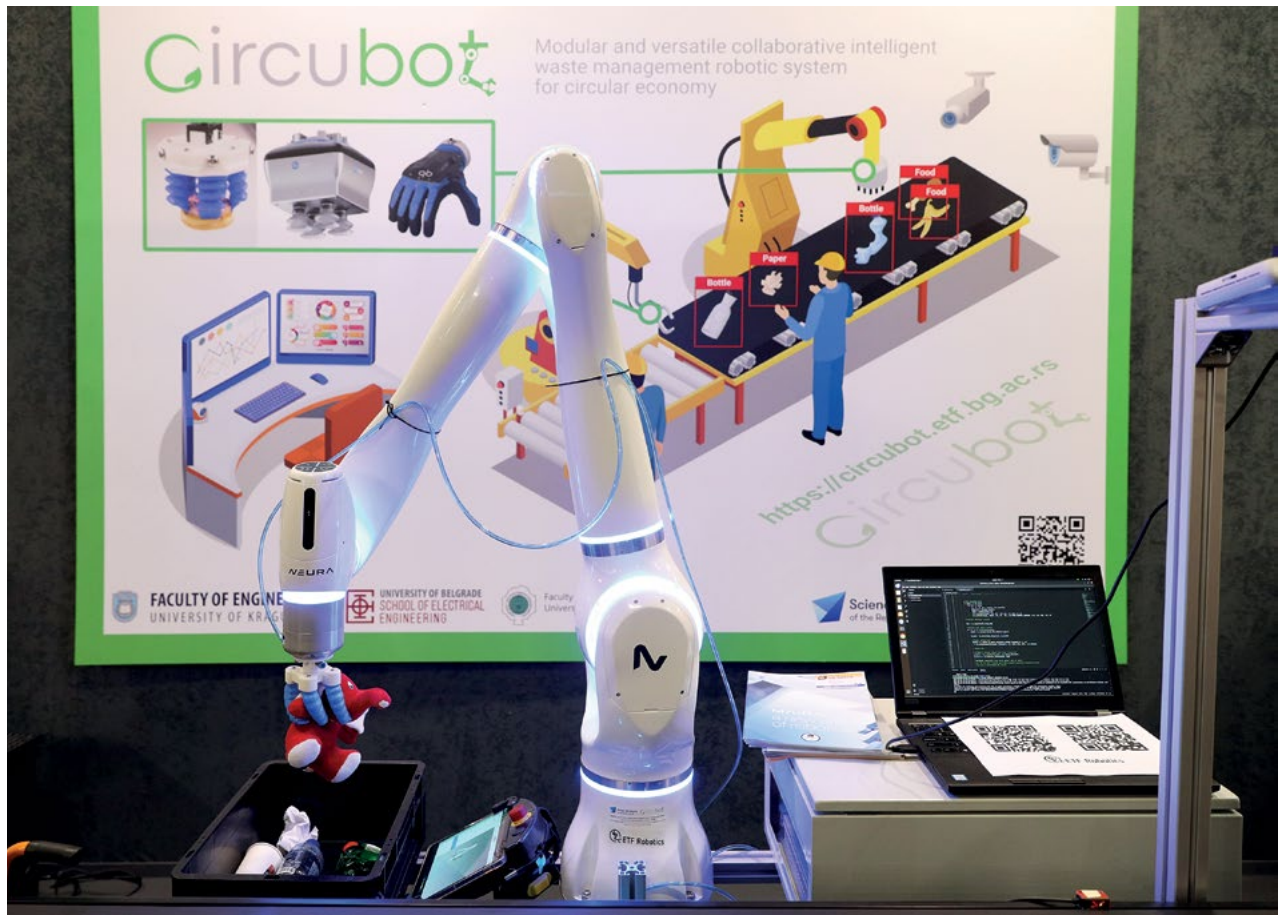
Funding sources: the Faculty of Mechanical Engineering, the School of Electrical

Engineering, the Faculty of Organizational Sciences, and the Faculty of Technology and Metallurgy.

Sponsors: ZF, Mercedes-Benz Emil Frey, Rivian, Brose, Synchrotek, and many others.

Authors: An 80-strong Road Arrow team of students from the University of Belgrade.





CircuBot—modular robotic station for collaborative waste collection, sorting, and management

School of Electrical Engineering, University of Belgrade

The CircuBot system consists of the MAIRA collaborative robot, a conveyor belt, a pneumatic soft gripper, and a vision system. The collaborative robot is responsible for the safe handling of waste transported by the conveyor belt, which is not suitable for manipulation by workers engaged in the same task. By using the soft gripper, it is possible to safely grasp objects of various dimensions and structures. Meanwhile, the vision system, combined with appropriate machine learning algorithms, performs real-time waste identification and classification, providing the necessary analytics for optimal waste management.

The exhibit was developed as part of the project: CircuBot - Modular and Versatile Collaborative Intelligent Waste Management Robotic System for Circular Economy.

Funding source: the Innovation Fund of the Republic of Serbia.

Authors: Arso Vukićević, Kosta Jovanović, Nikola Knežević, Miloš Petrović, Branko Lukić, Maja Trumić, Marko Đapan, Ivan Mačužić, Marija Savković, Dragana Nišić, and Uroš Petrović.



M2B

Кемоглобин из о

КЛ

ПОТЕНЦИ



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DIETARY SUPPLEMENTS BASED ON HEME IRON DERIVED FROM SLAUGHTERHOUSE BLOOD
PROJECT - SAJDE

M2BoostHEM

падне говеђе и свињско
и у стабилизованом
стом стању:
јететски суплемент
амског гвожђа



Special Recognition for Contribution to Technological Development

Dietary supplements based on heme iron derived from slaughterhouse blood
Institute for Medical Research—National Institute of Republic of Serbia,
University of Belgrade

Find out more about these exhibits on page 43

HiraVet and HiraPet animal probiotics

Invetlab Ltd., Adaševci

Invetlab designed the innovative HiraVet probiotic as a highly effective alternative to antibiotics in the prevention and treatment of intestinal infections in livestock production. HiraVet has a peculiar antimicrobial effect with a unique spectrum of activities to clinical pathogens, such as *Escherichia coli*, *Salmonella sp.* and *Clostridium sp.*

HiraVet has a positive effect on the colonization of gut microbiota in the first days after birth, helps restore disrupted microbiota, and strengthens newborns' immunity.

The exhibit was developed as part of the projects: Development of Technological Process for Production of Liquid Probiotic Fermented Feed for Pigs Using Natural Isolates of Lactic Acid Bacteria, and Development of Technological Processes for Production of Innovative Probiotic Products for Prevention and Treatment of Intestinal Infections in Animals.

Authors: Dr. Nataša Golić, Dr. Katarina Veljović, Dr. Amarela Terzić-Vidojević, and Igor Mrvaljević.

The image shows two side-by-side promotional posters for Invetlab's probiotics. The left poster is for 'HiraPet' and features a dog and a cat. The right poster is for 'HiraVet' and features a horse, a cow, a pig, and a goat. Both posters have the Invetlab logo at the top left and a QR code at the top right. Below the product name is a blue banner with white text: 'Prvi domaći fermentisani probiotički napitak za kućne ljubimce' for HiraPet and 'Prvi domaći fermentisani probiotički napitak za životinje' for HiraVet. At the bottom of each poster is the website 'invetlab.com'.



Flexible search of Serbian-language textual data in legal and administrative domain

Innovation Center of School of Electrical Engineering Ltd.,
School of Electrical Engineering, University of Belgrade

The developed solution allows users to search Serbian-language legal and administrative content and get relevant results to their queries regardless of the form (e.g. case, gender, number, etc.) in which words occur in the documents. In addition to this, it is possible to make queries that rely on different morphosyntactic patterns so as to isolate all occurrences of the searched word forms and/or syntactic structures.

The exhibit was developed as part of the project: *COMtext.SR*.
Funding sources: donations from Serbian and foreign foundations and companies.

Authors: Vuk Batanović, Lenka Bajčetić, and Tanja Samardžić.

Silko for grasses and cereals—new inoculant for ensiling and haying of grasses and cereals

Innovation Center of Faculty of Technology and Metallurgy Ltd.

Silko is a specialized product, a mixture of indigenous strains of lactic acid bacteria and hydrolytic enzymes (cellulase and xylanase) that break down lignocellulosic biomass. By decomposing lignocellulosic fractions, enzymes contribute to the release of additional sugar, thus facilitating strong growth and maintaining an optimal combination of beneficial lactic acid bacteria, as well as a sharp drop in pH. This improves the stability of silage and the nutritional value of food. The application of such inoculants ensures high-quality food and stable meat and milk yields throughout the year.

The exhibit was developed as part of the project: Innovation Voucher—Characterization and Production Improvement for Maximum Production of Bacterial Cellulase and Xylanase Enzymes.

Funding source: the Innovation Fund of the Republic of Serbia.



Authors: Dr. Nataša Šekuljica, Professor Zorica Knežević-Jugović, Professor Snežana Đorđević, Nikola Đorđević, Dr. Sonja Jakovetić Tanasković, Dr. Jelena Mijalković, and Dr. Nevena Luković.

Participating organizations: the University of Belgrade, the Faculty of Technology

and Metallurgy; the Innovation Center of the Faculty of Technology and Metallurgy Ltd., and Bio-Tech Solutions Inkubator Ltd. In Šimanovci.

Functional ice cream powder with vanilla flavor

Innovation Center of Faculty of Technology and Metallurgy Ltd. and partners: Faculty of Technology and Metallurgy, University of Belgrade, Aleva JSC, Innovation Fund of Republic of Serbia

This ice cream powder contains hydrolyzed whey proteins and inulin. The product is a rich source of antioxidants, proteins, and fibers, so it has tangible nutritional and health benefits. Proteins help maintain normal bones, keep and increase muscle mass, while inulin from chicory contributes to the normal functioning of the intestines by increasing the frequency of stools.

The exhibit was developed as part of the project: Innovation Voucher No. 1523/2023 Entitled Development of a New Product—Functional Ice Cream Powder.

Funding sources: Aleva JSC and the Innovation Fund of the Republic of Serbia.

Project Manager Dr. Tanja Krunic, Senior Research Associate, the Innovation Center of the Faculty of Technology and Metallurgy, the University of Belgrade.

Participants: Professor Marica Rakin, the Faculty of Technology and Metallurgy, the University of Belgrade; Dr. Danica Zarić, Principal Research Fellow, the Innovation Center of the Faculty of Technology and Metallurgy, the University of Belgrade; Professor Maja Vukašinović Sekulić, the Faculty of Technology and Metallurgy, the University of Belgrade; Dr. Maja Bulatović, Senior Research Associate, the Faculty of Technology and Metallurgy, the University of Belgrade; Dr. Natali Mićović, ALEVA JSC.



Nano cherry

Innovation Center of Faculty of Technology and Metallurgy Ltd.

Nanoencapsulated bioactive compounds extracted from an autochthonous sweet cherry cultivar from the Balkan region. Natural materials, like goat milk and/or polysaccharides, were used during the process, and the freeze-drying technique was applied to preserve the stability of sensitive bioactive compounds. Such products can be used as functional additives in food and cosmetic products, and thus help curb the use of synthetic antioxidants, increase the bioavailability of active compounds, and facilitate their permeability into the skin.

The exhibits were developed as part of the projects: Innovation Voucher No. 1414/2023: Natural Nano Cosmetics Enriched with Bioactive Compounds from Sweet Cherries and the IDEA



Program: Genetic Potential of Serbian Autochthonous Cherry Genotypes for Temperature-Adaptable Reproductive Behaviour and Nutraceutical Value – CherrySeRB (GRANT No.7739716).

Funding sources: the Innovation Fund of the Republic of Serbia and the Science Fund of the Republic of Serbia.

Authors: Dr. Mina Volić and Dr. Nataša Obradović.

Green biocatalyst for azo dye decolorization and biodegradation

Innovation Center of Faculty of Technology and Metallurgy Ltd., Faculty of Technology and Metallurgy, University of Belgrade

This green biocatalyst is a new environmentally acceptable and cost-effective bioproduct developed in line with the principles of circular economy and sustainable development. It was made from recycled lignocellulose agroindustrial waste utilized in laccase production, after which it also served to immobilize laccase by adsorption. This new product demonstrates a high efficiency of 90 percent in removing azo dyes at high temperatures and acidic pH for a very short time of 30 minutes, which makes it ideal for application in hot waste waters of the textile industry.

The exhibit was developed as part of the Proof of Concept Program (PoC 5634).

Funding source: the Innovation Fund of the Republic of Serbia.

Authors: Nevena Ilić, Marija Milić, Slađana Davidović, Suzana Dimitrijević-Branković, and Katarina Mihajlovski.





AgRobot Gari—a multimodal robotic solution for automating blueberry production

BioSense Institute, University of Novi Sad

AgRobot Gari is a modular robotic system designed for blueberry cultivation. It features three different modules for distinct activities: soil sampling and analysis thanks to specially developed hardware, weed detection and spraying with the help of computer vision, an industrial robotic arm with a spraying system, and plant health monitoring with two multispectral Plant-O-Meter sensors.

The system's modularity allows it to be used throughout the entire season, which is a major advantage over existing solutions that perform only individual tasks.

The exhibit was developed as part of the project: FLEXIGROBOTS from the Horizon 2020 Call.

Funding source: FLEXIGROBOTS from the Horizon 2020 Call.

Authors: Oskar Marko, Goran Kitić, Marko Panić, Damir Krklješ, Nikola Obrenović, Čaba Peteš, Dimitrije Stefanović, Slobodan Birgermajer, Vladan Filipović, Mina Mirović, Đorđe Dragojević, and Đorđe Vujić.



Satellite systems for agricultural monitoring

BioSense Institute, University of Novi Sad

By applying AI algorithms to process large amounts of data from the European Space Agency's Sentinel-2 satellites, researchers identified the crops sown in fields across Serbia, assessed soil quality, delineated production zones within fields, and predicted crop yields. These data are crucial for optimizing distribution, logistics, and making optimal decisions in the field, in an effort to

increase efficiency and reduce environmental impact.

The exhibit was developed as part of the projects: CYBELE, scientific research projects of the Autonomous Province of Vojvodina, and projects of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Funding sources: Horizon 2020, short-term projects of interest for the develop-

ment of scientific research activities in the Autonomous Province of Vojvodina, the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Branislav Pejak, Mirjana Radulović, Predrag Lugonja, Milijana Vujasinović, Vladan Minić, Sanja Brdar, Miloš Pandžić, Marko Panić, Oskar Marko, and Vladimir Crnojević.



In vitro method of obtaining sweet potato (*Ipomoea batatas*) planting material

Institute for Biological Research "Siniša Stanković"—National Institute of Republic of Serbia, University of Belgrade

This is actually a sweet potato seedling that scientists grew by applying *in vitro* technology. A slip from a sprouted sweet potato is propagated on a sterile culture medium containing minerals, vitamins, and sugars under controlled temperature and light conditions for an unlimited period of time so that seedlings are available at any time. Moreover, they are free from viruses, bacteria, and fungi. The *in vitro* culture is an alternative method of obtaining the planting material.

The exhibit was developed as part of the Agreement on the Implementation and Financing of Scientific Research Work of Scientific Institutions in 2024, No. 451-03-66/2024-03/ 200007 dated 05/02/2024.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Branka Vinterhalter, Tatjana Čosić, Dijana Smilagić, Nevena Banjac, Slavica Ninković, and Milica Đodić.



Insects—important link in implementing principles of circular bioeconomy

Institute for Biological Research "Siniša Stanković"—National Institute of Republic of Serbia, University of Belgrade

Insects can efficiently convert various substrates into feed for animals, food for humans, biomass and fertilizers for plants, thus making a valuable contribution to the circular bioeconomy. *Tenebrio molitor* (Coleoptera) and *Gryllus bimaculatus* (Orthoptera) not only represent a protein- and lipid-rich alternative food source, but are capable of decomposing different types of plastic and organic waste. Their frass can be used as a high-quality plant fertilizer.

The exhibits were developed as part of the previous projects: Biodegradation of Plastic—Establishing an Incubator Center (Phase I), Potential Use of Insects in Development of Serbian Agriculture; initiative within the project Reducing the Carbon Footprint of Local Communities

by Applying the Principles of the Circular Economy in the Republic of Serbia—Circular Communities; as well as the current one funded by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia through Contract No. 451-03-66/2024-03/200007.

Funding sources: previously—the EU for the Green Agenda in Serbia, the Ministry of Environmental Protection of the Republic of Serbia, the United Nations Development Program (UNDP) in cooperation with the Embassy of Sweden and the European Investment Bank (EIB), the Global Environmental Fund (GEF); and currently—the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, Contract No. 451-03-66/2024-03/200007.

Authors: Dr. Vesna Perić-Mataruga, Dr. Larisa Iljin, Dr. Dajana Todorović, Dr. Milena Vlahović, Dr. Marija Mrdaković, Dr. Milena Janković-Tomanić, Dr. Dragana Matic, and Dr. Aleksandra Filipović.

**Special Recognition for Contribution
to Technological Development**

**Functional beer enriched with phenolic
compounds from grape seeds**

Faculty of Technology and Metallurgy,
University of Belgrade (in cooperation with
Faculty of Agriculture, University of Belgrade)

Find out more about this exhibit on page 85



UMF



DOGMA



ФУНКЦИОНАЛНО





ПИВО

ОБОГАЋЕНО
ФЕНОЛНИМ
ЈЕДИЊЕЊИМА
ИЗ СЕМЕНКИ
ГРОЖЂА



Vinsko kuća
Milinčić

ПИВО





Cryopreservation of autochthonous plum varieties

Fruit Research Institute Čačak

For the first time in our country, scientists developed cryopreservation protocols for storing the nine most significant autochthonous plum genotypes. This laid the foundation for the establishment of the first cryobank of plant genetic resources in our country. Also for the first time, researchers successfully applied

the cryotherapy methods (V and D cryo-plate) to eliminate the plum pox virus.

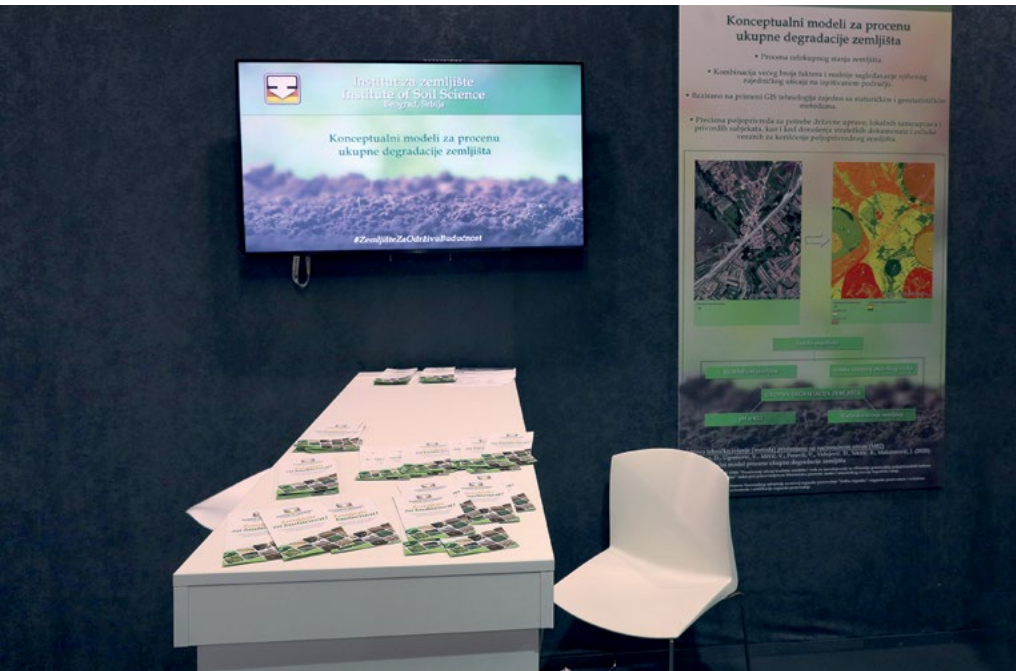
The exhibits were developed as part of the project: Conservation and Plum Pox Virus Eradication from Serbian Autochthonous Plum Genotypes Using Cryotechniques.

Funding source: the PROMIS Program of the Science Fund of the Republic of Serbia.

Authors: Darko Jevremović, Tatjana Vujović, Nebojša Milošević, and Tatjana Anđelić.

Conceptual models for total soil degradation assessment

Institute of Soil Science, Belgrade



These conceptual models make it possible to assess the overall soil condition. By analyzing numerous factors (the soil's chemical and physical properties, land use, etc.), the model takes into account their joint impact within the researched area. The models rely on the application of GIS technologies together with statistical and geostatistical methods. This concept can be applied in precision agriculture by the state administration, local self-governments, and businesses. The exhibit was developed as part of the project contract concluded with the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Dr. Darko Jaramaz, Dr. Vladan Ugrenović, Dr. Vesna Mrvić, Dr. Jelena Maksimović, Dr. Biljana Sikirić, Dr. Radmila Pivić, M.Sc. Sonja Tošić, M.Sc. Vojislav Lazović, Dr. Aneta Buntić, and Dr. Mira Milinković.

Hot plate for testing thermal conductivity of building material

Institute for Testing of Materials (IMS), Belgrade

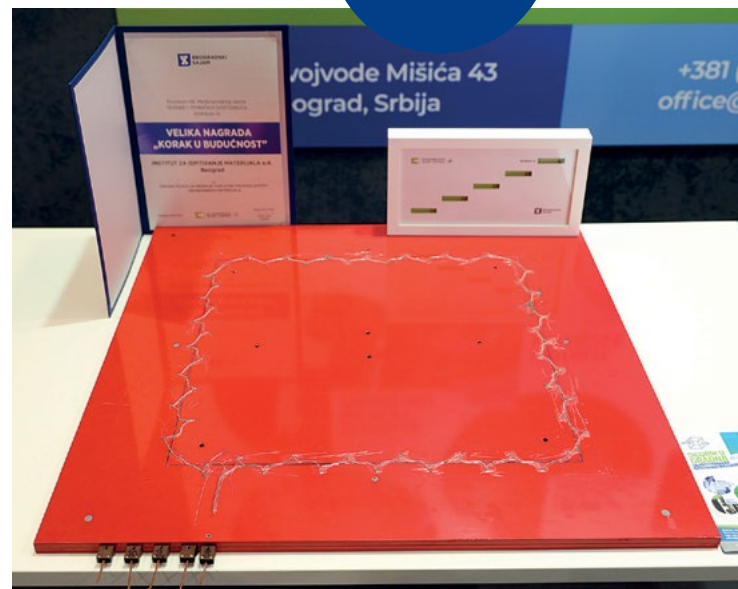
This *apparatus* was constructed in line with the design prescribed for applying the guarded hot plate method so as to achieve temperature uniformity. Thermal conductivity is calculated based on the measured heat flux. This innovative design solution has a different thermal bridge width than the regular one, and a gap between the hot plate and guard ring has been filled with thermal insulation glue.

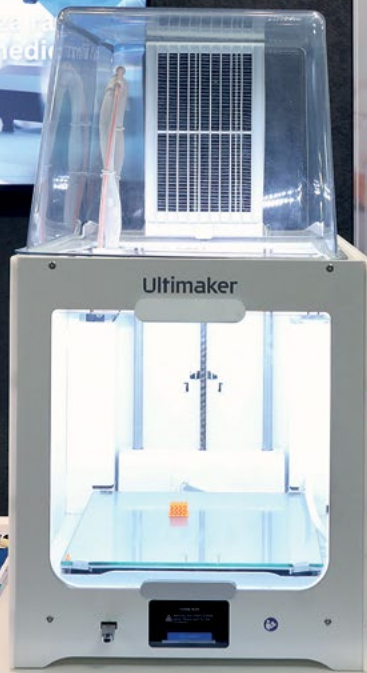
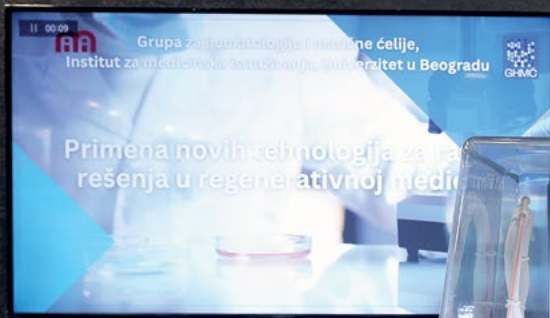
Heaters inside the hot plate and guard ring are made of wire for thermocouples and their geometry is optimized to achieve uniform and even heat distribution to samples.

The temperature uniformity was checked and experimentally validated. All results were in line with the following standards SRPS EN 12667 and SRPS EN 1946-3.

Funding source: the Institute's own funds.

Authors: B.Sc.M.E. Dragiša Ivanišević, M.Sc.M.E. Aleksandar Kijanović, M.Sc.C.E. Milica Mirković Marjanović, M.Sc.M.E. Snežana Ilić, and Dr. Ksenija Janković.





New technologies for development of solutions in regenerative medicine

Institute for Medical Research—National Institute of Republic of Serbia, University of Belgrade

Bioscaffolds made of polylactic acid (thermoplastic biodegradable polymer) in different geometric shapes/densities fabricated by FDM 3D printing technology (Ultimaker 2+) for bone defect reconstruction in combination with bone marrow cells.

Bioscaffolds with a placenta tissue homogenate in different geometric shapes/densities produced through 3D bioprinting (Celllnk BIO X) for breast reconstruction after mastectomy.

A lyophilized amniotic membrane homogenate for regeneration of oral wounds.

The exhibits were developed as part of the projects: RIABONE (New Therapeutic Strategies for Reconstruction of Bone Defects with Optimized RIA-Derived Autologous Grafts and Bone Substitute Materials), AmnioPrintCare (Determining the Potential of Placental Tissue Derivatives for Use in Post-Mastectomy Breast Reconstruction: Development of a 3D-Printed Bioscaffold), Development of Mucoadhesive Films with Amniotic Membrane Homogenate for the Potential Application in Oral Tissue Regeneration.

Funding sources: the German Federal Ministry of Education and Research

(BMBF)—RIABONE, the Science Fund of the Republic of Serbia—AmnioPrintCare, Bilateral Cooperation Project with the Republic of Slovenia—the Ministry of Science, Technological Development and Innovation.

Authors: Aleksandra Jauković, Hristina Obradović, and Ivana Okić Đorđević.

Partner: 3D Republika Ltd.

Dietary supplements based on heme iron derived from slaughterhouse blood

Institute for Medical Research—National Institute of Republic of Serbia, University of Belgrade

The research team developed a new technology for obtaining completely preserved high-purity hemoglobin from slaughterhouse bovine and porcine blood, a valuable source of heme iron, which has the best absorption without side effects. Knowing that iron deficiency anemia is the most prevalent nutritional deficiency, the team produced new long-term stable complexes of cost-effective sugar and isolated biologically active hemoglobin from slaughterhouse blood in the solid state as dietary supplements for treating or preventing anemia.

The exhibits were developed as part of the M2BoostHEM project under the Proof of Concept Program.

Funding sources: the Science Fund of the Republic of Serbia and Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE).

Authors: Dr. Ivana Drvenica and Dr. Vesna Ilić.

Special
Recognition for
Contribution to
Technological
Development



Special Recognition for Contribution to Technological Development

Application of HoloLens 2 in medicine—presentation of three years of experience

Faculty of Medicine, University of Belgrade (in cooperation with UCHC "Dr. Dragiša Mišović—Dedinje")

Find out more about this exhibit on page 66






 Иновативне технологије у здравству
 Технологија мешовите стварности у здравству и образовању zasnovana на вештачкој интелигенцији
 и трансформације кроз инovativну употребу...
 и...
 и...
 и...




 ЗАКОРАЦИ У ОДРЖИВУ БУДУЊНОСТ


 ...





Biotech dyes

Institute of Molecular Genetics and Genetic Engineering, University of Belgrade

Biopigments produced by bacteria such as *Streptomyces spp.*, *Pseudomonas spp.*, and *Serratia marcescens* are increasingly used in the textile, food, cosmetic, and pharmaceutical industries. Their popularity is driven by their environmental biodegradability and lack of toxic or carcinogenic properties. Another

advantage of these biopigments is that they are produced by bacteria that use organic waste as a nutrient source.

The exhibit was developed as part of the project: BioECOLogics, www.bioecologics.rs; Bio-Coloration of Textile Using Bacteria.

Funding sources: the Science Fund of the Republic of Serbia—IDEAS Grant No. 7730810, the Innovation Fund of the Republic of Serbia—PoC 5114.

Authors: Dr. Tatjana Ilić-Tomić, Vukašin Janković, Dr. Sandra Vojnović, Dr. Jelena Lazić, and Dr. Jasmina Nikodinović-Runić.

Insight into pore distribution on surface of pilot filter made from clay

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade



The exhibit was created to test a clay filter and gain insight into the position of pores on the monolith surface—the filter. The pilot filter was made by applying boric acid, pressing at low pressures, and sintering at low temperatures. Efforts are under way to optimize parameters that affect the uniform distribution of pores on the filter surface, as well as its separation power. The filter is intended for industrial wastewater treatment.

The exhibit was first made as part of the project: Natural Materials as Separation Media; and then further developed with the project: Modified Clay as Separation Medium.

Funding sources: the Innovation Fund of the Republic of Serbia under the Proof of Concept and Technology Transfer Programs.

Authors: Dr. Maja Kokunešoski and Dr. Jovana Ružić.

Antibacterial phone case

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade



Special
Recognition for
Contribution to
Technological
Development

The number of microbes on the surface of mobile phones is 30 times higher than on public toilet seats. Carbon quantum dots are an antibacterial agent. These phone cases have low production costs, low dark cytotoxicity, and non-solubility in water, blood, or sweat. The antibacterial activity of these photodynamic phone cases is triggered by visible light (ambient or sunlight), and eight bacteria strains can be eradicated for one hour of irradiation.

The exhibit was developed as part of the project: lumi4cell—Self-Sterilizing Polyurethane Films for Mobile Phones and Tablets, and photogun-4microbes—Are Photoactive Nanoparticles Salvation for Global Infection Threat?

Funding sources: the Innovation Fund of the Republic of Serbia (Proof of Concept and Technology Transfer Programs), the IDEAS Program of the Science Fund of the Republic of Serbia.

Authors: Biljana Todorović Marković, Zoran Marković, Milica Budimir Filimonović, and Danica Zmejkoski.



Industrial smoke neutralizer

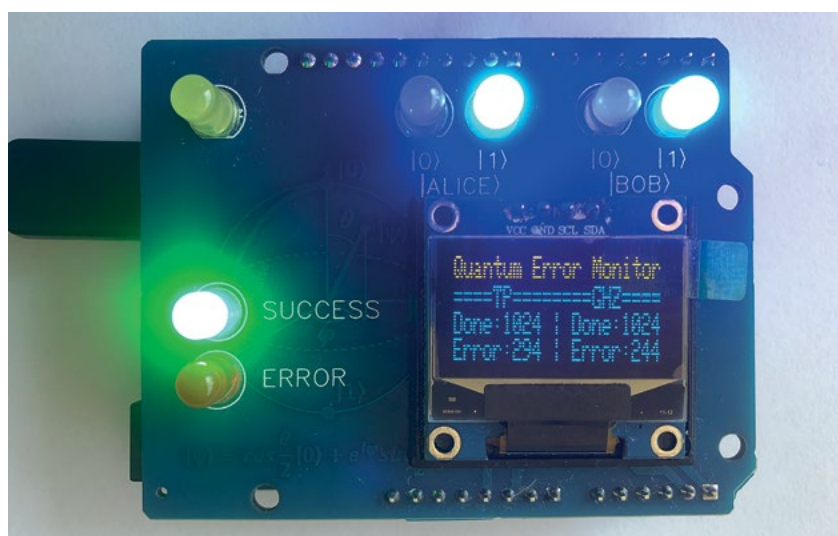
Vinča Institute of Nuclear Sciences—
National Institute of Republic of Serbia,
University of Belgrade

This is a system for desulfurizing industrial smoke and neutralizing harmful gases from furnaces of any kind (thermal power plants, smelters, heating plants etc.). This neutralizer consists of a steel cylinder with a mixer, together with a water suspension of natural aluminosilicate clays, and the entire system constitutes an alternative to complex and expensive scrubber systems that use a water solution of calcium carbonate. Aluminosilicate clays have an advantage over calcium carbonate as they leave no limescale on the system's components, reduce acid pH values as CO_2 is dissolved from smoke, and the clay itself is neutral to the skin so it can be handled without protective gear. In addition to all the advantages listed above, the most important characteristic is that aluminosilicate clays can absorb CO_2 and even NO_x , and this property has been examined. On top of this, the aluminosilicate clay used in this system can then be utilized as a fertilizer in agriculture.

The exhibit was developed as part of the projects: Novel Filler for Wet Scrubbers under the Technology Transfer Program of the Innovation Fund of the Republic of Serbia 2022–2023, the National PoC Project 2020–2021 of the Innovation Fund of the Republic of Serbia entitled Smokeless Smokestacks— SO_2 , NO_x , CO Filter for Smoke, the international project Smokeless Smokestack under EU4TECH PoC Scheme for the Western Balkans 2020–2021.

Funding sources: the Proof of Concept and Technology Transfer Programs of the Innovation Fund of the Republic of Serbia.

Authors: Dr. Sanja Milošević Govedarović, the Vinča Institute, Dr. Ana Mraković, the Vinča Institute, Dr. Tijana Pantić, the Vinča Institute, Dr. Silvana Dimitrijević, the Mining and Metallurgy Institute Bor, and Dr. Aleksandra Ivanović, the Mining and Metallurgy Institute Bor.



Quantum Error Monitoring Shield

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia,
University of Belgrade

This quantum error monitoring shield (QEMS) was developed to follow and observe the occurrence of quantum errors during quantum protocols. The QEMS is implemented in the shield format for the Arduino platform. The QEMS accesses the quantum computer IBMq through the Internet via a PC or mobile device, with the help of the Qiskit library. The QEMS visually signals the flow of quantum protocols, like teleportation, super-dense coding, GHZ, or BB84, between Alice and Bob, typical "quantum protagonists," while its OLED screen shows the basic info on the statistical analysis of quantum errors.

Authors: Mihajlo Slijepčević, David Binenfeld, and Stanko Tomić.

Polycardiograph

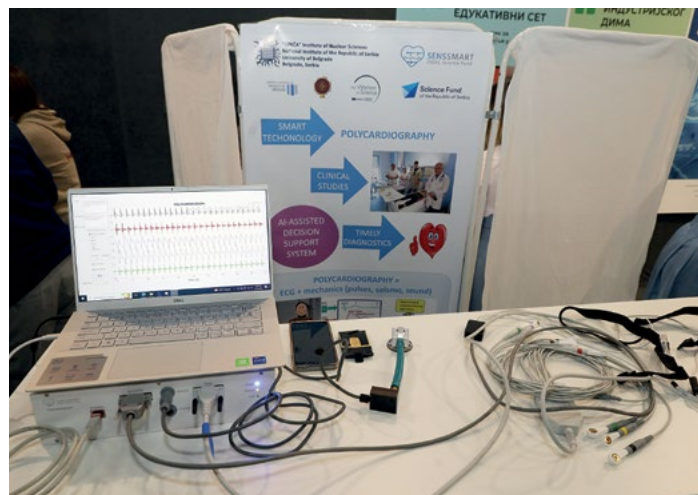
Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade

Polycardiography is a non-invasive method for measuring the electro-mechanical parameters of the cardiovascular system. It is performed with sensors that simultaneously collect information about the function of the heart and blood vessels: the ECG, phonocardiograph, photoplethysmograph, and accelerometer. It provides more diagnostic information than the standard screening and bears the potential for timely detection of serious conditions, such as heart failure. At the Fair, we successfully tested its application in non-clinical settings.

The exhibit was developed as part of the project: *SensSmart*.

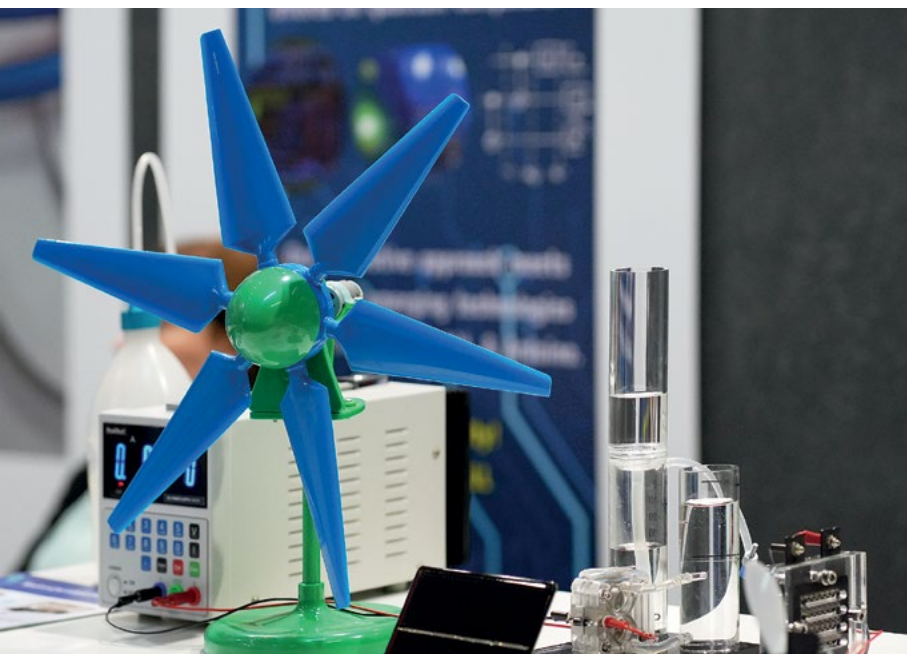
Funding source: the Science Fund of the Republic of Serbia.

Authors: Aleksandar Lazović, Marija Ivanović, Vladimir Atanasoski, Ljupčo Hadžievski, Mirjana Stojanović, Danka Stojanović, Aleksandra Maluckov, Jelena Kršić, Petra Beličev, Jovana Petrović, the Vinča Institute of Nuclear Sciences; Natalija Đorđević, Maša Tiosavljević, Predrag Tadić, the School of Electrical Engineering, the University of Belgrade; Arsen Ristić, Vladan Vukčević, the Faculty of Medicine, the University of Belgrade.



Hydrogen educational set – H₂EduS

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade



A modular educational kit comprises essential components for teaching young people about renewable energy fundamentals and hydrogen's role in future energy frameworks. The kit includes a fuel cell-powered electric vehicle, an electrolyzer that uses solar panels to produce green hydrogen, proton-exchange membrane fuel cells that generate electricity from hydrogen, and additional elements like solar panels, mini wind turbines, and small appliances to demonstrate how the fuel cells function.

The exhibit was developed as part of the project: Hydrogen Educational Set—H₂EduS under the Proof of Concept Program of the Innovation Fund of the Republic of Serbia.

Funding sources: the Innovation Fund of the Republic of Serbia, the Ministry of Education, Science and Technological Development of the Republic of Serbia through the Competitiveness and Jobs Project.

Authors: Dr. Ivana Perović, Dr. Snežana Brković, Dr. Petar Laušević, and Dr. Gvozden Tasić.



Antibacterial stickers

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade

These self-sterilizing polyurethane-based stickers can be applied on frequently touched objects in kindergartens, hospitals, and other healthcare institutions, public transport, on bed rails, chair rails etc. Carbon quantum dots are used as an antibacterial agent. These new stickers have low production costs, low dark cytotoxicity, universal application, and their antibacterial properties are triggered by visible light.

The exhibit was developed as part of the project: photogun4microbes—Are Photoactive Nanoparticles Salvation for Global Infection Threat?

Funding source: the IDEAS Program of the Science Fund of the Republic of Serbia.

Authors: Biljana Todorović Marković, Zoran Marković, Milica Budimir Filimonović, and Danica Zmejkoski.

Antibacterial coating for door handles

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade

The antibacterial action of these polyurethane-based coatings is achieved through the encapsulation of carbon quantum dots. Hence, with the application of these photodynamic coatings in hospitals and other healthcare facilities, it would be possible to improve surface sterilization and curb microbe transmission. When compared to regular door handles, these photodynamic solutions have lower production costs and low dark cytotoxicity. On top of that, composite films are not soluble in water, blood, or sweat and have long-term antibacterial action. The antibacterial activity of these coatings is prompted by visible light (ambient or sunlight).

The exhibit was developed as part of the project: photogun4microbes—Are Photoactive Nanoparticles Salvation for Global Infection Threat?

Funding source: the IDEAS Program of the Science Fund of the Republic of Serbia.

Authors: Biljana Todorović Marković, Zoran Marković, Milica Budimir Filimonović, and Danica Zmejkoski.

Antibacterial coating for laptop keyboards

Vinča Institute of Nuclear Sciences—National Institute of Republic of Serbia, University of Belgrade

It has been established that the number of microbes on laptop keyboards is about 400 times higher than on public toilet seats. Antibacterial action is achieved with the encapsulation of carbon quantum dots in polyurethane film. These photodynamic coatings have low dark cytotoxicity, low production costs, and ensure complete sterilization for one hour of visible light irradiation.

The exhibit was developed as part of the project: photogun4microbes—Are Photoactive Nanoparticles Salvation for Global Infection Threat?

Funding source: the IDEAS Program of the Science Fund of the Republic of Serbia.

Authors: Biljana Todorović Marković, Zoran Marković, Milica Budimir Filimonović, and Danica Zmejkoski.



Patent method and application procedure for silage additives

Institute for Science Application in Agriculture

In all parts of the world, farmers conserve feed for domestic animals. After harvest or haymaking, plants are transported from the field to the farm, put into silos, and compacted to force air out. Then, the silo is covered with special foils so as to create conditions for fermentation. Silage is then created as a product of plant conservation through spontaneous or targeted lactic acid fermentation brought about by lactic acid bacteria. This new method, however, cuts the time needed for an anaerobic phase of fermentation to occur as carbon dioxide is added in its solid state—also known as dry ice—or in the gas phase during the silo filling operation, and then farmers add another layer of plants that are additionally compacted. As a result, the anaerobic phase occurs up to two hours upon the application, thus cutting losses in the nutritional value of siloed plants. With the new procedure and additives, the period of aerobic stability has been extended by 80 percent due to stable pH values and better lactic and acetic acid content. The application of this patent paves the way for first-class silage quality.

Author: Dr. Aleksandra Ivetić.

Silage stabilizer

Institute for Science Application in Agriculture

This patent for a silage stabilizer constitutes an innovative solution in the process of plant conservation in horizontal silos, silo bags, and round bales. This innovation has numerous beneficial effects, ensuring a longer period in which silage keeps its nutritional value. Innovative elements are organic components that are safe for humans and animals. This discovery steps up the conservation of plant material, increases livestock production and cuts enteric methane emissions. This silage stabilizer can adjust to the conditions of each individual farm, ensuring a faster opening of silos in just 15 days or longer (400 days and more).

Funding sources: Patent Co. Serbia, the European Institute of Innovation and Technology, EIT Food, Belgium, the Innovation Fund of the Republic of Serbia.

Author: Dr. Aleksandra Ivetić.



Device for applying solid additives to farm silages

Institute for Science Application in Agriculture

This patent belongs to the A01 class according to the International Patent Classification (IPC) and relates to agriculture. Its constituent parts are already known in mechanical engineering and can be easily made from available materials. It is very important that these materials have wide applications in other industries, but this is the first time they have been used in agriculture. This discovery facilitates a quick, safe, precise, and affordable application of dry ice so as to force air out and ensure quality silage. Dry ice is the solid form of carbon dioxide, with the freezing point of -79°C . The sublimation of dry ice from the solid to the gaseous state pushes air out of the silage as carbon dioxide has 1.67 times higher density than air and drops to the bottom, thus creating an anaerobic environment. The proposed device safely and precisely adds dry ice to siloed plants without direct contact. The device can also find other applications in agriculture.

Funding source: the Peštan company, Serbia.

Author: Dr. Aleksandra Ivetić.

Device for applying solid additives to silo bags

Institute for Science Application in Agriculture

This patent solves the technical issue of applying solid additives to silo bags so as to create conditions for lactic acid fermentation and obtain quality silage with a good nutritional value for feeding domestic animals. For many farmers, silage production is an efficient way of utilizing available resources as they can store fodder (hay and silage) on their land. However, silage degradation can bring considerable financial losses as it increases animal feed costs. Silage can be stored in horizontal and trench silos that are stationary facilities, as well as silo bags and round bales that do not require building investment. Silo bags are used for feed storage with a humidity range between 20 and 80 percent, including crops (whole corn plants, small grain cereals, grasses) and industrial by-products. When compared to more complex conservation systems, dry-matter losses are significantly lower in this type of storage, as well as associated costs. The radius of silo bags can vary from 1.8 to 3.6m, and their length from 30m to 90m.

Leading biotech companies manufacturing silage additives use devices that spray the products. This patent is mounted directly onto the platform during the filling of silo bags and makes it possible to add various solid additives. This facilitates an effective application of additives with targeted lactic acid fermentation and ensures quality silage.

Funding source: Kefo Ltd., Serbia.

Author: Dr. Aleksandra Ivetić.

Device for adding gaseous carbon dioxide to round bales

Institute for Science Application in Agriculture

This system for adding gaseous carbon dioxide to round bales has constituent parts that are already known in mechanical engineering and can be easily made from available materials. Silage is stored in bales at agricultural holdings with intensive livestock production and smaller farms. Farmers can opt for this method to pack as much dry matter per bale as possible. This discovery makes it possible to directly add gaseous carbon dioxide into plant mass and create anaerobic conditions within a round bale.

Funding source: Kefo Ltd., Serbia.

Author: Dr. Aleksandra Ivetić.



**Special Recognition for Contribution
to Technological Development**

PrizmaBot

Science and Technology Park Čačak
(Prizma Science and Innovation Association)

Find out more about this exhibit on page 81

Dermocosmetics

Institute for the Application of Nuclear Energy (INEP)

Placental B™ is an active component of cosmetic anti-aging treatment that administers a placental extract (PE)

together with polyphenols in an amount sufficient to detect repair effects on the skin. Based on our *in vitro* findings,

Placental B™ will help reduce the appearance of wrinkles and ensure smooth skin texture. The team will further adapt the *Placental B™* formulation to make many separate products, starting from day and night creams, and a facial mask. The formulation was proven to have antioxidant, anti-aging, and regenerative effects beneficial to *in vitro* skin cells.

The exhibit was developed as part of the Proof of Concept Program of the Innovation Fund, and the Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE).

Authors: Dr. Milica Jovanović Krivokuća (lead researcher) and Dr. Marija Gnjatović.



In vitro diagnostic assay

Institute for the Application of Nuclear Energy (INEP)

The Institute has a well-established track record in manufacturing immunodiagnostic tests and specialized test components. One of the latest innovations in IVD relates to the detection of avian bornavirus (ABV) infection thanks to enzyme-linked immunosorbent assays (ELISA) and interferon-gamma release assays (IGRA). The ELISA test is used to identify the bornavirus-specific antibody response (IgY) in birds. The IGRA test is applied to ascertain bornavirus-specific T-cell responses in birds (cellular responses).

The exhibit was developed as part of the project: *in vitro* diagnostic assays (bornavirus).

Private sector financier: AGAPORNIS Ltd.

Authors: Dr. Marija Gnjatović (lead researcher) and Dr. Milica Jovanović Krivokuća.



Copper alloy for special purposes in military industry

Mining and Metallurgy Institute Bor,
Colored Metals Ltd. Bor

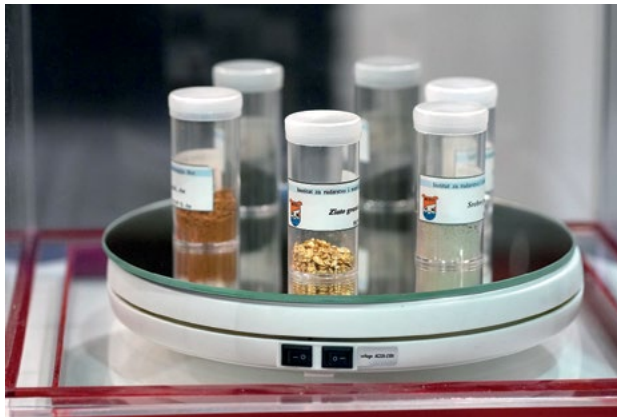


A special fine-grained copper alloy that is used as a starting material (so-called roundel) for deep extraction of funnels that form part of cumulative ammunition for the needs of the military industry. Scientists microalloyed copper with iron and phosphorus, extruded the synthesized alloy in the appropriate thermomechanical processing regime, and obtained this fine-grained alloy that meets the rigorous requirements of the military industry. The team achieved a tensile strength of more than 230 N/mm², an elongation of more than 40 percent, and a total number of grains of about 5000 grains/mm².

The exhibit was developed as part of the project: Conquering the Technology of Production of Copper Roundels.

Funding sources: the Innovation Fund of the Republic of Serbia, the Mining and Metallurgy Institute Bor, Obojeni metali Ltd. Bor, the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Dr. Biserka Trumić, Principal Research Fellow, the Mining and Metallurgy Institute Bor, Dragan Živković, Associate, Obojeni metali Ltd. Bor, Dr. Mile Bugarin, Principal Research Fellow, the Mining and Metallurgy Institute Bor, Borivoje Stojadinović, Director's Advisor, the Mining and Metallurgy Institute Bor.



Precious metals products

Mining and Metallurgy Institute Bor

Products made of precious metals and special alloys based on gold, silver, platinum, and palladium for commercial purposes and application in various production processes.

Funding sources: the Institute's own sources.

Authors: Dr. Ljiljana Avramović, Research Associate, the Mining and Metallurgy Institute Bor, Biserka Trumić, Principal Research Fellow, the Mining and Metallurgy Institute Bor, Vanja Trifunović, Research Assistant, the Mining and Metallurgy Institute Bor, Dr. Mile Bugarin, Principal Research Fellow, the Mining and Metallurgy Institute Bor.

PAQMON—personal air quality monitor

Mining and Metallurgy Institute Bor,
Faculty of Occupational Safety, University of Niš

This is a portable device for temporary or continuous air quality measurement. In the basic version, the device enables the measurement of air temperature, relative air humidity, and the concentration of suspended particles (PM10 and PM2.5 fractions). In the extended version, in addition to the mentioned parameters, this device can also be used for indicative measurements of carbon dioxide and formaldehyde concentrations in the air. The device is based on an Arduino Mega 2560 microcontroller and low-cost sensors.

The exhibit was developed as part of: Project No. III-42008: Assessment of the Energy Characteristics and Quality of the Interior Space in the Buildings of Educational Institutions in the Republic of Serbia with Consequences for Health of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Dr. Viša Tasić, Principal Research Fellow, the Mining and Metallurgy Institute Bor, Dr. Renata Kovačević, Research Associate, the Mining and Metallurgy Institute Bor, Tatjana Apostolovski-Trujić, Expert Advisor, the Mining and Metallurgy Institute Bor, Bojan Radović, Junior Researcher, the Mining and Metallurgy Institute Bor, Vladan Kamenović, Associate, Mining and Metallurgy Institute Bor, Tanja Stanković, Research Assistant, the Mining and Metallurgy Institute Bor, Nevena Ristić, Research Assistant, the Mining and Metallurgy Institute Bor, Dr. Milan Protić, Associate Professor, the Faculty of Occupational Safety in Niš, the University of Niš.



Mis Serbia – sheep breed of Institute for Animal Husbandry

Institute for Animal Husbandry, Belgrade

This is a new meaty breed of sheep with a strong constitution and exceptional meat properties. It is a white sheep that matures early and has excellent productivity. It combines the best characteristics of three different breeds as it was created by a complex combina-

torial crossing of representatives of the Pirot sheep, Merinolandschaf, and Île-de-France. Adapted to different conditions, it carries great potential for sheep breeding in Serbia and for global sheep production.

Authors: Dr. Milan P. Petrović—creator of the idea, Dr. Dragana Ružić-Muslić, Dr. Violeta Caro Petrović, Dr. Nikola Delić, Dr. Nevena Maksimović, Dr. Bogdan Cekić, and M.Sc. Ivan Ćosić.



Software for livestock breeding records

Institute for Animal Husbandry, Belgrade

This software is an essential tool for professionals, modern farmers, and breeders, as well as all other stakeholders engaged in animal husbandry. It makes it possible to efficiently enter and manage animal data with a view to

implementing the Main Breeding Program. The software enables the tracking of animal data, including origin and production parameters. It ensures data protection and helps analyze herd performance.

Authors: Dr. Dragan Nikšić, Dr. Bogdan Cekić, Dr. Vladimir Živković, Dr. Marina Lazarević, and M.Sc. Nenad Stojilković.



UNIVERSITY OF BELGRADE |
INSTITUTE OF PHYSICS | BELGRADE
 NATIONAL INSTITUTE OF
 THE REPUBLIC OF SERBIA

Quality assessment of slivovitz with Raman spectroscopy

Institute of Physics Belgrade—National Institute of Republic of Serbia

The quality of Serbia's traditional plum brandy *slivovitz*, which has been added to the UNESCO list of intangible cultural heritage, can be quantified with Raman spectroscopy and statistical analysis of large amounts of data. Raman spectroscopy constitutes a powerful, noninvasive optical method capable of quickly characterizing different materials and liquids. This innovative method can be significant for Serbian distilleries in their attempt to gain a foothold on the global market, and efforts to track down counterfeit products.

The exhibit was developed as part of the project: Quality Slivovitz as Assessed by Raman Spectrometry.

Funding sources: Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE), the World Bank, and the European Union.

Authors: Dr. Dejan Đokić, Dr. Marko Opačić, and Dr. Marko Nikolić.

Graphene-impregnated wood with increased biological resistance

Institute of Physics Belgrade—National Institute of Republic of Serbia

The wood impregnated with a graphene dispersion slows the growth of fungi in the porous material. The wooden products impregnated in this eco-ac-

ceptable and simple procedure become more resistant to biological conditions. In terms of biological resistance, the resulting material is on a par with the wood protected with generally acceptable and more frequently used coatings.

The exhibit was developed as part of the project: Graphene-Impregnated Wood with Increased Biological Resistance.

Funding sources: Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE), the World Bank, and the European Union.

Authors: Dr. Ivana Milošević, Dr. Jelena Pešić, and Dr. Tijana Tomašević-Ilić.

Non-invasive determination of cortisol from hair by Raman spectroscopy

Institute of Physics Belgrade—National Institute of Republic of Serbia

Hairs grow from the root, and their composition does not change until they fall off. That is why the composition of hairs along the growth axis illustrates the presence of chemical compounds in the body relative to time. The research team developed a method for determining the presence of cortisol along the hair growth axis. Cortisol is a stress hormone so the team applied the method to monitor firemen's exposure to stress and ascertain stress levels at the workplace. This method can help improve the well-being of workers in hazardous occupations.

The exhibit was developed as part of the project: Non-Invasive Determination of Cortisol from Hair in Chronic Stress by Raman Spectroscopy.

Funding sources: Serbia Accelerating Innovation and Growth Entrepreneurship Project (SAIGE), the World Bank, and the European Union.

Authors: Dr. Jasmina Lazarević and Dr. Bojana Višić.

Application of bacteria in synthesis of iron bio-nanoparticles

Institute of Physics Belgrade—National Institute of Republic of Serbia

Although well-researched, the synthesis of nanoparticles by traditional physical and chemical methods often implies the application of toxic reagents and high electricity consumption, which leads to low yields and high production costs, and makes it unsustainable. By using bacteria, the research team of the Institute of Physics in Belgrade ensured higher yields and better efficiency in the production of iron bio-nanoparticles so they plan to implement the method in an industrial context.

The exhibit was developed as part of the project: Optimization of Iron Bio-Nanoparticles Synthesis Using Bacteria.

Authors: Ivana Rosić, Marina Anteljević, Dr. Ivana Milošević, and Dr. Tijana Tomašević-Ilić.

Microfluidic chamber with integrated biosensor electrodes for simultaneous detection of biomarkers for animal health, animal welfare, and food safety

Institute of Meat Hygiene and Technology, Belgrade

It is intended for farmers who want to monitor the health and welfare of food-producing animals (detection of biomarkers for overall animal health and welfare); food business operators who want to control the production process (detection of food-borne pathogens in food processing, storage, and distribution), assess their suppliers/farmers (farm biosecurity level), and meet regulatory requirements (process hygiene and food safety criteria); competent authorities (veterinary and food inspectors) and auditors to carry out early and accurate diagnostics on the farm, at the slaughterhouse, meat processing, and retail facilities; retailers to monitor the safety of products during their shelf life; consumers who want to check the food safety

status of products; in biomedicine for personalized medicine (detection of selected blood parameters and intestinal tract contents, tumor biomarkers, drug testing); in environmental monitoring (detection of contaminants).

The invention can encourage political and societal demands for changes in the food production system that should be appreciated by both consumers (when changes create new value) and the government (when changes create societal value), facilitating the One Health approach (environment-animal-human interface).

The exhibit was developed as part of the project: Development and Integration of Multiplex Microfluidic Biosensors for

Meat Safety Monitoring in Farm-to-Slaughterhouse Continuum (DIBMES).

Funding source: the Innovation Fund of the Republic of Serbia through the Proof of Concept (ID5524) and Technology Transfer (TT1125) Programs.

Authors: A research team from the Institute of Meat Hygiene and Technology (INMES) comprising Dr. Ivan Nastasijević, Project Manager, Dr. Saša Janković, and Dr. Radmila Mitrović, as well as Dr. Vasa Radonjić, Dr. Ivana Gadanski Stanić, and Dr. Ivana Kundačina from the BioSense Institute.





From food industry waste to innovative herbal products

Institute for Medicinal Plants Research "Dr. Josif Pančić"

After pomegranates are processed into juice, their peels are discarded as waste, even though they are a rich source of biologically active ingredients. By optimizing the extraction process, scientists obtained an extract with a series of biological activities (anti-inflammatory, antimicrobial, antioxidant, anti-diabetic, and anti-neurodegenera-

tive). They formulated a capsule whose beneficial effects were evident in obese and people with type 2 diabetes in a double-blind, placebo-controlled randomized study.

The exhibit was developed as part of the Institute's internal project: Capsule with Pomegranate Peel Extract.

Funding source: the Ministry of Science, Technological Development and Innovation and the Institute's own funds.

Authors: Katarina Šavikin, Jelena Živković, Dubravka Bigović, Gordana Zdunić, Nada Čujić Nikolić, Tatjana Stević, Radan Milica, Nemanja Krgović, Snežana Kuzmanović Nedeljković, and Zorana Mutavski.

Movable hydraulic generator connected to safety TCimp block

Mihajlo Pupin Institute (IMP)

This mobile hydraulic generator is an IMP Automation & Control System product intended for testing hydraulic equipment in the field. It works by pressurizing the hydraulic system and supplying the hydraulic consumers with exactly the amount of pressurized oil they need at the moment. The safety TCimp-block is used as a very reliable device for protecting turbines and large energy systems from exceeding speed and power in a very short period of time (of the order of 0.1 [s]).

Authors: Aleksandar Pavlović, Đorđe Radenović, Predrag Dešnić, Jelena Ratković, and Nebojša Radmilović.



BVM8 Vibration monitoring module

Mihajlo Pupin Institute (IMP)

The BVM8 module receives signals from a vibration sensor, analyzes the measured values, and activates a warning or protection based on the set thresholds.

All types of vibrations are measured using the eight-channel vibration monitoring module BVM8 on a rotary machine that is an integral part of the test station. The software analyzes vibration levels and takes protective actions if they exceed the permitted values.

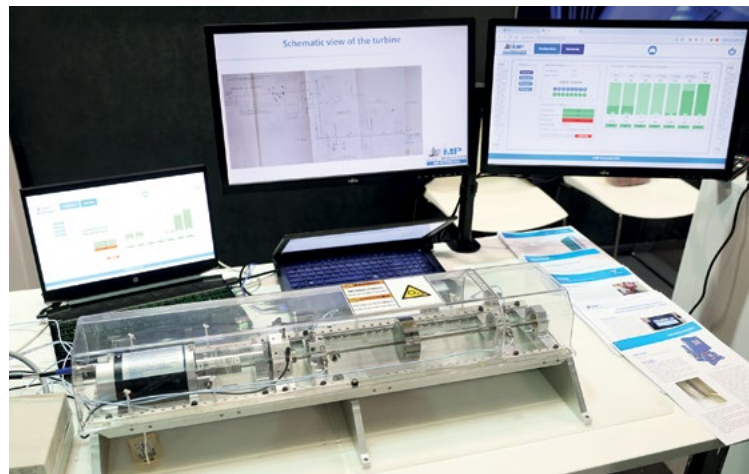
Authors: Đorđe Radenović, Jovana Petrović-Nešić, Miloš Stanković, and Branislav Šašić.

BPC Overspeed Protection Device

Mihajlo Pupin Institute (IMP)

This is a 2003 (two-out-of-three) SIL3 functional safety device. The TMR has a 24 VDC power supply. The device has a built-in self-test for each measurement channel and galvanic isolation between all inputs, outputs, and electronics. It allows us to arrange configuration, monitor measurements, and diagnose data via a web interface. The device relies on sensory signals to perform its main safety function of protecting rotating machines from overspeeding.

Authors: Miloš Stanković, Svetlana Despotović, Branislav Šašić, and Marko Vojinović.





Road information system

Mihajlo Pupin Institute (IMP)

A new SCADA system for unified data acquisition and management of intelligent roads. The PIS-ITS is a traffic management system with a wide range of functions. It has been designed to collect and process data obtained from sensors, detect situations of importance, ensure manual or automatic traffic management, provide a real-time graphic display of the system, control and supervise all important system elements, and produce relevant reports.

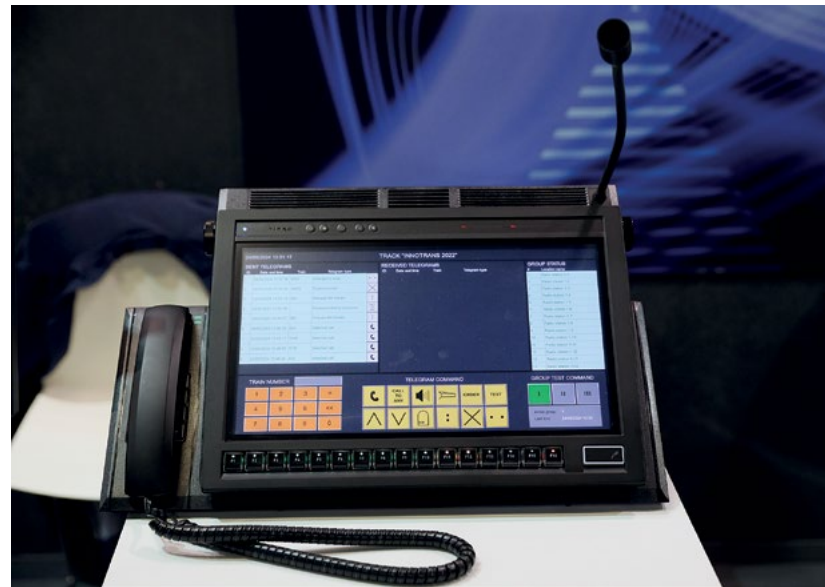
Authors: Nikola Marković, Jelena Ivanović, Nenad Vukićević, Vladimir Nešić, and Ognjen Ristić.

Digital Radio Dispatch Center (D-RDC)

Mihajlo Pupin Institute (IMP)

The system transmits speech and commands between trains and dispatchers. It consists of the dispatch center, fixed radio stations set up along the rail network, the modulation line, and mobile radio stations in rail vehicles. The solution is compatible with the existing analog dispatch center, supports all services, and adds new ones relying on the latest technologies.

Authors: Ivan Kokić, Nenad Petrović, Marko Ralić, Natalija Kokić, and Nenad Antonić.



STDM Demo 1

Mihajlo Pupin Institute (IMP)

The STDM (Space Technology Demonstration Module) is a satellite module for validating various space technologies and acquiring the necessary knowledge for designing satellite systems. The Institute developed the STDM Demo 1 module to bring satellite technologies closer to visitors in an interactive way. The module has a system for determining its own orientation and sends data to the simulator in real time, which then displays the satellite in a defined orbit.

Authors: Ivan Kokić and Igor Trojanović.

**Special Recognition for Contribution
to Technological Development**

SEN-3D-CAM

Science and Technology Park Niš

Find out more about this exhibit on page 77



56. MEĐUNARODNI
SAJAM TEHNIKE



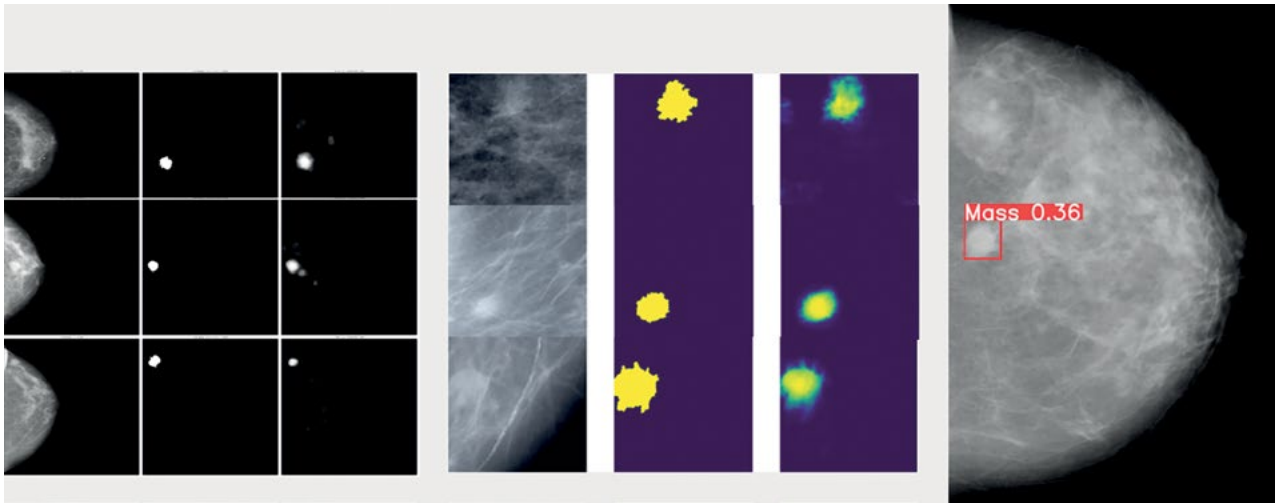
**POSEBNO PRIZNANJE
SAJMA TEHNIKE**

za eksponat koji doprinosi razvoju tehnike

SCIENCE
TECHNOLOGY
PARK
NIS



НАУЧНО
ТЕХНОЛОШКИ
ПАРК
НИШ



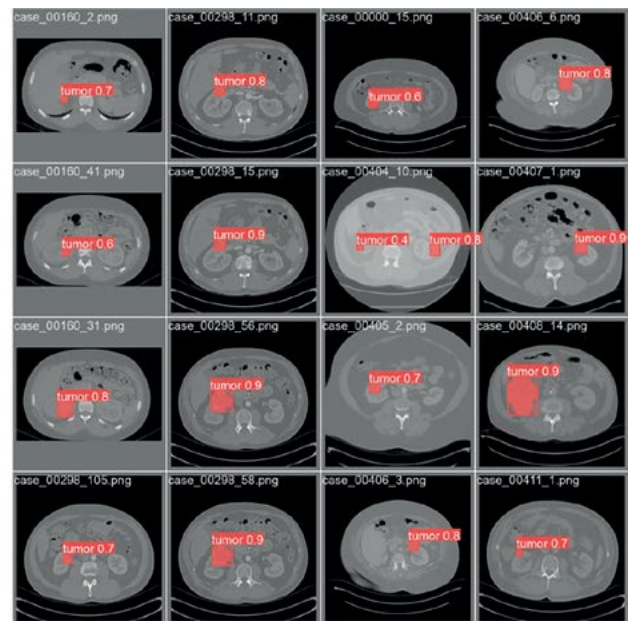
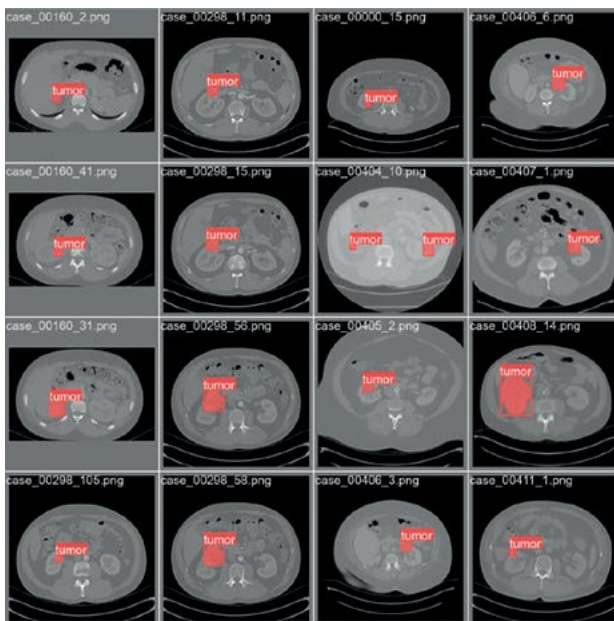
AI application in mammography

Institute for Artificial Intelligence of Serbia

The application of artificial intelligence (AI) in mammography allows for more precise and faster detection of breast tumors. By using advanced algorithms, AI can analyze mammographic images with greater accuracy than traditional methods, reducing the number of false positives and negatives.

This technology helps doctors make quicker decisions and improves patient outcomes.

Authors: Dr. Slobodan Ilić and Junior Research Assistant Nikola Jovišić.



AI-powered kidney tumor segmentation

Institute for Artificial Intelligence of Serbia

CT imaging of kidneys provides a detailed view of their structure and function. With advanced AI algorithms, CT scans can be analyzed more quickly and accurately, which can aid doctors in diagnosis and treatment planning.

Authors: Dr. Branka Rakić and Junior Research Assistant Ilija Tanasković.

AI in drug design

Institute for Artificial Intelligence of Serbia

The application of AI in drug design is revolutionizing the pharmaceutical industry. AI can analyze vast amounts of data and predict how different molecules would react, speeding up the discovery of new drugs. This leads to a more efficient development of therapies for various diseases, reducing the costs and time required for research and development.

Author: Dr. Ivan Tanasijević.



Predmet: Poziv na Konferenciju o naprednim tehnologijama 2024

GENERAL DOMAIN

Poštovana <PERSON>,

Sa zadovoljstvom Vas pozivamo na konferenciju o naprednim tehnologijama 2024, koja će se održati <DATE> 2024. godine. Ovaj događaj okuplja stručnjake iz industrije, akademsku zajednicu i entuzijaste tehnologije kako bi zajedno raspravljali o najnovijim trendovima, inovacijama i budućnosti tehnološkog razvoja.

Očekujemo izuzetne panele, interaktivne radionice i prilike za umrežavanje koje će Vam pružiti uvid u najnovija dostignuća i prakse u tehnološkom sektoru.

Molimo Vas da potvrdite svoje učešće do <DATE> 2024. godine, kako bismo mogli adekvatno pripremiti materijale i osigurati Vam najbolje iskustvo tokom konferencije.

Za više informacija i detalje o registraciji, molimo posetite <LINK>

Ukoliko imate bilo kakvih pitanja ili trebate dodatne informacije, slobodno me kontaktirajte. Radujemo se Vašem učešću i mogućnosti da zajedno istražujemo budućnost tehnologije.

Srdačno,

<PERSON>

<ORGANIZATION>

Anonymizer

Institute for Artificial Intelligence of Serbia

This tool relies on AI technology to protect user privacy. By utilizing advanced algorithms, the anonymizer removes or obscures personal data from databases while retaining the utility of data for further analysis. This technology is crucial for

complying with data protection laws and ensuring the security of user information.

Author: Dr. Dragiša Mišković.



*Step into
the Future
Award*

LOLA VMC4 vertical machining center

Lola Institute, Belgrade

The LOLA VMC4 machine tool has three translational and one horizontal rotational axis. With this kinematics, it can operate in Cartesian and polar-cylindrical coordinates. It is a domestic CNC machine tool, with an automatic tool change and developed proprietary control based on open-architecture software LinuxCNC. It marks a significant step forward in the technological efficiency of the machine's mechanism due to the manufacturing and use of

standard and typified components.

The exhibit was developed as part of the project: Multifunctional Desktop Machine for Rapid Prototyping – MULTIPRODESK, TT ID 1129, under the Technology Transfer Program of the Innovation Fund of the Republic of Serbia.

Funding sources: the Innovation Fund of the Republic of Serbia (TT ID 1129) and the Institute's own funds.

Authors: Dr. Zoran Dimić, Senior Research Associate, Nikola Vorkapić, B.Sc. Mech. Eng., Dr. Saša Živanović, Professor, Dr. Srećko Manasijević, Principal Research Fellow, Dr. Jelena Vidaković, Research Associate, and Dr. Nikola Slavković, Associate Professor.



Special
Recognition for
Contribution to
Technological
Development

Application of Hololens 2 in medicine—presentation of three years of experience

Faculty of Medicine, University of Belgrade (UCHC "Dr. Dragiša Mišović—Dedinje", Belgrade)

The Hololens 2 (HL2) device relies on mixed reality (MR) technology and machine learning algorithms. This innovation is set to step up the efficiency and quality of health care, minimize risk and effort, and optimize procedures.

Using a computer during surgeries is challenging due to sterility requirements and personal protective equipment. The HL2 device overcomes these obstacles by deploying machine learning algorithms to recognize hand movements

that the doctor may use to control. It also has special cameras, supported by additional algorithms, that observe eye movements and detect when the user focuses on an option offered by the user interface. Content visualization is achieved with mixed reality technology, through holographic 3D objects displayed in the real world. HL2 is also equipped with speech recognition technology, as well as another set of machine learning algorithms, which can

be used to select the user interface and control the environment. HL2 can also facilitate communication with remote experts, thus increasing the quality of medical services.

Funding source: the Hospital's own funds.

Authors: Predrag Stevanović, Nemanja Dimić, Irina Nenadić, Marko Đurić, Suzana Bojić, Marina Boboš, and Nikola Vasiljević.

Galaksija home computer

Museum of Science and Technology, Belgrade

Designer: Vojislav Voja Antičić.

The Galaksija home computer was presented in December 1983 in the opening issue of *Computers in Your Home* (*Računari u vašoj kući*), the first specialized magazine of that kind in the former Yugoslavia. Around 8,000 readers filled an order for the build-it-yourself Galaksija computer kit. Shortly, the local company Elektronika Inženjering and the Institute for Textbook Publishing and Teaching Aids of Serbia launched the production of a commercial version. The computer case was designed by renowned Serbian designer Gojko Varda. The Galaksija became one of the school computers that helped train the first generations of computer-literate students.

In the following years, many programs, mostly games, were written for the Galaksija. These programs were

distributed commercially, but also for free via radio waves, as they were aired as a sound signal during the live radio show dubbed Ventilator, presented by Zoran Modli on the Belgrade 202 radio channel. Programs were recorded to cassette tapes and then reproduced on the computer. As far as we know, this is a unique example of such distribution in the world.

The Galaksija was a build-it-yourself computer, and the case's appearance was not predetermined. The case should integrate a printed circuit board, several sockets, and an opening for a keyboard.

The designer of the Galaksija, engineer Voja Antičić, came up with one solution: his personal device, which was gifted to the Museum in 2017, had a blue case reminiscent of IBM's blue.

The second solution was provided by Elektronika Inženjering, which mass-produced the Galaksija for schools in Serbia. The company commissioned a solution from Gojko Varda, a famous Serbian industrial designer at the time, with a straightforward instruction: make it simple and affordable. Varda opted for a case made of anodized sheet metal, silkscreen printing; and placed a special emphasis on the Enter key. It is evident that Varda's solution followed the prevailing trend in the design of quality electronic products.

The third solution was another version that Elektronika Inženjering manufactured for schools. It had a robust case made of pressed metal sheet, painted in office beige, and a plate with the computer name embedded in it.



Nature's power in every leaf

Institute of Food Technology in Novi Sad

Dried and ground wild garlic leaves can be used as an additional ingredient in the production of durum wheat pasta. Pasta is popular across all age groups, and when enriched with wild garlic, it has bioactive and nutritional content that benefits the well-being of consumers. One serving (100g) of this durum wheat pasta can provide 32 percent of the

recommended daily intake of iron and 16.1 percent of the daily intake of zinc. That is why the durum wheat paste with wild garlic carries the nutritional labels "rich in iron" and "a source of zinc."

The exhibit was developed as part of the project: Cooperation with Industry, Technical Solution M82.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Jovana Kojić, Alena Stupar, Jelena Miljanić, Olivera Šimurina, Bojana Filipčev, Milica Pojić, and Dubravka Škrobot.

Functional products from oilseed cakes

Institute of Food Technology in Novi Sad, University of Novi Sad

The exhibited food products (bio-spreads and crackers) are made from oilseed cakes that remain after cold pressing. The selected oilseed cakes serve as valuable raw materials for making food products. These new products may carry nutritional claims such as "high in fiber," "source of protein," and "source of minerals." The move valorizes organic waste in line with the principles of circular economy. In addition to enhancing nutritional quality, the presence of selected raw materials met the condition of providing an acceptable sensory profile from a market placement perspective.

The exhibits were developed as part of the project: the Innovation Voucher.

Funding sources: the Innovation Fund of the Republic of Serbia, and the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

Authors: Lidija Perović, Branislava Đermanović, Miloš Županjac, Dr. Aleksandar Marić, Dr. Nikola Maravić, Dr. Jelena Tomić, Dr. Tamara Dapčević-Hadnađev, Dr. Miroslav Hadnađev, and Dr. Mladenka Pestorić.



Crayfish shell waste as adsorbent for wastewater treatment and production of chitin-based biomaterials

Institute of Food Technology in Novi Sad, University of Novi Sad (in cooperation with Faculty of Technology Novi Sad, University of Novi Sad)



The shell of *Faxonius limosus*, an invasive crayfish species, has significant valorization potential through the creation of eco-friendly products in line with the zero-waste concept. Some of these eco-products are adsorbents for purifying wastewater with elevated concentrations of heavy metal ions, as well as biomaterials based on chitin isolated from the crayfish shell.

The exhibit was developed as part of the project: Reducing the Negative Impact of Invasive Crayfish *Faxonius limosus* in the Danube by Smart Exploitation of Their Meat and Shells—DANUBECare.

Funding source: the Science Fund of the Republic of Serbia through the PRISMA Program.

Authors: Dr. Ivana Čabarkapa, Project Lead, with the DANUBECare research team.

Rapeseed—potential for producing cold-pressed oil, high-quality proteins, and dietary fibers

Institute of Food Technology in Novi Sad, University of Novi Sad (in cooperation with Faculty of Technology Novi Sad, University of Novi Sad)

The popularization of rapeseed oil and its wide application generate significant amounts of by-products in the production process. These by-products contain high-quality proteins with a balanced ratio of amino acids. After proteins are isolated, fibers remain that can be utilized in the food industry, contributing to sustainable development and waste reduction. Scientists presented rapeseed oil processing resulting in cold-pressed rapeseed oil as the main product and rapeseed cake as a by-product. Further processing focuses on obtaining proteins and dietary fibers.

The exhibits were developed as part of the project: PROTOPOWER—PROTEin from Rapeseed Oil Processing Waste: Application in FOod and WastewatEr Treatment.

Funding sources: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: PI Dr. Pavle Jovanov, with the PROTOPOWER research team.



3D-printed snack products

Institute of Food Technology in Novi Sad, University of Novi Sad

Innovative grain-based snack products with added nutritional value have an appealing look and texture set to attract modern consumers opting for quality and nutritionally rich products.

The exhibit was developed as part of the project: Increasing the Competitiveness of the Vojvodina Snack Food Market Using 3D Printing Technology.

Funding source: the Provincial Secretariat for Higher Education and Scientific Research of the Autonomous Province of Vojvodina.

Authors: Jovana Kojić, Jelena Miljanić, and Lidija Perović.





**Special Recognition for Contribution
to Technological Development**

Antibacterial phone case

Vinča Institute of Nuclear Sciences—National
Institute of Republic of Serbia, University of Belgrade

Find out more about this exhibit on page 47

GELSKIN





Edible insects

Institute of Food Technology in Novi Sad, University of Novi Sad

The larvae of the superworm (*Zophobas morio*), yellow mealworm (*Tenebrio molitor*), and adult crickets (*Acheta domesticus*) belong to the edible insects reared on plant biowaste. They are a highly nutritious raw material that can be used in animal feed. Additionally, these insects serve as primary raw materials for producing flour, protein isolates, and insect oil, which can find wide application in the food, cosmetic, and pharmaceutical industries.

The exhibit was developed as part of the doctoral dissertation of Dr. Danka Dragojlović: *The Potential of Different Insect Meals as Alternative Protein Sources in Animal Nutrition*.

Funding source: the Ministry of Science, Technological Development and Innovation.

Authors: Danka Dragojlović, Strahinja Vidosavljević, Nedeljka Spasevski, Viktor Stojkov, and Petar Ilić.

Alternative raw materials from freshwater and marine ecosystems for development of innovative food products and fish feed

Institute of Food Technology in Novi Sad, University of Novi Sad

Scientists presented raw materials sourced from freshwater and marine ecosystems (micro and macroalgae, duckweed), which will be used for the development of innovative food products for special consumer groups—vegans, vegetarians, as well as conventional eaters who would like to avoid products with additives. Furthermore, these raw materials will be used in formulating fish feed, in an effort to avoid the use of soybean meal, which is often derived from GMOs and associated with deforestation and biodiversity loss. These raw materials are rich in proteins, omega-3 fatty acids, polysaccharides, and bioactive compounds, enabling the production of valuable functional products with desirable techno-functional properties.

The exhibits were developed as part of the project: Innovative Approaches for Marine and Freshwater Based Ingredients to Develop Sustainable Foods and Value Chains.

Funding source: Horizon Europe (GA 101084437).

Authors: Dr. Dragana Ubiparip Samek, Dr. Vojislav Banjac, Dr. Predrag Ikonić, Miloš Županjac, Petar Ilić, Dr. Aleksandra Mišan, and Dr. Milica Pojić.

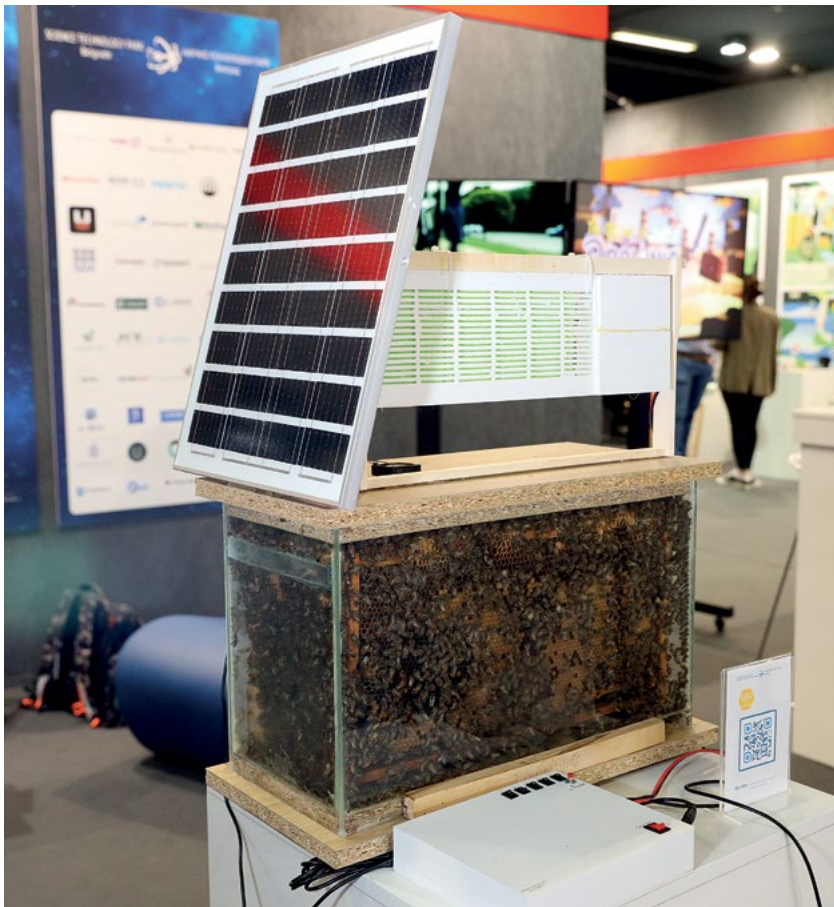


Demonstration panel of smart electricity metering infrastructure

Science and Technology Park Belgrade

This demonstration panel showed integrated and smart electricity meters, a data concentrator, and a computer with software for the remote control and parameterization of smart electricity meters. The panel displayed real-time remote communication between grid devices and the distribution center, readouts, parameterization, and consumption management.

Author: Meter&Control.



Eco-friendly anti-varroa beehive

Science and Technology Park Belgrade

Device for eco-friendly removal of honey bee Varroa mites.

The exhibit was developed as part of the projects: Technopark Serbia 2 under the Raising Starts program implemented by the Science and Technology Park Belgrade, and the Improved Competitiveness and Employment Project within the framework of the Mini Grants Program implemented by the Innovation Fund of the Republic of Serbia.

Funding source: the Innovation Fund of the Republic of Serbia, and a private investor.

Author: Eco Hive.

Acoustic sensor for remote-field sound effect detection with acoustic map generation and dominant source localization and classification

Science and Technology Park Belgrade

A microphone array with 64 microphones measuring 2 meters in diameter, with a central FPGA and an ARM 9 processing unit. The beamforming algorithm implemented on the FPGA localizes the dominant sound source at distances of up to 20 kilometers for strong sound sources and up to several hundred meters for speech. An acoustic map and an audio signal are generated every second and sent to the sound source recognition software.

The exhibit was developed as part of the project: Semi-Autonomous Border Surveillance Platform Combining Next Generation Unmanned Aerial Vehicles with Ultra-High Resolution Multi-Sensor Surveillance Payload, Border UAS.

Funding source: the European Union's Horizon 2020—Research and Innovation Framework Programme, H2020 SU-BES- 2019, under Grant Agreement No. 883272 and own funds.

Author: Dirigent Acoustics.



Automated Sound Transmission and Absorption Measurements In-Situ (aSTAMIN)

Science and Technology Park Belgrade



This device measures the acoustic properties of noise protection barriers according to the standards EN 1793-5 and EN 1793-2. It implements an array of nine microphones fixed at nine suitable positions, connected to a centralized platform that simultaneously generates and records sound and stores data in its internal memory. The device is battery-powered and portable.

The exhibit was developed as part of the project: IPA 2018 Science-Business Cooperation Program implemented by the Innovation Fund of the Republic of Serbia.

Funding source: the Innovation Fund of the Republic of Serbia and own funds.

Author: Dirigent Acoustics.

Water Me&You

Science and Technology Park Belgrade

A video game, an exclusive co-op platformer adventure for two players, one playing as a water droplet and the other as a seedlike creature on their way to regenerate their world.

The exhibit was developed as part of the projects: Technopark Serbia 2 under the Raising Starts program implemented by the Science and Technology Park Belgrade, and the Improved Competitiveness and Employment Project within the framework of the Mini Grants Program implemented by the Innovation Fund of the Republic of Serbia.

Funding sources: the Raising Starts program, the Innovation Fund of the Republic of Serbia, and own funds.

Authors: Shosha Games.





Rentomat

Science and Technology Park Niš, Nais Robotics Ltd.

Rentomat is a 24/7 system for automated rental services, issuing/returning all types of keys, and reception tasks. It is ideal for rent-a-car agencies, car share schemes, hotels, and apartments.

Rentomat optimizes the number of employees, significantly cutting staff costs. It also takes up much less space and can replace one counter, even an entire office. A quick and easy key handover in less than a minute saves users time and makes the process more efficient.

The system also provides high-level security thanks to user identification relying on biometric technology for document and person recognition. Additionally, Rentomat allows for ad hoc reservation so users can rent a room or vehicle on the spot without prior reservation.

Koško

Science and Technology Park Niš, Nais Robotics Ltd.

This innovation addresses the issue of physical inactivity among children and youth by introducing technology into recreational basketball, making the game more fun and challenging on the court. The smart Koško board records every successful shot and the success rate. All smart hoops are networked into an IoT system and connected to a web platform where the Koško League is organized.

The Koško League is a competition of smart hoops and their sponsors—socially responsible companies. The web application announces the winning hoops on a daily, weekly, monthly, and yearly basis.



Canandi—GPS system for real-time tracking of hunting dogs

Science and Technology Park Niš

The system includes a collar, a hunting transceiver, and a mobile app for tracking

movement without the need for the Internet or a mobile network. The innovative anti-theft design allows manual collar activation, while deactivation can only be done via the app using a four-digit code. The integrated antenna

facilitates the movement of dogs in inaccessible terrains. The waterproof collar with a 40-hour battery supports tracking up to 20 dogs at a distance of 20 km.



Canandi wild

Science and Technology Park Niš

The Canandi wild animal tracking collar allows for secure animal tracking and protection, collecting information about their behavior, migrations, and mortality, which can help address environmental challenges. The collar is tracked via 2G and 3G mobile networks, and the user always has information about the animal's location. All recorded points are easily tracked via a web panel, and a drop-off system on the device allows the collar to be unfastened from the wild animal via the app, causing it to fall off.

Scheme Blind Box

Science and Technology Park Niš

This smart locker offers advanced control and management features through iOS, Android, and web applications. Users can easily access the locker, share access, and rent space within the locker using digital keys. The system enables access control via the mobile app, NFC chips, QR codes, or PINs. Owners can share access for a limited time, which makes it an ideal solution for gyms, pools, hotels, and spa centers. Each locker is equipped with security features that can track openings and closings, as well as notify the owner of any unauthorized access attempts.





Senis 3MH6-E high-precision teslameter

Science and Technology Park Niš

The Senis 3MH6-E high-precision teslameter with an interchangeable Hall probe is the world's most precise 3D teslameter with a Hall probe. The teslameter is equipped with a triaxial Hall probe (Bx, By, Bz) and a temperature sensor. The probe dimensions are 8.0mm x 4.0mm x 0.9mm, and the device has the world's smallest triaxial sensitive volume, measuring 100 x 10 x 100 μm . The measurement accuracy for constant fields is better than 0.01 percent (100ppm), making it extremely reliable. The device supports four measurement ranges: 100mT, 500mT, 2T, and 20T, allowing for a wide range of applications. The frequency range spans from DC to 2.5kHz (-3dB), and the device is equipped with a 24-bit A/D converter, which contributes to high-precision measurements.



DMV

Science and Technology Park Niš

Urban cycling systems serve to collect data on cyclists' numbers, habits, and behaviors. This urban cycling system is one of the modules of the City Control Center software platform, which represents DMV's solution for smart mobility in cities. The DMV cyclist counter displays the number of cyclists per day and year, time, date, temperature, humidity, PM values etc. These counters come in single- or double-sided versions that can be mounted on a pole or as totems.

Special Recognition for Contribution to Technological Development

SEN-3D-CAM

Science and Technology Park Niš

The SEN-3D-CAM is the world's first true 3D camera for rapid mapping of magnetic induction on the surface of the camera head sensor. The key features of this camera include speed and precision, with a compact head suitable for a variety of uses. The camera measures all three components of the magnetic field simultaneously (Bx, By, Bz), allowing for detailed and comprehensive analysis. With a high magnetic and spatial resolution of 16k pixels, it boasts the world's smallest sensitivity area, measuring 27 μm x 9 μm x 4 μm per pixel. This camera also provides a high acquisition speed of up to 5 images per second, making it ideal for fast and accurate measurements.



ATAR Smart Sprayer—smart spraying system for arable farming

Science and Technology Park Novi Sad (Atar Agtek Ltd. Novi Sad)

This system relies on AI to enable arable sprayers to treat only weed plants instead of the entire crop area, thereby reducing herbicide usage by up to 80 percent.

The exhibit was developed as part of the project: ATAR Smart Sprayer.

Funding source: 50 percent—ATAR, 50 percent—the Innovation Fund of the Republic of Serbia through the Mini Grants Program.

Authors: Filip Injac, Mirko Šuka, and Goran Šuka.



Man overboard detection sensor

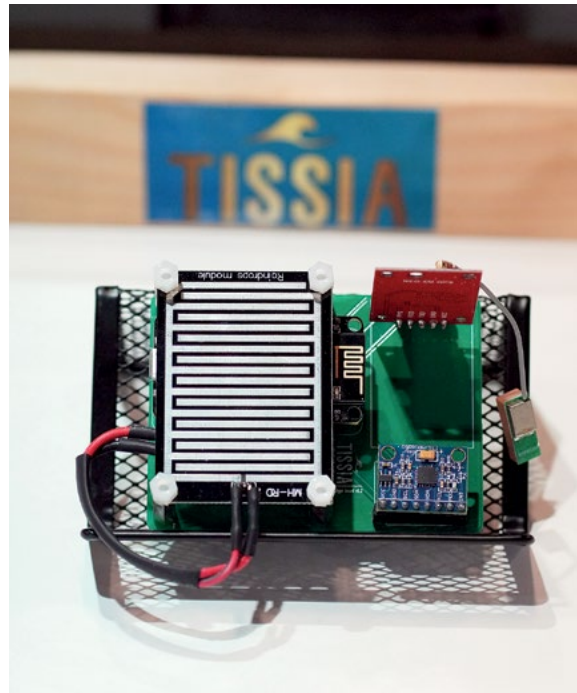
Science and Technology Park Novi Sad (TISSIA Ltd. Novi Sad)

This sensor detects when a person falls into the sea. It is intended to be worn on clothing or around the arm and forms part of a prototype system under development. The sensor works via low-frequency radio waves (the LoRa protocol) and contains detectors for acceleration, impact, water contact, and GPS. The device does not require WiFi, Bluetooth, or any connection, but only radio waves. Thanks to a set of well-defined parameters (acceleration, impact, contact with water) the sensor knows when a person falls into the sea and immediately sends a signal to the core device on the ship, which further initiates the standard rescue procedure.

The exhibit was developed as part of the LARA project.

Funding source: own funds.

Authors: Aleksandar Vorkapić, Vladimir Krsmanović, and Nebojša Nešković.



Interactive web app for computing tissue density and composition from CT scan

Science and Technology Park Novi Sad (Vinaver Medical Ltd. Novi Sad)

This web-based application relies on AI to process spectral CT images from CT scanners in hospitals and extract information about tissue density and composition. The web viewer displays a 3D image in three orthogonal views with traditional features of the scroll, zoom, window level, contrast adjustment etc., while the density or composition aspect is adjusted with the slider button. Such an



approach can contribute to the early detection and staging of many infiltrative, fibrotic, liver, and prostate cancers. Furthermore, half of detected cancers are treated with some form of external radiotherapy. Density and composition maps significantly improve the accuracy of treatment planning for the most advanced form of radiotherapy— proton and carbon particle therapy.

The exhibit was developed as part of the project: the Smart Start program of the Innovation Fund of the Republic of Serbia.

Funding source: the Innovation Fund of the Republic of Serbia.

Authors: Stevan Vrbaški, Luka Vrbaški, and Goran Stanić.

Thermal Cube, Current Profiler, Air Tracker, Digital Mind

Science and Technology Park Novi Sad (EnergyPulse Ltd. Novi Sad)

Thermal Cube (an IoT device for acquiring data on changes in temperature, pressure, relative humidity—thermodynamic processor), Current Profiler (an IoT device for acquiring data on changes in electric current intensity and energy use), Air Tracker (an IoT device for



acquiring air quality data), Digital Mind (a mid-level aggregation device that ensures all elements function optimally). The exhibits were developed as part of the project: System Dynamics on a Shoestring.

Funding sources: the EIT Climate-KIC - Stage 2 Grant, the 2020 Competition for the Best Technological Innovation in Serbia, the Mini Grants Program of the Innovation Fund of the Republic of Serbia.

Authors: Milovan and Milana Medojević.



Fragment panels, Fragment table

Science and Technology Park Čačak
(Fragment Incorporated Ltd.)

Fragment Incorporated is a startup company producing innovative building materials. In our factory, we have perfected the production of panels made from recycled glass as the primary raw material, using cement and additives as binders. Fragment panels offer entrepreneurs, architects, interior and exterior designers, as well as furniture manufacturers, a material that is new, sustainable, and aesthetically unique.

The idea of making some kind of Fragment panels first came to the mind of our artist Marija Marković during preparations for an exhibition, but then entrepreneur and sustainability advocate Pavle Milošević joined her in the design efforts. They discovered, however, that glass and cement are inherently incompatible materials and not easy to bond. This phenomenon intrigued them, and further research led them to

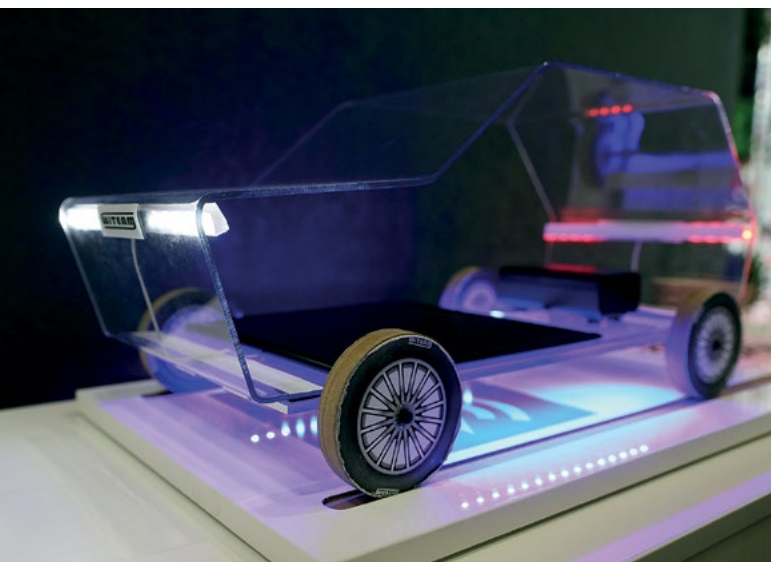
scientific papers published by professors from the Faculty of Technology and Metallurgy in Belgrade. This fusion of artistic instinct, scientific experience, and business orientation resulted in the Fragment panel, a new material for a new generation of consumers.

Funding source: the Innovation Fund of the Republic of Serbia.

Authors: Fragment Incorporated Ltd.

Conceptual solution for wireless charging of electric car battery

Science and Technology Park Čačak (WiTeam)



The electric car model integrates a conceptual solution for wireless battery charging. The system consists of a model car with a battery, transmitting and receiving coils for wireless power transfer, and additional equipment for visualizing the effects of power transfer and battery charging: indicators, displays, light bulbs, and others.

The exhibit was developed within the framework of cooperation between WiTeam and Science and Technology Park Čačak.

Funding source: own funds.

Authors: Dejan Janjić, B.Sc. Mechatronics, Dr. Branko Koprivica, Associate Professor, and Aleksandar Spasojević, Tech. Electronics.

PrizmaBot

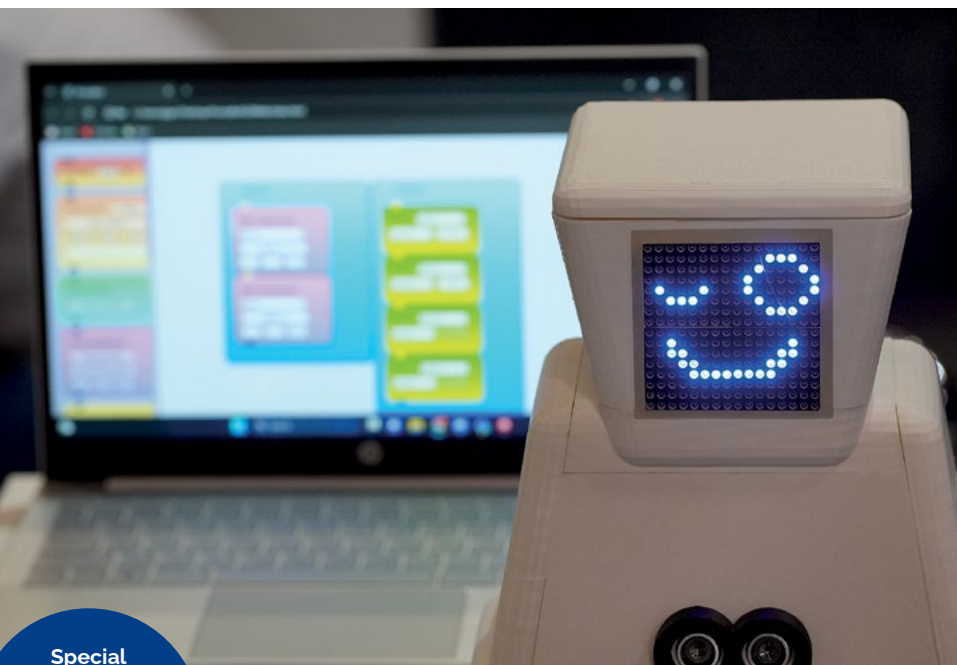
Science and Technology Park Čačak
(Prizma Science and Innovation
Association)

PrizmaBot is Serbia's first educational robot. This device will encourage children's interest in science, and help them grasp the fundamental concepts of robotics, coding, and electronics at an early age. The robot can be programmed through an innovative desktop app that presents complex programs graphically and more comprehensibly while simultaneously displaying the program code that executes the user's graphical commands.

The exhibit was developed as part of the project that got funding under the Smart Start program of the Innovation Fund of the Republic of Serbia.

Funding source: own funds.

Authors: Smart Start: Olga Dukić, Luka Bujošević, Veljko Jerotijević, and Tijana Lazović.



Special
Recognition for
Contribution to
Technological
Development

Insects as alternative protein source

Faculty of Agriculture, University of Novi Sad

Scientists presented a potential application of yellow mealworm larvae (*Tenebrio molitor*) as an alternative protein source in animal feed, as well as their possible use in human nutrition. For these purposes, a small batch of dark and milk chocolate with added whole yellow mealworm larvae was developed in collaboration with Barry Callebaut.

The exhibit was developed as part of the project: PRO-SUSTAIN.

Funding source: the Science Fund of the Republic of Serbia through the PRISMA Program.

Authors: Miloš Petrović, Saša Krstović, Marko Vukadinović, Nikola Laćarac, Darko Guljaš, Marko Damjanović, Vesna Nešković, Aleksandra Popović, Dejan Beuković, and Igor Jajić.





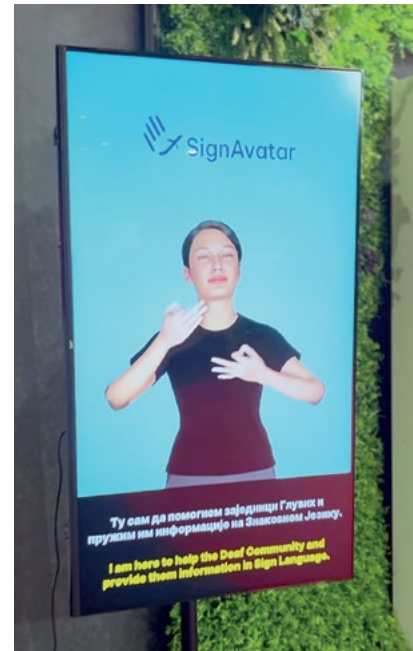
Smartphone checks heart and blood vessels

Svezdrav rešenja Ltd.

We made it possible for you to check the health of your heart and blood vessels with a mobile phone wherever you are. Cardiovascular diseases are still the leading cause of death although 80 percent of cases are preventable. A simple assessment can be done with the phone's camera and the application of AI/ML algorithms to signals collected through our app, which has over 150,000 downloads and 2,500,000 recordings.

Funding sources: *Startupbootcamp*, the Innovation Fund of the Republic of Serbia, and the UNDP.

Authors: Stevan Jokić and Ivan Jokić.



TransportSign

RedTech Ltd.

TransportSign is AI-powered software that translates public audio announcements at airports into sign language and multiple spoken languages in real time. This content is displayed on screens installed throughout the airport terminal (at gates). This system helps all passengers by providing announcements in their native language. It is of particular assistance to deaf people as they can now receive vital announcements in sign language.

Authors: Đorđe Dimitrijević, Matija Dodo-
vić, Mladen Bašić, Uroš Milenković, Luka
Perović, Katarina Agbaba, and Jovana
Gojković.



Sweet Duo

Team Sweet Duo

Sweet Duo is a 100 percent dried fruit dessert. The filling is made of osmotically dried plums and the crust is of dried apple peels. The product contains no added sugar, allergens, additives, or gluten and is rich in natural fibers.

The exhibit was made for Ecotrophelia Serbia, a student competition for the best eco-innovative product. In this national competition, the product won first place, and then finished second at the 2023 Ecotrophelia Europe.

Authors: a student team from the Faculty of Agriculture, the University of Belgrade, comprising Milica Simišić, Lav Antičević, Vanja Grahovac, and Ivana Pejanović.

Next-generation urinary catheter

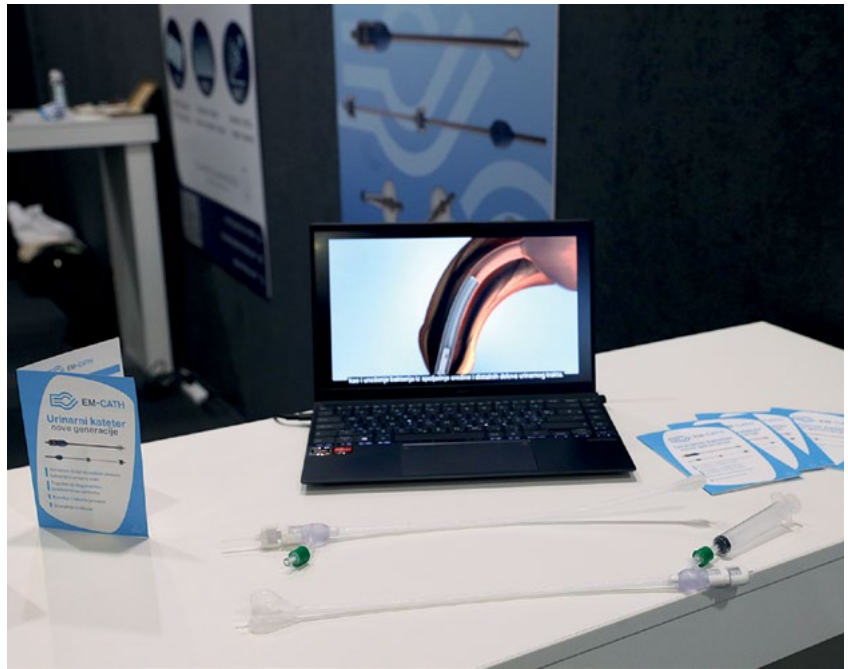
SremCath Ltd.

This novel urinary catheter is a unique technical solution with a single rolling membrane that forms a hermetically sealed space and thus prevents bacteria from entering the bladder. The medical device significantly reduces complications and improves the quality of life, and it has been designed for short- and long-term use.

The exhibit was developed as part of a project under the Mini Grants Program of the Innovation Fund of the Republic of Serbia.

Funding source: the Innovation Fund of the Republic of Serbia.

Authors: Dr. Boško Sremčević, Maja Čonkić, Professor Đorđe Veljović, and Igor Lazarević.



TES molecular wastewater treatment

TES Inno Tech Ltd.

An automatic wastewater purifier without a filter, which maintains itself during operation, constantly measuring water quality and adjusting the capacity from 1,000 to 5,000 L/h for maximum efficiency. On a molecular level, it cleans wastewater to the extent that meets requirements for safe return to nature or reuse within an industrial facility.

Funding sources: own funds and the backing from Branislav Gajić and the company Infostud 3 Ltd.

Authors: Atila Sloboda, Staniša Vučković, and Dušan Metodiević.



TES inverter for maximum solar panel efficiency

TES Inno Tech Ltd.

This inverter relies on new technology, unlocking the full potential of solar panel efficiency.

Funding sources: own funds and the backing from Branislav Gajić and the company Infostud 3 Ltd.

Authors: Atila Sloboda, Staniša Vučković, and Dušan Metodiev.

Coatings for urinary catheters

Faculty of Technology and Metallurgy, University of Belgrade (in cooperation with Innovation Center of Faculty of Technology and Metallurgy)

Scientists presented innovative and effective coatings based on poly(ϵ -caprolactone) nanofibers obtained through the electrospinning method with a controlled release of active substances, and antibacterial and antioxidant properties for the prevention of catheter-associated urinary tract infections.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, Contract Nos. 451-03-65/2024-03/200135 and 451-03-66/2024-03/200287.

Authors: Dr. Andela Radisavljević, Dr. Dušica Stojanović, Professor Vesna Radojević, Associate Professor Mirjana Rajilić-Stojanović, and Professor Petar Uskoković.



Functional beer enriched with phenolic compounds from grape seeds

Faculty of Technology and Metallurgy, University of Belgrade (in cooperation with Faculty of Agriculture, University of Belgrade)

This functional craft beer was enriched with phenolic compounds from the seeds of the indigenous grape variety Prokupac and fermented using immobilized yeast cells. Grape pomace seeds are an excellent source of flavan-3-ols, procyanidins, and phenolic acids, compounds known for their potent antioxidant properties. With this move, scientists tried to valorize waste from the wine industry in line with circular economy principles. Quality assessment results indicate that grape seeds contribute to the product's antioxidant activity, functionality, and sensory acceptability.

The exhibit was developed as part of the project: 'Development of Novel Fermentation Products Enriched with Plant and Mushroom Extracts', Contract No. (Annex II): 451-02-1236/2023-05), under the Science and Technology Development Program—Research Projects of the Republic of Serbia and the People's Republic of China.

Funding source: the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia.

Participating organizations: the Faculty of Technology and Metallurgy, the University of Belgrade as the coordinating institution; the Faculty of Agriculture, the University of Belgrade; the Institute for Biological Research "Siniša Stanković"—a National Institute of the Republic of Serbia, the University of Belgrade; the Faculty of Medicine, the University of Belgrade; the Institute of General and Physical Chemistry, the University of Belgrade, as well as the private craft brewery Dogma Ltd. as the partner.

Authors: Professor Mirjana Pešić, Dr. Danijel Milinčić, Tedor Milošević, Professor Steva Lević, Dr. Ana Salević-Jelić, Professor Viktor Nedović, Dr. Nataša Obradović, Dr. Bojana Balanč, Dr. Verica Đorđević, Tamara Đukić, and Professor Branko Bugarski.

Special
Recognition for
Contribution to
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NanoProVit—natural dietary supplement based on protein from waste leaf biomass, containing encapsulated vitamin B12

Faculty of Technology and Metallurgy, University of Belgrade; Innovation Center of Faculty of Technology and Metallurgy Ltd.; Faculty of Agriculture, University of Belgrade; Faculty of Technology Novi Sad

This natural dietary supplement is an enhanced formulation of nanoparticle systems with encapsulated vitamin B12. It was formulated from proteins isolated from green leaves, by-products in oilseed processing, and vitamin B12 with the application of advanced enzyme and encapsulation technologies. The produced supplement has all the advantages of protein macronutrients due to its adequate amino acid composition and antioxidant capacity, but also of a vitamin supplement due to the vitamin B12 content that is deficient in vegan products.

The exhibit was developed as part of the project: Multifunctional Leaf Protein and Assembled Nanocarrier Structures Delivered by Enzyme Technology—MultiPromis, Grant No. 7751519.

Funding source: the Science Fund of the Republic of Serbia.

Authors: Professor Zorica Knežević-Jugović, Dr. Verica Đorđević, Professor



Mirjana Antov, Dr. Jelena Mijalković, Neda Pavlović, Dr. Natasa Sekuljica, Dr. Sonja Jakovetić Tanasković, Dr. Bojana Balanc, Dr. Predrag Petrović, Dr. Milica Petrović,

Dr. Ana Salević, Professor Vesna Rakić, and Professor Branko Bugarski.

New macroporous bioactive cell carriers with improved osteointegration properties for bone tissue regeneration

Faculty of Technology and Metallurgy, University of Belgrade



New macroporous biomimetic materials that are being developed within the *HyBioComBone* project are bioactive and controlled biodegradable composites based on biodegradable hydrogels, nanoparticles of mesoporous bioactive glasses and multi-ion-doped calcium-phosphate nanoparticles. Their mechanical properties, controlled biodegradability, macroporosity, and bioactivity qualify them for carriers of stem cell derivatives and active substances in bone repair, regeneration, and cancer treatment.

The exhibit was developed as part of the project: Novel Hybrid Biomimetic Macroporous Composites with Tuned Biodegradability, Improved Osteointegration and Anticancer Properties for Bone Tissue Regeneration (*HyBioComBone*).

Funding source: the PRISMA Program of the Science Fund of the Republic of Serbia, Grant No. 7470.

Authors: Đorđe Veljović, Đorđe Janačković, Rada Petrović, Biljan Ljujić, Milena Radunović, Anđela Radisavljević, Željko Radovanović, Vukašin Ugrinović, Tamara Matić, Marija Milivojević, Miloš Papić, Tamara Vlajić-Tovilović, Irena Ognjanović, and Ivica Vujičić.

Concentrated peach juice enriched with oligosaccharides isolated from soybean industry by-products with prebiotic and antioxidant activity

Faculty of Technology and Metallurgy, University of Belgrade (in cooperation with Innovation Center of Faculty of Technology and Metallurgy Ltd. and Expergo Business Network SRL Bucharest – Romania)

This concentrated peach juice contains fibers and oligosaccharides with prebiotic and antioxidant activity. Fibers and oligosaccharides were isolated from soybean hulls through a combined process based on physical pretreatment and enzymatic extraction utilizing novel enzymes, such as xylanases. Xylanases are produced using solid-state fermentation techniques from *Penicillium rubens*

and have demonstrated potential for hydrolyzing waste biomass and obtaining oligosaccharides with defined chemical composition and prebiotic activity.

The exhibit was developed as part of the project: Novel Bioprocessing Tools for Production of Improved Bakery Products with Detoxified Gluten and Fortified with Dietary Fibres, EUREKA Project; E! 13082 BIOFLOSBAKE-LAVGLU.

Funding source: the Ministry of Science, Technological Development and Innovation of the Republic of Serbia

Authors: Dr. Zorica Knežević-Jugović, Dr. Catalin Bilbie, Dr. Nataša Šekuljica, Ivana Gazikalović, Dr. Sonja Jakovetić Tanasković, Dr. Jelena Mijalković, and Dr. Nevena Luković.

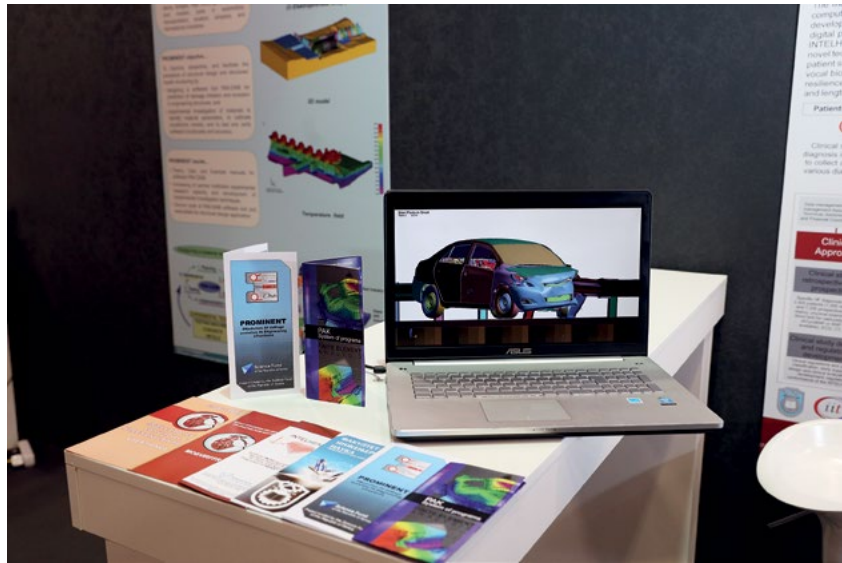


Prediction of damage evolution in engineering structures

Faculty of Engineering, University of Kragujevac (in cooperation with Institute for Information Technologies, University of Kragujevac)

This phase-field damage model (PFDM) will be used to design the specialized Finite Element Method software tool PAK-DAM to predict damage initiation, evolution, and failure of damaged metallic and concrete structures. Team members will work on improving and facilitating the procedure of structural design and health monitoring by designing the software tool PAK-DAM for the prediction of damage initiation and evolution in engineering structures and experimental investigation of materials to identify material parameters, calibrate constitutive models, and test and verify software functionality and accuracy.

The exhibit was developed as part of the project: PRediction Of daMAGE evolution IN ENgineering sTructures – PROMI-NENT, Grant No. 7475.



Funding source: the Science Fund of the Republic of Serbia through the PRISMA Program.

Authors: Miroslav Živković, Professor; Vladimir Dunić, Associate Professor; Vladimir Milovanović, Associate Professor; Snežana Vulović, Senior Research

Associate; Dragan Rakić, Associate Professor; Marko Topalović, Research Associate; Miloš Pešić, Research Assistant; Nikola Jović, Research Assistant; Aleksandar Bodić, Junior Research Assistant.

AI-driven decision support system for early and accurate diagnosis of heart failure

Faculty of Engineering, University of Kragujevac



The INTELHEART project aims to develop, implement, and assess the computerized digital platform for early and accurate diagnosis of heart failure. Relying on proven and new technologies, the project integrates patient-specific demographic and clinical data, including voice characteristics. The intelligent Decision Support System (DSS) and mobile application are being developed for patient stratification and heart failure prediction using artificial intelligence and computational modeling.

The exhibit was developed as part of the project: INTELHEART—Artificial INTELLIGENCE-based Decision Support System for Early and Accurate Diagnosis of HEART Failure.

Funding source: the Science Fund of the Republic of Serbia, Grant No. 7580.

Authors: Smiljana Tomašević, Tijana Geroski, and Nenad Filipović.

System for wireless power transfer

Faculty of Technical Sciences in Čačak, University of Kragujevac



Scientists displayed transmission and reception coils used for wireless power transfer. The presentation also included a power supply and load to demonstrate the system's operation and technical capabilities. The system incorporated appropriate additional equipment, such as light bulbs, to better demonstrate the energy transfer process.

The exhibit was developed within the framework of cooperation between the Faculty of Technical Sciences Čačak and the Science and Technology Park Čačak.

Funding source: own funds.

Authors: Associate Professor Branko Koprivica and doctoral student Dejan Janjić.

Current tube for determining resistance coefficient during body's movement through air

Faculty of Technical Sciences in Čačak, University of Kragujevac

This current tube has fans at each end that provide airflow. At the beginning of the tube, there are specially made parts set to create a laminar gas flow. Also, an object with an unknown resistance coefficient is introduced into the central part of the tube. The system is equipped with a microcontroller that, depending on the airflow speed, calculates the object's resistance coefficient and shows it on the display.

Funding sources: the Faculty's funds and own resources.

Author: Dr. Milentije Luković.



Interactive table

Faculty of Technical Sciences in Čačak,
University of Kragujevac

This modern coffee table is equipped with programmable RGB diorama lighting and several switches. The resolution is 64 pixels (diodes) and it can be used to display text, animation, various two-player games, as a reminder, and other creative applications.

Funding source: the Faculty's own funds.

Authors: Assistant Professor Mihajlo Tatović with second-year university students.



Reflex game

Faculty of Technical Sciences in Čačak,
University of Kragujevac

This reflex game was developed at an electronics workshop organized by the Faculty of Technical Sciences in Čačak for high-school students living nearby. It has programmable diodes, a switch, and a microcontroller station. When certain diodes match, players should press the switch, and with each successful attempt, they move to the next speed level.

Funding source: the Faculty's own funds.

Authors: Assistant Professor Mihajlo Tatović with high-school students.

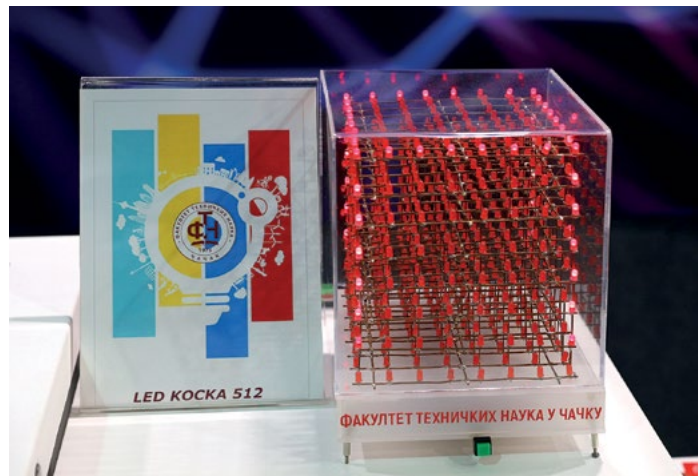
LED CUBE 512

Faculty of Technical Sciences in Čačak,
University of Kragujevac

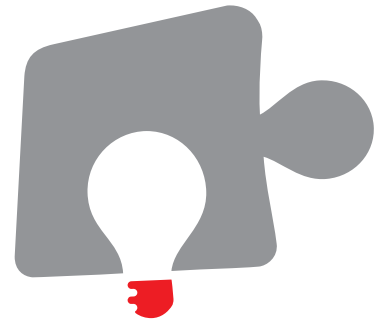
This LED cube contains 512 diodes arranged in 3 dimensions 8x8x8. It has a diode driver and a microcontroller unit. The device can be used for educational purposes and help students master programming skills; and marketing purposes—when displaying text and different 3D shapes.

Funding source: the Faculty's own funds.

Authors: Assistant Professor Mihajlo Tatović with second-year university students.



REPUBLIC OF SERBIA INNOVATION FUND



Innovation Fund

The Innovation Fund (IF) participated in the 66th International Fair of Technics and Technical Achievements, where it presented support programs for innovation development in Serbia. Together with all actors in the innovation ecosystem, the IF shared information on results and available sources of funding that contribute to sustainable progress and technological advancement.

The IF programs are primarily aimed at strengthening the startup ecosystem and backing young enterprises in the early stages of development (Smart Start Program, Mini Grants Program, Katapult Acceleration Program, Serbia Ventures Program, GovTech Program, and RISC), as well as fostering collaboration between the private and science sectors (Collaborative Grant Scheme Program

and Innovation Vouchers), supporting R&D institutions (Technology Transfer Program), and aiding the private sector in the commercialization of research and development (Matching Grant Program).

Point-of-Need (PoN) detection of GM field crops

Science Fund of Republic
of Serbia (BioSense Institute)

The exhibit outlined a methodology for the quick and successful field detection of isothermally amplified DNA material isolated from genetically modified (GM) crops (corn, wheat, soybean, and rapeseed) with novel electrochemical and field-effect transistor (FET) biosensors assembled using advanced 2D nanomaterials, such as graphene and MXenes.

The exhibit was developed as part of the project: LABOUR-LAMP-Based Biosensors for Detection of GMO in Agriculture. Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.



Authors: Dr. Ivana Gađanski, Dr. Zoran Pavlović, Dr. Ljiljana Šašić Zorić, Dr. Nikola Kanas, Dr. Ljiljana Janjušević, Teodora

Knežić, Mila Đisalov, Milinko Perić, Stefan Jarić, Ana Kuprešanin, and Marija Pavlović.

PhytoPFAS garden

Science Fund of Republic of Serbia (Faculty of Chemistry, University of Belgrade; Institute of Chemistry, Technology and Metallurgy, University of Belgrade; Faculty of Medicine, University of Belgrade)

The PhytoPFAS garden simulated phytoremediation—the process of using plants to restore and remediate the soil contaminated with perfluorinated compounds. Researchers on the PhytoPFAS multidisciplinary project employed this ecological and cost-effective process to remove perfluorinated compounds from the environment through a synergistic action of plant enzymes and microorganisms near the roots. By using different plant species, they managed to remediate soil areas with low concentrations of perfluorinated compounds, thus reducing the spread of contamination and soil erosion.

The exhibit was developed as part of the project: PhytoPFAS—Phytoremediation for *In Situ* Treatment of Agricultural Soil and Surface Waters Polluted with Per-



and Polyfluoroalkyl Substances—research on PFOS and PFOA as Model Compounds.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Dr. Kristina Joksimović, Dr. Marija Lješević, Dr. Nikoleta Lugonja, Dr. Branka Lončarević, Kristina Kasalica, and Professor Lidija Izrael Živković.

Insect-rearing cage containing mushroom-growing substrate

Science Fund of Republic of Serbia (Institute of Pesticides and Environmental Protection; Faculty of Agriculture, University of Belgrade)



Researchers displayed an insect-rearing cage containing a plastic box filled with a mushroom-growing substrate. Yellow sticky fly traps were attached to the upper inner side of the cage to monitor the number of mushroom flies. The project examined the efficacy of three beneficial microorganisms (bacterium *Bacillus amyloliquefaciens*, actinobacterium *Streptomyces flavovirens* and nematode *Steinernema feltiae*) in tackling the causal agent of the green mold disease (*Trichoderma aggressivum*) and the mushroom fly (*Lycoriella ingenua*). The aim was to produce healthy portobello mushrooms without chemical pesticides. Visitors could also see the larvae of mushroom flies and their adult counterparts in glass vials, and the colonies of pathogenic fungus in plastic Petri dishes.

The exhibit was developed as part of the project: MICRO-MUSH—Microbial Recipe for Edible Mushroom Production.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Dr. Dejan Marčić, Dr. Ivana Potočnik, Dr. Svetlana Milijašević-Marčić, Dr. Ljiljana Šantrčić, Dr. Tanja Drobňaković, Dr. Jelena Luković, Dr. Nikola Grujić, and M.A. Nikola Anđelković.

Unsaturated polyester resins derived from bio-based sources

Science Fund of Republic of Serbia (Faculty of Technical Sciences in Čačak, University of Kragujevac; Innovation Center, Faculty of Technology and Metallurgy, University of Belgrade; Institute of Chemistry, Technology and Metallurgy, University of Belgrade; Innovation Center, Faculty of Chemistry, University of Belgrade)

Researchers presented samples collected within the Step2PolyGreen project, as they aim to develop composite materials based on unsaturated polyester resins (UPRs) derived from bio-based sources and fillers obtained from various secondary raw materials, such as waste coffee grounds, waste textile material, waste eggshells, waste construction material (sand), and others.



The exhibits were developed as part of the project: Step2PolyGreen—A Step to Green Polyester Products: Sustainable Solutions for Everyday Objects.

Funding source: the Science Fund of the Republic of Serbia through the Green

Program of Cooperation between Science and Industry.

Authors: Dr. Pavle Spasojević, Dr. Olga Pantić, Dr. Maja Marković, Dr. Vesna Panić, Dr. Milica Spasojević Savković, Sanja Savić, and Katarina Antić.



Innovative green technology for removal of corrosive sulfur from insulating oil

Science Fund of Republic of Serbia (Electrical Engineering Institute Nikola Tesla)

To illustrate their efforts, researchers put on view a copper winding segment from a transformer from Norway, which was damaged due to the presence of corrosive sulfur in insulating oil; a stainless steel column—part of the pilot facility for the application of GreenCleanS technology; a glass vial with oil, a copper strip, and insulating paper and a special bottle with oil and a silver strip prepared for corrosion tests according to the standards IEC 62535 and ASTM D127; a panel showing copper and silver strips after oil corrosion tests, oil samples tested before and after the application of GreenCleanS technology, according to the standards DIN 51353, ASTM D127-15 and IEC 62535.

The exhibit was developed as part of the project: GreenCleanS—Development of Green Technology to Mitigate Power Transformer Failures Induced by Elemental Sulfur and Change Current Hazardous Practice in Transformer Oil Regeneration.

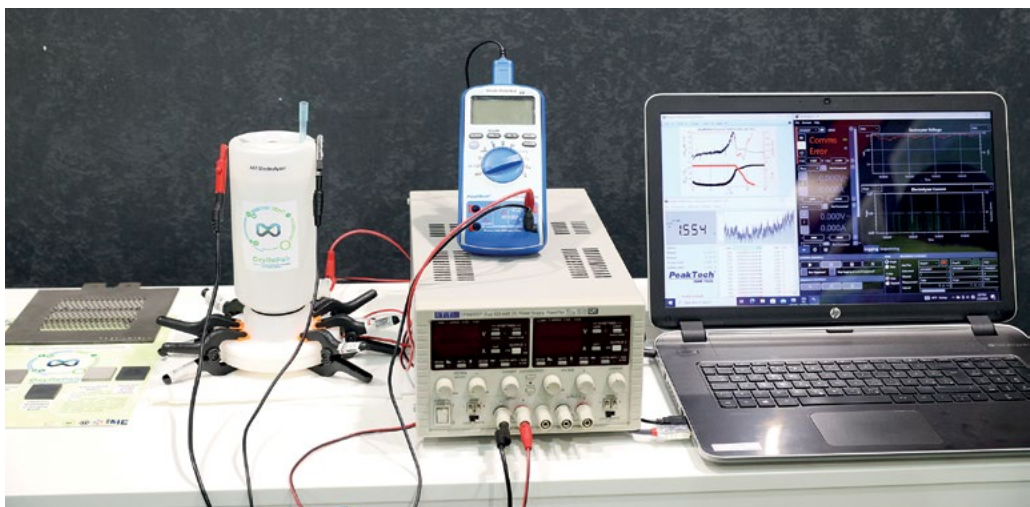
Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: the Electrical Engineering Institute Nikola Tesla.

Procedure for detailed performance testing of repaired oxygen-evolving anodes in industrial setting

Science Fund of Republic of Serbia (Institute of Chemistry, Technology and Metallurgy, University of Belgrade; Faculty of Organizational Sciences, University of Belgrade; State University of Novi Pazar; Innovation Center, Faculty of Technology and Metallurgy, University of Belgrade)

The exhibit demonstrated a lab procedure for testing the performance of oxygen-evolving anodes and analytical methods for processing the collected data so that findings could be applied in the manufacturing of metals and metal coatings, the protection of pipelines from corrosion, and the production of green hydrogen through water electrolysis from renewables.



Researchers also presented innovative activation steps for industrial anodes and the service processing of new and used anodes. Visitors could also see a lab electrolyzer prototype with accompanying instrumentation for data collection and processing, along with the output parameters of data processing.

The exhibit was developed as part of the project: OxyRePair—Renewal of the

Waste Oxygen-Evolving Anodes from Hydrometallurgy and Their Improved Activity for Hydrogen Economy, Waste-water and Soil Remediation.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Gavriilo Šekularac, Jovana Bošnjaković, and Dr. Vladimir Panić.

NanoCompAs filtration unit

Science Fund of Republic of Serbia (Faculty of Sciences, University of Novi Sad; Institute for Multidisciplinary Research, University of Belgrade)



The NanoCompAs project is developing an innovative, effective, and sustainable solution for removing arsenic from drinking water. Researchers displayed a filtration unit they used in the lab to investigate different nanocomposite materials. Visitors had an opportunity to familiarize themselves with the filter's function, as well as the advantages of the adsorption process. Within the exhibition space, scientists also displayed a world map marking locations with significant arsenic concentrations in drinking water, thus highlighting the global nature of the problem and the pressing need for arsenic removal solutions. Not only did the exhibit demonstrate current achievements in the field of arsenic adsorption and the development of new adsorbents, but it also stimulated discussions on future research directions and the implementation of these technologies on a global level.

The exhibit was developed as part of the project: NanoCompAs—Scale-up of Bifunctional Fe-Mn Binary Oxide Nanocomposite Filter Media: an Innovative Approach for Water Purification.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Dr. Jasmina Agbaba, Dr. Srđan Rončević, Dr. Mirjana Vijatović Petrović, Dr. Malcolm Watson, Dr. Jasna Atanasijević, Dr. Jasmina Nikić, Dr. Maja Vujić, M.Sc. Jovana Pešić, M.Sc. Jovana Jokić Govedarica, M.Sc. and Đorđe Pejcin.

Storm in a Jar

Science Fund of Republic of Serbia (Institute of Physics, University of Belgrade; Faculty of Medicine, University of Belgrade; Faculty of Veterinary Medicine, University of Belgrade)

At the project's demonstration dubbed *Storm in a Jar*, researchers showed the efficacy of ion generators in removing airborne particulate matter so as to improve air quality. They used a transparent jar and introduced smoke particles from an electronic cigarette. Upon the activation of generators, ions quickly bonded with smoke particles, causing them to aggregate and settle on the jar



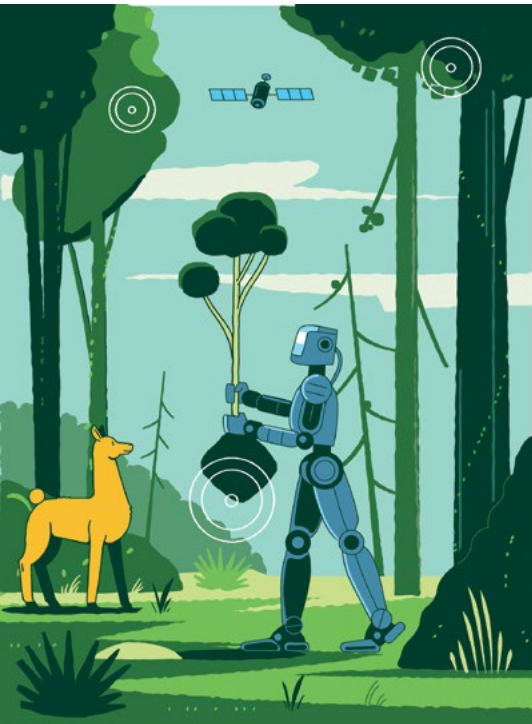
walls within seconds. The IonCleanTech research objective is to highlight ion generators as a practical method for reducing airborne pollutants, contributing to healthier indoor and outdoor environments worldwide.

The exhibit was developed as part of the project: IonCleanTech – Elimination of Respirable Airborne Particles, Microplastics, Microorganisms, and VOCs by

Ionization of Indoor Air and Filtration Systems: Comprehensive Investigation for Reliable Technological Answers.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Dr. Anđelija Ilić, Jelena Trajković, Marko Janković, and Professor Predrag Kolarž.



Canopy height data for Serbia

Science Fund of Republic of Serbia (Faculty of Civil Engineering, University of Belgrade; Faculty of Forestry, University of Belgrade)

Researchers put on display the 2020 canopy height data for Serbia for 2020 based on the paper by Lang et al.(2022). This research paper, entitled "Global Canopy Height Regression and Uncertainty Estimation From GEDI LIDAR Waveforms with Deep Ensembles," combines GEDI LIDAR data and Sentinel-2 imagery using advanced deep learning techniques.

These data are a key predictor for biomass estimation and captured CO₂ and are essential for ongoing research efforts to develop the ForestCO₂ project methodology based on EO and ML.

The exhibit was developed as part of the project: ForestCO₂—EO and In Situ-Based Information Framework to Support Generating Carbon Credits in Forestry.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Professor Dr. Milan Kilibarda, Professor Branislav Bajat, Professor Vesna Šešum-Čavić, Professor Dragutin Protić, Doc. Dr. Milutin Pejović, Doc. Dr. Aleksandar Sekulić, Doc. Dr. Slobodan Jelić, Dr. Ognjen Antonijević, Dr. Petar Bursać, Professor Vladan Ivetić, and Dr. Marko Kazimirović.

System for remote measurement of water quality parameters using smart buoys and drones

Science Fund of Republic of Serbia (Faculty of Technical Sciences (FTN), University of Novi Sad; Research and Development Institute for Artificial Intelligence of Serbia)

The display consists of three items: a model of a smart buoy with sensors for measuring water quality and communication modules; an unmanned aerial vehicle (drone) with a carrier for wireless communication equipment and a carrier for water sampling using a drone; and a server with database and graphic display of sensor measurements in real time.

The exhibits were developed as part of the project: REWARDING - REMote WATER quality monitoRING and INTEllIGence.

Funding source: the Science Fund of the Republic of Serbia through the Green Program of Cooperation between Science and Industry.

Authors: Professor Dejan Vukobratović, Professor Ivan Mezei, Professor Milica Petković, and Teaching Assistants Tijana



Devaja, Marko Vasiljević Toskić, Vukan Ninković, and Boris Radovanović.

The team of researchers from the Research and Development Institute for Artificial Intelligence of Serbia consists of researchers Milan Stojković, Vladimir Đapić, Milovan Medojević, Zorica Dodevska and Velibor Ilić.

The team from the Department of Environmental Protection Engineering and Occupational Safety (FTN) consists of: Professor Maja Turk Sekulić, Professor Jelena Radonić, Research Associate Maja Brborić, M.Sc. Sonja Dmitrašinović, and M.Sc. Sanja Radović.



The Spectra

Center for the Promotion of Science (CPN)

This interactive exhibition provides a peek into the nature of light, both visible and invisible to the naked eye, which underpins modern technologies. It is a window into the future of science, communication, security, and space exploration, but also a retrospective of research in the field of electromagnetic waves. The exhibition is open to the public, with a focus on those taking their first steps into the world of science and innovation.

The exhibition was staged to mark the UNESCO International Year of Light and Light-Based Technologies.

Authors: CPN Team.

UNDP

At the 66th International Fair of Technics and Technical Achievements, the United Nations (UN) in Serbia had a shared exhibition space that focused on the Sustainable Development Goals (SDGs). A special emphasis was given to the Resolution on the International Decade of Sciences for Sustainable Development, which was adopted by the UN General Assembly upon the Republic of Serbia's proposal.

The United Nations Development Program (UNDP), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the UN Refugee Agency (UNHCR) presented their projects and activities as part of the UN strategy for Serbia implemented by the UN Resident Coordinator.

The presented projects rely on innovations to contribute to reaching the SDGs: improving citizens' quality of life, upgrading digital skills, protecting the environment, empowering women and girls, providing support to refugees and at-risk groups, and strengthening inclusion efforts.

Among other items, the UN displayed an app for refugees learning Serbian, developed by high school students as part of the project In Their Shoes; green roofs that help tackle pollution; the application of AI and micro bits in teaching; an app providing mental health support to youth; the transfer and implementation of RNA technology in vaccine and drug manufacturing; and a map of sustainable investments in Serbia.



Ministries

МИНИСТАРСКИ ПАНЕЛ

СРБИЈА ЗЕМЉА
ЗЕМЉА И НОВА
ЗАКОРАЧИ У ОДРЖИВУ

др Јелена Беговић,
министарка науке, технолошког развоја и инова

Зоран Гајић,
министар спорта Републике Србије

Дејан Ристић,
министар информисања и телекомуникација Реп

Ивана Антонијевић,
помоћница министра туризма и омладине Репуб

Милан Пашић,
помоћник министра просвете Републике Србије



А НАУКЕ,
ЦИЈА
БУДУЋНОСТ!

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Ministry of Sports

This was the first time that the Ministry of Sports participated in the International Fair of Technics and Technical Achievements, with a view to presenting and exploring the latest technological advancements that could benefit the sports sector.

The fair brought together 579 exhibitors, and the Ministry of Sports displayed four exhibits:

EAGLE CS—video-check system for volleyball matches

Besides Italy and Poland, Serbia is the third country in Europe with its own challenge system for volleyball. The product is called Eagle CS (Challenge System) and got the green light from all five technical commissions of the European Volleyball Confederation (CEV) for application in all indoor tournaments. The video challenge system offers support to referees when making tough decisions. It is already in use at the Volleyball League of Serbia, the Croatian Volleyball League, the Champions League, the Challenger Cup, the CEV Cup in Serbia, the Super Cup, and the Serbian Cup.

InLoodis—augmented reality in basketball.

InLoodis is a Serbian startup that developed an innovative product to improve basketball training. During training, players wear glasses that rely on hologram technology to project obstacles, players, and other situations previously defined by the coach. This device steps up the efficiency of each situational exercise and unlocks new training possibilities.

Center for the Early Detection of Postural Deformities, Knjaževac

This is a cutting-edge device for the early identification of scoliosis, orthosis, flatfoot, and head movement that provides more than 80 parameters for only a couple of minutes. This is a non-invasive method, without X-ray radiation, so it is ideal for diagnosing children.

DARI MOTION—functional movement analysis

This system consists of eight cameras that efficiently provide a complete biomechanic analysis of human movement. This technology can be used to analyze sports activities—shots in basketball, smashes in volleyball etc. Eight cameras work in sync to analyze human movement and provide a layered analysis of sports activities that can inform the work of strength and conditioning coaches and help players achieve their best performance.

The Ministry of Sports also organized two lectures during the 66th International Fair of Technics and Technical Achievements.

- Application of New Technologies in Sports for Performance Boost—Professor Dimitrije Čabarkapa, the University of Kansas; and
- AI and Sports: How Innovations and Technologies are Changing Sports—Professor Zoran Milanović, the Faculty of Sport and Physical Education, the University of Niš.



Ministry of Tourism and Youth

This was the first time that the Ministry of Tourism and Youth took part in the International Fair of Technics and Technical Achievements as an exhibitor. The ministry's main partners were the Serbian Road Traffic Safety Agency together with the public enterprise Roads of Serbia, and the UNDP with the Sombor City Card project. The Road Traffic Safety Agency had a *safe zone* within the ministry's exhibition space, where visitors could learn more about the risks associated with drunk driving and see *drunk goggles* that simulate the effects of drinking on the driver's vision depending on alcohol percentage in blood.

Sombor City Card displayed an exhibit called Visit Online Smart Solutions, presenting a digital tourist card that was developed as part of the pilot project arising from the signed Declaration on Sustainable Tourism and aimed to offer various tourist services and incentives.

At the 66th International Fair of Technics and Technical Achievements, the Ministry of Tourism and Youth also organized two panel discussions. The Center for Youth and Social Development RES POLIS held a panel entitled *Data Safety and Protection*, whereas the topic *Youth Spaces and Innovations* was explored by representatives of OPENS, UNICEF, the Ministry of Tourism and Youth, TOC, and EC Kruševac.

Ministry of Information and Telecommunications

At the 66th International Fair of Technics and Technical Achievements, the Ministry of Information and Telecommunications presented innovative solutions and the state infrastructure that lays the groundwork for further digitization, new technologies, and human-centered services.

We showed the State Data Center in Kragujevac, which stores the data of state institutions and is one of the eight facilities in Europe with a Tier 4 security level. In addition to state bodies, the world's largest IT companies also entrusted their data to this Data Center. We also presented the company Data Cloud Technology, which was established by the Government of the Republic of Serbia to cater to the needs of commercial clients.

The State Data Center in Kragujevac also houses another key infrastructure resource, the National AI Platform (the so-called supercomputer). The Government of the Republic of Serbia made it available for free to the entire academic community

and Serbian startups, thus encouraging them to develop their AI-driven ideas and products.

In total, 38 institutions, mostly faculties and institutes, and 35 Serbian startups use the AI platform, and at this year's fair, we displayed two solutions developed thanks to it.

The Research and Development Institute for Artificial Intelligence of Serbia made software that recognizes human emotions in real time. On the screen, visitors could see the percentage values of their expressed emotions.

We also displayed the AI software of the company Machine Can See, which recognizes objects, detects empty parking spaces, and has multiple applications.

Within the Ministry's exhibition space, there also stood a time capsule containing messages for the future that were stored in December 2020, when the State Data Center in Kragujevac was declared open.



Ministry of Education

At the 66th International Fair of Technics and Technical Achievements, the Ministry of Education of the Republic of Serbia presented its activities and results. On this occasion, the Petlja Foundation and the United Nations Development Program (UNDP) showed the activities implemented as part of the project *Building Key Computing Competencies—Towards the Workforce of the Future*, which received backing from the Ministry of Education and the Government of the Republic of Serbia.

Among the showcased activities was also the STE(A)M Challenge, which supported Serbian high school students' best proposals for resolving local issues by relying on STE(A)M disciplines, digital

technologies, and data so visitors could find out more about the winning ideas.

The Petlja Foundation promoted its platform *petlja.org*, which supports formal and informal education (integrating coding into school curricula and encouraging algorithmic literacy among students). In addition, Petlja displayed the AI Assistant, which utilizes artificial intelligence to help teachers prepare classroom materials and plan activities. This tool should also assist teachers in designing test questions and organizing interactive classes (e.g. a classroom game for better learning).

The Ministry of Education also held a panel discussion entitled *Skills of the Future in the World Ahead—Where Do I Fit*

in?, moderated by State Secretary of the Serbian Ministry of Science, Technological Development and Innovation Vukašin Grozdić. The panel participants were Dr. Bojana Bašaragin, Research Associate at the Institute for Artificial Intelligence of Serbia, Dr. Dobrinka Kuzmanović, Assistant Professor at the Faculty of Philology in Belgrade, Jelena Ružičić, UNDP Portfolio Manager, Katarina Anđelković, Program Director of the Petlja Foundation, and Dragana Šutović Ilić, Project Manager of the Center for the Fourth Industrial Revolution. The panel provided profound insights into the latest trends and forecasts regarding future skills needs, highlighting the importance of digital literacy, creativity, and new technologies.

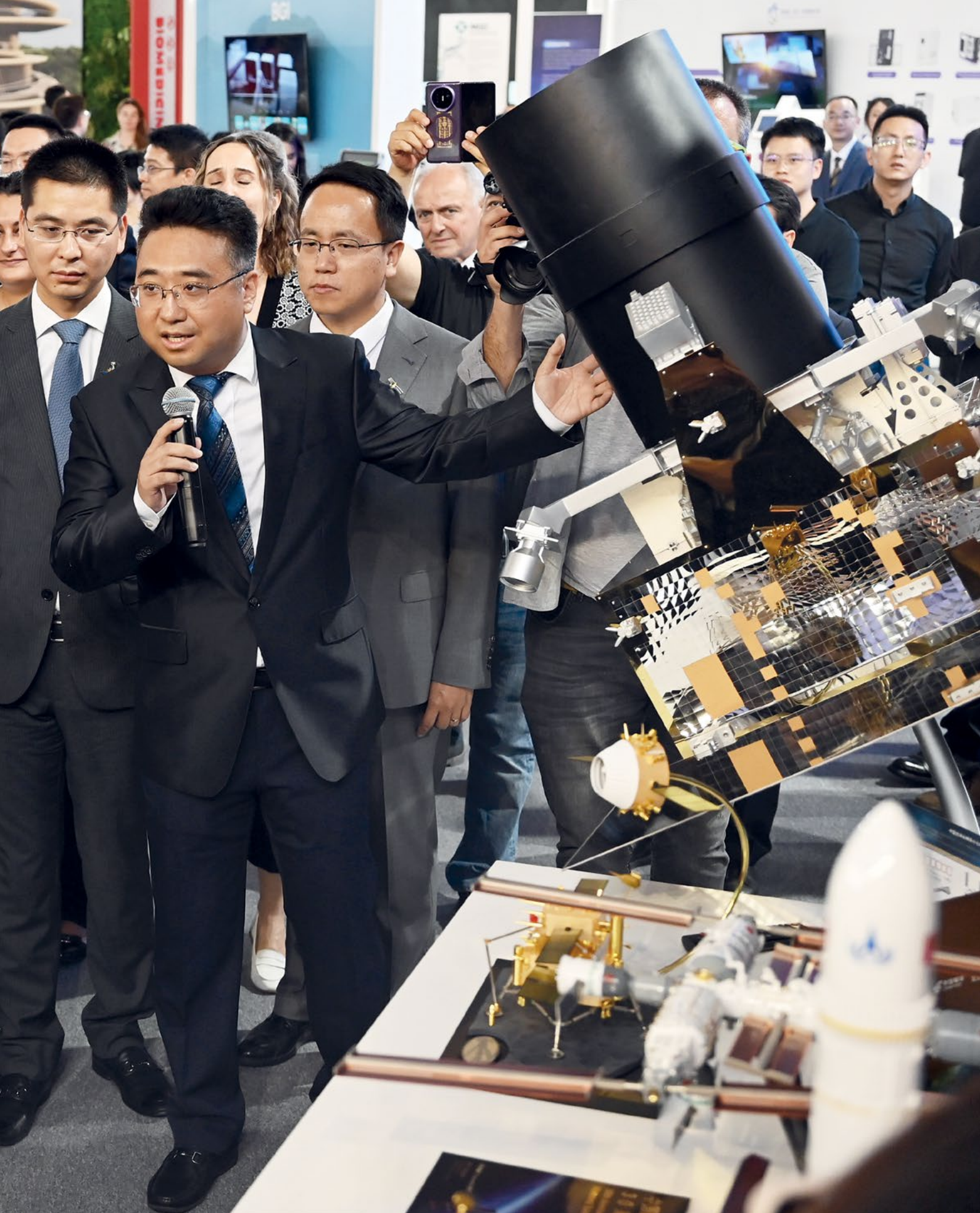








Exhibition of
the People's
Republic
of China



Space technology

Beijing Minospace Technology Co. Ltd.

Minospace showcased the design and production of satellites in orbit as it specializes in the design and manufacturing of optical and SAR satellites.

Minospace has two R&D and mission control centers, four state-of-the-art AIT and production centers, and six TT&C measurement and control stations. The company has successfully launched 24 satellites, which have orbited as scheduled nearly 30,000 times, operated stably for more than 40,000 hours, executed more than 30,000 commands and uploaded and downloaded more than 1,000 terabytes of image and data.

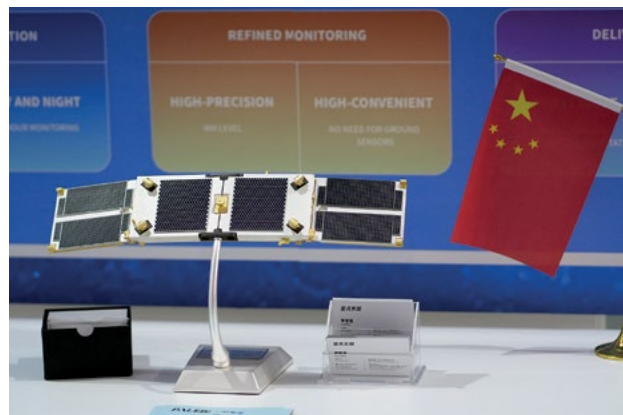
With cutting-edge technology and reliable services, Minospace is committed to implementing an international expansion strategy, promoting space exploration and maintaining its position as a leader in China's commercial satellite industry.



PaleblueRS (Beijing) Technology Co. Ltd.

PaleblueRS presented the InSAR technology. InSAR is used to monitor and prevent urban safety hazards from aging buildings,

urban subsidence, roads, transmission towers, subways, highways, high-speed rails, and dams.



Beijing Interstellar Glory Space Technology Co. Ltd. (iSpace)

The Hyperbolic-2 reusable liquid oxygen-methane verification rocket (SQX-2Y) successfully launched on its second test flight at the Jiuquan Satellite Launch Center in China. After flying at an altitude of 343.12 m, Hyperbolic-2 landed precisely and smoothly, and in a safe condition. This was China's first re-launch of a reusable rocket, demonstrating the rapid reusability of the first stage of China's first full-size liquid oxygen-methane rocket that took off vertically, landed,

and recovered successfully, the reliability of the low-altitude return and landing techniques, the minimal detection process, norms and standards of rocket reuse, the reuse reliability of systems and individual units and their adaptability to complex environments, the feasibility of re-launch of simple maintenance, short cycle, and high frequency, and the adaptability of the processing system in the rocket recovery area.



China Aerospace Science and Technology Corporation (CASC)

CASC placed an emphasis on the progress Serbia made in aid cooperation on remote sensing satellites and presented in detail China's space station, Chang'e-5, and other major national aerospace initiatives to demonstrate its technical competencies in supporting the development of Serbian space and push Serbia's aid remote sensing satellite project forward.

The Serbia aid remote sensing satellite model featured as the main part of the exhibition, which consisted of a 1:2.5 satellite model (including supports of 1.6m*0.5*1.8m), along with a

display board introduction. Remote sensing applications, as a special part of the in-depth presentation, were displayed vividly through typical domestic cases in multimedia format in combination with Serbia's needs. For capacity building, AIT facilities and joint training were showcased with a display board using Egypt Satellite 2 as an example. Models with appropriate ratios were used to showcase space stations, lunar exploration programs, and launch vehicles to demonstrate the capability of China's space industry.



Artificial intelligence (AI)

Beijing Airdoc Technology Co.Ltd.

Airdoc presented the AI fundus camera, a comprehensive and multi-faceted AI solution for early screening and management of chronic diseases, myopia prevention and control etc. It screens nearly 50 types of lesions based on a single retinal photo. Both the portable intelligent fundus camera and diabetic retinopathy diagnostic aid software have been MDR CE certified and can be used in scenarios such as hospitals, optometric centers, ophthalmology clinics, community clinics, pharmacies, and medical checkup centers.



Beijing RealAI Tec



Technology Co., Ltd.





Beijing VAS Medical Technology Co. Ltd.

China's major national R&D project entitled "Research on Industrialization and Demonstration Application of Surgical Robot for High Precision, Minimally Invasive Vascular Interventions," undertaken by Beijing Tiantan Hospital, produced a world-leading vascular intervention robot that has



completed the entire cerebral angiography procedure for the first time.

Beijing RealAI Intelligent Technology Co. Ltd

Beijing Baihui Weikang Technology Co. Ltd.

Baihui Weikang showed the RM-50 neurosurgical robot, the first of its kind in China with domestically developed core components, breaking technology bottlenecks in that regard. The robot's human-like "brain," "eyes," and "hands" coordinate with each other efficiently, assisting doctors in performing cerebral hemorrhage, biopsy, navigation, and other neurosurgical procedures in an accurate, safe, and minimally invasive manner.

RealAI presented two highly interactive products: the so-called AI invisibility cloak: a piece of clothing with a special pattern that makes a visitor undetectable by the target system; the generative AI content detection platform DeepReal that identifies AI face swapping, AI voice changing, AI-generated content, among others, which are indistinguishable for human eyes and ears. Both correspond to the endogenous and derivative risks in the AI security field. One reveals the inherent flaws and vulnerabilities of AI systems, and the other provides solutions to AI abuses and misuses.



Biomedicine

BGI Genomics

BGI participated with its ultra-high-throughput sequencer DNBSEQ-T20x2, Huo-Yan Laboratory's (air film) model developed for outbreak response and mass screening, DNA storage model, and the "Order of the Serbian Flag, I Class" awarded by Serbian President Vučić in recognition of BGI's contribution to COVID-19 response.

Oushisheng (Beijing) Technology Co. Ltd.

Oushisheng showcased a microreactor and flow chemistry total solutions. The company has many zero-to-one products in the field of flow chemistry that provide solutions for hazardous waste generation, hazardous chemical storage, and intrinsic safety.



JOINN Laboratories (China) Co. Ltd.

JOINN put on display its independently developed AI animal film reading system that significantly enhances the efficiency of drug discovery. With CDMO R&D pilot and production base, the company provides one-stop technical services for drug discovery.

Beijing Naton Technology Group Co. Ltd.

Naton is a leading company integrating research, production, and sales of medical devices in China. Its main exhibits include high-end orthopedic implants and devices, bio-based materials, surgical robots, and intelligent rehabilitation devices. Naton holds 50 percent of the world's patents on technologies and products of bio-based materials. Built on world-leading technologies, its surgical robot fills the gap in China. Its UGO rehabilitation exoskeleton device represents China's first project to obtain the NMPA registration certificate for neurological rehabilitation.



Beijing CytoNiche Biotechnology Co. Ltd.

As a high-quality 3D cell manufacturing expert, CytoNiche provides a one-stop, customized solution for cell scale-up based on 3D microcarriers and has developed an original 3D cell smart manufacturing platform for automated, intelligent, and closed large-scale cell drug and derivative production preparation to help customers worldwide establish their state-of-the-art cell drug production lines. CytoNiche is scaling up its pioneering 10 billion stem cell production process to 100 billion with a view to empowering the cell and gene therapy industry with large-scale 3D cell intelligent manufacturing technology to benefit more patients.



Hubei Topgene Biotechnology Co. Ltd.

Topgene showcased a new drug research and evaluation CRO service featuring large animal testing. With laboratories covering 30,000m², Topgene offers 9 categories of GLP services regarding traditional Chinese medicine, biological medicine, and chemical medicine in compliance with the standards of both China and the United States, as well as the OECD GLP. The company stated it was looking forward to working with universities, research institutes, and companies in Serbia in the fields of drug discovery and model animal development to promote the innovation-driven development of medicine worldwide.



Hubei Zhongke Human Factors Intelligent Technology Co. Ltd.

Zhongke presented a multimodal human factor bracelet kit, the first of its kind in China. This independently developed multimodal human factor data acquisition module integrates pulse, skin resistance, skin temperature, accelerometer, gyroscope, magnetometer, temperature, humidity, and barometric pressure sensors to analyze and evaluate mental states such as anxiety, depression, happiness/excitement, stress/tension, and fatigue. It is also China's first overscan-based group emotion recognition and modeling solution configured with capabilities including the similarity analysis of individual physiological response and behavioral convergence under the same emotional experience, and the temporal analysis of physiological responses to social interaction and collaboration within a team.

Wuhan Hesheng Technology Co. Ltd.

Hesheng presented technologies for genome mining and producing natural product molecules. The company applied for more than 50 patents for its automated high-throughput natural product mining platform and high-efficiency biosynthesis platform empowered by chassis cells. Based on the mining of natural molecules, Hesheng strives to unlock and maximize the potential value of natural products, create an arsenal of natural products, continuously adopt the *smart manufacturing* approach, and pioneer the intelligent manufacturing of natural products in China.



Autonomous driving

Beijing Autoroad Technology Co. Ltd.

Beijing Autoroad Technology showed intelligent driving, intelligent transportation, and IoT core sensor products and services. Since 2014, the company has accumulated extensive project experience and expertise in new millimeter-wave radar systems, novel radar signal processing algorithms, MIMO antenna technology, slotted waveguide array (SWA) antenna technology, vehicular synthetic aperture radar (SAR) technology, and testing and verification of automotive radar systems, has gotten certified by ISO14001 Environmental Management System, IATF16949 Automotive Quality Management System, GB/T29490 Intellectual Property Management System, ISO 26262 Functional Safety Standard for Road Vehicles, and ASPICE (Automotive SPICE) assessment, and has been recognized as a Z-Park High-tech Enterprise, National High-tech Enterprise, and Beijing Sophisticated SME etc.

UISEE Technology (Beijing) Ltd.

UISEE showcased *full-scenario, all-weather* genuinely autonomous driving technologies. The company provides a secure and dependable AI driver solution based on its proprietary High-Safety All-Scene Level 4 Autono-

mous Driving System, U-Drive™, a self-driving system that supports ten representative autonomous driving scenarios for all passenger cars, commercial vehicles, industrial vehicles, and special operation vehicles. The U-Drive™ system incorporates core features such as car-grade intelligent driving domain controller, cloud management service platform, and core autonomous driving algorithms, and stands at the forefront of scenario-specific autonomous driving technologies and end-to-end unmanned operation.

Beijing Jingwei Hirain Technologies Co. Inc.

Jingwei Hirain presented electronics, R&D services, and high-level intelligent driving total solutions for customers in the automotive and unmanned transportation sectors. Headquartered in Beijing, the company maintains a global presence with 14 branches worldwide and has established modern production facilities in Tianjin, Nantong, and Malaysia, developing a complete ecosystem encompassing R&D, manufacturing, marketing, and after-sales services. In 2022, the



company earned CNY 4,022 billion in revenue, and CNY 235 million in net profits, invested CNY 656 million in R&D, employed over 6,837 staff members, and secured more than 1,764 authorized patents. Its revenue is estimated to be CNY 4.6 billion in 2023.

Senior Auto Technology Co. Ltd.

Senior Auto put on view the technology that enables self-driving vehicles to automate the whole transportation process in a closed, semi-open mixed environment. Its self-developed fleet management system intelligently dispatches tasks, regulates vehicle capacity, and assists in production operations, helping improve the safety of production operations, lower logistics costs and enhance productivity.

Beijing Inchtek Co. Ltd.

Inchtek displayed its unique V2X (vehicle-to-vehicle and vehicle-to-infrastructure) demonstration system. With advanced communication technology, the system enables real-time information interaction between vehicles, and between vehicles and the infrastructure, to significantly enhance the safety and efficiency of road traffic. The demonstration will show the audience how the V2X system delivers real-time traffic information, warns of potential dangers, and

helps vehicles make smarter decisions for safer and more efficient travel. Inchtek is capable of building an adaptive in-depth defense information security system for each intelligent connected vehicle, effectively preventing various cyberattacks and data leakage risks. The company also provides ISO 21434 and WP.29 compliance consulting and technical solutions for the domestic automotive industry to go global, helping car makers to successfully pass the certification for international information security standards and enter international markets.



Beijing iDriverPlus Technology Co. Ltd.

iDriverPlus showcased self-driving applications. The company has always prioritized the development and application of the most advanced "brain" for driverless cars to acquire cheaper, richer data faster, consolidate and improve its ability to use data iteration algorithms, and thus transform the commercial advantage into a technological advantage.

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**Play for Humanity! Science for All—Step into a Sustainable Future
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SERBIA PROUD HOST OF EXPO 2027 BELGRADE



From 15 May to 15 August 2027, Belgrade and Serbia will proudly host a **Specialised Expo**, marking the first time this type of event is being held in our country and the Western Balkans region. Over the course of 92 days, in addition to **more than 4 million visitors** from around the world, Serbia will have the opportunity to present itself as a gracious host to **over 120 international delegations**, further enhancing its global reputation, and fostering collaborations across various sectors.

Expo is a global event dedicated to addressing current challenges humanity is facing and finding appropriate solutions. Specialised Expos, like the one that will be held in Belgrade in 2027, represent global events that should respond to a specific topic concerning humanity, last for three months and gather millions of visitors in one place.

Hosting the Specialised Expo in Serbia is a moment of great honour and pride, as it allows us to join the 170-year long history of events that have shaped the world. Serbia has been participating in International Exhibitions for 140 years and that experience represents a solid basis for positioning our country as a globally competitive host, using all the lessons learned to organise events that will attract attention and leave a lasting impression on visitors.

It is interesting that since the beginning, World Expos have been a platform for showcasing the greatest innovations that have shaped the world we live in today. Thus, Alexander Graham Bell demonstrated the world's first telephone in 1876 at the Centennial Exhibition of Arts, Manufactures and Products of Earth and Mines in Philadelphia.

Also, in the realm of technology, Charles Babbage's Analytical Engine was exhibited at the International Exhibition of Arts and Industry in London in 1862. The first live TV broadcast was at the 1939 New York World Expo, and Ultra HDTV debuted at Expo 2005 in Japan. Visitors to the 1962 Expo in Seattle were amazed by the IBM Showbox, an early computer that responded to voice commands. The World Expo in Osaka in 1970 gave visitors the first opportunity to see a prototype mobile phone.

In addition to technological inventions, World Expos were the stage for numerous food innovations, such as popcorn and Heinz ketchup at the Centennial Exposition in Philadelphia in 1876, or ice cream cones at the St. Louis Expo in 1904.

World Expos are a stage for the presentation of new ideas and inventions, both in science, technology, as well as in art, gastronomy and sports. They create a unique place to bring the world together, where we can all believe in the possibilities that lie ahead.

The theme of the Expo in Belgrade will be "Play for Humanity", and it focuses on the importance of play, sports, and music, and their contribution to the development of humanity. The theme emphasises the exploration of the power of play as a defence mechanism that helps us overcome challenges in an uncertain world. We view play as a superpower that enables people to create, innovate, grow, and develop.

When the EXPO 2027 Belgrade event comes to an end, its legacy will stand as a testimony of progress, a place for family, dialogue and socialising, but also an incentive for scientists.

THIS IS OUR CHANCE TO IMPACT THE WORLD!

For more information visit <https://expobelgrade2027.org/>

BIO4 Campus is a multidisciplinary R&D complex for biotechnology, biomedicine, bioinformatics, and biodiversity. This vibrant center combines academia and industry, housing 7 Faculties from Belgrade University, 9 scientific institutes, and dedicated infrastructure for startups and biotech companies. With over 1,000 PhDs and 5,000 students, it will be a powerhouse of innovation and collaboration, driving the future of life sciences in Serbia.

