



Goal 9. Industry, Innovation and Infrastructure.
«Build resilient infrastructure, promote inclusive
and sustainable industrialization and foster
innovation».

Karazin University Participated offline in the International Conference on Nanomaterials



From September 10th to 15th, the 13th International Conference "Nanomaterials: Applications&Properties" (NAP) took place in Bratislava, Slovakia. Senior Researcher at the Institute of Materials for Reactor Building and Physical Technologies of the Education and Scientific Institute "School of Physics" at Karazin University, Olga Maksakova, participated in the conference. She presented a report titled "Comparative Study of the Microstructure and Properties of Nanolaminated Coatings TiZrN/NbN and TiSiN/NbN" (co-authors: Professors Vyacheslav Beresnev and Sergii Lytovchenko). This presentation was recognized as one of the top three presentations in the "Multifunctional Thin Films and Coatings" category. The conference primarily focused on showcasing new fundamental and applied results in the field of applications and properties of various groups of nanomaterials and coatings. The conference is multidisciplinary, covering 13 thematic areas, ranging from methods of nanomaterial synthesis and transport properties of nanoscale systems to the application of nanomaterials in biomedicine and green energy.



Participation in the international conference on nanomaterials promotes the development of advanced technologies, science, and innovation in the field of nanotechnology, which is essential for sustainable technological progress.

The Meeting of the Supervisory Board within the LIA/IRP IDEATE Project



On September 19th, a meeting of the Supervisory Board was held as part of the LIA/IRP IDEATE project, which brings together the work of French and Ukrainian scientists, including representatives of the academic community from both countries. At the meeting of the project's steering committee, Karazin University was represented by a working group led by the Acting Director of the Research Institute of Physics and Technology, Pylyp Kuznetsov. During the meeting, discussions were held on joint developments by French and Ukrainian partners and the possibility of continuing the work of the Associated International Laboratory (LIA) within the International Research Project (IRP) "Instrumental Developments for Experiments on Particle Accelerators and Accelerator Technologies" (IDEATE).



“IDEATE: Instrumentation Developments for Experiments at Accelerator facilities and accelerating Techniques”

- ❑ Collaboration between CNRS, CEA and Universities from French side and leading research Institutes and Universities from Ukrainian side
- ❑ **Research** and **educational** components of the LIA: students become major actors in scientific projects
- ❑ > 120 participants, > 30 FTE

The project is focused on the research and development of accelerator technologies, which represents important innovative and scientific activity supported by modern infrastructure.

International Scientific and Practical Conference on 'Transformations of Personality, Society, and the Labor Market: Challenges of the Future and Their Impact on Education



From September 20th to 22nd, Karazin University hosted the International Scientific and Practical Conference "Transformations of Personality, Society, and the Labor Market: Challenges of the Future and Their Impact on Education" in a hybrid format. The conference took place within the framework of the Erasmus+ DEFEP project "Distance Education of the Future: Best Practices of the EU in Response to the Needs of Modern Higher Education and Labor Market Representatives." The goal of the conference was to bring together educators, researchers, business representatives, government officials, and civil society members from Ukraine, Moldova, and EU countries to share experiences and define perspectives for the further development of the education system in the context of contemporary and future challenges. Participants from Karazin University were welcomed by Anton Panteliimonov, Vice-Rector for Research and Teaching, who wished them productive work and engaging discussions. Representatives from 11 higher education institutions participated in plenary sessions, sectional meetings, and roundtable discussions, including the following universities: V.N. Karazin Kharkiv National University (Ukraine), Petro Mohyla Black Sea National University (Ukraine), Vadym Hetman Kyiv National Economic University (Ukraine), Uman National University of Horticulture (Ukraine), Lviv National University of Natural Resources and Life Sciences (Ukraine), Chernihiv Polytechnic National University (Ukraine), Moldova State University (Moldova), Technical University of Moldova (Moldova), Saarland University (Germany), King Juan Carlos University (Spain), University of Palermo (Italy).



The conference supports the development of digital and innovative educational technologies, especially in the context of distance learning. This helps modernize the educational infrastructure, focusing on sustainable industrial development and the digital transformation of education.

<https://karazin.ua/en/news/mizhnarodna-naukovo-praktychna-konferentsiia-laquo-transfor/>

On September 20, the administration of Karazin University, led by Rector Tetyana Kaganovska visited the Ministry of Higher Education, Science, and Innovation of the Republic of Uzbekistan.



During the meeting, discussions centered on strengthening the integration of education, science, and industry, the commercialization of new developments, and the advancement of rationalization activities. Further cooperation in several areas was also planned, including the establishment of a representation of Karazin University in the Republic of Uzbekistan and joint scientific research projects

Education + Innovation + Production — the "knowledge triangle" model that meets the modern requirements of sustainable development.

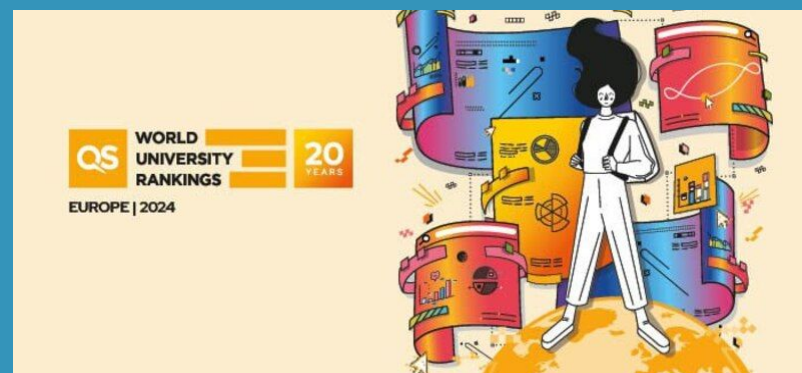


The discussion on the commercialization of scientific developments and the advancement of inventive activity is aimed at strengthening innovation potential. This aligns with the goal of developing research and innovation infrastructure, as well as enhancing the connection between science and industry.

Development of scientific and educational infrastructure. Karazin University in the QS World University Rankings: Europe 2024



The QS World University Rankings have been published: Europe 2024 is the first ranking of the international agency QS, which focuses exclusively on European universities. The ranking includes 31 higher education institutions of Ukraine. Karazin University was ranked 316th among European universities and 3rd among Ukrainian ones. The first place in Ukraine is taken by Taras Shevchenko Kyiv National University, the second - by Igor Sikorsky Kyiv Polytechnic Institute.



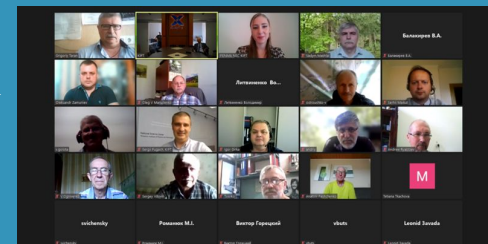
Karazin University was included in the QS Europe 2024 ranking, achieving a high position among Ukrainian higher education institutions, which reflects the high quality of its educational services, scientific work, and academic reputation. Such rankings promote transparency, the improvement of higher education standards, and encourage universities to pursue continuous development.

<https://karazin.ua/en/news/karazinskyi-universytet-u-nbsp-reitynhu-qs-world-university/>

The International Seminar "Plasma Electronics and New Acceleration Methods"



On September 5-6, the XVI International Seminar on Plasma Electronics and New Acceleration Methods took place at the National Scientific Center "Kharkiv Physics and Technology Institute." The seminar featured seven sections with a total of 57 presentations, including 24 research studies conducted with the participation of Karazin University staff. Participants of the seminar represented 18 local and 14 international universities and scientific centers, including institutions from the United Kingdom, Italy, Germany, Poland, the United States, and France. The peer-reviewed scientific articles have been published in the journal "Issues of Atomic Science and Technology," which is indexed in the Scopus scientific database.



The seminar topic — "new acceleration methods" — is directly related to the development of scientific innovations with potential applications in industry, medicine, energy, and IT.

Research in plasma electronics stimulates technological progress.

Interdisciplinary innovations in high-energy physics.

Building a scientific foundation for sustainable technological development.

<https://karazin.ua/en/news/mizhnarodnyi-seminar-nbsp-laquo-plazmova-elektronika-ta-nbs/>

Karazin University signed a Cooperation Agreement with the International European University

Joint scientific research activities and the implementation of innovative technologies



On September 27th, the Rector of Karazin University, Tetyana Kaganovska, and the vice-rector for Research and Teaching, Zarif Nazirov, met with the President of the International European University, Alla Navolokina. On September 27th, the Rector of Karazin University, Tetyana Kaganovska, and the vice-rector for Research and Teaching, Zarif Nazirov, met with the President of the International European University, Alla Navolokina. The mutual plans include the exchange of experience in the use of modern teaching technologies, cooperation in the field of educational quality, organization of scientific and methodological and scientific research work, and the enhancement of the qualifications of the academic and pedagogical staff at the universities. The International European University is a multi-profile educational institution of the new generation, designed to prepare professionals in various fields of knowledge and practice, relying on the standards, regulations, experience, achievements, and traditions in education and scientific research in Europe.



<https://karazin.ua/en/news/karazinskyi-pidpysav-dohovir-pro-nbsp-spivrobitnytstvo-z-nbs/>

Karazin University, in partnership with Max Planck Institute for Microstructure Physics won a Grant Competition to Establish a Scientific Laboratory in Kharkiv



Karazin University, in partnership with the Max Planck Institute for Microstructure Physics of the Max Planck Society in Halle, Germany, secured victory in the competition held by the German Federal Ministry of Education and Research (BMBF) to obtain a grant for establishing a "Core of Excellence" (CoE) in Kharkiv. This CoE will serve as a scientific laboratory adhering to the highest global standards, and the project has been named PLASMA-SPIN-ENERGY. Within the framework of CoE, advanced plasma technologies developed by experts from Karazin University will be implemented in state-of-the-art nanoscale spintronic devices, a development led by German partners. The preparation of this project took over two years, with graduates of Karazin University, Andrii Stervoyedov and Oleksiy Biletsky (Education and Research Institute "School of Physics and Technology"), along with Kyrylo Dronov (School of Computer Science), being the initiators of the project at the Max Planck Institute for Microstructure Physics. The project also involved active participation of the leading research fellow of the Education and Research Institute "School of Physics and Technology," Stanislav Dudin, Professor Igor Hirka of the Education and Research Institute "School of Physics and Technology," and Professor Oleksiy Chechkin from the University of Potsdam in Germany. This project received support from the Kharkiv Regional Military Administration, the Kharkiv City Council, the National Academy of Sciences of Ukraine, the National Science Center "Kharkiv Institute of Physics and Technology," Joint-Stock Company "FED," and the Technological University of Queensland in Australia. The selection of projects for funding was highly competitive, with the collaboration between Halle and Kharkiv being among the 12 teams chosen after rigorous screening at the first stage, granting them the right to prepare a detailed plan for the establishment of the CoE. On October 16, 2023, four winners were announced, including two centers to be established in Lviv, one in Kyiv, and one in Kharkiv, based at Karazin University.



Establishment of a scientific laboratory and development of nanotechnologies

<https://karazin.ua/en/news/karazinskyi-universytet-spilno-z-nbsp-partneramy-vyhrav-konk/>

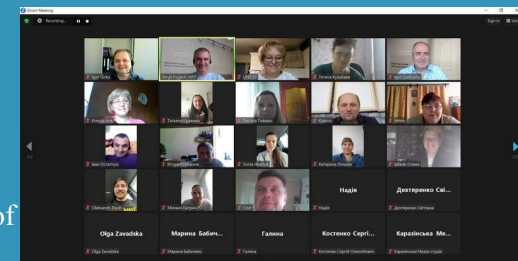
The logo for the Sustainable Development Goals (SDGs) is a circular arrangement of 17 colorful icons, each representing a specific goal. The icons are set against a light blue background with a white grid pattern. The text "SUSTAINABLE DEVELOPMENT GOALS" is written in a bold, sans-serif font across the center of the circle. The entire logo is held in the palm of a stylized, orange hand.

<https://karazin.ua/en/news/karazintsi-vzialy-uchast-u-litnii-shkoli-v-rumunii/>

European Day of Controlled Thermonuclear Fusion for Teachers from FuseNet Association. Teacher Education, Use of Innovative Materials, and STEAM Development. Integration of innovative content into school and extracurricular education.



On October 6th, the FuseNet association organized the 4th European Day of Controlled Thermonuclear Fusion for teachers in an online format. The Ukrainian part of the event was organized by professors from the Education Research Institute "School of Physics and Technology" and the graduates of the institute with technical support from the National Contact Point Euroatom in Ukraine and the media studio of Karazin University. Over fifty teachers from all corners of Ukraine participated in the event. The introductory remarks to the participants were delivered by a Professor of the Education Research Institute "School of Physics and Technology," Corresponding Member of the National Academy of Sciences of Ukraine, Igor Hirka, and the Euroatom NCP Coordinator in Ukraine, Sergiy Pugach. Yevgeniya Babenko, a graduate of the institute in 2011, who currently works in the field of plasma as a source of light at the Advanced Research Center of Nanolithography in Amsterdam, the Netherlands, spoke about plasma as a light source. Yelizaveta Velyzhanina, who, after completing her studies at the institute in 2019, works in the Laboratory of Dynamics of Systems at the Free University of Brussels, Belgium, introduced teachers to her research in computational hydrodynamics in the context of designing thermonuclear reactors. Dmytro Rafalskyi, a graduate of the Education Research Institute "School of Physics and Technology" in 2007 and the Technical Director and Co-Founder of the aerospace company ThrustMe in France, gave a presentation on "Current Challenges in Plasma Application in the Aerospace Industry." The Ukrainian part of the event was concluded by Academician of the National Academy of Sciences of Ukraine, Deputy Director-General for Scientific Work of the National Scientific Center "Institute of Plasma Physics" of the National Academy of Sciences of Ukraine, Head of the Institute of Applied Physics and Plasma Physics at the Education Research Institute "School of Physics and Technology," Igor Harkusha. He delivered a presentation on the activities of the Ukrainian Research Unit of the EUROfusion project. In the overall European part of the event, teachers were introduced to the educational materials available on the FuseNet website and also conducted an online tour of the JET and ITER tokamak facilities.



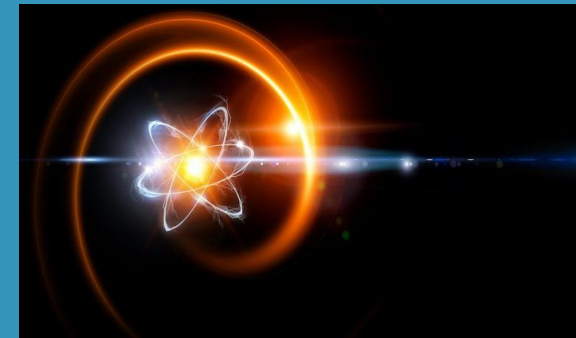
Integration of science into education, presentations on modern research and technologies

<https://karazin.ua/en/news/evropeiskyi-den-kerovanoho-termoiadernoho-syntezu-dlia-nbsp/>

Karazin University joined the work of the Scientific Committee of the European Contest of Scientific Projects in the Field of Controlled Fusion



On 18-19 September 2023, professors of the Education and Research Institute of the School of Physics and Technology took part in the work of the Scientific Committee (Jury) of the European Call for Scientific Projects in the field of Controlled Fusion. In particular, the Head of the Department of Applied Physics and Plasma Physics, Academician Ihor Harkusha worked in the Materials Science section, while Professor of the same department, Corresponding Member Ihor Hirka worked in the Technologies and Systems section. The jury reviewed the results of their pre-evaluation of the funding requests and made recommendations for funding the best requests and improving the selection procedure in the future to the EUROfusion General Assembly. Out of fourteen requests, three projects were recommended for funding in each section.



Engaging scientists in global initiatives promotes the development of innovative technologies, such as fusion energy technologies, which could become the foundation for the future sustainable development of industry.

Projects of Kharkiv University Students are Among the Winners of the Competition for Scientific Research from the Ministry of Education and Science of Ukraine



Development of scientific and innovation infrastructure — through support for research at the state level;
Strengthening Ukraine's scientific potential — by supporting both fundamental and applied research

Karazin's projects are among the winners of the research competition from the Ministry of Education and Science of Ukraine.

The difficult circumstances in which our country, Kharkiv, and the University are currently living encourage us to unite and mobilize our efforts, to work hard and persevere, to search for light even in the pitch darkness.

For the Karazin community, science remains one of the sources of strength, shedding light on hope for the future, for the reconstruction of Ukraine after the trials of war. The victory in the competition of scientific projects supports and inspires our community during the constant shelling and pressure of the enemy.

13 research projects at Kharkiv University and three projects by young scientists from the university have successfully passed the competitive selection for fundamental scientific research, applied scientific research, and scientific-technical (experimental) developments. According to the orders of the Ministry of Education and Science (No. 1572, No. 1569), the implementation of these projects will begin in 2024 with funding from the State Budget of Ukraine.

<https://karazin.ua/en/news/proiekt-y-karazintsiv-nbsp-mdash-sered-peremozhtsiv-konkurs-1/>

Karazin Expresses Gratitude for Assistance in Eliminating the Consequences of Shelling

Even under the extraordinary conditions caused by the war, Karazin University demonstrates its commitment to restoring infrastructure, fostering community cooperation, and effectively mobilizing resources.



On January 2, as a result of another enemy shelling in Kharkiv, Karazin University suffered significant damage. The university community once again demonstrated unity and resilience in overcoming the trials of war.

A lot of volunteers joined the efforts to eliminate the consequences of the rocket strike in the buildings and auditoriums of the main and northern campuses, as well as university dormitory No. 4 of Karazin University. Currently, all damaged windows of these buildings have been successfully boarded up with chipboard panels.

We express sincere gratitude to representatives of School of Medicine, School of Law, School of Foreign Languages, School of Chemistry, School of Sociology, The Institute of International Education for Study and Research, Office of the Rector, Center for the Development of the Digital Space, Department for the Development of Educational and Social Space and Efficient Use of Property, Student Campus, Chief Engineer's Office, Exploitation and Technical Department, Repair and Construction Service, Chief Energy Department, Economic Department, Public Relations Center, Central Scientific Library.

Volunteers from the following organizations have also joined the restoration works:

NGO "I Am Saved"

NGO "Food for Kharkiv Residents"

NGO "Pyatyhatky-BAM"

NGO "Center for Tactical Medicine "East""

Charitable Foundation "Roxi"

NGO "Frunze Kitchen"

Charitable Foundation "Safe Sky"

NGO "ETOS"

Charitable Foundation "Unbroken Kharkiv"

NGO "Station Kharkiv"

NGO "Community of the Caring "Action""

Administrative and Economic Service of KhAI.

The insulation of boarded windows and the activation of the heating system in the affected premises are planned. We thank everyone who contributed to helping Karazin University! Once again, we are convinced that the enemy may destroy and ruin, but it will never succeed in overcoming the unity and strength of our people.



<https://karazin.ua/en/news/karazinskyi-vdiachnyi-za-nbsp-dopomohu-v-nbsp-likvidatsii-na/>

The German Government Will Take Part in the Reconstruction of Karazin University



Restoration of educational infrastructure damaged by armed aggression.
International technical assistance as a tool for sustainable development and modernization.
Enhancing urban resilience through partnerships between the university, local authorities, and international donors.
Integration of a gender-sensitive approach — supporting vulnerable population groups (as outlined in the overall goals of the SUR project).



Within the framework of the project "Strengthening Urban Resilience" (SUR), which is part of the "Sustainable Society" cluster, Karazin University signed a memorandum of understanding with GIZ Ukraine. The signing of the document took place with the participation of the Head of the Economic Section, Mr. Christopher Fuchs. The memorandum provides for the restoration of 550 windows at Karazin University, damaged as a result of a missile attack on Kharkiv on January 2, 2024.

"We know that Karazin University has ambitious plans, and they must be implemented, so we are more than happy to be able to support," emphasized Eric Schweikhardt, director of the project "Strengthening the sustainability of cities in Ukraine".

"We managed to make a positive decision in the shortest possible time to provide assistance in the restoration of Kharkiv University, said Christopher Fuchs, Head of the Economic Section of the Embassy of the Federal Republic of Germany in Ukraine. — And we look forward to working closely with the university in the future."

Rector of Karazin University, professor Tetyana Kaganovska, on behalf of the entire Karazin community, expressed gratitude for the help and emphasized that the replacement of windows will contribute to the offline restoration of a number of social projects of Karazin University, including the Karazin Weekends project for school children.

The SUR is a part of the transitional development assistance, provided by the German government. The aim of the project, commissioned by the BMZ, is to strengthen urban resilience in the areas of supply infrastructure and housing with a particular focus on women and vulnerable groups.

In addition to activities in disaster risk management, development of resilient urban development concepts and digital damage analysis, the project also focuses on the rehabilitation of supply infrastructure, housing and social infrastructure in the areas most affected by the war.

<https://karazin.ua/en/news/uriad-nimechchyny-vizme-uchast-u-nbsp-vidnovlenni-karazinsko/>

The International School of Pedagogical Mastery

"Education 4.0 and Pedagogical Excellence"



From December 16 to 20, the Ukrainian Engineering and Pedagogics Academy hosted the fifth International School of Pedagogical Mastery, "Education 4.0 and Pedagogical Excellence," organized by the Department of Information and Computer Technologies and Mathematics and the Center for Innovative Educational Technologies. Approximately 300 educators, trainers, researchers, and administrators registered for the event, with 90 to 130 participants attending online master classes.



The special theme of the school, "The Digital Compass of a Modern Specialist," is aimed at raising awareness of digital tools, which is key to supporting innovation in the fields of education and the economy.

The school was supported by the Public Union "Association for the Development of Professional and Lifelong Education," the project "Strengthening the Capacity of Ukrainian Academic Workers in Innovative Pedagogical-Psychological Education and Research" implemented by Masaryk University (Brno) with the support of the Ministry of Foreign Affairs of the Czech Republic, Erasmus+ project CRED4TEACH ("Microcredentials Based on MOOCs for Professional Development of Educators"), and Erasmus+ project UA-Talent-UP ("Development of Entrepreneurial, Creative, and Intercultural Competencies for Quality Teaching in Ukraine"). Participants gained exposure to new platforms, services, and advanced AI and digital technologies in education. They were also encouraged to complete individual assignments and submit them to the organizing committee.

As a result of the program, all attendees will receive certificates and invaluable experience in emerging educational and scientific trends. They are now better equipped to adopt new developments from international higher education institutions.

Karazin is Proud: in 2024, the Department of Molecular Genetics Research of the "Karazin BioMed" Biomedical Research Laboratory was opened



In 2024, Karazin University opened a new modern educational and scientific space —the Department of Molecular Genetics Research in the Biomedical Research Laboratory "Karazin BioMed" at the Department of Biochemistry, School of Biology. Thanks to world-class equipment, students and researchers now have a unique opportunity to work with technologies shaping the future of medicine: from automated DNA extraction to real-time PCR analysis.



Here, students acquire skills that meet the highest employer demands in molecular diagnostics, medical genetics, and forensics. Modern equipment, including the robotic QIAcube system and the AriaMx system, comes with its virtual simulator, providing access to learning even remotely.

The opening of a new educational and scientific space at Karazin University contributes to the development of innovative scientific infrastructure in the field of biomedicine.