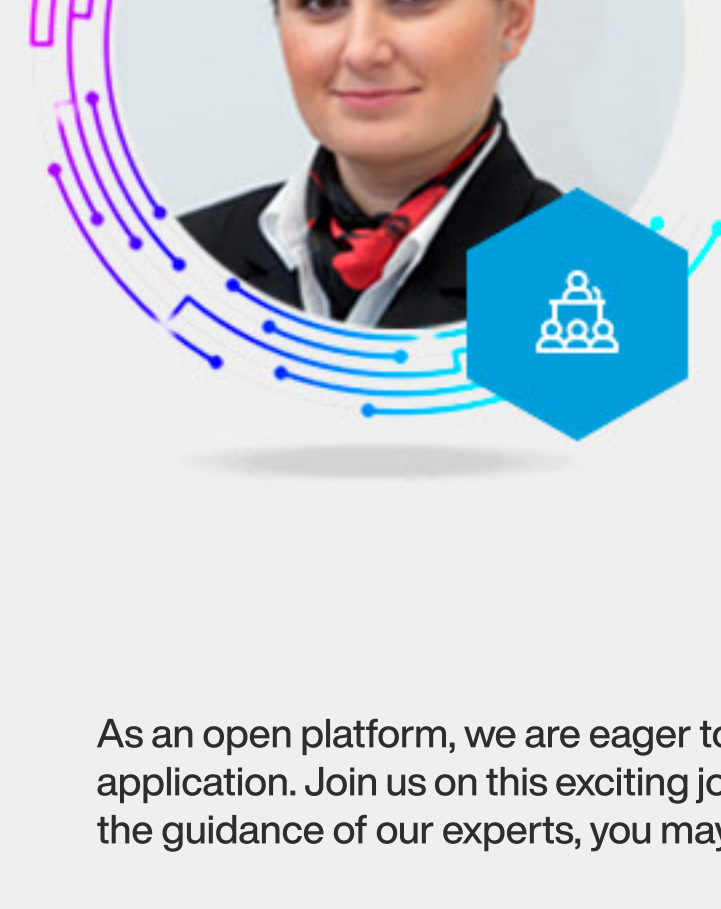




Opening Words



Prof. Jana Kukutschová
Director of FIP-AI@VSB-TUO and
Vice-Rector for Science and Research at VSB-TUO

Dear reader,

We are excited to share the first issue of the newsletter of the Fraunhofer Innovation Platform for Applied Artificial Intelligence for Materials & Manufacturing at VSB – Technical University of Ostrava (FIP-AI@VSB-TUO). We would like to keep you up to date with all the latest news from this exceptional collaboration between **VSB – Technical University of Ostrava** and the renowned Fraunhofer-Gesellschaft, the world's leading applied research organisation. Together with the **Fraunhofer Institute for Machine Tools and Forming Technology IWU** and the **Fraunhofer Institute for Chemical Technology ICT**, we have created a Czech-German partnership focused on the development of sustainable industrial production. Our joint efforts involve three key players, each contributing their own expertise. VSB-TUO excels in artificial intelligence and next-generation computing, Fraunhofer ICT focuses on materials research and energy systems, and Fraunhofer IWU specialises in manufacturing technology and production.

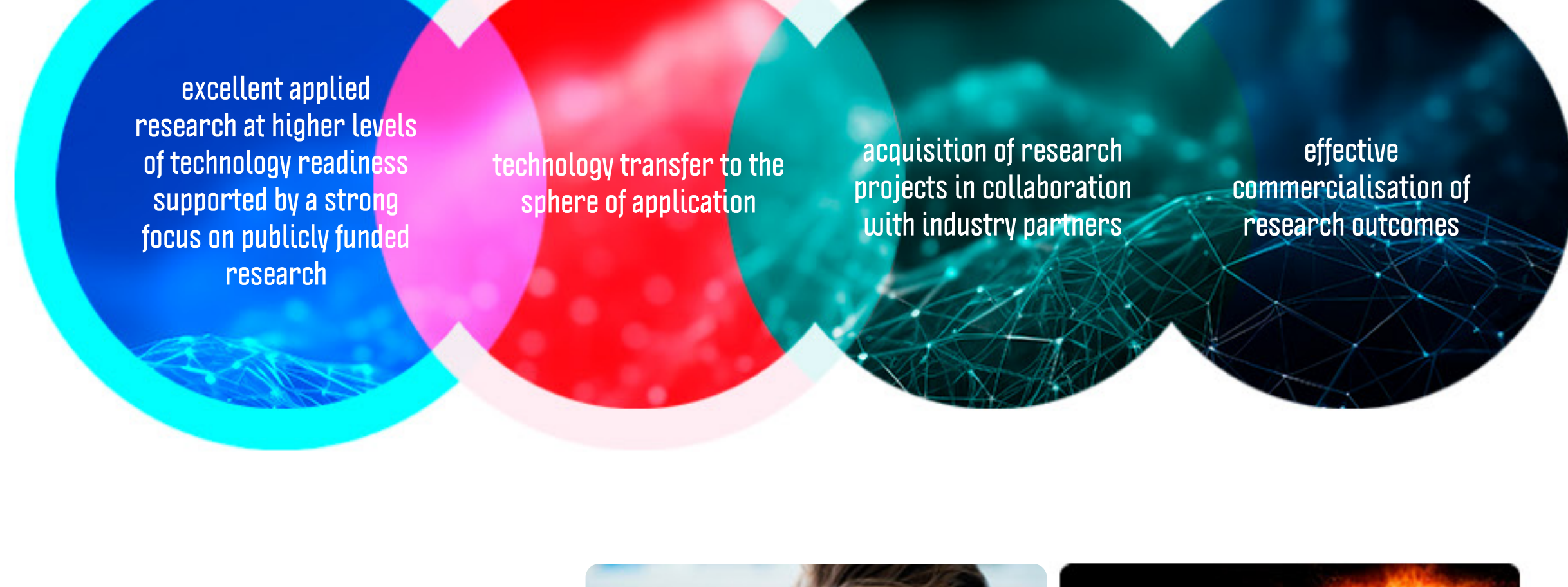
As an open platform, we are eager to foster stronger connections and relationships with partners from the sphere of application. Join us on this exciting journey and tap into the extensive knowledge of our top-notch collaboration. With the guidance of our experts, you may even seize opportunities to enter global markets.

We believe that this newsletter will serve as a valuable source of information, keeping you informed about our joint activities and inspiring new opportunities for cooperation. Your suggestions and ideas are welcome.

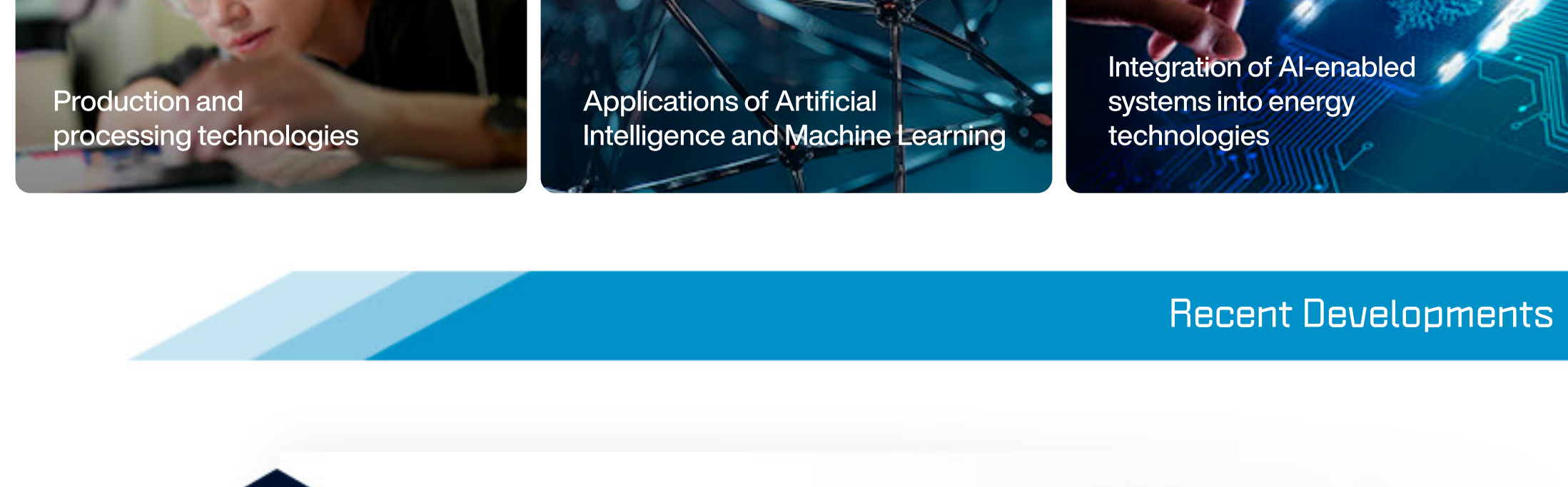
Why work with FIP?



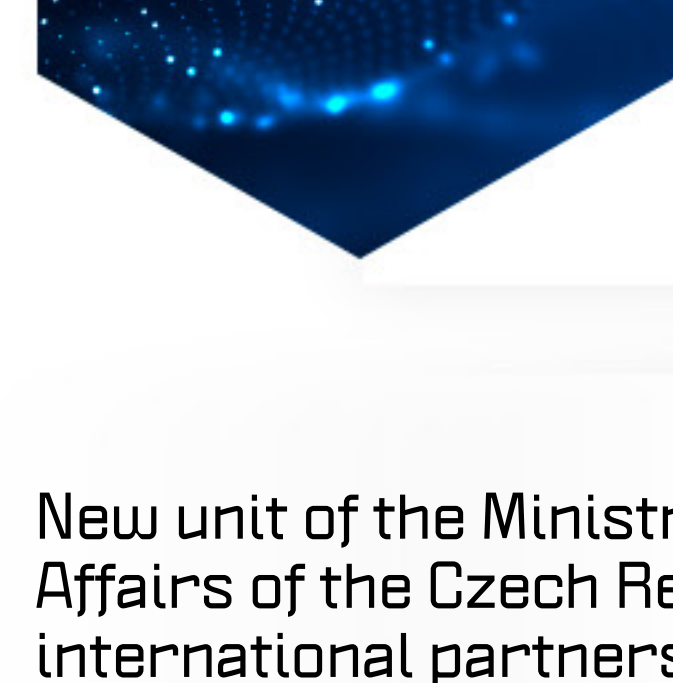
FIP-AI@VSB-TUO provides a strong team for:



Areas of cooperation



Recent Developments

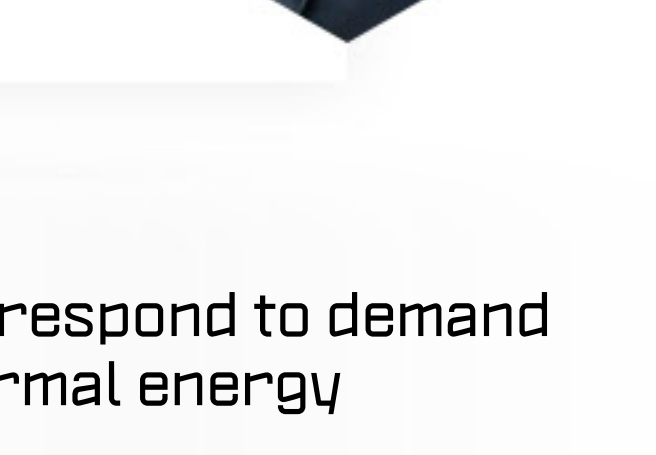


The FIP Management reviewed the results achieved thus far and discussed further development

The Advisory Board meeting of the Fraunhofer Innovation Platform for Applied Artificial Intelligence for Materials & Manufacturing took place at VSB – Technical University of Ostrava in early March. During the meeting the team reviewed what has already been achieved and outlined plans for the upcoming phases. The participants agreed, among other things, on the need to develop cooperation with academic and commercial partners as well as the necessity to further increase the visibility of the platform.

New unit of the Ministry of Foreign Affairs of the Czech Republic to facilitate international partnerships

Jiří Kozák, the First Deputy Minister of Foreign Affairs of the Czech Republic, met with representatives from VSB – Technical University of Ostrava during his recent visit to the Moravian-Silesian Region. Along with visiting the IT4Innovations National Supercomputing Center, there was also an exchange of ideas regarding the University's collaboration with the recently established Department of Science Diplomacy and the introduction of the Fraunhofer Innovation Platform, FIP-AI@VSB-TUO, the only one of its kind in the Czech Republic.



VSB-TUO researchers respond to demand for sustainable geothermal energy

How to extract energy from the rock environment beneath the Earth's surface and utilise it, for example, for heating buildings? Scientists at VSB – Technical University of Ostrava (VSB-TUO) have been working on this question for a long time. However, with recent developments such as the Green Deal, the conflict in Ukraine, and the energy crisis, there has been a substantial surge in public demand for sustainable energy. A starting point for further research is the newly completed international project Geothermal Energy in Special Underground Structures (GeoUS), during which researchers from VSB-TUO collaborated with the German research organisation Fraunhofer-Gesellschaft and the University of Vaasa in Finland. The EnergyLab which is part of the upcoming RE-FRESH project will also deal with the use of geothermal energy.

German Ambassador Andreas Künne's visit to VSB-TUO

It was our great pleasure to host Andreas Künne, the German Ambassador to the Czech Republic, on Friday 9th June. We engaged in fruitful discussions regarding our University's activities, with a special focus on the remarkable Czech-German partnership fostered through the Fraunhofer Innovation Platform FIP-AI@VSB-TUO, which is celebrating its second anniversary this week. During his visit, the Ambassador also had the opportunity to meet with representatives from the Faculty of Materials Science and Technology, and together they explored the StudentCar automotive design laboratories.



FIP Academy



The FIP Academy's fruitful journey: eight webinars fostered knowledge exchange this academic year

The FIP Academy's eighth webinar concluded programme with expert speakers – Clemens Possel from the Fraunhofer Institute for Chemical Technology ICT, who focused on the potential of quantum computing for the prediction of properties of molecular systems, and Michal Kravčenko from the IT4Innovations National Supercomputing Centre at VSB-TUO, who spoke about surrogate models in engineering using artificial intelligence methods.



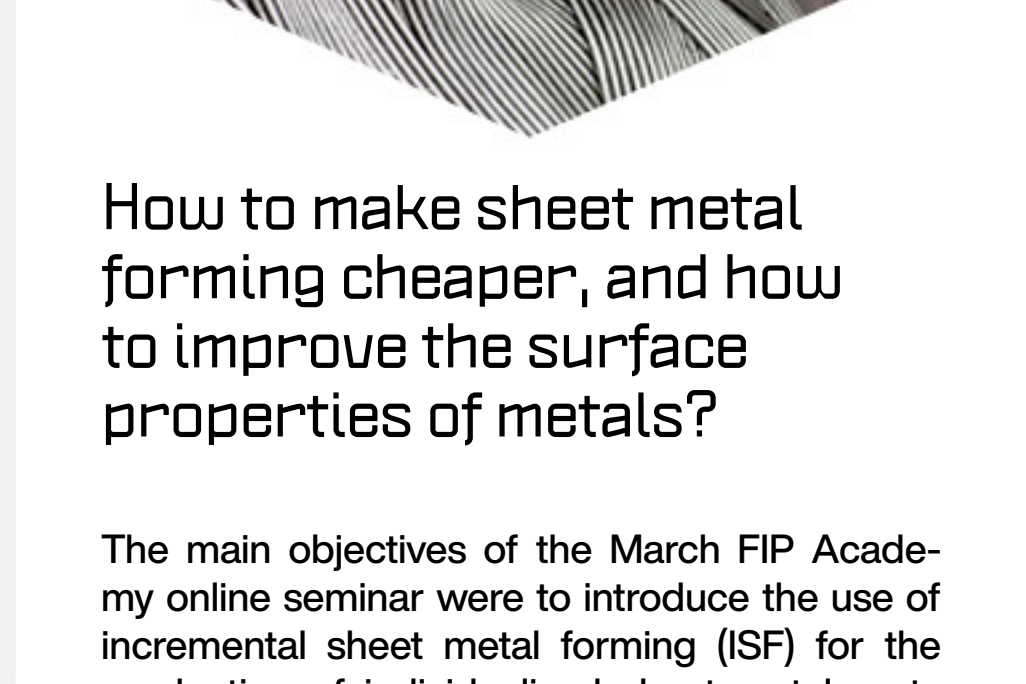
Exploring sustainable energy technologies: insights from the FIP Academy webinar

How to get heat from sustainable sources and can photocatalysis be used to solve the climate crisis? Participants in the May FIP Academy webinar pondered these questions. Research on both topics was presented by Dieter Weise from the Fraunhofer Institute for Machine Tools and Forming Technology IWU and Martin Reli from the Institute of Environmental Technology, one of the CEET units at VSB – Technical University of Ostrava.



The April FIP Academy webinar: nanofilters and 3D skeleton winding

Ladislav Svoboda from the Nanotechnology Centre, one of the CEET units at VSB-TUO, and Björn Beck from the Fraunhofer Institute for Chemical Technology ICT were the main protagonists of the April FIP Academy webinar. In the first presentation the interested parties could learn about some specific applications of graphitic carbon nitride, and in the second they were introduced to the possibilities of applying 3D skeleton winding, a novel process for the production of thermoplastic structural lightweight components.



How to make sheet metal forming cheaper, and how to improve the surface properties of metals?

The main objectives of the March FIP Academy online seminar were to introduce the use of incremental sheet metal forming (ISF) for the production of individualised sheet metal parts in small quantities, and also to demonstrate the possibilities of the relatively new micro-arc oxidation technology for surface modification of structural materials and titanium implants. These topics were presented by Dieter Weise from the Fraunhofer Institute for Machine Tools and Forming Technology IWU and Roman Gabor from the Nanotechnology Centre, part of the Centre for Energy and Environmental Technologies at VSB – Technical University of Ostrava.



Scientists highlight the importance of programmable materials and supportless 3D printing

The series of FIP Academy online seminars continued in February 2023 with a presentation by Christof Hübner from the Fraunhofer Institute for Machine Tools and Forming Technology IWU and the Faculty of Electrical Engineering and Computer Science at VSB-TUO - the cutting-edge automated quality assurance software Xeidana and the Smart Cushion Pin 4.0, designed for sheet metal forming processes.

Highlights

We have established cooperation with the Fraunhofer Project Center for Advanced Lightweight Technologies (FPC ALiHT) at Opole University of Technology, Poland. This partnership has already facilitated mutual visits between our universities, fostering a fruitful exchange of ideas and expertise. Opportunities for joint projects or publications are being identified. Both institutions have also agreed to join forces in promoting research and innovation in international markets.

FIP-AI@VSB-TUO was represented at the International Engineering Fair held in Bmo. One of the highlights of our exhibition was the display of collaborative exhibits developed in partnership between the Fraunhofer Institute for Machine Tools and Forming Technology IWU and the Faculty of Electrical Engineering and Computer Science at VSB-TUO - the cutting-edge automated quality assurance software Xeidana and the Smart Cushion Pin 4.0, designed for sheet metal forming processes.

In March this year, we had the great opportunity to join representatives from ten FIPs from Brazil, Canada, China, Finland, Israel, the Netherlands, South Africa, and South Korea at the FIP Global Exchange meeting in Munich. This platform serves as a hub for exchanging experience, sharing valuable information, and discussing best practices among individual FIPs. The central focus of the event was "Clients' perspective – understanding the FIP".

The Energy Forum 2023, which took place on 26 April in cooperation with VSB-TUO, Fraunhofer IWU and EINS within the European project GeoUS – Horizon 2020, explored the topic of renewable heat. The event featured discussions on international research projects and applications at regional level.

In May, the Fraunhofer Institute for Chemical Technology ICT and the IT4Innovations National Supercomputing Centre at VSB TUO presented results from their co-operation in applying methodologies from Artificial Intelligence (AI) to the development of high temperature corrosion-resistant coatings on the International Conference for Metallurgical Coatings and Thin Films ICMCTF 2023, held annually in San Diego, California, USA. The findings achieved by means of AI were highlighted and perspectives for further progress were shown.

The Fraunhofer Innovation Platform FIP-AI@VSB-TUO attended the Science Fair, the largest popular science event in the Czech Republic, organised by the Czech Academy of Sciences, for the first time. The aim of their attendance was to highlight the cooperation with its partners and in this case in particular the research institutes at VSB – Technical University of Ostrava.

Follow us

LinkedIn

Brochure

