Discover **new** research opportunities

AGENDA GUIDE

ICMEM 2025 | NATURE FIRST
International Conference on Manufacturing Engineering and Materials
23.06 - 27.06 2025, **Nový Smokovec, Hotel Atrium, Slovakia**
www.icmem2025.eu

ICMEM 2025

International Conference 2025 Foreword

Ladies and gentlemen, distinguished guests, fellow speakers, dear Friends,

It is with immense pleasure and anticipation that we welcome you to the International Conference on Manufacturing Technology and Materials, jointly organized by the esteemed Faculty of Manufacturing Technologies of the Technical University of Košice (TUKE) with its seat in Prešov, Slovakia, and the Mechanical Engineering Faculty of VŠB-Technical University of Ostrava, Czech Republic. We are particularly delighted to host this significant gathering in the breathtaking setting of the High Tatras, at the Hotel Atrium in Nový Smokovec.

This conference serves as a vital platform for researchers, academics, and industry professionals from across Europe – with over 60 participants representing diverse institutions and nations – to converge, exchange cutting-edge knowledge, and foster collaborations in the dynamic fields of manufacturing technology and materials science.

In an era defined by the urgent need for sustainable practices, this conference places a strong emphasis on how innovation in manufacturing can contribute to a more environmentally responsible future. We are thrilled to feature two distinguished keynote speakers who will illuminate critical aspects of this theme. Our first keynote from Germany will focus into Condition Monitoring by Means of Acoustic Emission and Artificial Intelligence, showcasing how advanced sensing and intelligent algorithms can optimize industrial processes, minimize waste, and extend the lifespan of machinery – key pillars of sustainable manufacturing.

Our second keynote from Italy will explore Powder Mixed Electric Discharge Machining in Micromachining, highlighting precision techniques that can lead to resource-efficient production of intricate components, reducing material consumption and environmental impact.

International Conference 2025 Foreword

One of our largest and most significant sessions will be dedicated to Water Jet Technology. This versatile and increasingly sophisticated technology plays a crucial role in sustainable manufacturing by offering precise cutting with minimal material waste, reduced heat generation, and the elimination of hazardous fumes often associated with other cutting methods. Its applications across diverse industries highlight its potential to contribute significantly to more environmentally friendly production processes. We are eager to explore the latest advancements and applications in this vital field

Among the many other exciting topics, we are also keen to explore the potential of Revolutionizing 3D Printing Through Machine Learning: Potential and Challenges in Bioprinting. This session promises to highlight how intelligent automation can optimize material usage and drive innovation in fields like bioprinting, with significant implications for sustainability in healthcare and beyond.

We believe that the exchange of ideas and the networking opportunities provided by this conference will be instrumental in driving forward research and development that not only enhances manufacturing efficiency and product quality but also minimizes our environmental footprint. The stunning natural beauty of the High Tatras serves as a potent reminder of the importance of environmental stewardship, further reinforcing the significance of our focus on sustainability within the context of manufacturing and materials science.

We are also delighted to announce that the MM Science Journal is a valued partner of this conference, and accepted papers from the event will be published in their esteemed journal, providing a valuable opportunity for wider dissemination of your research.

We extend our sincere gratitude to all participants, keynote speakers, presenters, reviewers, and the organizing committees from both TUKE in Prešov and VŠB-TU Ostrava for their dedication and hard work in making this conference a reality. We trust that your time in Nový Smokovec will be both productive and inspiring, fostering new collaborations and contributing to a more sustainable and innovative future for manufacturing.

Welcome to ICMEM 2025!

Sergej Hloch
Conference Chair

International Conference 2025 INFORMATION

Highlights

- **Advanced Manufacturing:** Exploring conventional & unconventional technologies.
- **Materials Characterization:** Understanding material properties for sustainable use.
- **Environmental Preservation:** Focus on natural resource management.
- **Rationalized Processes:** Visions for efficient and lean manufacturing.
- **Industrial Competitiveness:** Achieving sustainability as a competitive edge.
- **Industry 4.0 for Sustainability:** Leveraging digitalization for eco-friendly practices.
- **Reduced Environmental Footprint:** Strategies and technologies for minimizing impact.

Who We Are

We, the organizing committee, are a passionate collective of researchers deeply immersed in the realms of advanced manufacturing, innovative material processing, and thorough material characterization. Recognizing the pressing environmental realities that confront our world, we are driven by a commitment to generate new knowledge that can serve as a vital piece in the intricate puzzle of achieving sustainable manufacturing and engineering, both here on Earth and in the exciting possibilities of extra-terrestrial environments. This conference embodies our dedication to fostering the exchange of ideas and advancements that will pave the way for a more sustainable future.

www.icmem2025.eu

International Conference 2025 Keynotes

Jan Olaf

Professor DHBW

Intelligent Machines: AI-Based Condition Monitoring in Manufacturing

- AI Predicts Tool Failure with High Accuracy (up to 92%) via Acoustic Emission.
- Minimize Waste: AI-Powered Prediction of Machining Tool Lifespan.
- Acoustic Emission & AI (CNNs) for Precise Tool Failure Prediction.
- Smarter, Sustainable Machining through AI-Driven Condition Monitoring.

Chiara Ravasio

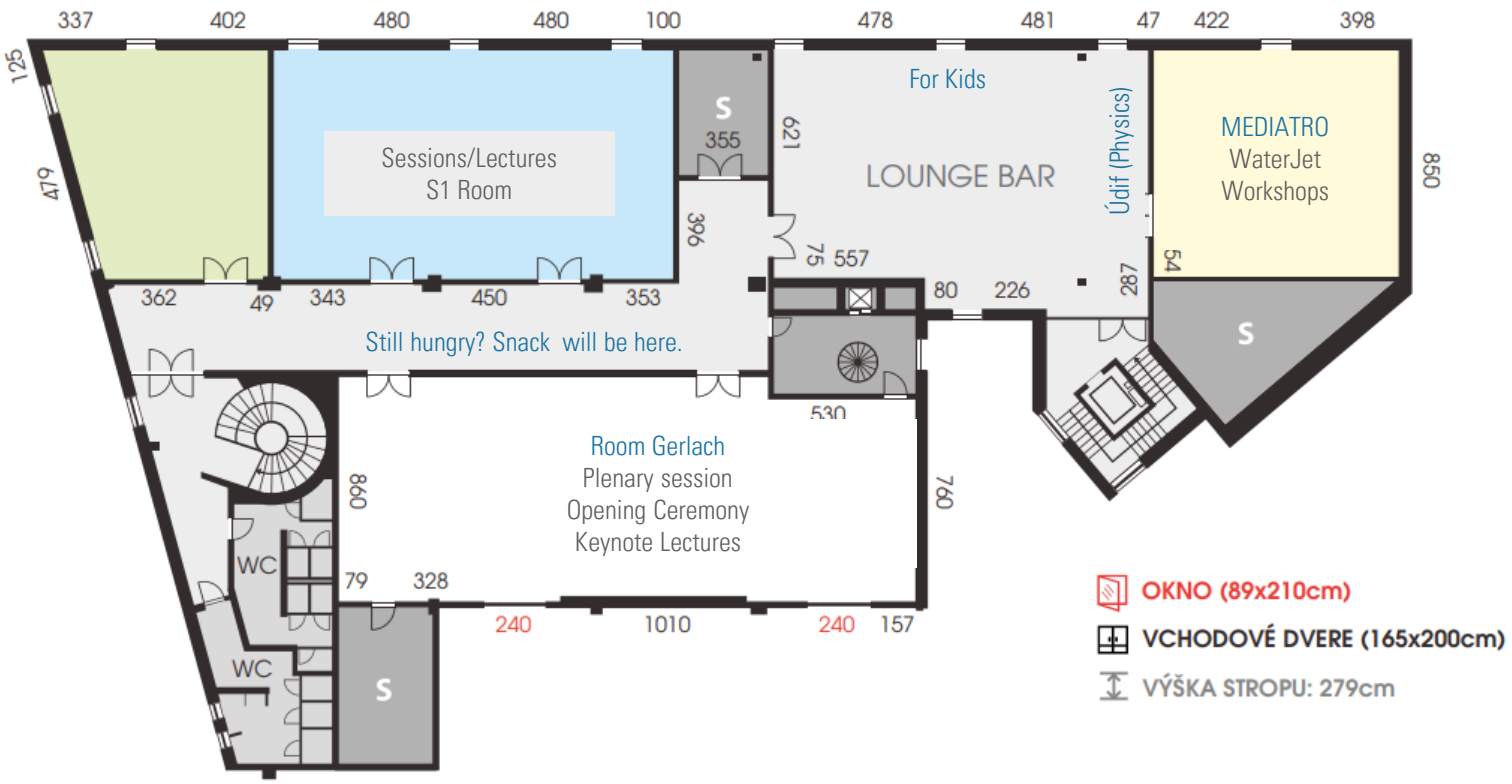
Professor DHBW

Powder Mixed Electric Discharge Machining in Micromachining

- Micro EDM: Internal Hole Surface & Material Transfer Analysis.
- SEM/EDS Reveals Internal Surface Effects & Material Migration in Micro EDM.
- Understanding Internal Quality in Micro EDM Drilled Titanium.

International Conference 2025 Program

	23rd June 2025	24th June 2025	25th June 2025	26th June 2025	27th June 2025
7:00		Breakfast			
8:30		Atrium Restaurant			
9:00		**Opening Ceremony**			
9:15		Room Gerlach			
9:15		Keynote Lectures	**Advanced Manufacturing**		
10:30		Room Gerlach	Room Mediatro		
10:30		Coffee Break		Networking	Check out
10:45					
10:45		Lectures	**Advanced Manufacturing**		
12:30		Room Mediatro	Room Mediatro		
12:30		**Lunch**			
14:00		Atrium Restaurant			
14:00		Lectures	**Lectures/Closing Ceremony**		
15:30		Room Mediatro	Room Mediatro		
15:30		Coffee Break		Networking	
16:00	**Registration**				
16:00		Lectures	Networking		
18:00		Room Mediatro			
19:00	Warm up - Dinner	Dinner	Dinner	Dinner	
22:00	Atrium Restaurant	Atrium Restaurant	Atrium Restaurant	Atrium Restaurant	



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International Conference 2025 - 23th June

15:30 – 18:00 Registration

15:30 – 18:00 Accommodation

18:00 – 22:00 Get-together Dinner Atrium restaurant. First floor.

Manufacturing Engineering and Materials

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Tuesday June 24th

Opening Ceremony | Room Gerlach

9:15 – 9:30
Opening Ceremony

Robert Čep | dean of the Faculty of Mechanical Engineering VSB – Technical University Ostrava
Jozef Zajac | dean of the Faculty of Manufacturing Technologies TUKE with seat in Prešov
Sergej Hloch | Faculty of Manufacturing Technologies TUKE with a seat in Prešov

Amazing Theater of Physics Laser piano

Keynote Lectures

9:30 – 10:30
Keynote Lectures | Room Gerlach
Moderator: Sergej Hloch, Akash Nag

|Technical note|
The presentation length is 30 minutes +10 minutes Q&A session.

Jan Olaf	Baden-Wuerttemberg Cooperative State University Loerrach	Condition monitoring by means of acoustic emission and artificial intelligence	DE
Chiara Ravasio	University of Bergamo	Powder Mixed Electric Discharge Machining in Micromachining	IT

10:45 – 11:00 **Collective photo | In front of Hotel Atrium**

10:30 – 10:45 **Coffee Break | Foyer**

Lectures

11:00 – 12:30

Lectures | Room S1

Moderator: Akash Nag, Gabriel Stolárik

|Technical note|
The presentation length is 15 minutes +5 minutes Q&A session.

Krzysztof Adamczuk University of Zielona Góra	Analysis of tribological and strength properties of selected polymeric materials produced by 3D printing using SLA technology.	**PL**
Damián Peti Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Kinetic Analysis of Crack Formation in Cathodic Electrodeposited Coatings: Influence of Polymerization Time and Thermal Conditions	**SK**
Radoslaw Maruda University of Zieleno Gora	Modeling of problems related to hydrodynamics of nanoparticles-filled active medium formation during machining in minimum quantity cooling and lubricating conditions.	**PL**
János Líska GAMF Faculty of Engineering and Computer Science, John von Neumann University	Harmonic response of acoustic materials by Finite element modeling	**HU**
Witold Habrat Rzeszow University of Technology	Multisensory measurements of thermomechanical interactions during machining of aluminum alloys	**PL**
Botond Szigeti GAMF Faculty of Engineering and Computer Science, John von Neumann University	Agglomeration tendency analysis of stainless-steel powders for dmls production using SEM imaging	**HU**
Ladislav Morovič Faculty of Materials Science and Technology in Trnava, STU - Bratislava	Effect of selected parameters on FDM-high-speed 3D printed specimen properties	**SK**

12:30 – 13:45 **LUNCH | Restaurant Hotel Atrium**

Tuesday June 24th

Lectures

13:45 – 15:30

Lectures | Room S1

Moderator: Jakub Poloprudský, Gabriel Stolárik

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

Krzysztof Adamczuk University of Zielona Góra	Analysis of tribological and strength properties of selected polymeric materials produced by 3D printing using SLA technology	**PL**
Patrik Fejko Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Observation of technological parameters influencing mechanical properties and crack development in aluminum components post-cataphoretic coating	**SK**
Paulina Jamrozińska Opole University of Technology	Wear assessment of aluminum cages in a large-size wire raceways bearing	**PL**
Joanna Lisowicz Rzeszow University of Technology	Graphite-Enhanced MQL in Ti-6Al-4V Turning: An Integrated Analysis of Machining Performance.	**PL**
Piotr Niesłony Opole University of Technology	Assessment of the impact of techniques and methods for measuring electromagnetic surfaces	**PL**
Ritu Rai Opole University of Technology	Nanomaterials for sustainable technology applications	**PL**

15:30 – 15:45 — **Discussion during Coffee Break | Foyer**

15:45 – 17:15

Lectures | Room S1

Moderator: Jakub Poloprudský, Gabriel Stolárik

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

Piotr Niesłony Opole University of Technology	Verification of methods for assessing internal surfaces of skeletal structures produced by 3D printing techniques	**PL**
Anna Bazan-Krzywoszańska University of Zieleno Gora	Hybrid modeling as a decision support tool for sustainable (urban) development	**PL**
Anastasiia Nazim Faculty of Manufacturing Technologies TUKE with a seat in Prešov	The concept of a digital twin based on the asset administration shell (AAS) standard with 3D visualization	**SK**
Marcin Salata Rzeszow University of Technology	Effect of Diamond Grinding Wheel Properties on the Creep-Feed Flute Grinding of Cutting Tools	**PL**
Łukasz Żyłka Rzeszow University of Technology	The influence of Abrasive Grain Characteristics on Surface Quality and Grinding Performance in CFG of Inconel Alloy	**PL**
Anna Bazan Rzeszow University of Technology	An example of using Monte Carlo methods to estimate the repeatability of surface topography parameter determination in measurements performed with the focus variation method	**PL**
Lenka Čepová Faculty of Mechanical Engineering, VSB – Technical University of Ostrava, Ostrava, Czech Republic	Influence of the measurement of anti-reflective coating layers for optical measurement	**CZ**
Matúš Geľatko Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Eddy current testing of Inconel 718 alloy – preliminary study	**SK**

End of the Session – see you at 18:00 Dinner

Wednesday June 25th

Waterjet Workshop

9:00 – 10:30

Lectures | Room Mediatro

Moderator: Sergej Hloch

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

Jana Petrů Faculty of Mechanical Engineering, VSB – Technical University of Ostrava, Ostrava, Czech Republic	Evaluation of erosion resistance of additive 3d printed materials under continuous and pulsating water jet exposure	**CZ**
Alice Chlupová Institute of Physics of Materials, The Czech Academy of Sciences, Brno, Czech Republic	Water erosion performance of 316L steel prepared by selective laser melting	**CZ**
Gabriel Stolárik Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Surface treatment with a pulsating water jet.	**SK**
Jakub Poloprudský Institute of Physics of Materials, The Czech Academy of Sciences, Brno, Czech Republic	Attenuation of droplet impacts on Ti alloy caused by submerged conditions	**CZ**
Grzegorz Krolczyk Opole University of Technology	Predictive Modeling and Surface Analysis Waterjet Erosion in Biometals	**PL**

10:30 – 10:45 — **Coffee Break | Foyer**

10:45 – 12:15

Lectures | Room Mediatro

Moderator: Sergej Hloch

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

Munish Gupta Opole University of Technology	Data-Driven Approaches in Non-Conventional Machining Processes: A Short Review	**PL**
Akash Nag Faculty of Mechanical Engineering, VSB – Technical University of Ostrava, Ostrava, Czech Republic	Abrasive water jet micromachining	**CZ**
Timotej Hloch University of Chemistry and Technology Prague	Rotaxanes as building blocks for metal organic frameworks	**CZ**
Frank Prude Baden-Wuerttemberg Cooperative State University Loerrach	Water Jetting Technologies: A Joint Master's Program Proposal	**DE**

12:30 – 13:45 — **LUNCH | Restaurant Hotel Atrium**

International Conference 2025

Wednesday June 25th

Manufacturing Session

14:00 – 15:30

Lectures | Room S1

Moderator: Phu Ma Quoc, Akash Nag

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

František Botko Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Machining of protruding shapes using abrasive water jet – preliminary study	**SK**
Dániel Medgyesi GAMF Faculty of Engineering and Computer Science, John von Neumann University	Validation of a Simplified Vehicle Model Using a Genetic Algorithm	**HU**
Andrzej Perec AJP University, Gorzow	The fragmentation of chosen abrasive materials grains during the AWJ machining process	**PL**
Chiara Ravasio University of Bergamo	Analysis of the modification of both electrodes in microEDM drilling	**IT**
Dagmar Klichová Faculty of Manufacturing Technologies TUKE	Transformation of metrology procedures for surface quality evaluation using profile parameters.	**SK**
Ladislav Morovič Faculty of Materials Science and Technology in Trnava, STU - Bratislava	Accuracy of drawn steel tubes manufactured under mass production conditions	**SK**

15:30 – 15:45 — **Discussion during Coffee Break | Foyer**

15:45 – 17:00

Lectures | Room S1

Moderator: Phu Ma Quoc, Akash Nag

|Technical note|
Presentation length is 10 minutes +5 minutes Q&A session.

Mohamad Ghasemian Faculty of Mechanical Engineering, VSB – Technical University of Ostrava, Ostrava, Czech Republic	Advanced Lattice Design for Biomedical Applications Using Additive Manufacturing Techniques	**CZ**
Radoslaw Maruda University of Zieleno Gora	Modelling analysis and process optimisation of injection-moulded and blanked parts used in high reliability relays for critical infrastructure applications	**PL**
Olha Kalman Faculty of Manufacturing Technologies TUKE with a seat in Prešov	Surface quality assessment using a multispectral camera focusing on accuracy and color variations of printed parts made with FDM technology	**SK**
Richard Antala STU Bratislava	Laser modification of surface properties of Ti based composites prepared via powder metallurgy	**SK**
Phu Ma Quoc Faculty of Mechanical Engineering, VSB – Technical University of Ostrava, Ostrava, Czech Republic	Research activities in Additive Manufacturing at VSB-TUO and opportunities in using bioprinting for cancer research	**CZ**
Lukasz Wieczorek Kelvion Sp. z o.o., Kobaltowa 2, 45-641 Opole, Poland	Analysis of vibrations and hole surface roughness during drilling of packages sheets using tools with varying degrees of wear	**PL**

17:30 – 18:00 Closing ceremony – The Best Paper Award

End of the Session – see you at 18:00 Dinner

THURSDAY | June 26th, 2025

Networking – Cooperation opportunities, project opportunities, future manuscripts

FRIDAY | June 27th, 2025

ICMEM 2025 | Farewell ICMEM

Journal Support

Journal information

MM SCIENCE JOURNAL

Publisher name: MM SCIENCE

Journal Impact Factor ™

0.6	0.5
2023	Five Year

JCR Category	Category Rank	Category Quartile
ENGINEERING, MECHANICAL *in ESCI edition*	163/180	Q4

Source: Journal Citation Reports 2023. Learn more

Journal Citation Indicator ™

0.17	0.17
2023	2022

JCI Category	Category Rank	Category Quartile
ENGINEERING, MECHANICAL *in ESCI edition*	160/180	Q4

Financial support

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Potlač textilu

For KIDS

Block 1 Experiments with IR and Microwave Radiation: What's important is invisible to the eye. Near-infrared radiation, though unseen by our eyes, has the ability to warm us or increase our electricity bill if it emanates from our chandeliers. You will see what the world looks like through infrared eyes, why Coca-Cola appears white, and why you can no longer buy a camera with night vision.

What shouldn't we try at home in the microwave? The plasma generator we all have at home will show us sparks and discharges, melt glass, and with the help of chocolate, we'll see how microwaves are distributed inside it. How about measuring the speed of light at home? Get inspired by our microwave demonstrations.In the manufacturing part with children, we will make an electronic game "Don't Touch." A simple circuit trains patience and precision. Can you navigate the path with a loop without touching?

Block 2 Experiments with Fire: Can something burn but not be consumed? Is it always a good idea to extinguish with water? And what colors can a flame have? We will show a variety of flammable experiments, and perhaps even ignite someone's passion for science.WS with Fire (Workshop): We will let you touch fire, play alchemists discovering gunpowder, and pyrotechnicians coloring light fireworks. And finally, you will make a rocket from cat litter powered by gunpowder

Block 3 Experiments with UV Light: Is dazzling white laundry really cleaner? How to detect counterfeit money and identify who has artificial teeth or dyed hair? We will look around in UV light and illuminate the world around us and yourselves. We will even draw with UV light!For Younger Students - WS with Density (Workshop): Colorful and fragrant experiments where children will observe a physical cocktail, create their own small lava lamp, and their own diver.

….A true love affair….with an engineering revealed.

What an incredible few days at ICMEM 😍 2025, Jana! The energy, the insights... truly inspiring. So much passion for engineering!

Absolutely, Robert! The dedication here has been excellent. It makes you excited for what's next, doesn't it? 😘 🤩

Definitely! Speaking of what's next... With Valentine's Day 💞 coming up, my heart's already set on our next gathering. 😉

I'm ready! Let's do it. 🎉

Our 💕 are already focused on ICMEM 2027! 😉 💖

Yes, I 💘 it! ICMEM 2027: Engineering with Heart for a Sustainable Future! 💖

Join us Feb 9-11, 2027. Just like Valentine's Day celebrates passion, ICMEM 2027 will be our. 💡

Because true engineering ⚙️ comes from the 💖.

Save your 🗓️ Feb 9-11, 2027 🌱. Let's make this next chapter of our engineering 'love story' truly unforgettable! 🚀

February 9-11, 2027, VŠB – Technical University Ostrava

Protolab 3D Printing Centre

Protolab was founded with the idea of enabling small and medium-sized companies to access modern prototyping technologies and thus enable them to compete not only within the region but also on a European or global level. Cutting-edge technologies for industrial 3D printing are very expensive and out of reach for many SMEs.











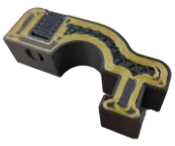

Professional 3D Printing in Ostrava

We offer 3D printing products and design services to small and medium-sized companies in the Moravian-Silesian region and beyond.

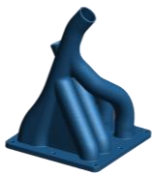
Inspired by Research, Driven by Innovation


Metal printing


Plastic printing


Composite printing


3D scanning


Reverse engineering


3D modelling & optimization