

# GERMAN-POLISH YOUNG RESEARCHERS SCHOOL ON MATHEMATICS AND MECHANICS – GPSON2M

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The first edition of the German-Polish Young Researchers School on Mathematics and Mechanics (GPSON2M) took place at the WUST in Wrocław on 12-14 January 2025. The GPSON2M was organized by the Wrocław University of Science and Technology (WUST), the Poznań University of Technology (PUT) and the Polish Section of GAMM. We are grateful for the patronages over GPSON2M that were provided by the President of GAMM – Prof. Karsten Urban, Rector of PUT – Prof. Teofil Jesionowski, Rector of TU Dresden – Prof. Ursula Staudinger, Rector of WUST – Prof. Arkadiusz Wójs. The school was sponsored by the Polish Ministry of Science and Higher Education, Rector of WUST, and Rector of PUT.

The initiative to organize an annual school for young scientists from Poland and Germany was born during a meeting of: Prof. Mieczysław Kuczma – Chairman of the Polish Section of GAMM (PUT), Prof. Dariusz Łydzba – Deputy Rector of WUST, and Prof. Matthias Ziegenhorn (BTU Cottbus-Senftenberg). The principal aims of GPSON2M are:

- to bring together young mathematicians and mechanicians from academia and industry of the two EU neighbour states in order to present and exchange results of cutting-edge research, and
- to learn modern computer-based methods for laboratory testing, mathematical modelling and numerical solution of hot research problems.

These scientific meetings are also intended to foster better mutual understanding and cooperation among young scientists from these two neighbouring EU countries. As the guiding scientific disciplines, we have chosen Mathematics and Mechanics, which inspire and complement each other, expanding their research areas, as well as cognitive tools and methods. Together, they constitute the indispensable foundations of all sciences, ensuring consistency and precision in the analysis of phenomena. In the era of rapid development of knowledge and civilization, based on computers and information processing technologies, including increasingly advanced artificial intelligence, the importance of Mathematics and Mechanics can-



not be overstated. Their application is not limited to theory, but includes practical solutions to problems in engineering, natural and social sciences, as well as in the development of technologies of the future, such as big data analysis, process automation and the creation of digital models (Digital Twins). Thanks to the synergy of these two fields of science, it is possible to further push the boundaries of human cognition and improve tools supporting the development of human civilization.

The agenda of GPSON2M consisted of a session devoted to the memory of Prof. Fritz Nöther (1884–1941), three workshops, and a roundtable discussion. Prof. Fritz Nöther (younger brother of Emmy Nöther) worked at the WUST (then: Lehrstuhl für Höhere Mathematik und Mechanik an der Technische Hochschule Breslau) in the years 1921–1933, and his fate ended tragically in the Soviet Union during the totalitarian systems then; Prof. Holm Altenbach and Prof. Matthias Ziegenhorn talked about Fritz Nöther's life and scientific activities. Prof. Janusz Badur (IMP PAN Gdańsk) gave a lecture on "From continuum mechanics

backgrounds to Emmy Noether's symmetries". Prof. Michael Kaliske (TUD) delivered lectures on "Computational engineering to drive innovations", Prof. Łukasz Płociniczak (WUST) talked on "Numerical methods for PDEs, FEM, stability, convergence", while Prof. Janusz Szwabiński (WUST) presented the topic "Artificial intelligence and machine learning methods in mechanical engineering". The roundtable discussion, chaired by Prof. Błażej Skoczeń (Kraków UT), focused on the issue of "Scientist and Science: their roles and responsibilities towards society and the environment".

Altogether over 60 participants took part in the first edition of GPSON2M. In the future other components of GPSON2M will be implemented, including posters and short presentations by young researchers. The next editions of GPSON2M are already planned: Prof. Michał Kaliske will organize GPSON2M in Dresden in 2026 and Prof. Mieczysław Kuczma will organize GPSON2M in Poznań in 2027.