GAMM 2025 POZNAŃ

KARSTEN URBAN, GAMM PRESIDENT

Ladies and Gentlemen,
dear GAMM members and colleagues,

on behalf of the board, I cordially welcome you to Poznań and to the 95th annual meeting of the GAMM, the International Association for Applied Mathematics and Mechanics.

It is a pleasure to particularly welcome
- the State Secretary of the Ministry of Science and Higher Education, Mrs. Karolina Zioło-Pużuk,
- the Vice-Marshal of the Wielkopolska Region, Mrs. Katarzyna Kretkowska
- and the Rector of the Poznań University of Technology, Prof. Dr. Teofil Jesionowski.

It is a good tradition of GAMM to regularly hold our annual meeting outside Germany. In fact, even though GAMM has been founded in 1922 in Germany and is an organization under the German society law, GAMM has always been an international science organization, which is also reflected by our name: *International* Association for Applied Mathematics and Mechanics. However, for many reasons including the Covid pandemic, our last annual meeting being held outside Germany dates to 2019, when we met in Vienna. Six years later we are in Poznań. It is for the third time that we meet in Poland after 1991 in Krakow and 2009 in Gdansk. I welcome Prof. Gwidon Szefer from the Technical University of Krakow, who organized the first GAMM meeting in Poland in 1991.
We are extremely grateful to GAMMs national section in Poland with its president Prof. Kuczma and the chairs of the organizing committee, Professors Kuczma, Lodygowski and Sumelka for inviting us to this wonderful city and the impressive campus of the Poznań University of Technology.

Drogi Mietku, drogi Tomasz, drogi Wojciech,
drogie Koleżanki i Koledzy z Politechniki Poznańskiej,
drodzy Członkowie polskiej sekcji GAMM,
drodzy Przyjaciele,

w imieniu GAMM serdecznie dziękuję Wam za gotowość zorganizowania naszej 95. Dorocznej Konferencji tutaj w Poznaniu. Jesteśmy ogromnie wdzięczni za wielką go cinność, której do wiadczyli my już podczas wizyty Zarządu w styczniu 2024 roku, a teraz także podczas samej konferencji. Wielu z nas wie, ile ciężkiej pracy wiąże się z organizacją i przeprowadzeniem konferencji o takiej skali, i bardzo doceniamy, że podjęliście się dla nas tego wyzwania. Serdeczne podziękowania za to, że umożliwiliście nam przeżycie tego wyjątkowego wydarzenia na tej wspaniałej uczelni, w tym cudownym mieście i w tak uroczym kraju!

Dziękujemy![1]

The timing of this year's conference slightly differs from the usual week in March. This causes the fact that some of our colleagues could not come because the semester already started in some universities. However, such a deviation is also an opportunity. In fact, for many of you it is the first participation at a GAMM annual meeting, maybe the first international conference of that size at all. This is a great opportunity, and I call you to benefit from the broad spectrum of activities during these days here in Poznań. Discuss with the plenary lecturers, take active part in the mini symposia, the sections, the poster sessions and so many other activities. Use the time during the breaks and in the evenings to talk to researchers who's names you might only know from papers.
But even more, if your main area of research is in engineering, please stay for those presentations, which appear to be more mathematical – and vice versa. It is one of the key selling points of GAMM that we are an interdisciplinary organization. GAMMs founding fathers Richard von Mises and Ludwig Prandtl understood that the synergies of Applied Mathematics and Mechanics are so large and so deep that both communities benefit from their collaboration. Leave your comfort zone, listen to ideas and facts also from other areas and learn, do human learning.
Machine Learning and Artificial Intelligence has initiated a huge hype also in science and research. In fact, we will have many talks at this conference focusing on AI for and in Applied Mathematics and Mechanics. The development of ChatGPT has opened new perspectives also for science

1 Dear Mietek, dear Tomaz, dear Wojciech, dear colleagues from the Poznań University of Technology, dear members of the polish section of GAMM, dear friends!
On behalf of GAMM, I would like to thank you all very much for your willingness to host our 95th Annual Meeting here in Poznań. We are overwhelmed by the great hospitality we have received, both during the Executive Board's visit in January 2024 and now at the conference. Many of us know how much hard work goes into organizing and hosting a conference of this size and greatly appreciate you taking it on for us. Thank you very much for making this experience possible for us at this great university, in this wonderful city, and in this lovely country!
Thank you!

and technology. It seems natural to ask what the specific role of our community might be?

Looking into history often gives a clue. The computer pioneer Joseph Weizenbaum published a ChatBot called ELIZA already in 1966. ELIZA was celebrated as a milestone in artificial intelligence. One version of ELIZA called "Doctor" simulated a conversation with a psychologist. Doctor seemed to pass the Turing test as many users didn't realize they were communicating with a machine. Weizenbaum could have been proud on his success, but he was merely horrified at how seriously many people took this relatively simple program by revealing the most intimate details of themselves in dialogue. ELIZA was perfect at collecting private data. This was the reason why Weizenbaum stopped the experiment ELIZA quite quickly. ChatGPT and others, however, are here to stay – there's no denying that.

One reason is that artificial intelligence has also become a huge business model. A model, however, which is not yet profitable on a large scale, so that the involved companies are highly interested in keeping the current hype alive. Attention creates profit. Moreover, it is a fact that these technologies, as impressive as they are, consume huge amounts of resources and energy. Just as an example, to meet the energy needs of artificial intelligence, Microsoft has inked a major power purchase deal with the owners of the nuclear power plant *Three Mile Island* in Pennsylvania. Recall, the 1979 partial meltdown of the power plant at Three Mile Island was the worst nuclear accident in U.S. history. What does that teach us? What can we learn as engineers or applied mathematicians?

Ivo Babuska, computational scientist and world-renown mathematician for his contributions to the analysis of the finite element method, often posed the question to his students: "Will you sign the blueprint?" When you think on your research in Applied Mathematics and Mechanics, I ask you to keep Babushka's question in mind. Use techniques from artificial intelligence and machine learning as a tool to possibly gain new insights concerning the problem you are currently studying. But never leave the solid ground of knowledge-based findings. As an engineer, use the physics to understand a problem. Keep relying also on first principles and experiments. As a mathematician, maybe you want to try to contribute to the theoretical foundations of artificial intelligence, you might attempt to prove when and why Machine Learning might fail in some cases. Both mathematicians and engineers can help creating new optimization techniques such that the training of huge neural networks can be done without reinstalling Three Mile Island.

There are so many fascinating research directions in our fields. And GAMM is a perfect platform to share, to exchange and to discuss your results, your questions, your success as well as your failures.

This is my third and last annual meeting as president of GAMM. It happened that the role of the sciences for the society is a dominant topic throughout my presidency so

far. As we just had to learn these days, independence of research and teaching as well as an adequate financing is no longer guaranteed in several countries around the globe. However, progress and prosperity are based upon scientific knowledge, research and development. And science is based upon openness, equal rights, international cooperation, freedom, the rule of law, self-determination and diversity. Even though, of course, GAMM is no political society, I am convinced that all scientific associations and their members need to stand for the fundamental values our work in research and teaching is based upon.

However, for me, it is still a great honor and pleasure to serve our association. The pleasure was and is mainly due to the cooperation with so many dear colleagues serving on the various GAMM boards and due to the commitment of the young generation for the GAMM – our very active GAMM juniors, the GAMM junior research groups, our activity groups, the committee for equality, the women networking event, the local GAMM groups and so many more. But GAMM would not function as it does without our good heart and soul Doreen Göhlert, who us running GAMMs office in Dresden, arranging so many things behind the scenes and among all also manages the current GAMM president with his crazy ideas. On behalf of all GAMM members, thank you, Mrs. Göhlert!

Ladies and gentlemen, again, a warm welcome to the 95th annual meeting. I wish us all a scientifically excellent and socially successful, interesting, and exciting meeting here in Poznań.

Karsten Urban, GAMM President