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ADVANCED MATERIALS SCIENCE

Fields of Expertise TU Graz

One of the missions of the FoE Advanced Materials Science is to bring us researchers in the field of materials science together.

This connection is intended to establish mutual support, strengthen current topics, foster out-of-the-box thinking, and jointly explore new material-driven approaches. In doing that, the FoE AMS community is like an active organism, striving for new ideas to tackle emerging challenges and exploring fields introduced by new colleagues.

To support the FoE AMS best, the steering team plans to visit the institutes and to introduce our FoE directly there. So, who are you, active researchers, which topics do you burn for, and what is your perspective on the FoE AMS (what do you know about it, what would be good to have?).

Nothing fuels our research and networking as much as inspiration, especially from our creative and successful young scientists.

We congratulate Robert Winkler from the Institute of Electron Microscopy and Nanoanalysis on being awarded an ERC starting grant for the “Fabrication of functional, freestanding 3D nanoarchitectures via Focused Electron Beam Induced Deposition”. Building nanometer-sized structures atom-by-atom in custom shapes and properties is ready for the next level. His approach will make the tiny structures self-propelled so that function will be brought where needed even in very confined spaces.

Members of the FoE Advanced Materials Science are pursuing intriguing ideas. In the 23rd call of the initial funding programme of TU Graz, we were able to fund innovative project proposals in the areas of physics, chemistry, material science, and geology. The following were successful: Franziska Stamm, Institute of Applied Geosciences; Glen Smales, Institute of Inorganic Chemistry; Anton Tamtögl, Institute of Experimental Physics; Florian Linder, Institute of Solid State Physics; Fabian Gasser, Institute of Solid State Physics; and Melito Gian Marco, Institute of Mechanics. The project ideas range from automated lab-based synthesis and characterization, finding new methods to monitor and control dynamic processes in 2D materials and catalytic surfaces, clarifying the chemical behavior of amorphous silica phases, detecting chiral order in crystals using a new X-ray based approach, realizing a Brillouin spectrometer to optically measure mechanical properties of crystalline materials, and optimizing alloy design by determining the truly relevant process variables. We wish all recipients good luck with their proposal submissions.

In this edition, Aleksandar Kondinski, FoE tenure track professor at the Institute of Physical and Theoretical Chemistry, explains his area of research. He wants us to formalize the construction of complex molecular materials and the language we use to describe it. Can our existing knowledge of complex molecular assemblies with their properties, building blocks, and the reactions that form them become machine-actionable and subject to reasoning algorithms?

Karin Zojer

Source: Lunghammer – TU Graz

What sounds like a purely technical challenge here could fundamentally reshape material design. The principles of such a rich knowledge base, connecting structure to properties, are not unique to a single family of molecular materials. Could this knowledge of assembly modelling be used to create a more general “reverse-engineering” approach for chemistry and even enable inverse design? Imagine requesting a new porous material with certain properties and receiving computationally viable solutions and the synthetic protocols required to make it!

Please save the date: The Advanced Materials Science Poster Day 2026 will take place on Wednesday, 4th February 2026, 14:00.

Advanced Materials Science