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New Thuringian joint project "MikroGraph" launched: Innovative graphene sensor technology for monitoring micropollutants in water

Funded by the European Regional Development Fund (ERDF) and the Free State of Thuringia, the new joint project "MikroGraph" ("Development and Integration of Graphene Sensor Technology for the Analysis of Micropollutants in Combination with Separation Column and Mass Spectrometer Technologies") starts on September 1, 2025. The project is coordinated by the Turchanin Research Group at the Institute of Physical Chemistry of the Friedrich Schiller University Jena.

In collaboration with a strong consortium of Thuringian research and industry partners – the Institute for Microelectronics and Mechatronics Systems (IMMS gGmbH), the Leibniz Institute of Photonic Technology (Leibniz IPHT), Analytik Jena GmbH, LUCAS instruments GmbH, and microfluidic ChipShop GmbH – the project is developing a highly automated and cost-effective analysis system for monitoring micropollutants directly on-site in bodies of water and wastewater treatment plants.

The technological heart of the project is the synergistic integration of three key technologies:

- Graphene Sensor Technology: Development of highly sensitive field-effect transistors (FETs) based on the two-dimensional material graphene for the detection of pollutant molecules at very low concentrations.
- Separation Column Technology: Further development of chromatographic methods for the selective separation of specific pollutants from complex water samples.
- Mass Spectrometer Technology: Design of a new, compact, and portable mass spectrometry unit for the precise identification and quantification of the substances.

Research and Development Project Thuringia "MikroGraph" Joint Project No.: 1003625