



GESELLSCHAFT DEUTSCHER CHEMIKER
ORTSVERBAND HANNOVER

Einladung zum GDCh-Colloquium des Ortsverbandes Hannover

Das Colloquium findet um 17c.t. im Hörsaal OCI (Raum 056, Geb. 2505) der Leibniz Universität Hannover, Organische Chemie, Schneiderberg 1B, 30167 Hannover statt.

Felix-Bloch-Vorlesung *der Gesellschaft Deutscher Chemiker*
auf Vorschlag der Fachgruppe Magnetische Resonanz

27.11.2025 **Prof. Dr. Torsten Gutmann,**
Universität Paderborn

Dynamic Nuclear Polarization and In-situ Solid-State NMR – Powerful Tools to Study Local Structures and Processes in Functional Materials

We are interested in studying functional materials with applications in sensorics, optics, energy storage or catalysis. The main goal is to get a deeper understanding of their mesoscopic structures (range of ca. 10^{-9} to 10^{-6} m), which define the macroscopic properties, i.e. optical properties, catalytic performance etc., of the materials. This information is crucial for a tailor-made design of specific devices with applications in life science.

To obtain this goal we apply multinuclear solid-state NMR techniques to identify structural sites. We further develop and apply dynamic nuclear polarization (solid-state DNP) to boost the sensitivity and thus to make solid-state NMR applicable to materials containing only small surface areas or less sensitive nuclei in natural abundance. Especially, the selective signal enhancement produced by the DNP approach is a powerful tool to identify small amounts of functional groups in the presence of large amounts of NMR active bulk materials.

Very recently we started to investigate sodium containing energy storage materials for which we performed first ex-situ solid-state NMR experiments. In the near future, this research field will be extended to operando techniques that allow to study such materials under working conditions.

Prof. Dr. Jens-Uwe Grabow
Vorsitz OV Hannover

Vor dem Colloquium findet ab ca. 16 c.t. eine ‚Kaffeerunde‘ mit dem Vortragenden in der Bibliothek des Instituts für Physikalische Chemie, Callinstraße 3A statt.