Our Research

Scientists conduct basic research on the storage of chemical and electrochemical energy, explore substitution concepts for sustainable and resource-efficient materials and further develop semiconductors, other functional materials and microelectronic devices in order to operate future technologies, for instance in the field of photonics, optoelectronics and electronics. The Research Campus Focus also examines the macroscopic characteristics of modern materials relevant to technical applications, with an emphasis on mechanical, electronic and optical aspects.

Battery research: from the nanometre scale to the electric car

Battery research is one of the many joint projects at the Campus Research Focus. Work centres on research on materials and concepts for safe and powerful battery cells of the next generation, e.g. solid-state batteries, considered to be the successor to lithium ion batteries with research questions focusing on the synthesis of new materials, characterisation and modelling from the atomic to the macroscopic length scale, and the analysis of damage to battery packs installed in vehicles.

Our Key Questions

- What does the battery of the future look like?
- How can new materials make batteries safer and more powerful?
- Are batteries in electric cars dangerous?

Contact

Forschungscampus Mittelhessen (FCMH)
Management Office
Senckenbergstr. 3
35390 Giessen
+49 641 16481
geschaeftsstelle@fcmh.de
www.fcmh.de

fcmh.de/mat/en
Current Research Projects

- Federal Ministry of Education and Research Competence Cluster FestBatt
- Participation in excellency cluster “Beyond Lithium” (Karlsruhe Institute of Technology, Ulm University)
- DFG CRC 1083 Structure and Dynamics of Internal Interfaces
- DFG RTG 1782 Functionalization of Semiconductors
- DFG RTG 2204 Substitute Materials for Sustainable Energy Technologies
- DFG SPP 1807 Control of London Dispersion Interactions in Molecular Chemistry
- DFG FOR 2824 Amorphous Molecular Materials with Extreme Non-Linear Optical Properties

Contact Persons

Justus Liebig University Giessen
Prof. Dr. Jürgen Janek
Zentrum für Materialforschung (ZfM/LaMa)
+49 641 99 34501
Juergen.Janek@phys.Chemie.uni-giessen.de

Dr. Thomas Leichtweiß
Zentrum für Materialforschung (ZfM/LaMa)
+49 641 99 33601
thomas.leichtweiss@materialwiss.uni-giessen.de

Philipps-Universität Marburg
Prof. Dr. Kerstin Volz
Wissenschaftliches Zentrum für Materialwissenschaften (WZMW)
+49 (0) 6421 28 22297
kerstin.volz@physik.uni-marburg.de

Technische Hochschule Mittelhessen University of Applied Sciences
Prof. Dr. Stefan Kolling
Institut für Mechanik & Materialforschung
+49 641 309 2123
stefan.kolling@me.thm.de

More Information

fcmh.de/mat/en

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