

Cooperation and memberships

Scientists at Fraunhofer IKTS are active in numerous thematically oriented networks, alliances and groups. This enables us to offer our customers a joint and coordinated range of services and to take up new topics.

Memberships

AGENT-3D

agrarWert e.V.

AMA Association for Sensors and Measurement

American Ceramic Society (ACerS)

Arbeitsgemeinschaft industrieller Forschungseinrichtungen
"Otto von Guericke" e. V. / German Federation of Industrial
Research Associations

Association Competence Center for Aerospace and Space
Technology Saxony/Thuringia (LRT)

Association for Manufacturing Technology and
Development (GFE)

Association of Electrochemical Research Institutes (AGEF)

Association of German Engineers (VDI)

Association of Thermal Spraying (GTS)

Automotive Thuringia

BfR Commission for Risk Research and Risk Perception
(RISKOM)

biosaxony e. V.

Carbon Composites e. V. (CCeV)

Ceramic and Glass Industry Foundation

Ceramics Applications

Ceramics Meeting Point

CiS Forschungsinstitut für Mikrosensorik GmbH

CO₂ Value Europe AiSBL

Competence Center for Nano Evaluation nanoeva®

Competence network OceanTechnologies@Fraunhofer

Competence Network on Optical Technologies (Optonet)

COMPOSITES UNITED e. V.

Cool Silicon e. V.

DECHEMA Society for Chemical Engineering and Biotechnology

DeepSea Mining Alliance e. V.

Deutsche Glastechnische Gesellschaft e. V. (DGG)

Deutsche Industrie- und Handelskammer, Industrie- und
Forschungsausschuss

Deutsche Keramische Gesellschaft e. V. (DKG) / German
Ceramic Society

DIN/VDI Standards Committee Acoustics, Noise Control and
Vibration Engineering

DIN Standards Committee Biological and Clinical Evaluation of
Medical Devices

DIN Standards Committee Information Technology and
selected IT Applications (NIA)

DIN Standards Committee Health and Environmental Aspects
(NMP NA)

DIN Standards Committee Materials Testing (NMP)

DIN Standards Committee Precision Mechanics and Optics

DKE German Commission for Electrical, Electronic &
Information Technologies in DIN and VDE

DKG Anwenderkreis Additive Keramische Fertigung

DRESDEN-concept e. V.

Dresden Fraunhofer Cluster Nanoanalysis

Dresdner Gesprächskreis der Wirtschaft und der Wissenschaft

ECPE European Cluster for Power Electronics

EIT Health

Energy Saxony e. V.

European Ceramic Society (ECERS)

European Materials Characterisation Council (EMCC)

European Powder Metallurgy Association (EPMA)

European Research Association for Sheet Metal Working (EFB)

European Society of Thin Films (EFDS)	German Biogas Association
Expert Group on Ceramic Injection Molding in the German Ceramic Society (DKG)	German Chemical Society (GDCh)
Expert Group on High-Temperature Sensing Technology in the German Society for Materials Science (DGM)	German Electroplating and Surface Treatment Association (DGO)
Fachverband Pulvermetallurgie	German Energy Storage Association (BVES)
FarmTech Society (FTS) ASBL	German Federation of Industrial Research Associations (AiF)
Fördergemeinschaft für das Süddeutsche Kunststoff-Zentrum e. V.	German Institute for Standardization (DIN)
Fördergesellschaft Erneuerbare Energien (FEE)	German Materials Society (DGM)
Forschungsgemeinschaft Werkzeuge und Werkstoffe e. V. (FGW)	German Phosphor Plattform
Fraunhofer Adaptronics Alliance	German Physical Society
Fraunhofer Battery Alliance	German Platform NanoBioMedizin
Fraunhofer Big Data and Artificial Intelligence Alliance	German Society for Crystallography (DGK)
Fraunhofer Chemistry Alliance	German Society for Membrane Technology (DGMT)
Fraunhofer Competence Field Additive Manufacturing	German Society for Non-Destructive Testing (DGZfP)
Fraunhofer Energy Alliance	German Thermoelectric Society (DTG)
Fraunhofer Group for Materials and Components – MATERIALS	Gesellschaft für Thermische Analyse (GEFTA)
Fraunhofer Hydrogen Network	GRAVOMER - Intelligent Surface Technology Network
Fraunhofer Nanotechnology Network FNT	Growth core smood® – smart neighborhood
Fraunhofer Network “Science, Art and Design”	HERMSDORF e. V.
Fraunhofer Simulation Network	Hydrogen Europe Research
Fraunhofer Research Field Lightweight Construction	HYPOS Hydrogen Power Storage & Solutions East Germany
Fraunhofer Research Institution for Battery Cell Production FFB	HySON – Förderverein Institut für Angewandte Wasserstoff-forschung Sonneberg e. V.
Fraunhofer Water Systems Alliance (SysWasser)	InDeKo Innovationszentrum Deutschland Korea
Freiberg Science City	InfectoGnostics Research Campus Jena
German Association for Small and Medium-sized Businesses (BVMW)	Initiative Erfurter Kreuz e. V.
German Association of University Professors and Lecturers (DHV)	Innovation alliance “BioZ – Biobasierte Innovationen aus Zeit und Mitteldeutschland”
	Innovation Institute for Nanotechnology and Correlative Microscopics – INAM e. V.

Innovation Platform for Sustainable Sea and Ocean Solutions (ISSS)	QBN Quantum Business Network
Innovationszentrum Bahntechnik Europa	Rail.S e. V.
Institut für Energie- und Umwelttechnik e. V. (IUTA)	Regionale Aktionsgruppe Saale Holzland e. V.
Institute for Application Technology Powder Metallurgy and Ceramics at RWTH Aachen University (IAPK)	Research Association for Diesel Emission Control Technologies (FAD)
Institut für Mikroelektronik- und Mechatronik-Systeme gGmbH	Research Association Mechatronic Integrated Devices 3-D MID
International Adsorption Society	Research Association of the German Ceramic Society (FDKG)
International Institute for the Science of Sintering	Research Association on Welding and Allied Processes of the German Welding Society (DVS)
International Microelectronics and Packaging Society, IMAPS Deutschland	Silicon Saxony e. V.
International SOS GmbH	SmartTex Network
International Zeolite Association	Society for Corrosion Protection (GfKORR)
Iso Technical Committee	Technology and competence center for organic waste recycling (TKoR)
JenaVersum network	Thüringer Erneuerbare Energien Netzwerk e. V. (ThEEN)
Joint Committee High Performance Ceramics of the German Materials Society (DGM) and the German Ceramic Society (DKG)	Thüringer Wasser-Innovationscluster (ThWIC)
KMM-VIN (European Virtual Institute on Knowledge-based Multifunctional Materials AiSBL)	Thuringian Alliance for Hydrogen in Industry (ThAWI)
medways e. V.	Thuringian H ₂ Ecosystem
Meeting of Refractory Experts Freiberg (MORE)	TITK Materials research institute for polymer functional and engineering materials
Metropolitan region of Central Germany	TRIDELTA CAMPUS HERMSDORF e. V.
microTEC Südwest	TWI Innovation Network
MNT Mikro-Nanotechnologie Thüringen e. V.	VDMA Medical technology
Nachhaltigkeitsabkommen Thüringen	Verband Deutscher Maschinen- und Anlagenbau e. V. (VDMA)
NAFEMS – International Association Engineering Modelling	Verein für Regional- und Technikgeschichte e. V. Hermsdorf
Organic Electronics Saxony	Wind Energy Network Rostock
Ostthüringer Ausbildungsverbund e. V. Jena	Working Group: Bioceramics in the DKG/DGM Joint Committee - High-Performance Ceramics
ProcessNet – an initiative of DECHEMA and VDI-GVC	World Academy of Ceramics

Fraunhofer Group for Materials and Components – MATERIALS

The Fraunhofer Group for Materials, Components – MATERIALS stands for cross-scale materials expertise along industrial value chains. It applies its expertise from materials science fundamentals to materials engineering system solutions to create innovations for the markets of its customers and partners.

The Fraunhofer MATERIALS Group bundles the competencies of materials science and materials engineering in the Fraunhofer-Gesellschaft. This applies in particular to the development of new and improved materials, the application-specific (re)design of existing materials, the appropriate manufacturing processes and process technologies up to quasi-industrial scale, the characterization of material and component properties up to the evaluation of the system behavior of materials and components in products.

Numerical modeling and simulation techniques are used as well as state-of-the-art experimental investigations in laboratories and pilot plants. Both are carried out across all scales from molecules and components to complex systems and process technology. In parallel, the methods and tools used are constantly being developed to the highest standards. In terms of materials, the Fraunhofer MATERIALS Group covers the entire range of metallic, inorganic-non-metallic and polymeric materials, and materials produced from renewable raw materials, as well as semiconductor materials, hybrid and composite materials.

The scientists in the collaborative institutes apply their know-how and expertise primarily in the business areas of mobility, health, mechanical and plant engineering, construction and housing, microsystems technology, safety and security, and energy and the environment. They are well networked at national, European and international level and make a significant contribution to innovation processes at these levels. At European level, for example, the Group is committed to strengthening Europe's technological sovereignty through excellent materials science and engineering as part of the Advanced Materials Initiative (AMI 2030).

In the view of the Fraunhofer MATERIALS Group, a key function lies in the digitization of materials research and materials technology throughout the entire value creation process, along the life cycle of materials. Digitization in this area is an essential prerequisite for the sustainable success of Industry 4.0, as well

as for the realization of resource efficiency. Data generation and the development of digital material twins are therefore a particular focus of the Fraunhofer Group's projects.

Climate change, scarcity of resources and a simultaneous increase in demand for mobility, living space and comfort call for a general rethinking in product development. From the point of view of the Fraunhofer MATERIALS Group, hybrid lightweight system construction offers a high potential for solutions. The target parameter in the development process here is resource efficiency with a weight-optimized and at the same time function-optimized design of components. The Group sees lightweight construction as a holistic challenge and focuses on sustainable, recyclable materials, intelligent hybrid structure design and integrated material and component evaluations.

Renewable energies are gaining a dominant importance in the course of the energy transition. In order to generate, store, transport and convert them, a variety of materials will be used to a much greater extent than for classic energy supply systems, from copper, steel and concrete to rare earths. The Fraunhofer Group for Materials, Components – MATERIALS is working on this complex of issues in the context of sustainability, particularly with regard to resource efficiency, the development of new material flows and the creation of closed resource cycles.

Contact

Group chairman

Prof. Dr. Peter Gumbsch
Fraunhofer Institute for Mechanics of Materials IWM

Deputy group chairman

Prof. Dr. Bernd Mayer
Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM

Head of central office

Dr. phil. nat. Ursula Eul
ursula.eul@materials.fraunhofer.de

www.materials.fraunhofer.de/en

Ceramics Meeting Point

The Treffpunkt Keramik (Ceramics Meeting Point) in Dresden continues to be an integral part of our institute's public relations activities. In cooperation with Ceramic Applications from Göller Verlag, the infrastructure is now available to 90 partners. Fraunhofer IKTS showcases its range of services with exhibits and information material and uses this platform to inform all guests about new applications in industry and research. The cooperation is an effective combination of science and communication practice.

The exhibition presents highlights from the institute's own portfolio and from industry over three floors in the center of the institute. In conjunction with the possibility of holding seminars and training courses, the meeting point is an integral part of all tours of the institute and is used for staff discussions. This turns coffee breaks into small training sessions and market explorations. Raw material suppliers can be found here as well as suppliers of machine technology.

However, the focus is still on components and process information. Many of the systems marketed by meeting point members are part of the IKTS equipment and can also be viewed in the laboratories.

Additively manufactured components in oxide and non-oxide ceramics will be presented, as will material composites. Lab tours are available on request. From powder preparation and shaping to finishing and component testing, the entire process is presented.

Gigantic structural ceramic components made of silicon carbide weighing more than 50 kg are on display, as are complex, modular, soldered structures made of aluminum oxide that are more than two meters high. Of course, there are also exhibits from the fields of energy and hydrogen technology. Even after 20 years of Treffpunkt Keramik in Dresden, the fascination of the material is still infectious.



Ceramics Meeting Point at Fraunhofer IKTS in Dresden-Gruna.

In 2025, Fraunhofer IKTS, the German Ceramics Society (DKG) and the German Society for Materials Science (DGM) will once again be holding seminars and training courses. In-house training courses at companies are also an option. Participants of ECerS 2025 are also expected.

A slightly smaller version of Treffpunkt Keramik has been available at the IKTS site in Hermsdorf since March 2024.

Center for Energy and Environmental Chemistry Jena (CEEC)

*Automated and robot-assisted:
Analysis and degradation of water
pollutants.*



The Center for Energy and Environmental Chemistry Jena (CEEC) is an interfaculty center operated jointly by Fraunhofer IKTS and Friedrich Schiller University (FSU) Jena for 10 years now. The CEEC bundles the activities of the two research institutions in the fields of energy conversion, energy storage, and technical environmental chemistry. Focus is mainly on electrochemical energy storage systems and the materials, especially ceramics and polymers, used for them, energy converters, such as solar cells, and innovative water and wastewater treatment methods. There are currently 15 professorships from FSU and 5 departments from IKTS represented at the CEEC.

In addition to the new institute buildings in Jena, which have been in operation since 2015 and 2024, laboratories and pilot-scale facilities for battery manufacturing and membrane technology are part of the center at IKTS in Hermsdorf. For IKTS, the CEEC represents a strategic cooperation platform with Friedrich Schiller University Jena, especially in the field of basic research. Numerous joint Master's and PhD theses are organized, joint events offered, research projects initiated, and large-scale equipment used via the center. The "Chemistry – Energy – Environment" Master's program, in which IKTS is particularly prominent with its research activities, is also supervised and overseen by the CEEC and is the only program of its kind offered in Germany.

One focus of the collaboration is the "Technical Environmental Chemistry" chair, which is held by Prof. Michael Stelter. The chair's two working groups, led by Dr. Marcus Franke and Dr. Sebastian Engel, are dedicated to water treatment and water

analysis using novel methods, as well as to innovative materials for environmental sensors and environmental technology. In 2024, new high-performance analytics were once again procured to expand the range of methods in the field of hybrid and biogenic functional materials for water purification and the construction of photonic systems.

Additional topics addressed at the CEEC and of particular relevance to IKTS include the following:

- Materials for electrochemical reactors and batteries
- Organic active materials and membranes
- Carbon nanomaterials
- Glasses and optically active materials for photovoltaics and photochemistry
- Physical characterization

Contact

Prof. Dr. Michael Stelter
Chair Technical Environmental Chemistry
michael.stelter@uni-jena.de
www.ceec.uni-jena.de