

Cooperation in Groups, Alliances and Networks

Scientists at Fraunhofer IKTS are active in numerous thematically oriented networks, alliances and groups. Therefore, our customers benefit from having a coordinated range of joint services available to them.

Membership in Fraunhofer Groups, Alliances and Networks

AGENT-3D

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.

BTS Rail Saxony

Carbon Composites e. V. (CCeV)

Ceramics Meeting Point

CiS Forschungsinstitut für Mikrosensorik GmbH

CO₂ Value Europe AiSBL

Competence Center for Nano Evaluation nanoeva®

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)	Fraunhofer Energy Alliance
Deutsche Keramische Gesellschaft e. V. (DKG) / German Ceramic Society	Fraunhofer Group for Materials and Components – MATERIALS
DIN Standards Committee Optics and Precision Mechanics (NAFuO)	Fraunhofer Lightweight Design Alliance
DIN Standards Committee Information Technology and selected IT Applications (NIA)	Fraunhofer Nanotechnology Alliance
Dresden Fraunhofer Cluster Nanoanalysis	Fraunhofer Numerical Simulation of Products and Processes Alliance
DRESDEN-concept e. V.	Fraunhofer Textile Alliance
Dresdner Gesprächskreis der Wirtschaft und der Wissenschaft e. V.	Fraunhofer Water Systems Alliance (SysWasser)
ECPE European Cluster for Power Electronics	German Association for Small and Medium-sized Businesses (BVMW)
EIT Health	German Association of University Professors and Lecturers (DHV)
Energy Saxony e. V.	German Biogas Association
European Powder Metallurgy Association (EPMA)	German Chemical Society (GDCh)
European Research Association for Sheet Metal Working (EFB)	German Electroplating and Surface Treatment Association (DGO)
European Society of Thin Films (EFDS)	German Energy Storage Association (BVES)
Expert Group on Ceramic Injection Molding in the German Ceramic Society (DKG)	German Federation of Industrial Research Associations (AiF)
Expert Group on High-Temperature Sensing Technology in the German Society for Materials Science (DGM)	German Materials Society (DGM)
Fachverband Pulvermetallurgie	German Phosphor Plattform
Fördergemeinschaft für das Süddeutsche Kunststoff-Zentrum e. V.	German Physical Society
Fördergesellschaft Erneuerbare Energien (FEE)	German Platform NanoBioMedizin
Fraunhofer Adaptronics Alliance	German Society for Crystallography (DGK)
Fraunhofer Battery Alliance	German Society for Membrane Technology (DGMT)
Fraunhofer Big Data Alliance	German Society for Non-Destructive Testing (DGZfP)
Fraunhofer Competence Field Additive Manufacturing	German Thermoelectric Society (DTG)
	HERMSDORF e. V.
	HYPOS Hydrogen Power Storage & Solutions East Germany

HySON – Förderverein Institut für Angewandte Wasserstoff-forschung Sonneberg e. V.	QBN Quantum Business Network
InDeKo Innovationszentrum Deutschland Korea	Research Association for Diesel Emission Control Technologies (FAD)
InfectoGnostics Research Campus Jena	Research Association Mechatronic Integrated Devices 3-D MID
Initiative Erfurter Kreuz e. V.	Research Association of the German Ceramic Society (FDKG)
Innovation Institute for Nanotechnology and Correlative Micro-scopics – INAM e. V.	Research Association on Welding and Allied Processes of the German Welding Society (DVS)
Innovationszentrum Bahntechnik Europa	Silicon Saxony e. V.
Institut für Energie- und Umwelttechnik e. V. (IUTA)	smart ³ e. V.
Institut für Mikroelektronik- und Mechatronik-Systeme gGmbH	SmartTex Network
International Microelectronics and Packaging Society, IMAPS Deutschland	Society for Corrosion Protection (GfKORR)
International SOS GmbH	Thüringer Erneuerbare Energien Netzwerk e. V. (THEEN)
International Zeolite Association	TITK Materials research institute for polymer functional and engineering materials
JenaVersum network	Traegerverein Institut für Holztechnologie Dresden e. V.
Joint Committee High Performance Ceramics of the German Materials Society (DGM) and the German Ceramic Society (DKG)	TRIDELTA CAMPUS HERMSDORF e. V.
KMM-VIN (European Virtual Institute on Knowledge-based Multifunctional Materials AiSBL)	VDMA Medical technology
Materials Research Network Dresden (MFD)	Verband Deutscher Maschinen- und Anlagenbau e. V. (VDMA)
medways e. V.	Verein für Regional- und Technikgeschichte e. V. Hermsdorf
Meeting of Refractory Experts Freiberg (MORE)	Growth core smood® – smart neighborhood
microTEC Südwest	Wind Energy Network Rostock
Nachhaltigkeitsabkommen Thüringen	
NAFEMS UK	
Organic Electronics Saxony	
Ostthüringer Ausbildungsverbund e. V. Jena	
ProcessNet – an initiative of DECHEMA and VDI-GVC	

Fraunhofer Group for Materials and Components – MATERIALS

MATERIALS – the Fraunhofer Group for Materials and Components – pools the expertise of the Fraunhofer Institutes working in the area of materials science and engineering. The Group uses its expertise, from the fundamentals of materials science to materials engineering system solutions, to create innovations for its customers' and partners' markets. The basis for this the Groups cross-scale materials expertise along industrial value chains.

Materials science and engineering at Fraunhofer covers the entire value chain, from developing new and improving or application-specifically adapting of existing materials to manufacturing technology on a quasi-industrial scale, in addition to characterizing properties and assessing service behavior. This also applies to the components and products made from these materials and their system behavior in relevant applications.

Equal importance is attached to experimental studies in laboratories, technical centers and pilot plants and to methods of numerical simulation and modeling; they are used across scales, from molecule and component, to complex system and process simulation.

Where materials are concerned, the Fraunhofer MATERIALS group covers the full spectrum of metals, inorganic non-metals, polymers, and materials made from renewable resources, as well as semiconductor materials. Over the last few years, hybrid materials have gained significantly in importance.

The scientists working in the Group's institutes deploy their knowledge and expertise on behalf of their customers specifically in the fields of mobility, healthcare, mechanical engineering and plant construction, building construction and living, micro-systems technology, safety and energy and environment. As part of strong national and international networks they contribute towards material-related innovations and innovative processes in a wide range of working fields.

The Group considers digitization of materials along their entire value chain as a key requirement for the lasting success of Industry 4.0 as well as for the realization of resource-efficient materials and processes. With its initiative Materials Data Space® (MDS) the Group supports and pushes this development.

Special attention is also given to the development of customized materials for additive manufacturing, from expanding the range of materials that can be used to developing multi-material systems. Thus the Group is making a significant contribution to maximizing and economically exploiting this promising manufacturing technology.

Another key topic within the Group is hybrid lightweight construction. Climate change, scarcity of resources and a simultaneously increasing need for mobility call for a rethink in product development. Resource efficiency with weight and function-optimized design of components is becoming a central target parameter in the development process. Fraunhofer MATERIALS sees lightweight construction as a holistic challenge and focuses on sustainable, recyclable materials, intelligent hybrid structure design and consistent material and component evaluations.

The importance of renewable energies is rapidly gaining momentum as the energy transition continues. A large number of materials, from copper, steel and concrete to rare earths will be used to generate, store, transport and convert energy, to a significantly greater extent compared with traditional energy supply systems. The Group is addressing this set of questions, particularly with a view to resource availability and the creation of closed resource cycles for these systems and components.

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Ceramics Meeting Point – Ceramic Applications

The Treffpunkt Keramik (Ceramics Meeting Point) is an integral part of our institute's public relations activities. During the Covid-19 pandemic, the area was used mainly as a break room. The goals for 2022 have been newly defined to once again introduce external guests and the next generation of scientists to technical ceramics. Here, we benefit from the growing number of exhibitors. A total of 50 component manufacturers, 14 raw material suppliers and 7 equipment manufacturers are exhibiting at "Treffpunkt Keramik". Göller Verlag's "Ceramic Applications" has established itself as a marketing and information platform for end users and manufacturers. The members were also particularly involved at the Ceramitec Conference 2021 in Munich.

The exhibition makes it possible to include the complete manufacturing chain, from powder to component, in every visitor's tour in a very effective way. In addition to learning about the research infrastructure, visitors can thus also gain insights into the market with the portfolios of partner companies presenting real components weighing from a few milligrams to more than 100 kilograms.

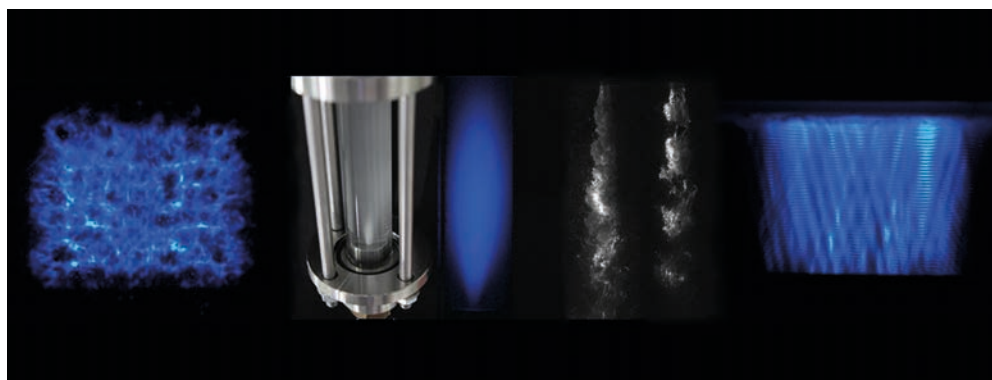
The guests gain insights into the focal points of current research, from transparent ceramics to projects on corrosion protection in deep-sea applications. Exhibits you can touch help to build trust in the economic feasibility of new ideas and make it easier to initiate forward-looking projects in the future.

In-person seminars organized by Fraunhofer IKTS, the German Ceramic Society (DKG), and the German Materials Society (DGM) will once again take place in 2022. Special exhibits will be shown at the user forum of Ceramitec 2022, making this trade fair a ceramics meeting point for end users, manufacturers, suppliers, and research institutions.



Ceramics Meeting Point at Fraunhofer IKTS in Dresden-Gruna.

Center for Energy and Environmental Chemistry Jena (CEEC)



Hydrodynamic and acoustic cavitation phenomena and visualization of cavitation fields in reactors (source: P. Bräutigam, CEEC).

The Center for Energy and Environmental Chemistry Jena (CEEC) is an interfaculty center operated jointly by Fraunhofer IKTS and Friedrich Schiller University (FSU) Jena. 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 13 professorships from FSU and 5 departments from IKTS represented at the CEEC, including the Fraunhofer ATTRACT group “CAV-AQUA” under the leadership of Dr. Patrick Bräutigam. In addition to the new institute building in Jena, which has been in operation since 2015, 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 working group is dedicated to water treatment, water purification, and water analysis using novel methods, such as

ultrasound and hydrodynamic cavitation, electrochemistry, and ceramic membrane technology.

In 2019, new equipment for high-performance analytics, penetrating extremely low concentration ranges and providing data on pollutant degradation processes in automated high throughput, could be procured especially in the research area of trace substances. This technology opens the path for digitalization and sensors even in water treatment.

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

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