

Welcome to LIKAT

Catalysis is the science of accelerating chemical elementary processes. The use of high-performance catalysts allows chemical reactions to be carried out in a resource-saving manner, enables increasing yield, avoiding by-products and reducing specific energy requirements. Catalysis is a cross-sectional science that contributes to finding solutions to the major challenges of the 21st century. Catalytic processes are increasingly to be found not only in chemistry, but also in the life sciences, energy supply and climate and environmental protection.





For 70 years now we have been dedicated to the research of catalysis. Initially, it all started with research into the production of artificial butter in the post-war period. Today, the Leibniz Institute for Catalysis (LIKAT Rostock) is one of the largest publicly funded catalysis institutes in Europe with approx. 300 employees and guests and occupies a position at the **interface of fundamentals and applications**. Thus, we define our focus in the field of application-oriented basic research and promote industrial implementation. Concretely, this means that each year the scientists at the institute transfer at least two catalysts or catalytic processes to the industrial pilot scale. The classical boundaries between homogeneous and heterogeneous catalysis are consistently dismantled at the LIKAT, in favour of a comprehensive, materially and methodologically oriented science. In addition, the interdisciplinary interaction of inorganic, organic and technical chemistry, nanosciences, physical chemistry and process engineering plays an important role.

The institute's research activities are constantly adjusted in order to do justice to the actuality and **social relevance** of LIKAT research.

LIKAT at a Glance

The Leibniz-Institut für Katalyse is one of the leading European research institutions in the field of catalysis with approx. 300 employees and guests. It is a competent contact for the research and development of homogeneous and heterogeneous catalysts as well as catalytic processes and technologies. The institute carries out application-oriented basic and applied research projects and cooperates with a large number of industrial companies and research institutes.

Research Profile

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Social Relevance

The global demand for an efficient use of all resources is only possible with efficient catalysis research. Four out of five chemical products are already undergoing a catalysis cycle during production. Catalysis is a cross-sectional science that contributes to finding solutions to the major challenges of the 21st century. Its further development requires the interdisciplinary cooperation of inorganic, organic and technical chemistry, nanosciences, physical chemistry and process engineering. Catalytic processes are increasingly to be found not only in chemistry, but also in the life sciences, energy supply and climate and environmental protection.

Goals & Current Research

The main objectives of the scientific work of LIKAT are the acquisition of new findings in catalysis research and their application up to technical implementation. The strategic goals of LIKAT are to determine the development of relevant catalysis research for future-oriented economic sectors and to realize new catalysis applications in these sectors.

In addition to the classic areas of chemistry, the focus is also on alternative energy technologies as well as the production of materials and applications in the life sciences, whereby the entire breadth of modern research instruments has been made available in one institute.

Operational research work at LIKAT has already been organised for many years in the form of a project matrix structure. For an innovative research approach, the focus is not on the separation into the classical areas of catalysis, homogeneous vs. heterogeneous, but on answering important research questions. This existing project matrix structure is currently organised in thematic fields, which replace the previous organisational structure with three programme foci. This results in stronger synergy effects and thus different results compared to the previous structure with frequent coexistence of homogeneous and heterogeneous analysts and analytical staff. The service areas of analytics, technology and administration are still available to all employees of the Institute. The demand for a holistic view of the phenomenon of catalysis can put the Institute in a better position to contribute significant amounts to solving the "Grand Challenges" of the 21st century, such as health, sustainability, energy supply or climate change, with its research results.

Organisational Structure & Committees

As an affiliated institute of the University of Rostock, the institute has the legal status of a registered association (e.V.) with the organs general meeting, board of trustees and scientific advisory board. The LIKAT is a research institution of the Leibniz Association. Funding is provided equally by the federal and state governments. The Ministry of Education, Science and Culture of Mecklenburg-Vorpommern is responsible for the technical aspects of the research, while the Federal Ministry of Education and Research (BMBF) is responsible for the federal government. The current organizational structure of the Institute is shown in the organization chart.

Board (as of June 2022)

Prof. Matthias Beller	Scientific Director
Dr. Mirko Kirschowski	Business Director
Prof. Angelika Brückner	Deputy Director
Prof. Jennifer Strunk	Member of the Board

Internal Scientific Committee & University in Leibniz

The guidelines of the scientific work within the statutory research assignment are determined by the Executive Board in close consultation with the Internal Science Committee (also known as the Management Committee or the Service Advisory Committee). It includes all scientific department heads, the heads of the service departments and, on certain occasions, also the heads of the working groups "University in Leibniz" (associated professors from the University of Rostock - see organizational chart). The committee is chaired by the scientific director of the Institute.

Service Divisions

In addition to scientific topics, a central analytics service division supports the research groups in LIKAT by providing the necessary analytical services. In close coordination with the clients, the required methods are developed and adapted to the concrete questions. Efficient analytical methods are essential for successful chemical research. This is guaranteed by highly qualified personnel who maintain and further develop a wide range of state-of-the-art instruments.

The service divisions administration and technology fulfil all necessary administrative and technical tasks to support the scientific tasks of the LIKAT. The administration is subdivided into the subject areas IT, Finance, Human Resources/Social Affairs, Purchasing/Assets and Project Management. The entire technical infrastructure is covered by the technical department.

Key Facts 2021

Budget (total):	26.6 Mio. €		
thereof			
basic funding	13.3 Mio. €		
external funding	7.5 Mio. €		
	(thereof 2.8 Mio. €		
	from industry)		
construction investment	5.8 Mio. €	Publications (total)	316
		thereof	
		Journals	306
		Books	1
		Book Chapter	9
Personnel total):	303		
Scientists	223		
thereof PhD	100		
Science Supporting Staff			
(Laboratory, Administration etc.)	55	Patent Applications with	
		LIKAT Participation	39

Organization Chart

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Leibniz Institute for Catalysis

Scientific Advisory Board Chair: Prof. Dr. Brigitte Voit / IPF Dresden		Board of Curators Chair: Woldemar Vohrer / BM-MV		General Meeting Chair: Prof. Dr. Ralf Ludwig / University of Rostock						
Scientific Director Prof. Dr. Matthias Beller		Prof. Dr. Angelika Brückner		Commercial Director Dr. Mirko Kirschkowski						
Applied Heterogeneous Catalysis Prof. M. Beller <ul style="list-style-type: none"> Synergy between homo- & heterogeneous Catalysis Applied Carbonyl Synthesis Catalysis for Life Sciences Catalysis for Energy Redox Reactions Theory of Catalysis Sustainable Excited-State Catalysis 	Catalysis with Bioresources Dr. E. Baráth <ul style="list-style-type: none"> Liquid Phase Oxidations Technology Oriented Processes Inorganic Functional Materials 	Heterogeneous Catalytic Processes Dr. S. Wohlrab <ul style="list-style-type: none"> Liquid Phase Oxidations Technology Oriented Processes Inorganic Functional Materials 	Catalytic In Situ-Studies Prof. A. Brückner <ul style="list-style-type: none"> Optical Spectroscopy & Thermoanalytical Methods Magnetic Resonance & X-Ray Methods 	Catalyst Discovery & Reaction Engineering Dr. D. Linke <ul style="list-style-type: none"> High-Throughput Technologies Reaction Engineering Reaction Mechanisms 	Heterogeneous Photocatalysis Prof. J. Strunk <ul style="list-style-type: none"> CO₂ Reduction Structure-Function Correlations Micro Reaction Engineering 	Coordination Chemistry & Catalysis PD Dr. T. Beweries <ul style="list-style-type: none"> Catalysis with Early Transition Metals Catalysis with Late Transition Metals Mechanisms in Homogeneous Catalysis 	Hydrogenations & Hydroformylations Prof. A. Börner <ul style="list-style-type: none"> Hydroformylations Catalysis for Heterocycles 	Electrochemistry & Catalysis Dr. R. Francke <ul style="list-style-type: none"> Catalyst-design for Electro-synthesis Molecular Electro-chemistry 	Biocatalysis & Polymer Chemistry Prof. U. Kragl <ul style="list-style-type: none"> Biocatalysis Polymer Chemistry & Catalysis 	Staff Unit Dr. S. Hinze Services Analytics PD Dr. W. Baumann Chromatography XPS • EA • IR • MS NMR • TEM UV/Vis • XRD Administration Dr. M. Kirschkowski Finances • Project Management • Purchase Law & Personnel • IT Technical Service A. Schupp Building Services Workshop
Junior Research Groups <ul style="list-style-type: none"> Catalytic Functionalization Dr. J. Pospech N.N. 		„Uni in Leibniz“ Associated University Research Groups at LIKAT		University of Rostock Prof. M. Brasholz • Prof. B. Corzilius Prof. R. Ludwig • Prof. K. Neymeyr Prof. A. Schulz • Prof. W. Seidel						
Employee Representatives Labour Council • Dr. J. Holz Equal Opportunities • Dr. S. Hinze Ombudsperson • PD W. Baumann Data Protection • Dr. T. Schareina Disabled Persons • A. Simmula		University of Linz Prof. M. Hapke		University of Paderborn Prof. T. Werner						