

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

With about 300 employees and guests, the Leibniz Institute for Catalysis is one of the leading European research institutions in the field of catalysis and a competent partner for the research and development of homogeneous and heterogeneous catalysts as well as catalytic processes and technologies. It carries out basic and applied research projects and cooperates with a large number of industrial companies and research institutes.

Research Profile

Catalysts control and accelerate chemical processes. They increase yields and avoid by-products by enabling starting materials to react specifically and selectively at the molecular level.

For 70 years, the Leibniz Institute for Catalysis (LIKAT) in Rostock has been conducting catalysis research for the benefit of society. The institute was founded in 1952 as the first research institute in Europe dedicated exclusively to catalysis. Among the milestones of LIKAT research was the commercialization of the process for the production of Isicom, a Parkinson's drug, in 1986 as the world's second process for organometallic chiral catalysis. Today, LIKAT in Rostock is one of the largest publicly funded research institutes in its field in Europe and occupies a place at the interface of basic research and its applications. The institute was admitted to the Leibniz Association in 2003. Today, it combines homogeneous and heterogeneous catalysis research as well as complementary current fields, e.g. photocatalysis and electrocatalysis, under one roof.

The spectrum of research work at LIKAT ranges from the identification of suitable catalyst materials, their production, kinetic and mechanistic studies to the development and optimization of industrially relevant processes.

Research objectives & societal relevance

One of LIKAT's overriding strategic goals is the development of catalysis research relevant to society for the closure of material cycles and their effective application in industry. In addition to the classical chemical areas, the focus is on alternative energy technologies as well as the production of materials and applications in the life sciences.

The chemical industry can play a key role in terms of resource efficiency, sustainability and circular economy. The challenges here include the gradual substitution of fossil raw materials and energy sources, the steadily increasing demand for sustainable products on the one hand and production processes on the other. Processes must be designed more flexibly in order to be able to implement various renewable raw materials, energy



sources and hitherto little-used secondary and waste streams from the circular economy. Catalysis is a key technology in this context, because resource and energy efficiency are inherent properties of catalysis.

Over 85% of all chemical products in our daily lives are produced with the help of catalytic processes. The field of catalysis thus reaches far into society. Research in this field regarding the closure of cycle flows has an effective impact on chemical production and processes. Chemistry is closely linked to almost all industries and is a component of many value chains.

The Board

Prof. Matthias Beller (Scientific Director)
Dr. Mirko Kirschowski (Commercial Director)
Dr. Eszter Baráth (Scientific Board Member)
Prof. Robert Francke (Scientific Board Member)

Organization & Committees

As a member of the Leibniz Association, answering socially relevant research questions is at the forefront of our research, which requires a holistic and interdisciplinary approach. Consequently, the operative research work at LIKAT is organized in a research matrix structure with interdisciplinary *Topics*, which bundle specific competences of the entire institute.

A total of seven *Topics* have been defined, which are regarded as future-oriented, socially relevant research areas. The *Topics* are addressed by the ten existing research departments (RD) with their individual research groups, the junior research

groups and the associated university research groups (*Uni in Leibniz*).

As an affiliated institute of the University of Rostock, the institute has the legal form of a registered association (e.V.) with the organs *General Meeting, Board of Curators* and *Scientific & Industrial Advisory Board*. LIKAT is a research institution of the Leibniz Association. It is financed equally by the federal and state governments. The professional responsibility lies with the Ministry of Education, Science and Culture of the state of Mecklenburg-Vorpommern and the Federal Ministry of Education and Research (BMBF). The current organizational structure of the Institute is shown in the organization chart.

Service Departments

The *Analytical service department* supports the research work at LIKAT by providing central analytical services. In close cooperation with the researchers, the required methods are developed and adapted to the specific problems. The analytical methods are supervised by staff with many years of experience. Another important aspect is the cooperation with the Institute of Chemistry at the University of Rostock, which consists of the joint use of large-scale equipment and mutual exchange of personnel.

The *Administrative and Technical service departments* fulfill all necessary tasks to support the research at LIKAT. Administration is subdivided into the teams Finance, Project Management, Law & Personnel and IT. The technical department covers the entire technical infrastructure.



Key Facts 2024 (Reference Day 31.12.2023)

Budget (total):	20.67 Mio. €	Publications (total)	324
thereof		thereof	
basic funding	13.5 Mio. €	Journal contributions	321
external funding	7.17 Mio. €	Books	1
(thereof industry)	2.1 Mio. €	Book chapters	2
Personnel (total):	315	Patents with LIKAT participation	10
Scientists	261		
thereof PhD	100		
Science supporting staff	54		
(Laboratory, Administration, Technical etc.)			

Organization chart

