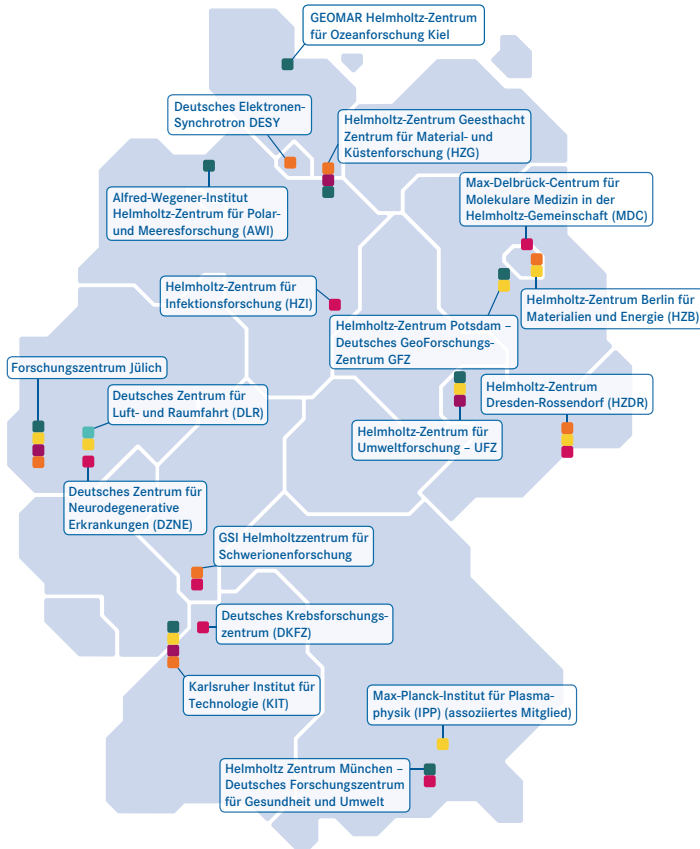


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HELMHOLTZ RESEARCH FOR
GRAND CHALLENGES



Research Areas

- Energy
- Earth and Environment
- Health
- Aeronautics, Space and Transport
- Key Technologies
- Matter

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THE HELMHOLTZ ASSOCIATION OF GERMAN RESEARCH CENTERS

SHAPING THE FUTURE WITH CUTTING-EDGE RESEARCH

The Helmholtz Association comprises 18 centers that perform research in the natural sciences, technology and engineering, as well as in biology and medicine, with more than 38,000 employees and an annual budget of more than €4 billion.

Research for mankind and the environment

All research at the Helmholtz Association, whether it concerns the energy supply, mobility, preserving an intact ecosystem or treatments for diseases, is ultimately directed at securing the foundations of human life in the long term and creating the technological basis for a competitive economy.

Excellent science from basic research to application

With over 14,000 scientific publications, over 400 patent applications per year and currently around 3,000 industry collaborations, the Helmholtz Association has an excellent track record in both basic research and in developing applications. It has the stamina to drive large-scale projects forward and the capacity to bring together expertise from different areas of research.

Knowledge and technology transfer

The Helmholtz Association is becoming increasingly engaged in the transfer of knowledge to society. The Helmholtz Centers have been developing successful structures and processes for technology transfer for many years. This is evidenced by the numerous products on the market, license revenues, cooperation agreements and, in particular, a high number of spin-offs. In the last few years, the Helmholtz Association has created additional funding tools such as the Validation Fund, spin-off funding, innovation labs and innovation funds to ensure the success of these undertakings.

Talent-Management

Attracting the brightest minds and providing them with the best environment to develop their potential is a top priority of the Helmholtz Association. Promoting young scientific, administrative and technical talent is a key component of our future strategy. Alongside the measures promoting young researchers in the individual Helmholtz centers, the Association has set up overarching funding lines with its Initiative and Networking Fund. These funding tools and the idea behind them have grown into a comprehensive talent management strategy.

ACHIEVING MORE TOGETHER

Cooperation

Networking and cooperating with national and international partners from science, industry and government are a key component of the Helmholtz Association's strategy for achieving outstanding research results quickly and efficiently. Our research goes beyond the borders of individual disciplines and countries. This makes it internationally competitive and able to deliver a decisive contribution to solving the major challenges facing society today.

Research infrastructure and large-scale devices

The Helmholtz Association provides excellent research infrastructures and large-scale devices such as observatories, particle accelerators, super computers and research vessels that are unique in the world. Every year, thousands of visiting researchers from all over the world come to the Helmholtz centers to make use of the unique research opportunities afforded by these devices.

International project management

Developing and operating the powerful infrastructures of the Helmholtz Association requires years of experience in the management of large-scale projects. There is good reason why the Helmholtz Association is frequently the hub of major international research projects. As a strong member of the global scientific community, the Helmholtz Association plays its part in shaping the future of modern societies.

MISSION OF THE HELMHOLTZ ASSOCIATION

- We contribute to solving the major challenges facing society, science and the economy by conducting top-level research in strategic programs within six fields: Energy, Earth and Environment, Health, Aeronautics, Space and Transport, Matter, and Key Technologies.
- We research highly complex systems with our large-scale devices and infrastructures, cooperating closely with national and international partners.
- We contribute to shaping our future by combining research and technology development with perspectives for innovative applications and provisions in tomorrow's world.
- We attract and promote the best young talent, offering a unique research environment and general support throughout all career stages.

The Helmholtz Association's research is divided into six major research fields. Our scientists work in interdisciplinary teams and in programs that cover the whole spectrum from basic research to application. The content and goals of our research programs are reviewed by distinguished scientists from around the world.

ENERGY

In the Energy research field, we are working on solutions to secure an economically, ecologically and socially sustainable supply of energy. We explore and develop innovative technologies for energy conversion, distribution, use and storage as well as the intelligent integration of these technologies in a sustainable energy system, always taking account of the climate and environmental impacts involved. One of our main goals is to work towards replacing fossil and nuclear fuels with sustainable, climate-neutral energy sources. To this end, we are also exploring the potential of renewable energy sources. Our work is thus making a major contribution to the successful implementation of the energy transition.

EARTH AND ENVIRONMENT

In the field of Earth and Environment, we conduct research into the Earth system and the complex interactions between society and nature. Our work focuses on expanding and interconnecting long-term observation systems, improving predictions and rapidly making the results available to society. We make science-based policy recommendations on how the Earth's resources can be used in a sustainable way without destroying the foundations of life. Such knowledge is essential to securing quality of life for future generations.

HEALTH

In the Health research field, we investigate the complex causes and development of major common diseases. These include cancer, cardiovascular, metabolic, pulmonary and infectious diseases, allergies and disorders of the nervous system. Our aim is to use strong basic research to develop new approaches for prevention, diagnosis, early detection and individualized treatment. This field requires an interdisciplinary approach, which the Helmholtz centers implement in cooperation with partners from medical schools, other research organizations and industry.

AERONAUTICS, SPACE AND TRANSPORT

In the research field Aeronautics, Space and Transport, we address the major challenges facing society in the fields of mobility, information systems, communication, resource management, the environment and safety. We develop concepts and solutions and provide advice to policymakers. The German Aerospace Center (DLR) is Germany's national center for aeronautics and aerospace research. In its capacity as the German space agency, the DLR is responsible for research within the framework of the national aerospace program and for Germany's contribution to the European Space Agency (ESA).

KEY TECHNOLOGIES

Research in this field focuses on three areas: information technology, materials sciences and life sciences. In the coming years, these areas will play a decisive role in shaping the scientific, social and economic development of our country. Integrating multi-disciplinary approaches, such as the linking of technology and medicine, simulation and big data, supercomputing and brain research, as well as microbial biotechnology and plant sciences, provides the groundwork for innovative solutions in Key Technologies.

MATTER

We explore the building blocks of matter and the forces operating between them at a wide range of levels, from elementary particles to complex functional materials to the systems and structures in the universe. We are thus creating the basis for a better understanding of our universe, and of materials and active substances for industrial or medical application. This field of research includes the development, construction and operation of outstanding research infrastructures and large-scale scientific devices that are intensively used by researchers from Germany and abroad .