

# The German Research Landscape Who does research in Germany?



AN INITIATIVE OF THE

Federal Ministry  
of Education  
and Research

Research in  
Germany

  
Land of Ideas

[www.research-in-germany.de](http://www.research-in-germany.de)

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# The German Research Landscape

Who does research in Germany?





# Contents

<b>Welcome to the Land of Ideas!</b> .....	7
<b>Research-Performing Organisations</b> .....	8
Universities .....	10
Academies of Sciences and Humanities.....	12
Union of German Academies of Sciences and Humanities.....	14
Fraunhofer-Gesellschaft.....	16
Helmholtz Association .....	18
Leibniz Association .....	20
Max Planck Society .....	22
Federal Research Institutions .....	24
State ("Länder") Institutions.....	26
Companies/Industrial Research .....	28
German Federation of Industrial Research Associations (AiF).....	30
<b>Networks and Clusters</b> .....	32
go-cluster: Exzellent vernetzt!.....	34
The Leading-Edge Cluster Competition .....	36
Entrepreneurial Regions.....	38
<b>Research Infrastructures</b> .....	40
Deutsches Elektronen-Synchrotron (DESY).....	42
German Climate Computing Centre (DKRZ) .....	44
Research Vessel <i>Polarstern</i> .....	46
FLASH II - Free-Electron Laser in Hamburg .....	48
About "Research in Germany" .....	50





# Welcome to the Land of Ideas!

From the internal combustion engine through the fuel cell to the MP3 player – German inventions and discoveries have shaped the world and changed people's lives. At the same time, research and development are what keeps a successful economy going and represent the key to global competitiveness. Germany is the Land of Ideas.

"The German Research Landscape" shows who is behind this successful and innovative centre of science and research: universities and institutes, networks and clusters, federal and state ("Länder") institutions. Last but not least, a crucial role is played by industry, which provides more than two thirds of

research and development funding in Germany. Together, these partners form a research infrastructure of international significance. Here, academics from all over the world are offered first-class working conditions and an environment promoting communication and creativity. International research institutions and businesses can find partners and options for networking.

This booklet informs you about the background and focus of the individual actors. Figures, facts and contacts complement the portraits. We invite you to have a walk around the German research landscape – enjoy discovering it!







# Research-Performing Organisations

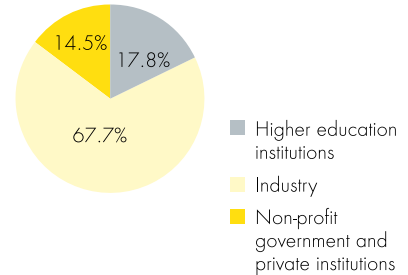
Science and research in Germany are characterised by an excellent infrastructure, a wide variety of disciplines, well-equipped research facilities and competent staff. Germany offers various forms of research locations: universities, non-university institutes, companies and institutions run by federal or state ("Länder") authorities. All in all, there are more than 800 publicly funded research institutions in Germany, plus research and development (R&D) centres run by companies.

In selected fields or regions, these industrial and academic institutions pool their research and development activities in networks and clusters to work more efficiently and to benefit from a higher level

of knowledge. Also, cooperation at European as well as international level has become an essential dimension of sciences and humanities in Germany.

## Research Budget

In 2011 the gross domestic expenditure on research and development (GERD) was 75.5 billion euros with more than two thirds of research funding provided by industry. Higher education institutions account for 18% of this spending and non-university research institutions invest almost 15% of the R&D total. The proportions of public and private funding vary according to the type of institution and the kind of research it conducts (basic/applied).



## Facts and Figures



more than 800 public-funded research institutions; approx. 100 research networks and clusters at national level



567,000 staff in R&D



bilateral, European and multilateral partnerships with more than 40 countries



Gross domestic expenditure on R&D: 75.5 billion euros

## More Information

Germany offers various forms of research locations: universities, non-university institutes, companies and institutions run by federal or state ("Länder") authorities. For an overview, visit the "Research in Germany" website.

[www.research-in-germany.de/research\\_landscape](http://www.research-in-germany.de/research_landscape)

## Research Explorer:

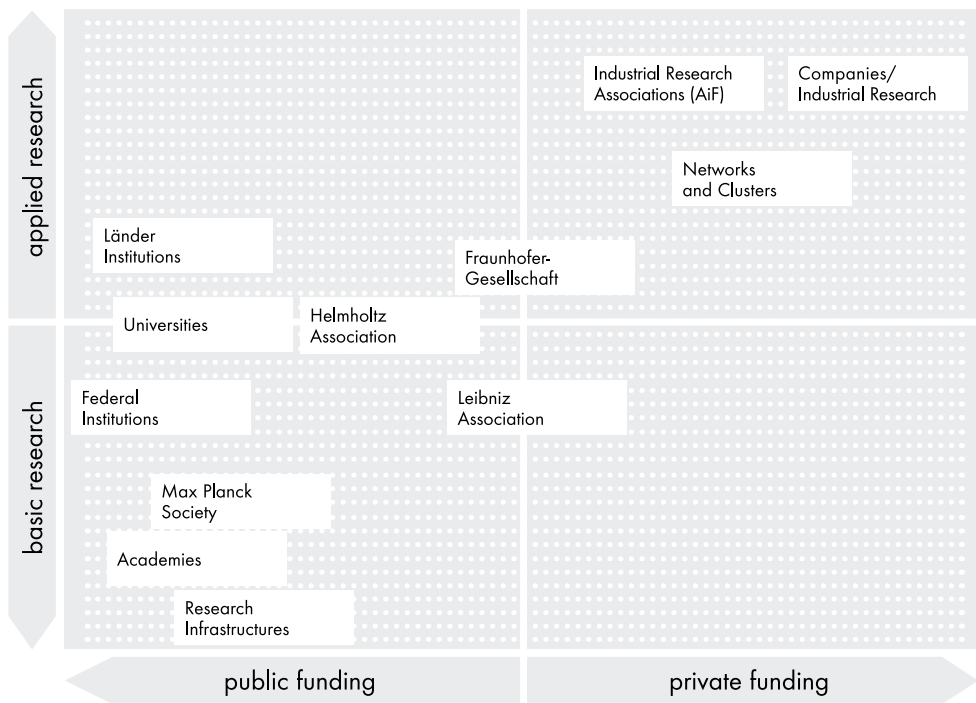
This database contains over 19,000 institutes at German universities and non-university research institutions, searchable by geographic location, subject and other structural criteria.

[www.research-explorer.de](http://www.research-explorer.de)



Overview of research-performing organisations in Germany

Research institutions differ in terms of their type of research (basic/applied) and financing (public/private).



# Universities

Germany is home to approx. 390 higher education institutions which offer the entire range of academic disciplines. The German higher education system is characterised by a close link between teaching, learning and research. German universities see themselves as institutions where research and teaching are united. This principle has a long tradition and was formulated by Wilhelm von Humboldt (1767-1835), the philosopher and founder of Humboldt University in Berlin.

More than 280,000 international students are enrolled at German higher education institutions. Currently, almost 24,000 international doctoral candidates are enrolled and approximately 33,500 foreign academics work in German higher education. That makes Germany one of the world's most attractive research and higher education nations.



Germany is one of the world's most attractive countries for international students.

**HRK** German Rectors' Conference  
The Voice of the Universities

## Facts and Figures



approx. 390 higher education institutions  
(including more than 220 universities of applied sciences)



640,000 staff in total, 354,000 academic staff  
2.5 million students in total, 281,000 international students (11.3%)



Gross domestic expenditure on research and development (GERD)  
at institutions of higher education: 13.5 billion euros (2011)

The Federal Government and the German states ("Länder") have set up the Excellence Initiative that provides additional support for research activities in various disciplines at German universities. From 2006–2017 a total of 4.6 billion euros will be invested to promote top-level research and to improve the international competitiveness of German higher education and research.

### German Higher Education System

There are approx. 390 higher education institutions in Germany, more than 220 of which are universities of applied sciences (Fachhochschulen/Hochschulen für Angewandte Wissenschaften). They offer students a more practice-oriented education based on scientific research.

The German Rectors' Conference – Hochschulrektorenkonferenz (HRK) – as the association of state and state-recognised universities in Germany is the

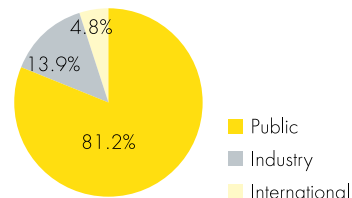
### Contact

German Rectors' Conference  
Hochschulrektorenkonferenz (HRK)  
Ahrstraße 39  
53175 Bonn  
Germany  
Phone: +49 228 887-0

political and public voice of German universities and the forum for higher education institutions' joint opinion-forming process. It currently has 268 member institutions at which more than 94% of all students in Germany are registered.

### Research Activities

Universities and other higher education institutions offer a broad spectrum of research activities, including basic research, applied research and development. 32% of researchers work in the natural sciences and mathematics, 29% in the humanities and social sciences, 22% in engineering sciences, 15% in medical science and 3% in agricultural sciences. Roughly two thirds of the over 90,000 researchers engaged in



R&D work at universities. In addition, there are some 10,000 funded doctoral students and more than 12,000 scientists conducting research at university medical institutions.

### Research Budget

Gross domestic expenditure on research and development (GERD) at institutions of higher education totals approx. 13.5 billion euros (2011) and is borne by the public (81.2%), industry (13.9%) and international funding (4.8%) (2010).

### More Information

German Rectors' Conference/Hochschulrektorenkonferenz (HRK): [www.hrk.de](http://www.hrk.de)  
Interactive Research Map: [www.hrk.de/activities/research-map](http://www.hrk.de/activities/research-map)

Search engine providing extensive information on Germany's higher education institutions: [www.higher-education-compass.de](http://www.higher-education-compass.de)

Visit [www.daad.de](http://www.daad.de) to get information about the German higher education system: "Information for Foreigners" > "10 steps to studying in Germany" > "Looking for courses" > "Finding the right university".

# Academies of Sciences and Humanities



The academies within the Union were founded between 1700 and 2004. The National Academy of Sciences Leopoldina was founded in 1652, acatech in 2002.



The functions of the German academies of sciences and humanities include providing guidance and advice to policymakers and society as a whole relating to general and specific issues of science and the humanities, including emerging issues. They organise symposia and public events, with which they make a valuable academic contribution to the dialogue between research, society and industry. With opinions based on excellent expert knowledge, the academies support policymakers and the public in finding suitable answers to current issues and problems.

In addition, a key mission of the academies is the coordination and support of long-term basic research projects and the development and cultivation of interdisciplinary dialogue.

Two examples of these academies are the National Academy of Sciences Leopoldina and acatech – National Academy of Science and Engineering.

### **Leopoldina – National Academy of Sciences**

The German Academy of Sciences Leopoldina was founded in 1652 and appointed as the German National Academy of Sciences in 2008. Today the Leopoldina provides academically sound advice to both policymakers and society as a whole and represents the German scientific community in international committees.

### **acatech – National Academy of Science and Engineering**

acatech – the National Academy of Science and Engineering – represents the interests of Germany's science and technology communities at home and abroad. As a working academy, acatech supports policymakers and society with expert scientific opinions in their respective fields and forward-looking recommendations.



**Leopoldina**  
Nationale Akademie  
der Wissenschaften



#### **More Information**

National Academy of Sciences  
Leopoldina:  
[www.leopoldina.org](http://www.leopoldina.org)

acatech – National Academy of  
Science and Engineering:  
[www.acatech.de](http://www.acatech.de)



# Union of German Academies of Sciences and Humanities

The Union of German Academies of Sciences and Humanities is comprised of eight academies based in Berlin, Düsseldorf, Göttingen, Hamburg, Heidelberg, Leipzig, Mainz and Munich. The aim of the Union is to coordinate the basic research of the Union's member academies and to support them in enhancing their profile at home and abroad. The member academies of the Union have elected more than 1,900 scientists and scholars from a wide range of disciplines as ordinary, corresponding and extraordinary members.



## Facts and Figures



8 academies in the Union



more than 1,900 scientists and scholars



close cooperation with researchers and foundations abroad



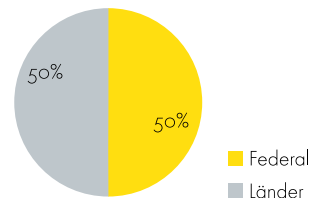
annual budget of the Academies' Programme (2013): approx. 57 million euros

## Academies' Programme

The Academies' Programme (Akademienprogramm) is coordinated by the Union of German Academies of Sciences and Humanities. It is one of the largest German research programmes in the humanities, bringing together 150 research and publication projects of the academies under one umbrella. It involves a total of 150 projects with 200 working groups (2013). The projects consist of 22 dictionaries and 118 editions in the humanities, eight long-term studies in the natural sciences and two basic research projects in social sciences and cultural studies.

## The eight academies in the Union are:

- Berlin-Brandenburg Academy of Sciences and Humanities (1992/1700), seat: Berlin and Potsdam
- Göttingen Academy of Sciences and Humanities (1751)
- Bavarian Academy of Sciences and Humanities (1759), seat: Munich
- Saxonian Academy of Sciences and Humanities in Leipzig (1846)
- Heidelberg Academy of Sciences and Humanities (1909)
- Academy of Sciences and Literature, Mainz (1949)
- North Rhine-Westphalian Academy of Sciences, Humanities and the Arts (1970), seat: Düsseldorf
- Academy of Sciences and Humanities in Hamburg (2004)



## Research Budget

As part of their service role, the academies also administer the Academies' Programme, which is funded equally by the German states ("Länder") and the Federal Government with a total budget of 57 million euros (2013). As the individual academies of sciences are state institutions rather than federal institutions, their basic budgets are funded solely by their respective states.

## Contact

Union of German Academies of  
Sciences and Humanities  
Union der deutschen Akademien der  
Wissenschaften  
Head Office  
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55131 Mainz  
Germany  
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## More Information

Union of German Academies of Sciences and Humanities:  
[www.akademienunion.de](http://www.akademienunion.de)

Click on the menu headings "The Union" > "International Relations" to find further information on the international memberships of the Union.



# Fraunhofer-Gesellschaft

The Fraunhofer-Gesellschaft conducts applied research for both private and public enterprises as well as for the general benefit of the public. The association takes its name from Joseph von Fraunhofer (1787-1826), the illustrious Bavarian researcher, inventor and entrepreneur.

The Fraunhofer-Gesellschaft is the largest organisation for applied research in Europe. It conducts research under contract for industry, the service sector and public administration and also offers information and services. One of its most famous inventions is MP3, which was developed by the Fraunhofer Institute for Integrated Circuits (IIS). MP3 is the most widely used method for encoding and decoding digital audio data.



MP3 was invented by Fraunhofer IIS.

## Facts and Figures



66 Fraunhofer Institutes and research facilities at different locations in Germany



approx. 22,000 staff; the majority are scientists and engineers



research centres, representative offices and senior advisors in Europe, North and South America, Asia, Australia, the Middle East and Africa



annual budget: approx. 1.9 billion euros



## Research Activities

The Fraunhofer-Gesellschaft works on different areas of research such as information and communication technology, life sciences, microelectronics, surface technology, photonics, production, defence and security, materials and components.

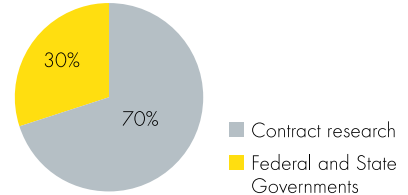
## International Cooperation

The Fraunhofer-Gesellschaft has research centres, representative offices and senior advisors in the world's major economic regions:

- Fraunhofer Brussels office
- Fraunhofer subsidiaries in the United States, Austria, Portugal, Italy, United Kingdom, Sweden and Chile

- Fraunhofer project centres in Greece, Poland, Hungary, Canada, Brazil, Japan, Singapore and Australia
- Representative offices in Japan, China, Indonesia, Korea and India
- Fraunhofer senior advisors in Brazil, the United Arab Emirates, Egypt and South Africa

In addition, Fraunhofer participates in international networks and organisations like ERCIM (European Research Consortium for Informatics and Mathematics), EARTO (European Association of Research and Technology Organisations), GRA (Global Research Alliance) and WAITRO (World Association of Industrial and Technological Research Organizations).



## Research Budget

The annual research budget amounts to 1.9 billion euros. Of this sum, 1.6 billion euros is generated by contract research. More than 70% of the Fraunhofer-Gesellschaft's contract research revenue is derived from arrangements with industry and from publicly financed research projects. Almost 30% is contributed by the German Federal Government and the states ("Länder") in the form of base funding.

## Contact

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## More Information

Fraunhofer-Gesellschaft, Fraunhofer Institutes and research establishments:  
[www.fraunhofer.de](http://www.fraunhofer.de)

# Helmholtz Association

The Helmholtz Association of German Research Centres conducts advanced scientific research on behalf of society, science and industry to address the major challenges of the present. The Helmholtz Association is the largest scientific organisation in Germany. Its work follows the tradition of the great natural scientist Hermann von Helmholtz (1821–1894). Scientists in 18 Helmholtz Centres work on a wide variety of topics in areas ranging from health, the environment and energy to fundamental research such as elementary particle physics.



Solarthermal power station (Plataforma Solar de Almería).



## Facts and Figures



18 research centres (scientific-technical and biological-medical research centres)



approx. 35,000 staff; more than 12,000 scientists and engineers (2013) and 7,400 visiting scientists (2011)



international collaborative research projects in Europe, America and Asia



annual budget: approx. 3.8 billion euros (2013)

### Organisational Details

The Helmholtz Association is comprised of 18 scientific-technical and biological-medical research centres with approximately 35,000 staff, including 12,000 scientists and engineers and more than 7,400 visiting scientists.

### Research Activities

Helmholtz Centres perform top-level research in strategic programmes in six core fields: energy, earth and environment, health, key technologies, the structure of matter, aeronautics, space and transport. The Association's research centres provide the most modern scientific infrastructure, particularly large-scale facilities and instrumentation that are also used by the international scientific community.

### Contact

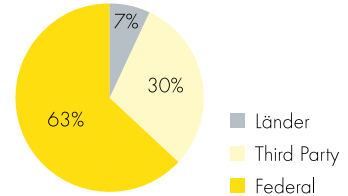
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53175 Bonn  
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Email: [org@helmholtz.de](mailto:org@helmholtz.de)

### International Cooperation

The Helmholtz Association maintains numerous strategic partnerships with institutions and organisations all over the world, including countries such as Russia, the USA and China. It is involved in supporting young scientists at an international level with a special focus on China and Russia.

### Research Budget

The total budget of the Helmholtz Association amounts to approximately 3.8 billion euros, with two thirds provided by public sponsors (with a 9:1 ratio allocated by federal and state ("Länder") authorities). Each individual Helmholtz Centre is responsible for acquiring the remaining 30% as contract funding from public- and private-sector sponsors.



### More Information

Helmholtz Association:  
[www.helmholtz.de](http://www.helmholtz.de)

International Helmholtz offices and research projects: [www.helmholtz.de/en/helmholtz\\_centres\\_networks](http://www.helmholtz.de/en/helmholtz_centres_networks)  
Read more about the international Helmholtz network and how it supports young scientists and its offices abroad.

# Leibniz Association

The Leibniz Association is the umbrella organisation for 89 research institutes, all of which address issues of national importance. Leibniz Institutes conduct research, provide scientific and research infrastructure and perform research-based services (liaison, consultation, transfer) for the public, for policymakers, for academia and for businesses. The Museum of Natural History ("Museum für Naturkunde") in Berlin, one of the five largest natural history museums in the world, is a prominent example of a member of the Leibniz Association.

The Leibniz Association was named after Gottfried Wilhelm Leibniz (1646-1716), who remains the epitome of a great universal scholar.



Research at the Leibniz Association.



## Facts and Figures



89 research institutes;  
conducting research or providing scientific infrastructures



about 7,500 researchers, about 18,000 staff in total



annual budget: approx. 1.6 billion euros

## Organisational Details

The Leibniz Association is known for the wide range of themes addressed by its member institutes. The Leibniz Association has a decentralised organisational structure. Each institute is a legally and financially independent organisation and autonomously determines its research programme in consultation with its boards only. The 89 Leibniz Institutes employ more than 18,000 people and have an annual budget of 1.6 billion euros.

## Research Activities

Leibniz research institutes cover the humanities and social sciences, economics, spatial and life sciences, mathematics, natural sciences, engineering and environmental research.

## Contact

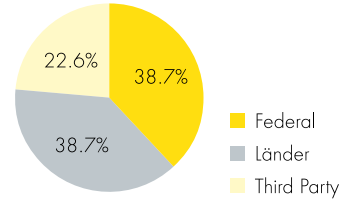
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10115 Berlin  
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Phone: +49 30 206049-0

Email: [info@leibniz-gemeinschaft.de](mailto:info@leibniz-gemeinschaft.de)

## International Cooperation

Most international cooperative projects of the Leibniz Association are run by the individual institutes. Each individual institute is responsible for initiating and running international cooperation projects independently and in accordance with its own research focus. The headquarters supports its member institutions by representing them abroad and facilitating their relations with authorities and the international research community. The Association participates in committees convened by the Federal Ministry of Education and Research (BMBF) and the German Academic Exchange Service (DAAD) regarding Scientific and Technical Cooperation (WTZ) and in the International Marketing Campaign for Higher Education in Germany.



In 2013, Leibniz Institutes were involved in over 3,400 international collaborative projects in 116 countries all over the world.

## Research Budget

The budget totals approx. 1.6 billion euros, comprising an equal share from the Federal Government and the federal states ("Länder") and an additional share of third-party funding, which amounts to almost a quarter of the total budget.

## More Information

Leibniz Association:  
[www.leibniz-gemeinschaft.de](http://www.leibniz-gemeinschaft.de)



# Max Planck Society

The Max Planck Society (MPG) is an independent, non-profit research organisation named after the world-famous physicist Max Planck (1858–1947). With its focus on basic research in the natural sciences, life sciences, humanities and social sciences, the MPG complements research projects at universities. The MPG is well-known for its excellence in research. Since it was established in 1948, seventeen MPG researchers have received the Nobel Prize. Gerhard Ertl, physicist and surface chemist at the Fritz Haber Institute of the MPG, received the renowned award in 2007 (Nobel Prize in Chemistry).



Headquarters of the Max Planck Society in Munich.



MAX-PLANCK-GESELLSCHAFT

## Facts and Figures



83 research institutes (5 institutes and one branch abroad)



approx. 17,000 staff (including 5,470 researchers) and 4,500 scholarship holders and visiting researchers from all over the world (2013)



annual budget: approx. 1.5 billion euros (2013)



## Organisational Details

More than 21,400 people are employed at the MPG. The MPG headquarters is located in Munich.

## Research Activities

Max Planck Institutes conduct basic research in the interest of the public. The fields of research are natural sciences, life sciences, social sciences and the humanities. Some institutes also perform services for university research, providing equipment and facilities to researchers, such as telescopes, large-scale equipment, specialised libraries and documentary resources.

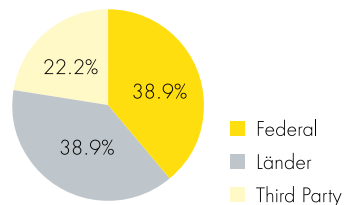
## Contact

Max-Planck-Gesellschaft (MPG)  
Hofgartenstraße 8  
80539 München  
Germany  
Phone: +49 89 2108-0  
Email: [post@gv.mpg.de](mailto:post@gv.mpg.de)

## International Cooperation

Max Planck Institutes frequently build international networks to create the critical mass for specific research topics. The fact that MPG researchers are highly sought-after and appreciated as esteemed research partners worldwide is evidenced by more than 6,900 foreign visiting and junior researchers at Max Planck Institutes and over 2,000 ongoing international research projects with more than 5,000 partners in over 120 countries around the world in 2012.

As a research partner, the MPG collaborates with numerous institutes and multinational research facilities outside Germany.



## Research Budget

The MPG is primarily financed out of public funds from the Federal Government and the states ("Länder"). The MPG has been allocated just under 1.53 billion euros for 2013. It also receives third-party project funding from public and private bodies as well as the European Union.

## More Information

Max-Planck-Gesellschaft (MPG):  
[www.mpg.de](http://www.mpg.de)

Max Planck Institutes:  
[www.institutes.mpg.de](http://www.institutes.mpg.de)

International Max Planck Research  
Schools: [www.imprs.mpg.de](http://www.imprs.mpg.de)



# Federal Research Institutions

Germany's Federal Ministries fund 40 federal R&D institutions. This departmental research is always directly related to the respective ministry's field of activity. The main objective of this research is to support the ministry's activities and provide the necessary scientific basis for the execution of government measures.

One example of a departmental research institute is the Robert Koch Institute in Berlin which is responsible for disease control and prevention. It is the central reference institution for both applied and response-oriented research as well as for the public health sector. Another example is the Institute for Materials Research and Testing (BAM). BAM is responsible for increasing safety and reliability in chemistry and materials technologies, including statutory regulations on safety standards and threshold values.



Germany's Federal Ministries fund 40 federal R&D institutions that perform research in nearly all areas.

## Facts and Figures



40 research organisations



21,300 staff; 9,300 researchers (2011)



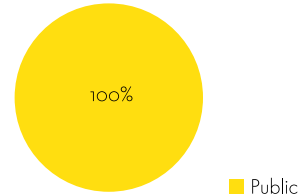
planned budget in 2012: 1.7 billion euros; for R&D: 828 million euros

## Research Activities

Federal research institutions perform research in nearly all areas: society, security and defence, science, infrastructure, animal protection, strategic issues, nature conservation, environmental protection, consumer protection, healthcare, development policy and economic policy.

## Research Budget

Departmental research institutes are 100% publicly funded. The planned total budget in 2012 was approx. 1.7 billion euros, with 828 million allocated for R&D.



## More Information

Robert Koch Institute: [www.rki.de](http://www.rki.de)

Federal Institute for Materials Research and Testing (BAM): [www.bam.de](http://www.bam.de)

Interactive map and list of federal research institutions: [www.bmbf.de](http://www.bmbf.de)  
Click on the menu headings "Academia" > "Maps of Research" > "Federal Institutions" to find an interactive map of federal research institutions in Germany provided by the Federal Ministry of Education and Research (BMBF).

# State ("Länder") Institutions

The German federal states ("Länder") act as research funding bodies and operate several research institutes which support state research activities. There are 130 institutes covering a broad range of research areas.



Flexible photovoltaic module.



## Facts and Figures



130 research organisations in 16 German states ("Länder")



approx. 6,300; 3,100 scientists and researchers (2010, including municipal institutions)



521 million euros  
for R&D: 274 million euros (2010, including municipal institutions)

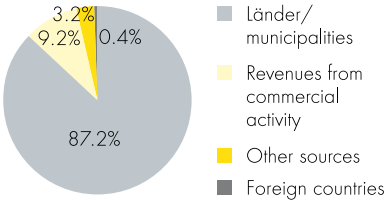
One example is the Centre for Solar Energy and Hydrogen Research (ZSW). The co-founder of ZSW, Professor Dr. Werner H. Bloss, has been conducting pioneering research on unconventional energy transformation since the late 1950s. The state of Baden-Württemberg set up ZSW in 1988 as a non-profit foundation bringing together universities, research institutes and companies. One of the key research goals of ZSW is to develop technologies for generating sustainable and climate-friendly electricity. With its approx. 220 staff and 100 student and research assistants ZSW has established itself as one of the key European institutes in its field.

**Research Activities**

Research activities are conducted in engineering, the humanities, health research and natural sciences.

**Research Budget**

State institutions that conduct research are primarily state-funded with occasional external funding.



**More Information**

State research institutes in Germany: [www.bmbf.de](http://www.bmbf.de)  
Click on the menu headings “Academia” > “Maps of Research” > “State Institutions” to find an interactive map and a list of state research institutions in Germany provided by the Federal Ministry of Education and Research (BMBF).

Centre for Solar Energy and Hydrogen Research (ZSW) Baden-Württemberg:  
[www.zsw-bw.de](http://www.zsw-bw.de)

# Companies/Industrial Research

German companies are among the most innovative in Europe. Industry based and financed investments account for almost two thirds of all R&D funding in Germany. Companies are especially involved in applied research and work closely with the global network of Fraunhofer Institutes (see p. 16) and the German Federation of Industrial Research Associations (AiF) (see p. 30). Examples of successful technology transfer can be found in the areas of environmental research, resource-efficient production and new materials.

## Research Activities

Roughly 32% of internal R&D spending in industry was invested in the automotive sector, approx. 13% in the electrical engineering sector, a good 15% in the chemical and pharmaceutical industries and about 9% in mechanical engineering.



Innovation made in Germany: The automotive sector.

## Facts and Figures



distribution of the internal industrial research budget: 11.0% small enterprises (up to 249 employees), 5.2% medium-sized enterprises (250-499), 83.8% large enterprises (more than 500 employees)



approx. 350,000 research staff, of which 25% work in the automotive industry (2011)



annual budget (2013, planned): approx. 53.1 billion euros (internal R&D expenditure)

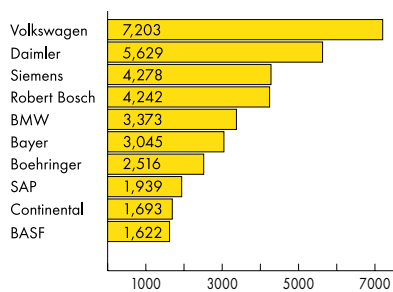
## Where does industrial research take place?

The Federation of German Industries (BDI) is the umbrella organisation for enterprises and industry-related service providers. The BDI coordinates the views and recommendations of its members and provides business support, i.e. information covering all fields of economic policy.

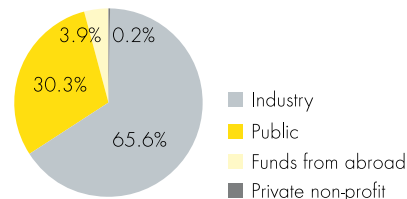
Particularly in the field of applied research, companies work with universities and research institutes on joint projects that are co-funded by public institutions. The industrial research budget is distributed as follows: 11% small enterprises, 5.2% medium-sized enterprises and

83.8% large enterprises. The ten large enterprises listed below account for the lion's share of the total industrial research budget.

Companies with the highest R&D spending in Germany (in million euros, 2011)



Source: European Commission: The 2012 EU Industrial R&D Investment Scoreboard



Gross Domestic Expenditure on Research and Development (GERD) by funding sources; % of total GERD (2010)

## Research Budget

German industry spends approx. 53.1 billion euros on internal research (2013, planned). Industry is responsible for carrying out and funding at least two thirds of R&D activities.

## Company Links

- Volkswagen: [www.volkswagenag.com](http://www.volkswagenag.com)
- Daimler: [www.daimler.com](http://www.daimler.com)
- Siemens: [www.siemens.com](http://www.siemens.com)
- Robert Bosch: [www.bosch.com](http://www.bosch.com)
- BMW Group: [www.bmwgroup.com](http://www.bmwgroup.com)
- Bayer: [www.bayer.com](http://www.bayer.com)
- Boehringer: [www.boehringer.com](http://www.boehringer.com)
- SAP: [www.sap.com](http://www.sap.com)
- Continental: [www.conti-online.com](http://www.conti-online.com)
- BASF: [www.basf.com](http://www.basf.com)

## More Information

German Business Portal: [www.german-business-portal.info](http://www.german-business-portal.info)

Federation of German Industries (BDI): [www.bdi.eu](http://www.bdi.eu) (in German only)

Company Register: [www.unternehmensregister.de](http://www.unternehmensregister.de)

All the important company data requiring publication are centrally consolidated in this database.

Germany Trade & Invest: [www.gtai.de](http://www.gtai.de)

This organisation promotes Germany as a business and technology location, supports companies based in Germany with global market information and informs and advises international companies setting up a business in Germany.



# German Federation of Industrial Research Associations (AiF)

The German Federation of Industrial Research Associations (AiF) was founded in 1954. As a registered non-profit association, the AiF promotes R&D in all industrial sectors on behalf of small and medium-sized enterprises (SMEs). The association is active at the national and European level.

The AiF is organised by industry and is particularly involved in increasing the competitive strength of SMEs by supporting the efficient application and advancement of R&D programmes. This includes a variety of fields of applied research, such as process control, building industry, medical technology, food science and agricultural science.



Fuel technology at the Gaswärme-Institut (GWI) e.V. in Essen, a member of AiF.



## Facts and Figures



network of 100 industrial research associations from all sectors (industry and service sector) with 50,000 affiliated companies (above all SMEs)



485 million euros of public funding for research projects by SMEs (2012)

### Organisational Details

The AiF promotes R&D for small and medium-sized enterprises in several ways:

- organisation of joint industrial research for the benefit of entire industrial sectors
- administration of programmes for governmental R&D support measures
- promotion of R&D through open innovation processes
- networking within and between industrial sectors and politics

### Research Budget

In 2012, the AiF managed an annual budget of 485 million euros allocated from public funds for research projects by SMEs. It is currently a partner to the Federal Ministry of Economics and Technology (BMWi).



### Contact

German Federation of Industrial Research Associations  
Arbeitsgemeinschaft industrieller Forschungsvereinigungen "Otto von Guericke" e.V. (AiF)  
Bayenthalgürtel 23  
50968 Cologne  
Germany  
Phone: +49 221 37680-0  
Email: [info@aif.de](mailto:info@aif.de)

### Affiliates

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Tschaikowskistraße 49  
13156 Berlin  
Germany  
Phone: +49 30 48163-3  
Email: [info@aif-projekt-gmbh.de](mailto:info@aif-projekt-gmbh.de)

AiF F-T-K GmbH  
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### More Information

German Federation of Industrial Research Associations (AiF):  
[www.aif.de](http://www.aif.de)



# Networks and Clusters

Over the last few years, the Federal Government has initiated a series of projects which aim to create networks and clusters that promote new technologies. They involve both industrial and academic institutions in their research and development activities.

One key aim of these bodies is to accelerate the process of making new technology products marketable.

Networks and clusters are arranged with respect to

- regional representation
- research topics
- specific application areas and future markets.



Both the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Economics and Technology (BMWi) support these types of associations with different programmes and competitions such as:

- go-cluster (see p. 34)
- Leading-Edge Cluster Competition (see p. 36)
- Entrepreneurial Regions (see p. 38)

### **Clusterplattform Deutschland**

Clusterplattform Deutschland is a joint information portal of the BMWi and the BMBF. The website offers an overview of support measures and events for research clusters and facilitates access to the individual initiatives.

### **Example of research network:**

#### **Innovation Alliance on Lithium-Ion Battery LIB 2015**

The Innovation Alliance on Lithium-Ion Battery LIB 2015 consists of some 60 project partners from politics, industry, science and research and is supported by the Federal Government. 15% of the research project is financed by the Federal Government (60 million euros) and 85% by the consortium of BASF, BOSCH, EVONIK, LiTec and Volkswagen (360 million euros). It is an example of how government incentives can advance research and development. The framework of networks and clusters also strengthens the country's contribution to international research cooperation.

### **Research Activities**

Research activities are conducted in a variety of fields – for example, engineering, biotechnology, energy and environment, chemistry and nanotechnology.

### **Research Budget**

Statistics on the total budget are not available. Public funding is provided as seed capital to form networks and clusters and support research projects on condition that industry and private investors share the financial costs.



### **More Information**

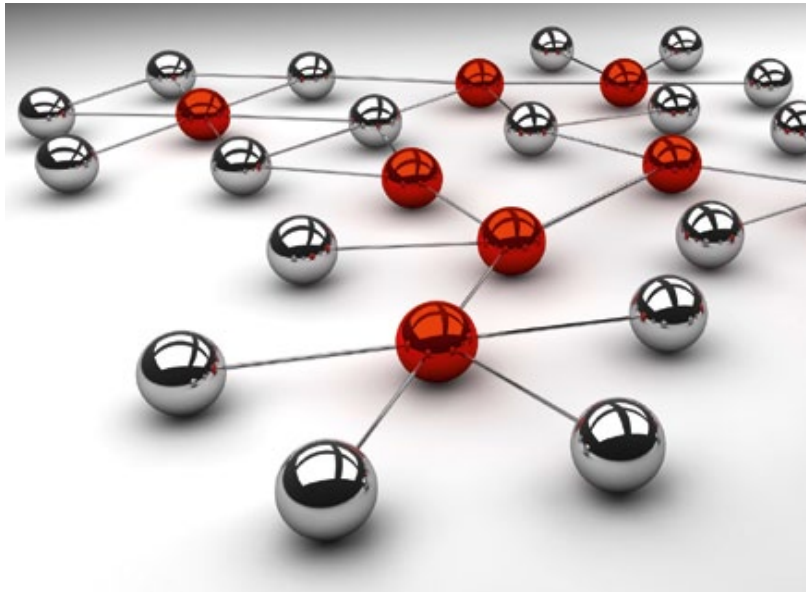
Federal Ministry of Education and Research (BMBF): [www.bmbf.de](http://www.bmbf.de)

Federal Ministry of Economics and Technology (BMWi): [www.bmwi.de](http://www.bmwi.de)

Clusterplattform Deutschland:  
[www.clusterplattform.de](http://www.clusterplattform.de)

# go-cluster: Exzellent vernetzt!

The go-cluster programme that was launched by the Federal Ministry of Economics and Technology (BMWi) in 2012 currently unites 90 innovation clusters from all regions of Germany. They are trailblazers for innovation and reflect Germany's competence in a large number of industries and technological fields.



**BUSINESS.  
GROWTH.  
PROSPERITY.**



## Facts and Figures



90 innovation clusters, eight of which having achieved the gold-label status of the "European Cluster Excellence Initiative" (ECEI), and involving more than 5,500 SMEs, 1,300 large companies and 1,500 higher education institutions and research institutes

go-cluster supports groups of clusters in developing their expertise by offering services for the professionalisation of cluster management, such as seminars and individual coaching on cluster-specific subjects including strategy processes, internationalisation, funding and the organisation of groups of actors.

In addition, the development and implementation of new, high-risk service strategies has been supported financially by the BMWi. Cluster managements participating in this programme will profit from the realisation of these new service concepts. The strength of cluster management will be presented both nationally and internationally in various public relations events.

## Contact

VDI/VDE Innovation + Technik GmbH  
Steinplatz 1  
10623 Berlin  
Germany  
Phone: +49 30 310078-387  
Email: [info@go-cluster.de](mailto:info@go-cluster.de)

## Research Activities

The members of go-cluster networks are active in a wide range of research areas, such as biotechnology, health and medical science, transportation and mobility, materials technologies and chemistry, production and engineering, aerospace, energy and the environment, information and communication and micro-nano-opto technologies. They focus especially on collaborative research with the industry.

## More Information

go-cluster: Exzellent vernetzt!  
[www.go-cluster.de](http://www.go-cluster.de)

For an overview of all members in the go-cluster project, click on the menu heading "Innovation Clusters".

# The Leading-Edge Cluster Competition

The Leading-Edge Cluster Competition was launched by the Federal Ministry of Education and Research (BMBF) in 2007 as part of the High-Tech Strategy for Germany. A core element of this strategy is building bridges between science and industry. Clusters are constituted by companies, scientific institutions and policymakers.



## Facts and Figures



15 clusters in three rounds of competition



600 million euros (Federal Government funding) and 600 million euros from participating companies over the entire project period (until 2017)



## About the Competition

Three rounds of the competition have been held. The emphasis is on innovative approaches to a long-term cluster strategy. Clusters are arranged with respect to regional representation.

### Winners of the First Round (2008):

- BioRN – Biotech Cluster Rhine-Neckar ([www.biorn.org](http://www.biorn.org))
- Cool Silicon – Energy Efficiency Innovations from Silicon Saxony ([www.cool-silicon.org](http://www.cool-silicon.org))
- Forum Organic Electronics, Rhine-Neckar Metropolitan Region (MRN) ([www.m-r-n.com](http://www.m-r-n.com); [www.innovationlab.de](http://www.innovationlab.de))
- Aviation Cluster Hamburg Metropolitan Region ([www.hamburg-aviation.com](http://www.hamburg-aviation.com))
- Solarvalley Mitteldeutschland ([www.solarvalley.org](http://www.solarvalley.org))

### Winners of the Second Round (2010):

- Software-Cluster, Hesse, Rhineland-Palatinate, Saarland, Baden-Württemberg ([www.software-cluster.com](http://www.software-cluster.com))
- Munich Biotech Cluster – m<sup>4</sup>, Bavaria ([www.m4.de](http://www.m4.de); [www.bio-m.org/en](http://www.bio-m.org/en))
- Medical Valley Europäische Metropolregion Nürnberg, Bavaria ([www.medical-valley-emn.de](http://www.medical-valley-emn.de))
- MicroTEC Südwest, Baden-Württemberg ([www.microtec-suedwest.de](http://www.microtec-suedwest.de); [www.mstbw.de](http://www.mstbw.de))
- EfficiencyCluster LogistikRuhr, North Rhine-Westphalia, Hesse ([www.logistik-ruhr.de](http://www.logistik-ruhr.de))

### Winners of the Third Round (2012):

- BioEconomy Cluster ([www.bioeconomy.de](http://www.bioeconomy.de))
- Cluster für Individualisierte Immunintervention (Ci3) ([www.ci-3.de](http://www.ci-3.de))
- Elektromobilität Süd-West ([www.e-mobilbw.de](http://www.e-mobilbw.de))
- it's OWL Intelligente Technische Systeme OstWestfalenLippe ([www.its-owl.de](http://www.its-owl.de))
- M A I Carbon ([www.mai-carbon.de](http://www.mai-carbon.de))

## Research Budget

In each round of the competition, up to 200 million euros has been made available to form up to five excellence clusters (40 million euros each) over a period of no longer than five years. Realisation requires a matching level of funding from industry and private investors.

### More Information

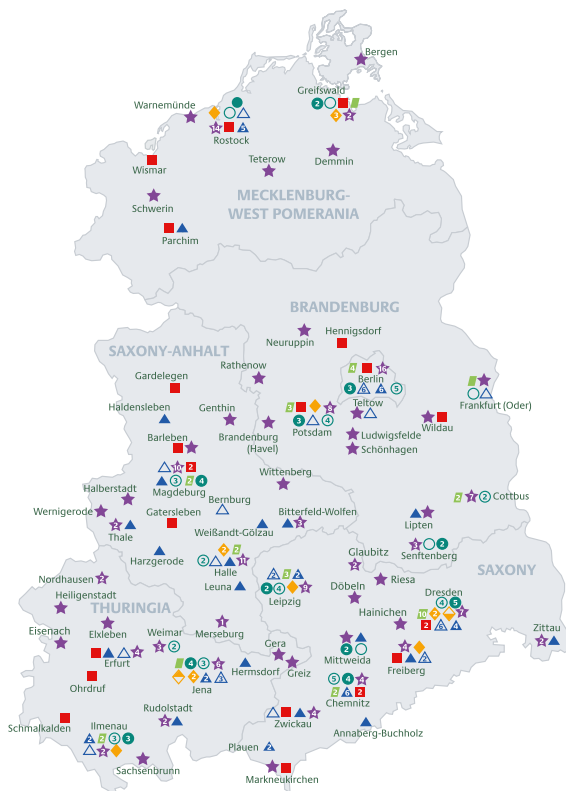
High-Tech Strategy:  
[www.hightech-strategie.de](http://www.hightech-strategie.de)

Leading-Edge Cluster Competition:  
[www.bmbf.de](http://www.bmbf.de)

For more information on the Leading-Edge Cluster Competition, click on the menu headings "High-Tech Strategy" > "Science and Business" > "The Leading-Edge Cluster Competition".

# Entrepreneurial Regions

Entrepreneurial Regions is an innovation initiative of the Federal Ministry of Education and Research (BMBF) in eastern Germany. The initiative uses different funding programmes to support regional alliances that develop their core competencies into clusters of a high standard and with a strict market orientation. All programmes observe the principles: think laterally, collaborate, plan strategically and act entrepreneurially.



## Facts and Figures



Entrepreneurial Regions consists of seven funding programmes for the new states ("Länder") in eastern Germany



total research budget (partially until 2019): approx. 1.63 billion euros

One example is LEANTEC, a joint project in which five regional companies and three institutes of the TU Dresden and Ilmenau University of Technology have developed an entirely new kind of electric drive. Environmentally friendly, energy-efficient and lighter than conventional drive systems, the LEANTEC technology satisfies future requirements in the fields of electromobility and engineering and thereby promises successful marketing opportunities for the partners. The joint project aims to create a complete value chain with separate marketable products of the highest technological standard. The collaborative project is being funded until 2014.

### **Mission of Entrepreneurial Regions**

Entrepreneurial Regions aims to develop regional alliances in eastern Germany into regional clusters. The initiative funds outstanding innovation potentials in a targeted way. The focus is firmly on the feasibility and marketability of the ideas involved.

### **Research Budget**

Since 1999, the BMBF has supported more than 450 initiatives in the new states ("Länder") with funding of approx. 1.63 billion euros in seven individual programmes. "Zwanzig20 - Partnerschaft für Innovation", the latest funding line, is making available 500 million euros until 2019 for supraregional and interdisciplinary partnerships in the new states.

### **Contact**

Federal Ministry of Education  
and Research  
Hans-Peter Hiepe  
Head of Division  
Division 114: Regional Innovation  
Initiatives; New Länder  
Hannoversche Straße 28-30  
10115 Berlin  
Germany



### **More Information**

Entrepreneurial Regions:  
[www.unternehmen-region.de](http://www.unternehmen-region.de)

# 🌸🌺🌻 Research Infrastructures



Neumayer-Station III is a German research station in the Antarctic operated by the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI).

Germany is home to several research infrastructures (RIs) of global significance. Research infrastructures are major instruments, resources or service facilities for research in all disciplines that stand out because they are of at least national significance and have a long life – as a rule, more than ten years. In the case of the natural, biological, environmental and technological sciences as well as medicine, investment costs amount to at least 15 million euros. The most important research infrastructures in Germany include:

- Deutsches Elektronen-Synchrotron (DESY) (see p. 42)
- German Climate Computing Centre (DKRZ) (see p. 44)
- Research Vessel *Polarstern* (see p. 46)
- FLASH II – Free-Electron Laser in Hamburg (see p. 48)

Germany also contributes to the funding of infrastructures in other countries, e.g. the European Organization for Nuclear Research (CERN) in Geneva, Switzerland. Germany provides 20% of CERN's budget, making it the largest contributor of funding to this most renowned centre of fundamental physics.

### Research Activities

Research activities are conducted in physics (fundamental research), earth sciences, climate research and humanities.

### Research Budget

The Federal Government provides the majority of funding for large-scale equipment in basic research with an annual budget of 1.1 billion euros (planned in 2013). The budget is also supplemented by international funding.

### More Information

Database of European Research Infrastructures: [www.riportal.eu](http://www.riportal.eu)  
This database provides information on a large number of research infrastructures (RIs) of pan-European interest in all fields of science.

European Organization for Nuclear Research (CERN): [www.cern.ch](http://www.cern.ch)



# Deutsches Elektronen-Synchrotron (DESY)

Founded in 1959, “Deutsches Elektronen-Synchrotron” (DESY) is an internationally renowned centre of fundamental research and one of the world’s leading institutions investigating the structure of matter. DESY is a member of the Helmholtz Association and is supported by public funds.



DESY Campus in Hamburg.



## Facts and Figures



2 sites (Hamburg and Zeuthen)



approx. 2,000 staff, more than 3,000 visiting researchers each year



annual budget: 192 million euros (2011)

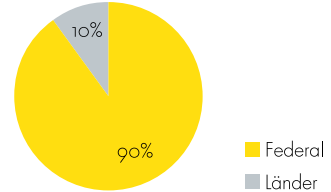
DESY has one site in Hamburg and another in Zeuthen (near Berlin) and employs a total of approx. 2,000 staff (including 650 scientists). The centre's principal working areas are accelerators, photon science and particle physics. More than 3,000 scientists from over 40 countries visit DESY each year. Approximately 700 graduate students, PhD students and postdocs work at DESY, which also trains more than 100 young people in commercial and technical occupations.

### Research Activities

DESY develops, runs and uses accelerators and detectors for photon science and particle physics. It is operating the world's best synchrotron radiation facility PETRA III and the first free-electron laser for soft X-rays FLASH.

### Research Budget

DESY has an annual budget of approx. 192 million euros. As a research centre of the Helmholtz Association it is chiefly funded by the Federal Government (90%).



### Contact

Deutsches Elektronen-Synchrotron (DESY)  
Location Hamburg  
Notkestraße 85  
22607 Hamburg  
Germany  
Phone: +49 40 8998-0  
Email: [desyinfo@desy.de](mailto:desyinfo@desy.de)

Deutsches Elektronen-Synchrotron (DESY)  
Location Zeuthen  
Platanenallee 6  
15738 Zeuthen  
Germany  
Phone: +49 33762 7-70  
Email: [desyinfo.zeuthen@desy.de](mailto:desyinfo.zeuthen@desy.de)



### More Information

Deutsches Elektronen-Synchrotron (DESY): [www.desy.de](http://www.desy.de)



# German Climate Computing Centre (DKRZ)

The German Climate Computing Centre (DKRZ) is a national facility. By offering customised services that exclusively support climate researchers it enjoys a unique status among other German high performance computing centres.

The High Performance Computing System for the Earth System Research 2 (HLRE2) is the workhorse of the “German laboratory of climate research”. Its total system peak performance is 158 TeraFLOPS. From 2014 onwards, the new high-performance system HLRE3 will significantly boost the available computing power and thus further strengthen the DKRZ’s leading role as a global centre for climate data. The DKRZ already plays a vital role in the infrastructure of climate change research. Its results complement research on observable changes in climate to form the basis for a sustainable policy.



DKRZ's High Performance Computing System for Earth System Research 2 (HLRE2) is exclusively used for climate modelling.



## Facts and Figures



1 centre in Hamburg



approx. 80 staff



non-profit limited company with a budget of approx. 7.6 million euros (2012)

### Organisational Details

Founded in 1987 as a limited liability company (GmbH) with four shareholders (largest: Max Planck Society), the DKRZ is a non-profit and non-commercial research centre.

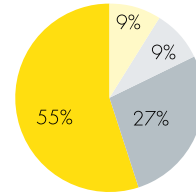
### Research Activities

DKRZ's high-performance computing facilities are used to conduct research on climate modelling. Its computing power enables the application of sophisticated, realistic numeric models for the quantitative computation of complex processes in the climate and earth system.

In addition to this, the DKRZ installs and maintains software tools and hardware infrastructure for the storage, management and analysis of extremely large data sets. The centre is a coordinating node in the national and European network of climate researchers.

### Research Budget

DKRZ operates as a non-profit limited company. The Max Planck Society holds 55% of the company's shares.



- Helmholtz-Zentrum Geesthacht
- Alfred Wegener Institute
- Free and Hanseatic City of Hamburg (represented by the university)
- Max Planck Society

### Contact

German Climate Computing Centre  
Deutsches Klimarechenzentrum GmbH (DKRZ)  
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20146 Hamburg  
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Email: sekretariat@dkrz.de



### More Information

German Climate Computing Centre  
(DKRZ): [www.dkrz.de](http://www.dkrz.de)

# Research Vessel *Polarstern*

The research vessel *Polarstern* was first commissioned in 1982. Since then, the ship has already completed 53 expeditions to the Arctic and Antarctic and began her 54<sup>th</sup> expedition in summer 2013. Specially designed for working in polar seas, the *Polarstern* is currently one of the most sophisticated polar research and supply vessels in the world.

The ship is equipped for research in the areas of: biology, geology, geophysics, glaciology, chemistry, oceanography and meteorology. It has nine research laboratories and can be equipped with additional laboratory containers.

The Federal Government plans to replace the Bremerhaven-based *Polarstern* with a new vessel by 2019.



RV *Polarstern* in the Arctic. Scientists on board investigate e. g. changes in sea ice thickness and their effects on life beneath the ice and down to the deep sea.

## Facts and Figures



max. 44 crew, approx. 50 scientists



daily cost of operation: 55,000 euros

### Organisational Details

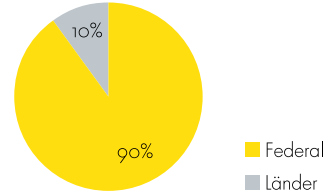
This research vessel is operated by the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) in Bremerhaven and owned by the Federal Government, represented by the Federal Ministry of Education and Research (BMBF).

### Research Activities

Scientists on board the *Polarstern* conduct polar, earth, marine and climate research.

### Research Budget

Because the AWI, which operates the *Polarstern*, belongs to the Helmholtz Association, 90% of its annual budget comes from federal funds, with 10% provided by three German states ("Länder").



### Contact

Alfred Wegener Institute, Helmholtz  
Centre for Polar and Marine Research  
(AWI)  
Am Handelshafen 12  
27570 Bremerhaven  
Germany  
Phone: +49 471 4831-0



### More Information

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)/*Polarstern*:  
[www.awi.de](http://www.awi.de)

The AWI carries out research in the Arctic and Antarctic as well as in the high and mid latitude oceans. Read more about the research vessel *Polarstern*, its detailed expedition schedule and much more:  
[www.awi.de/en/infrastructure/ships/polarstern](http://www.awi.de/en/infrastructure/ships/polarstern)

# FLASH II – Free-Electron Laser in Hamburg

FLASH II, the extension of the free-electron laser facility in Hamburg that is still under construction, represents a major research infrastructure of the future. Germany is a pioneer in the field of free-electron lasers (FEL). FLASH at “Deutsches Elektronen-Synchrotron” (DESY) in Hamburg, which began user operation in 2005, was the first laser in the low-energy ultraviolet and soft X-ray range and it has retained its globally unique status until the present.



FLASH accelerator tunnel.



## Facts and Figures



Time schedule: construction phase from autumn 2011 to early 2014  
Laser operation from 2014

Now, with FLASH II, a second tunnel is being added with a second FEL and an experimental hall for up to six user experiment stations. X-ray lasers that create an X-ray beam using free electrons (free-electron lasers) enable completely new insights into structures and processes in the nano range. Individual molecules, atoms and clusters as well as the processes between them can be observed directly with the aid of the ultrashort high-intensity X-ray pulses. This provides important insights for the development of new materials.

#### Participating Research Institutions

- Deutsches Elektronen-Synchrotron (DESY)
- Helmholtz Institute Jena
- Helmholtz-Zentrum Berlin (HZB)



#### Contact

Deutsches Elektronen-Synchrotron (DESY)  
Location Hamburg  
Notkestraße 85  
22607 Hamburg  
Germany  
Phone: +49 40 8998-0  
Email: [desyinfo@desy.de](mailto:desyinfo@desy.de)

#### More Information

Visit [www.desy.de](http://www.desy.de) for more information on FLASH II:  
"Research" > "FLASH" > "FLASH II"



# About "Research in Germany"

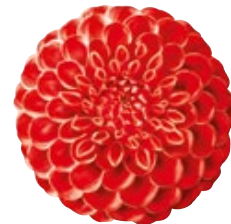
The Federal Ministry of Education and Research (BMBF) launched the initiative to "Promote Innovation and Research in Germany" in 2006.

Under the brand "Research in Germany - Land of Ideas" various promotional measures and events presenting German innovation and research in key international markets have been organised on behalf of the BMBF. The initiative seeks to strengthen and expand R&D collaboration between Germany and international partners.

The following and many more "Research in Germany" publications are available at [www.research-in-germany.de/downloads](http://www.research-in-germany.de/downloads):

- "German Funding Programmes for Scientists and Researchers"
- "FAQs - Doing a doctorate in Germany"
- "FAQs - Preparing a successful research stay in Germany"
- "Discover the Future of Research. Now. Germany - Europe's leader in science"
- "Germany - Partner for Medical Technology"
- "Keeping the Blue Planet Green"
- "Welcome to Nanotech Germany"

We hope that our brochures will provide useful information about the German research landscape. For more information about "Research in Germany", please visit our website at [www.research-in-germany.de](http://www.research-in-germany.de) and subscribe to our newsletter at [www.research-in-germany.de/newsletter](http://www.research-in-germany.de/newsletter).









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