



Open Science and Helmholtz

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Roland Bertelmann roland.bertelmann@os.helmholtz.de

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HELMHOLTZ

RESEARCH FOR GRAND CHALLENGES

With more than around 43,000 employees
at a total of 18 research centers and
a total annual budget of 5 billion euros,

Helmholtz is Germany's largest scientific organization.



Helmholtz Research Mission & Strategy

Research for Grand Challenges

- Systems solutions for grand challenges based on:
 - Scientific excellence
 - Interdisciplinarity and critical mass
 - long term research programs
- Helmholtz provides a highly attractive environment for talents and brilliant brains
- Profound expertise in large scale research infrastructure
- Helmholtz as a prime strategic partner at the local, national and international level
- Transfer of knowledge into economy and society



ELBE, HZDR // AWI

The Six Research Fields of the Helmholtz Association

ENERGY



EARTH AND
ENVIRONMENT



HEALTH



AERONAUTICS,
SPACE AND
TRANSPORT



MATTER

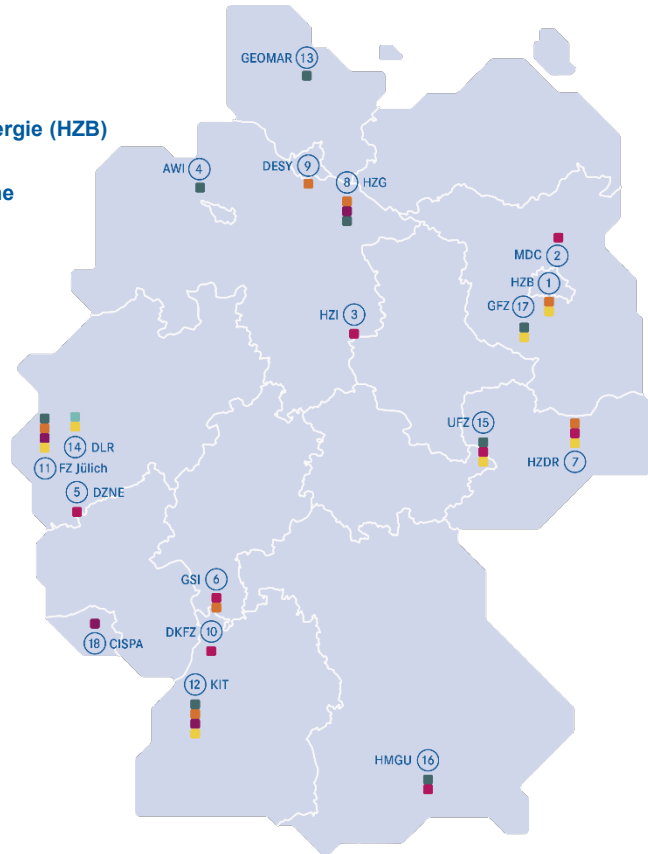


INFORMATION



Helmholtz Centers

1. Berlin
Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)
2. Berlin-Buch
Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC)
3. Brunswick
Helmholtz Center for Infection Research (HZI)
4. Bremerhaven
Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (AWI)
5. Bonn
German Center for Neurodegenerative Diseases (DZNE)
6. Darmstadt
GSI Helmholtz Center for Heavy Ion Research
7. Dresden
Helmholtz Center Dresden Rossendorf (HZDR)
8. Geesthacht
**Helmholtz Center Geesthacht
Center for Material and Coastal Research (HZG)**
9. Hamburg
Deutsches Elektronen-Synchrotron DESY



Research Areas:

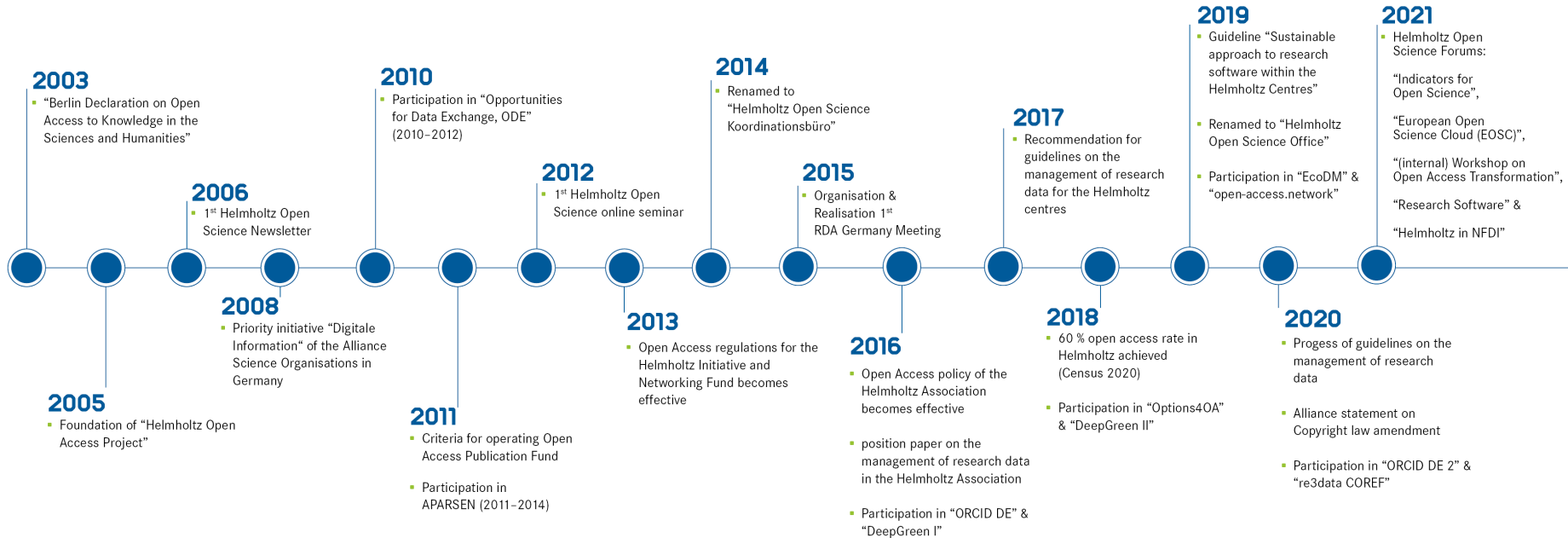
- | | |
|-----------------------|----------------------------------|
| Energy | Aeronautics, Space and Transport |
| Earth and Environment | Matter |
| Health | Information |

10. Heidelberg
German Cancer Research Center (DKFZ)
11. Jülich
Forschungszentrum Jülich (FZ Jülich)
12. Karlsruhe
Karlsruhe Institute of Technology (KIT)
13. Kiel
GEOMAR Helmholtz Center for Ocean Research Kiel
14. Cologne
German Aerospace Center (DLR)
15. Leipzig
Helmholtz Center for Environmental Research – UFZ
16. Munich
Helmholtz Center Munich – German Research Center for Health and the Environment (HMGU)
17. Potsdam
**Helmholtz Center Potsdam
German Research Center for Geosciences GFZ**
18. Saarbrücken
Helmholtz Center for Information Security – CISPA

Open Science in the Helmholtz Association

- Cultural change in the scientific way of working, organization, and communication
- Consistently employ digitization to make all components of the scientific process (publications, research data, research software, etc.) open, comprehensible, reusable, and easily accessible to everyone (meaning impeded by as few technical, legal, and financial obstacles as possible).
- Extends the transparency and the possibilities for quality assurance, increases the efficiency of science, and promotes innovations based on scientific knowledge.
- The development of open science differs in levels of extent in the research fields of the Helmholtz Association, depending on the discipline and respective publication culture.

Open Science: Long standing tradition

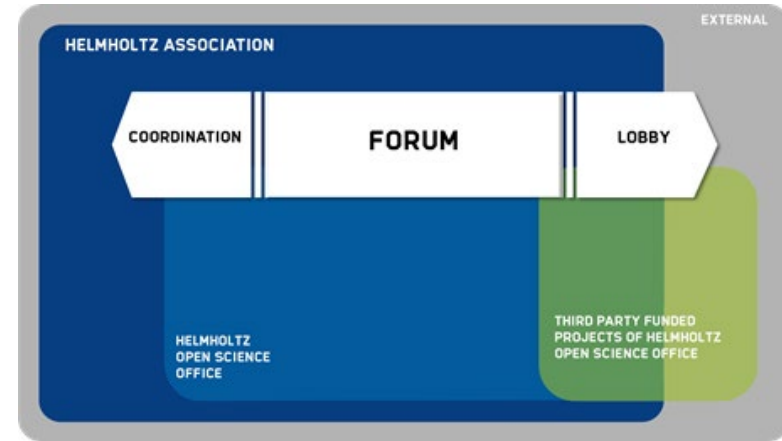


Open Science in the Helmholtz Association

- Open Science is an important cross-cutting topic with numerous points of contact
 - in the Centers, esp. in the contexts: digitization, research infrastructures, libraries, and data centers
 - in the entire Association: Digitization Strategy, KPIs, Information & Data Science Incubator platforms, Initiative and Networking Fund, transfer
- Core fields of action:
 - Open access – access to and re-use of textual publications
 - Open research data – access to and re-use of research data
 - Open research software – access to and re-use of research software

Mission Helmholtz Open Science Office

- Mission: Enabling Open Science practices in Helmholtz!
 - is a service provider for the Association for the cultural change “from closed to open”.
 - promotes dialogue and provides impulses within the Association.
 - offers training and support concerning all aspects of open science.
 - delivers a key contribution to the Helmholtz Digitization Strategy.
 - represents Helmholtz positions on open science on a national and international level.



Current focus topics of the Helmholtz Open Science Office

- Transfer and open science
- Incentives, indicators and metrics for open science
- Open science publishing
- Open science practices in the Centers

Open Access

- For open access, one of the Helmholtz Open Science Office's key endeavours is the promotion of the transformation from subscription-based access to open access. Open Access Green and Open Access Gold are implemented as equal strategies. In 2016 the President signed the “Expression of Interest” of the international OA2020 Initiative.
 - In 2016, the Assembly of Members specified the [Open Access Policy](#), offering a framework of action to the Helmholtz Centres for a coordinated transformation towards open access.
- Yearly monitoring of progress
 - Open Access metrics integrated in Helmholtz internal reporting, also in report on federal level

Open Research Data

- The Helmholtz Association is leading in generating, managing and providing access to [research data](#).
- In 2016, the Helmholtz Association adopted a **position paper** with the title “[Making information resources more usable](#)” on the handling of research data.
- In 2017, the Helmholtz Association adopted the Recommendations for guidelines of the Helmholtz centers for handling research data, which guides the Centers in the formulation of their respective [Research Data Policies](#).

Scientific Recognition: The provision of research data for further use is a service that not only benefits science but also society as a whole. The GFZ accepts this additional effort as part of the scientific performance and sees it as its duty to further promote such an approach both nationally and internationally. (Example from the Guidelines on Research Data at the GFZ German Research Centre for Geosciences, 2016)

Open Research Software

While open science calls for accessibility and reuse of scientific results, in many research areas, this can only be ensured if source code is made openly accessible in addition to the corresponding research data.

Current core areas of activity:

- Incentives and Metrics
- Software development and documentation practice
- Strategies for accessibility, publication, and transfer
- Infrastructures
- Licensing and other legal issues

Outcomes:

- 2017: Position paper: Access to and re-use of research software
- 2019: Model guideline for sustainable research software at the Helmholtz Centers
- 2019: Recommendations for the implementation of guidelines and policies for handling research software at the Helmholtz Centers.

Incentives, indicators and metrics for open science

- Need of trusted infrastructures

e.g. re3data (Helmholtz as main driver with the Karlsruhe Institute of Technology and the Helmholtz Open Science Office)



- Persistent identification is an important base for reliable indicators

e.g., Helmholtz Open Science Office leads a project on the national implementation of ORCID, the Open Researcher and Contributor iD



Incentives, indicators and metrics for open science

- Beyond the big picture,
also small steps count: integration of Open Research Europe (ORE)
in the internal reporting system (not only WoS, Scopus-indexed publications)

Incentives, indicators and metrics for open science

- **Helmholtz Forum: Indicators for Open Science (2021)**
- Follow up process in 2022

- Currently: **process of integration data and software publication in the internal assessment** (reporting system).
As a first step, aim is to develop a quality indicator



Contact

- Mail – open-science@helmholtz.de
- Website – <https://os.helmholtz.de>
- [Open Science Newsletter](#)
- Twitter – [@helmholtz_os](https://twitter.com/helmholtz_os)
- LinkedIn – [Helmholtz Open Science Office](#)

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