

HELMHOLTZ

Open Science

Helmholtz Open Science Office - Enabling Open Science at Helmholtz

Marcel Meistring

Helmholtz Association
Helmholtz Open Science Office

Max Planck Open Science Ambassadors Meeting,
November 6-7, 2024

Content

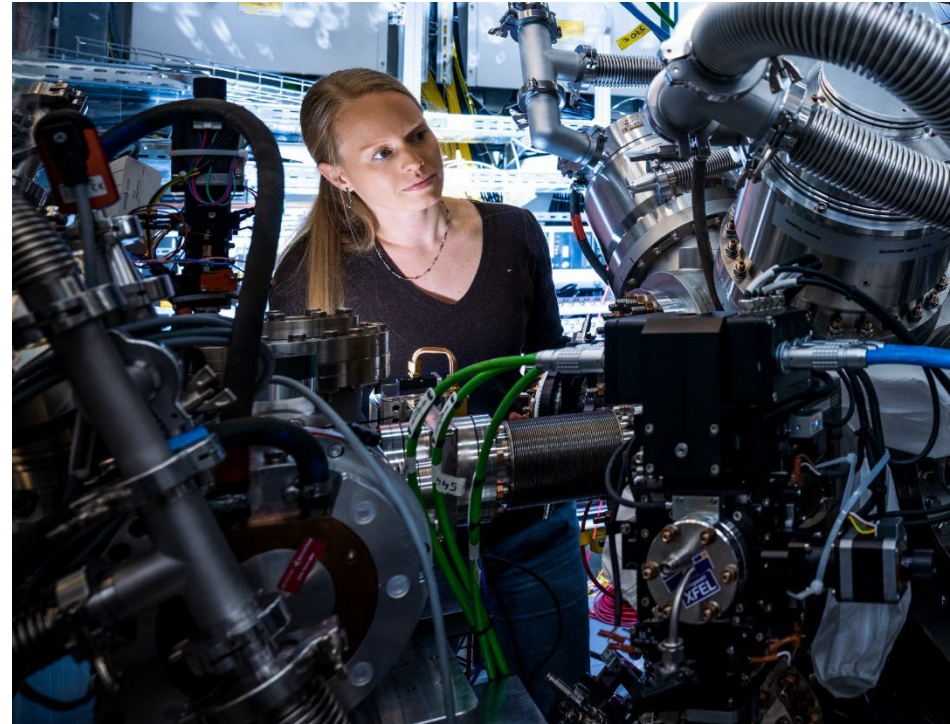
- Helmholtz Association
- Helmholtz Open Science Office
- Open Access
- Open Research Data
- Open Research Software
- Indicators and Research Assessment
- National and international Network
- Projects of the Helmholtz Open Science Office
- Dialogue

Helmholtz Association

Helmholtz Research Mission and Strategy

Research for Grand Challenges

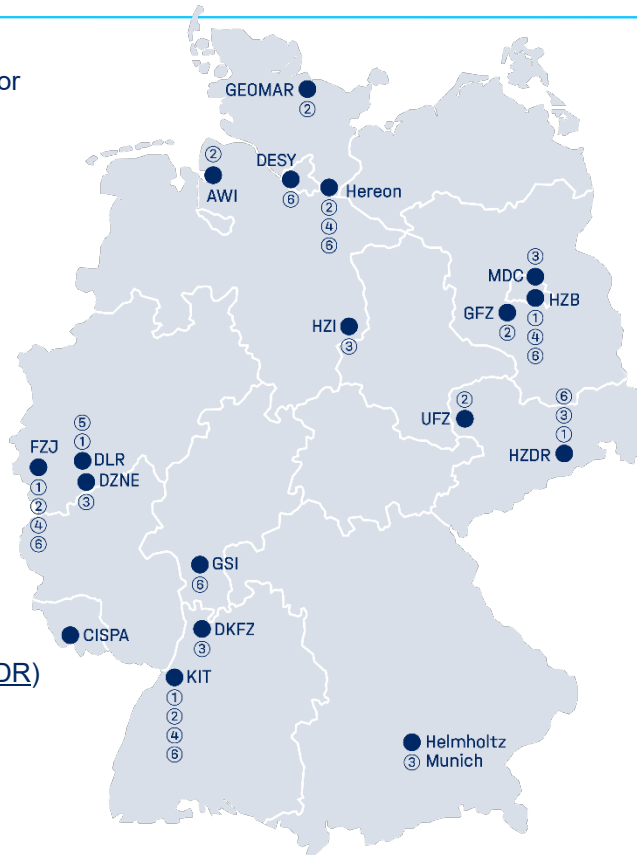
- Systems solutions for grand challenges based on:
 - Scientific excellence
 - Interdisciplinarity and critical mass
 - long term research programs
- Helmholtz provides a highly attractive environment for talents and brilliant brains
- Profound expertise in large scale research infrastructure
- Helmholtz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



Helmholtz research centers

18 centers in 6 Research Fields

- Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research ([AWI](#))
- [CISPA](#) – Helmholtz Center for Information Security
- Deutsches Elektronen-Synchrotron [DESY](#)
- Forschungszentrum Jülich ([FZJ](#))
- [GEOMAR](#) Helmholtz Centre for Ocean Research Kiel
- German Aerospace Center ([DLR](#))
- German Cancer Research Center ([DKFZ](#))
- German Center für Neurodegenerative Diseases ([DZNE](#))
- [GSI](#) Helmholtz Center for Heavy Ion Research
- Helmholtz Center Dresden Rossendorf ([HZDR](#))
- Helmholtz Center for Environmental Research – [UFZ](#)



- Helmholtz Center for Infection Research ([HZI](#))
- Helmholtz Center Potsdam – German Research Center for Geosciences [GFZ](#)
- [Helmholtz Munich](#)
- Helmholtz-Zentrum Berlin für Materialien und Energie ([HZB](#))
- Helmholtz-Zentrum Hereon
- Karlsruhe Institute of Technology ([KIT](#))
- Max Delbrück Center ([MDC](#))

Research Fields:

- (1) Energy, (2) Earth and Environment
- (3) Health, (4) Information
- (5) Aeronautics, Space and Transport, (6) Matter

The six research fields of the Helmholtz Association

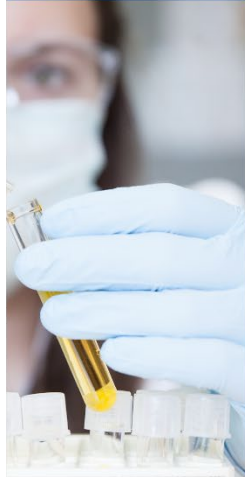
Energy



Earth and
Environment



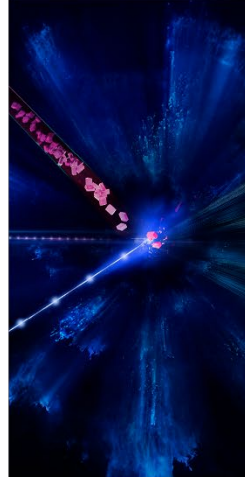
Health



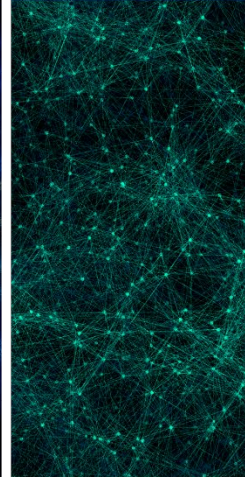
Aeronautics,
Space
and
Transport



Matter



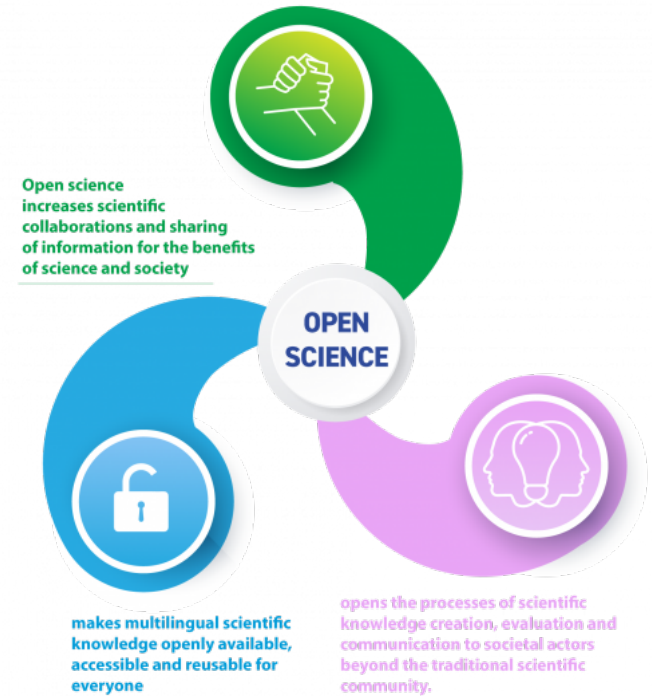
Information



Helmholtz Open Science Office

Open Science

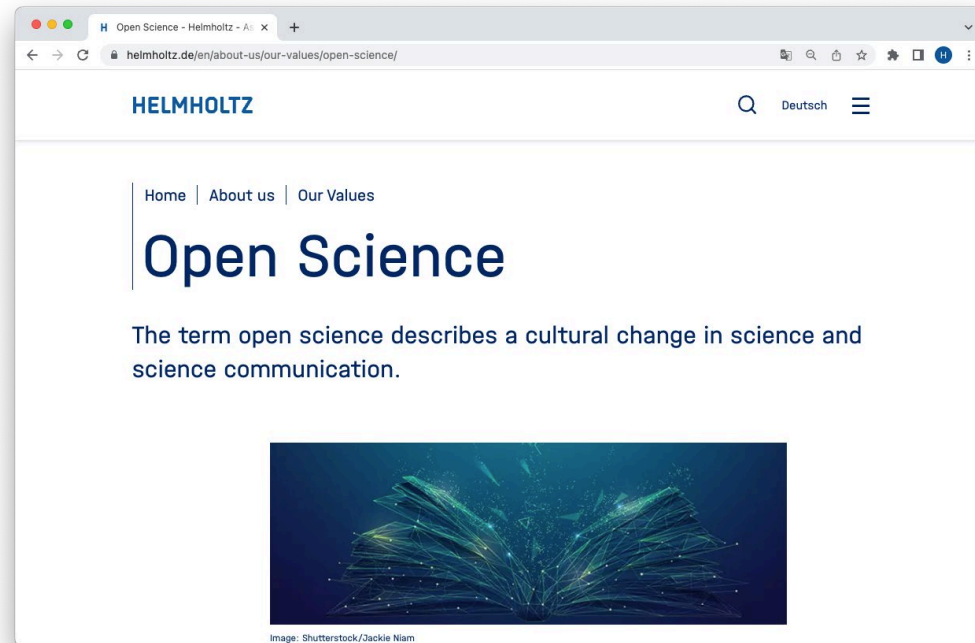
- Cultural change in scientific working methods, organization, and communication.
- Consistently employs digitization to make all components of the scientific process (publications, research data, research software, etc.) open, traceable, reusable, and accessible to everyone (in terms of reducing technical, legal, and financial hurdles).
- Expands transparency and the possibilities for quality assurance, increases the performance of science, and promotes innovations based on scientific findings.
- 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.



Source: [UNESCO](#)

Open Science in Helmholtz

- Open Science is an important **cross-cutting** topic with numerous points of contact
- In the Centers:
 - digitization, research infrastructures, libraries, data centers, transfer, etc.
- In the entire Association:
 - Digital transformation, KPIs, incubator platforms, Initiative and Networking Fund, transfer, etc.



<https://www.helmholtz.de>

Helmholtz Open Science Office: Mission

Enabling Open Science practices at Helmholtz!

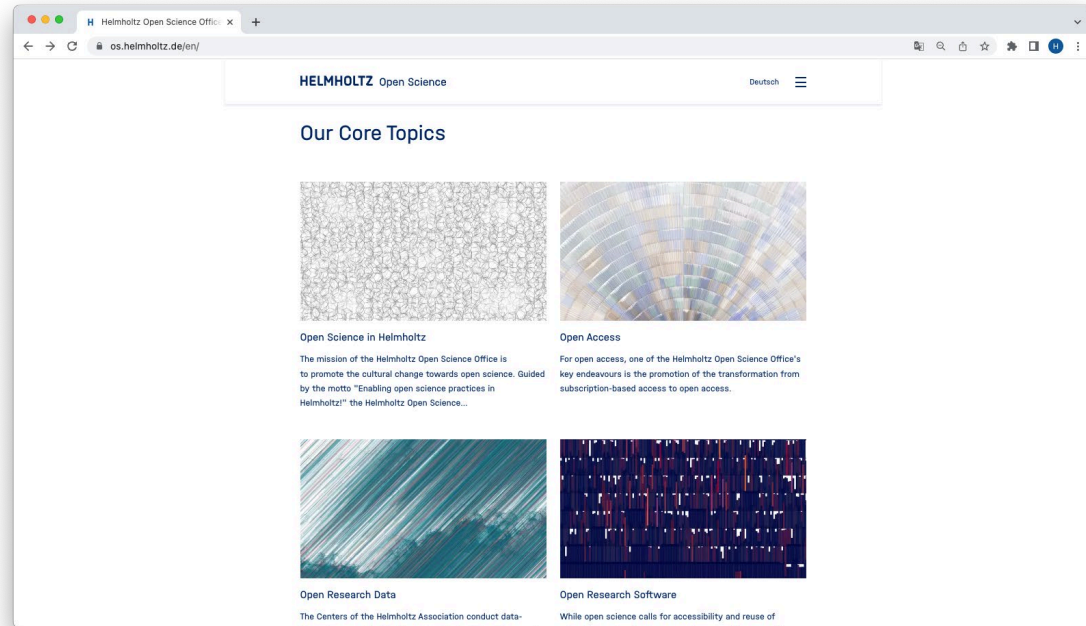
- The Helmholtz Open Science Office
 - is a service provider to the Association for the cultural change “from closed to open”.
 - promotes dialogue and provides impulses within the Association.
 - cooperates with the centers in the Open Science working group and in joint task groups
 - delivers a key contribution to the digital transformation.
 - represents Helmholtz positions on open science on a national and international level.



Mathijs Vleugel (Head), Christoph Bruch, Lea Maria Ferguson, Steffi Genderjahn, Marc Lange, Marcel Meistring, Heinz Pampel, Johannes Schneider, Antonia C. Schrader, Paul Schultze-Motel, Leonie Voland

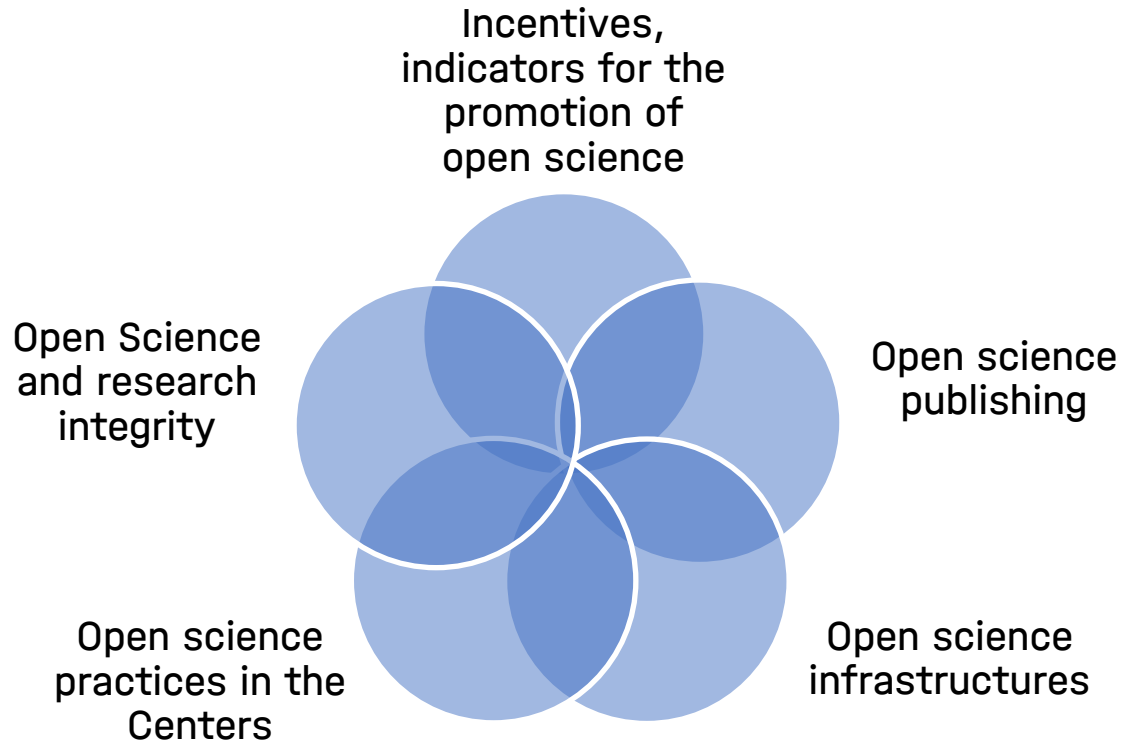
Open Science in Helmholtz

- Our current core topics
 - **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
 - National and international **network** concerning open science

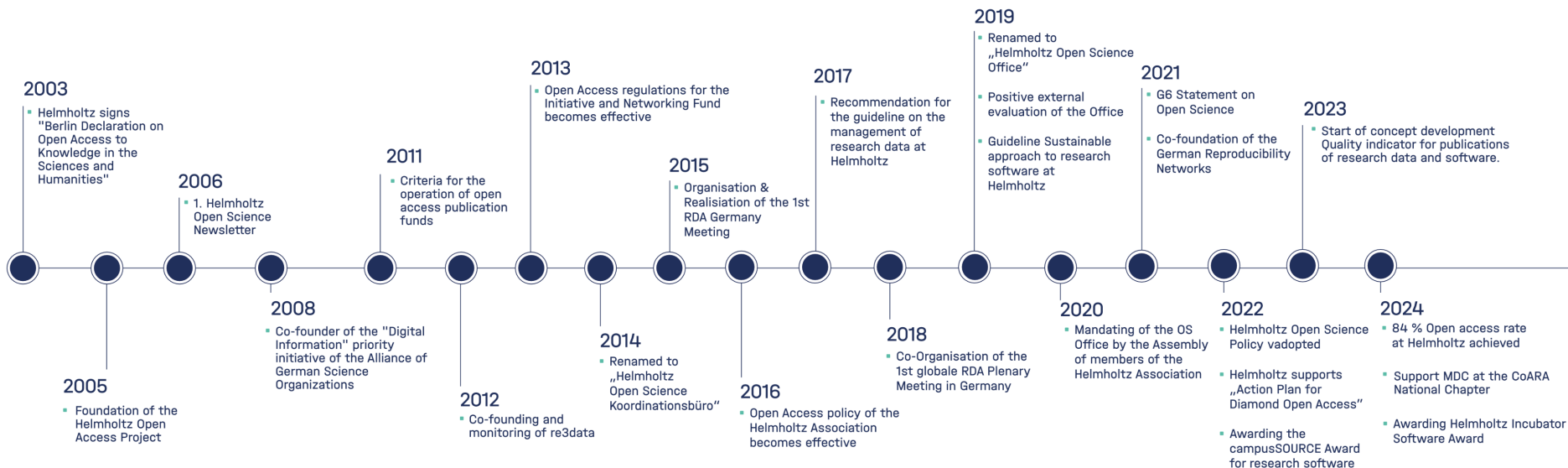


<https://os.helmholtz.de>

Helmholtz Open Science Office: Focus topics 2024/2025



Milestones



Current Topics

Helmholtz Open Science Forums

- As part of the Helmholtz Open Science Forums, the Helmholtz Open Science Office offers the community and the centers a platform for discussing current topics in the field of open science.
- Selection:
 - [EOSC](#)
 - [Research assessment](#)
 - [Research data management](#)
 - [Research software](#)
 - [Helmholtz in the NFDI](#)
 - [Indicators for Open Science](#)
 - [Open Science and transfer](#)
 - [Publication cost management](#)
 - [Scholar-led Publishing at Helmholtz](#)

Current topics

Briefing Papers and Factsheets

As part of the Helmholtz Open Science Forums, the Helmholtz Open Science Office communicates important developments in the field of open science to the community and the centers

Selection

- Wissenschaftliches Publizieren bei Helmholtz: Status Quo, Szenarien für Scholar-led Publizieren - ein Diskussionspapier, doi.org/10.48440/os.helmholtz.073
- Helmholtz Open Science Briefing: 2nd Helmholtz Open Science Forum “Open Science and Transfer”, <https://doi.org/10.48440/os.helmholtz.075>
- Helmholtz Open Science Briefing: 5th Helmholtz Open Science Forum: Research Software. Helmholtz Open Science Office. <https://doi.org/10.48440/os.helmholtz.074>
- Open Science Briefing: Recommendations for open science publications in the Helmholtz Association, <https://doi.org/10.48440/os.helmholtz.068>
- more at <https://os.helmholtz.de/publikationen>

Helmholtz Open Science Policy

Helmholtz Open Science Policy

On the Way to Openness by Design

Open Science Policy

Adopted by the Helmholtz Association's General Assembly in 09/2022



Strategic Positioning



Monitoring



Implementation

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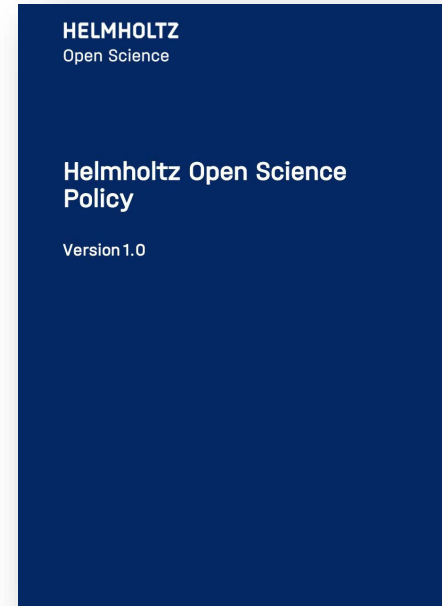
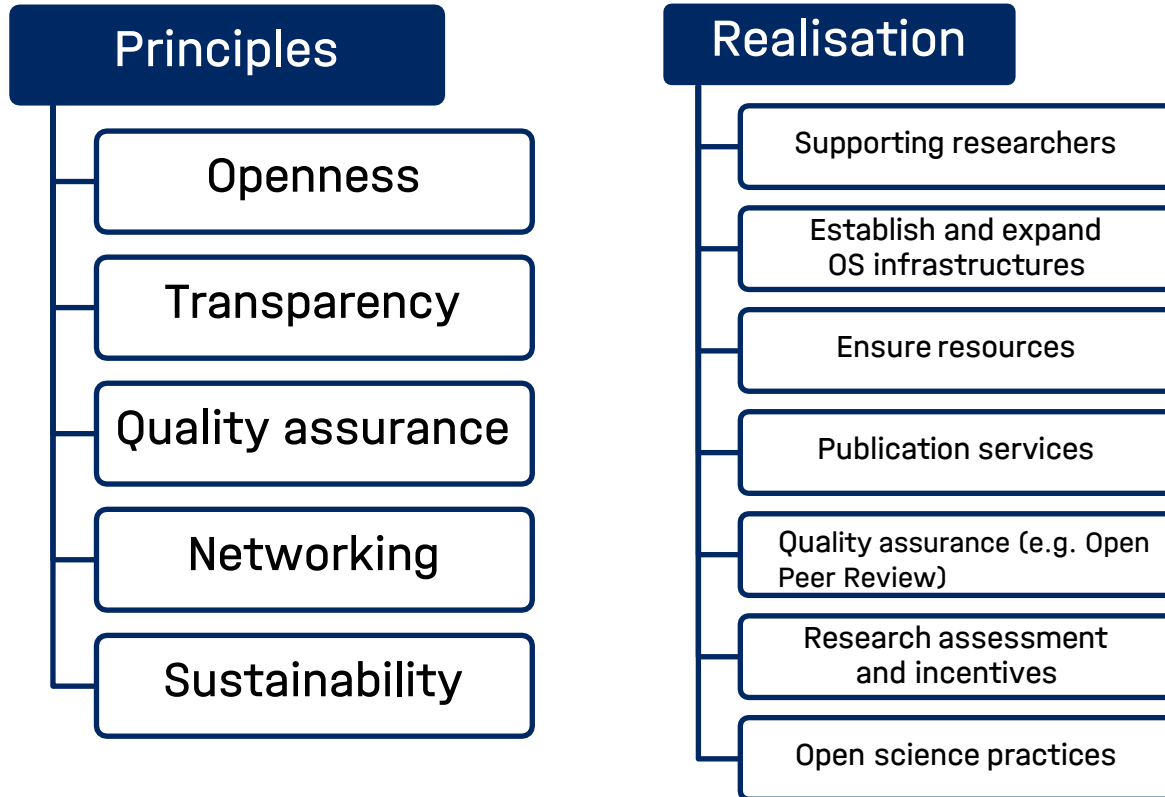
Helmholtz Open Science
Policy

Version 1.0

<https://doi.org/10.48440/os.helmholtz.056>

Helmholtz Open Science Policy

Strategic Positioning: Principles



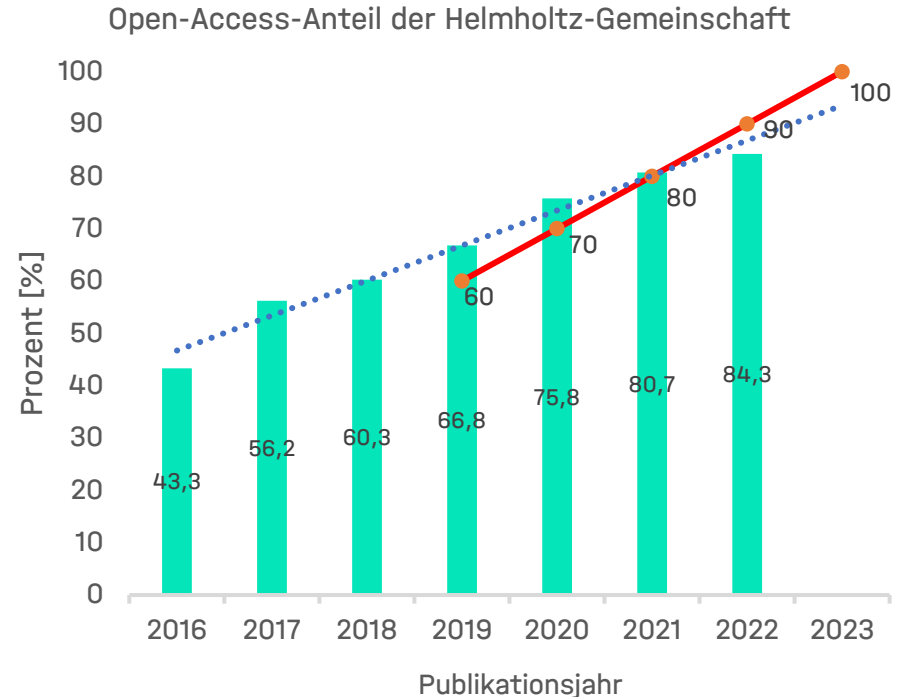
<https://doi.org/10.48440/os.helmholtz.056>

Open Access

Core topic

Open Access

- Helmholtz Association was one of the initial signatories of the [Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities](#) in 2003.
- Since 2016 the promotion of the transformation from subscription-based access to open access is a key endeavor for the OS Office
- In 2016, the Assembly of Members specified the [Open Access Policy](#) as framework of action to the Helmholtz Centers for a coordinated transformation towards open access.
- Joint Task Group of the Working Groups Open Science and Library and Information Management to promote Open-Access-Transformation and scholar-led publishing at Helmholtz, moderated by Helmholtz Open Science Office



Open-Access-share of publications at Helmholtz (green) with linear trend (blue) and target-quota (orange) for publication years 2016 to 2023

Helmholtz Open Science Policy

Open Access

1.1 The employees

shall deposit electronic copy in centers repository (green OA)

shall preferably use Public License (CC BY)

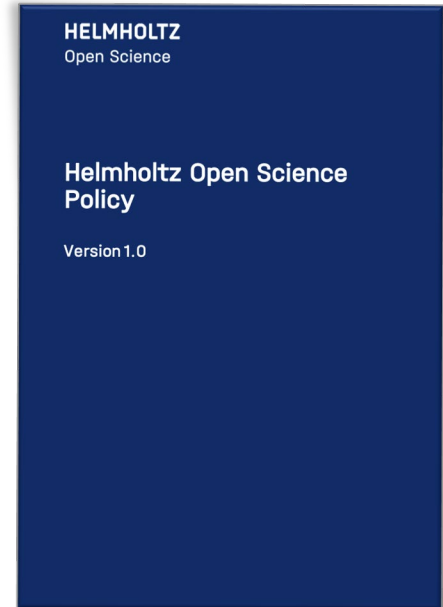
are encouraged to reserve sufficient rights

1.2 The Centers shall ensure...

that the metadata of the deposited publications are accessible

that the metadata is identified by means of suitable persistent identifiers

that the publication fees for peer-reviewed genuine OA are funded in-house



Open Research Data

Core topic

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](#).
- The Helmholtz Open Science Office promotes the [coordination of the Centers](#) and supports them in [developing policies and related practices](#) in handling digital research data; esp. concerning the utilization of the [FAIR principles](#) in Helmholtz.
- In 2022, the Helmholtz Association's General Assembly adopted the [Helmholtz Open Science Policy](#).
- In May 2024, [16 out of 18 centers](#) have their own research data policy.
- The work of the Helmholtz Open Science Office thus complements the developments of platforms in the [Helmholtz Incubator](#).

Helmholtz Open Science Policy

Open Research Data

2.1 The employees...

RD shall be managed **responsibly** and in **accordance** with the **FAIR Principles**

shall use the **data management plan (DMP)** tool & take into account:

deposit of research data **as early as possible**

in a **trustworthy repository** that is indexed in **re3data**

as open as possible, as closed as necessary

2.2 The Centers shall ensure...

that the **metadata** of the deposited data are published **CC0 or equivalent** (if possible)

that the **metadata** of the deposited data are **published** in accordance with the **FAIR Principles**

that the **metadata include minimal information** (on data set, PID licensing conditions,...)

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Helmholtz Open Science
Policy

Version 1.0

Report on the status of the development and implementation of research data policy by the centers

- Organisation of support services for RDM are increasingly institutionalized and are mainly provided by libraries and IT departments.
- Wide range of services: Offerings for the use of research data repositories and research software are most frequently provided.
- RDM onboarding: The integration of RDM services into the centre-internal onboarding of new employees is not yet standard in all centres.
- Cooperation for research data infrastructures: Many centres also provide services in the context of RDM and the publication of research data for third parties
- Long-term archiving of research data remains a challenge.
- Cultural change and challenges: Positive RDM progress and implementation of open science practices, need for resources

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Bericht zum Stand der
Entwicklung bzw. der
Implementierung von
Forschungsdaten-Policies
durch die Zentren

Stand Juli 2024
Version 1.0
Für den Helmholtz-internen Gebrauch

Research Data Repositories and Portals in Helmholtz

- The Helmholtz Centers operate about 100 data infrastructures in the Association in which unique and valuable digital research data is curated.
- An overview offers [re3data](#) - Registry of Research Data Repositories

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES



The screenshot shows a web browser window displaying the Helmholtz Open Science Office website. The page title is "Research Data Repositories" and the URL is "os.helmholtz.de/en/open-research-data/research-data-repositories/". The page content includes the Helmholtz Open Science Office logo, a navigation menu with "Deutsch" and a hamburger menu icon, and a main heading "Research Data Repositories". Below the heading, there is a paragraph: "An overview of research data repositories and portals with Helmholtz participation is realized by the Helmholtz Open Science Office with the help of re3data - Registry of Research Data Repositories." There is also a section titled "Research Data Infrastructures in Helmholtz" with a paragraph of text: "The Helmholtz Open Science Office has been actively involved in the operation of re3data - Registry of Research Data Repositories since 2011. This global service offers researchers, funding organizations, and other stakeholders an overview of digital research infrastructures for making research data accessible. As of April 2022, the directory lists over 2,800 repositories, databases, and portals." At the bottom of the page, there is a paragraph of text: "Funding agencies such as the European Commission recommend researchers use the service to implement the open science conditions in Horizon 2020 as well as the new Horizon Europe funding program. re3data also provides information for the Open Science Monitor of the European Commission and OpenAIRE's Open Science Observatory. The National Science Foundation (NSF) recommends re3data for researching suitable research data repositories. The European Research Council (ERC) also lists re3data among its recommendations for Open Science, and the"

<https://os.helmholtz.de/en/open-research-data/research-data-repositories>

Open Research Data NFDI Participation

- Numerous consortia of the **National Research Data Infrastructure (NFDI)** are being implemented with substantial Helmholtz participation.
- All Helmholtz Centers are members of the NFDI.

Participation of the Helmholtz Centers in the National Research Data Infrastructure (NFDI)



● All Helmholtz Centers are members of the National Research Data Infrastructure (NFDI) association

Open Research Data

EOSC-Beteiligungen

- The [European Open Science Cloud \(EOSC\)](#) has been started in 2015 as a project of the European Commission to make it easier for European researchers to access scientific data, platforms, and services for data processing.
- Participation of Helmholtz Centers in **10** ongoing EOSC projects (as of April 2024):

[AI4EOSC](#): KIT

[AquaINFRA](#): Hereon u. KIT

[Blue-Cloud 2026](#): AWI

[EOSC4CANCER](#): DKFZ

[EOSC-Beyond](#): DESY, FZJ u. KIT

[EVERSE](#): HZDR

[FAIR-EASE](#): AWI

[FAIR-IMPACT](#): KIT

[O.S.C.A.R.S](#): DESY u. FZJ

[Skills4EOSC](#): KIT



Open Research Software

Core topic

Open Research Software

- The topic of Open Research Software continues to gain importance; while open science calls for **reuse** and **reproducibility** 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.
- At the Helmholtz Centers, various research software initiatives are currently being implemented.
- Works:
 - 2017: position paper [Access to and re-use of research software](#)
 - 2019: [Model Policy on Sustainable Software at the Helmholtz Centers](#)
 - 2021: [Checklist for the Implementation of Software Policies at the Helmholtz Centers](#) (German only)
 - 2022: [Helmholtz Open Science Policy](#) & Beteiligung am [campusSOURCE Award 2022](#) für Forschungssoftware
 - 2023: [Helmholtz Research Software Directory](#) & [Helmholtz Incubator Software Award](#)

Helmholtz Open Science Policy

Open Research Software

3.1 The employees shall ensure...

that wherever possible, the program code that is necessary for reusing and/or validating the published data is made openly accessible in a repository

3.2 The Centers shall ensure...

researchers are supported in publishing research software

that the metadata of the deposited software are published CCO or equivalent (if possible)

that the metadata include minimal information (on the program code, PID, licensing conditions,...)

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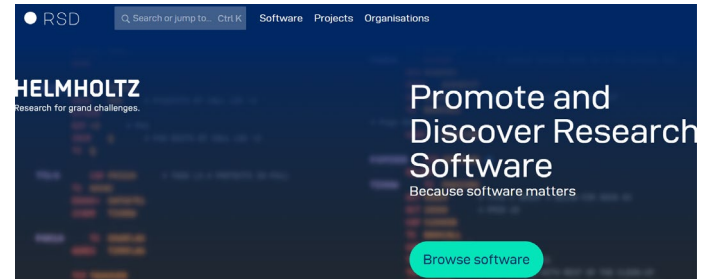
Helmholtz Open Science
Policy

Version 1.0

Core topic

Open Research Software

- All Centers will aim to establish detailed research software management procedures in publicly available policies by 2025.
- Task Group Research Software
 - Close cooperation with HIFIS, [Helmholtz Research Software Directory](#)
 - Current project: [Helmholtz Software Award](#)
 - Regular fora on [Research Software](#)
 - Various links to the work of [de-RSE](#)



Indicators and Research Assessment

Core topic

Indicators and Research Assessment

- The goal is to develop incentives and indicators to promote open science at Helmholtz.
- The ongoing discussion process to anchor open science in the process of **research evaluation** at Helmholtz needs to be further accompanied in order to develop indicators and incentives for open science in the areas of open access, open research data, and open research software.
- In this context, European and international developments in research assessment are considered and continued; see also [G6 and Open Science Statement](#)

Core topic

Indicators and Research Assessment

- The San Francisco Declaration on Research Assessment (DORA) deals with the reform of research assessment and contains recommendations for funders, organizations and individuals.
 - Helmholtz signatories: FZJ, KIT, MDC, DKFZ, GFZ
- Reforming the practice of research assessment in the Coalition for Advancing Research Assessment (CoARA)
 - Recognizing diverse outcomes, practices, and activities in the assessment of research, researchers, and research institutions
 - Max Delbrück Center (MDC): CoARA membership and participation in the CoARA National Chapter
 - The OS Office supports the MDC in fulfilling this mission.
- Barcelona Declaration on Open Research Information
 - Launched in 2023
 - It advocates openness in research information by default

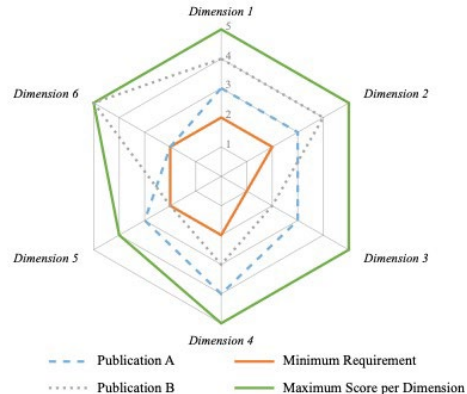


BARCELONA
DECLARATION ON
OPEN RESEARCH
INFORMATION

Task Group

Helmholtz Quality Indicators for Data and Software Products

- The [Task Group Helmholtz Quality Indicators for Data and Software Products](#) of the Working Group Open Science of the Helmholtz Association is dedicated to the development of Helmholtz Quality Indicators for Data and Software Products.
- Duration: From March 2022 onwards.
- In 2023, a basic indicator for the presentation of citable research data publications was established as an incentive within the framework of the PoF.
- The “Quality indicator” will replace basic indicator
- Defined quality dimensions based on FAIR and FAIR4RS



give value to all relevant research activities and scientific outputs including high-quality FAIR data and metadata, well-documented and reusable software, protocols and workflows, machine-readable summaries of findings, and teaching, outreach and engagement of societal actors

National and International Network

National and international Networking

- [Allianz der deutschen Wissenschaftsorganisation: Schwerpunktinitiative „Digitalität in der Wissenschaft“](#)
- [Confederation of Open Access Repositories \(COAR\)](#)
- [DEAL Konsortium](#)
- [Deutsche Initiative für Netzwerkinformation \(DINI\)](#)
- [European Association of Research and Technology Organisations \(EARTO\)](#)
- [German Reproducibility Network \(GRN\)](#)
- [Nationalen Forschungsdateninfrastruktur \(NFDI\)](#)
- [Network G6](#)
- [PREMIER](#)
- [Research Data Alliance \(RDA\)](#)
- [Re3data Working Group](#)
- [RDA Deutschland](#)



Priority Initiative "Digitality in Science"

- From 2023, continuation of the cooperation of the Alliance of German Science Organizations with a [focus](#) on "Digitality in Science".
- The guiding principle of the cooperation is: [Shaping digitality - promoting openness and sovereignty](#)
- 2008 - 2022 Helmholtz cooperates with other research institutions as part of the [Alliance of German Science Organizations](#) in the [priority initiative "Digital Information"](#).



Priority Initiative "Digitality in Science"

Topic Areas

- Further development of scientific publishing
- Digital tools and their development, including artificial intelligence and machine learning
- Digital infrastructures, services and data tracking
- Personnel, education and training
- Reputation and incentives
- Regulatory framework and legislation



HMC-Collaboration

Community Building for research data repositories at Helmholtz

The [Helmholtz Metadata Collaboration \(HMC\)](#) and the Helmholtz Open Science Office launched a joint initiative to promote [research data repositories](#) at Helmholtz at the end of 2022.

Goals:

- Establishment of a [networked community](#) at Helmholtz
- Establishment, dissemination and implementation of [best practices](#)
- Improve the [visibility of Helmholtz infrastructures](#) at national and international level



Projects of the Helmholtz Open Science Office

Project participation of the Helmholtz Open Science Office

The Helmholtz Open Science Office participates in relevant third-party funded projects.

These are currently:

- [Helmholtz Metadata Collaboration](#) (HMC) Community building
- [OA Datenpraxis](#) (DFG)
- [open-access.network](#) (BMBF)
- [PID Network Deutschland](#) (DFG)
- [PID4NFDI](#) (BASE4NFDI)
- [Transform2Open](#) (DFG)

Completed projects:

Alliance Permanent Access to the Records of Science in Europe Network ([APARSEN](#)), [DeepGreen](#), Ecosystem Data Management ([EcoDM](#)), Opportunities for Data Exchange (ODE), Options4OA, [ORCID DE](#) und [re3data](#).



Transform2Open

In 2022, the project was evaluated in detail on behalf of the BMBF:

The [evaluation report](#) recommended follow-up funding.

Participation of the Helmholtz Open Science Office in six work packages:

- Editorial expansion and consolidation of content ([web editing](#))
- New approaches to [Open Access funding](#) (workshops and handouts)
- [Helpdesk](#) (consulting services)
- Services for [small institutions and departmental research](#) (workshops and report)
- Specialist services [in cooperation with learned societies](#) (workshops and handout)
- [oa.atlas](#) (data collection, data maintenance and reporting)

- More information: <https://open-access.network> ; <https://os.helmholtz.de/aktuelles/projekte/open-accessnetwork>

- The **aims** of Transform2Open are
 - Development of **strategies, concepts and measures** for shaping the **open access transformation**
 - Further development of budgets, criteria, competencies and associated processes with regard to the **financial aspects** of the open access transformation
- The **target group** for the results of Transform2Open are **universities and non-university research institutions**
- The project organizes **dialogue forums and workshops** with various target groups and ensures interaction with other projects and activities in the field of open access transformation (e.g. open-access.network, openCost, information budget focus group, open access data practice)
- More information: <https://www.transform2open.de> ; <https://os.helmholtz.de/aktuelles/projekte/transform2open>
- Mastodon: <https://openbiblio.social/@Transform2Open>



With a view to the **Open Access transformation** at scientific institutions in Germany the project pursues the following **goals**:

- Improvement of data-based governance
- Strengthening of collaborations
- Development of standards for collaborative data practice
- Minimizing dependencies on commercial data sources
- Improvement of information provision

The focus is on **promoting and establishing** processes and procedures for **sovereign data practice** in shaping the open access transformation.

- More information: <https://oa-datenpraxis.de/> ; <https://os.helmholtz.de/aktuelles/projekte/oa-datenpraxis>

- PID4NFDI will initially be funded in the initialization phase as part of [Base4NFDI](#).
- Objective: Establishment of a basic service to support the NFDI consortia in the application, use and implementation of **persistent identifiers** (PIDs)
- Main areas of work:
 - **Analysis** of the NFDI PID landscape and the **needs** of the NFDI consortia
 - Identification of necessary **technical measures** and metadata processes to improve the user-friendliness and integration of PID systems within the NFDI
 - Development of **training concepts** and instructions for the use and application of PIDs within the NFDI
 - **Documentation** and evaluation of relevant governance, business and licensing models of the various **PID providers**
 - Public relations and **networking** activities
- Close cooperation between PID4NFDI and the PID Network Germany
- More information: <https://base4nfdi.de/projects/pid4nfdi>

DFG Project

PID Network Deutschland



- Objective: Establishment of a network of existing and new actors in science and culture to promote and consolidate the application, implementation, standardization and international networking of PID systems at local, national and international level and development of a national PID roadmap.
- Project proposal: <https://doi.org/10.48440/os.helmholtz.059>



The 10 PID application areas on which the project will focus.

- More information: <https://www.pid-network.de> ; <https://os.helmholtz.de/aktuelles/projekte/pid-network-deutschland>

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