Connecting the Dots

The Helmholtz Research Data Ecosystem and its Links to the NFDI

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The Helmholtz Centers operate scientific-technical infrastructures that produce a high volume of digital research data, making Helmholtz a hub for expertise in research data. With the rapid digital transformation and growing volume of data, Helmholtz has implemented relevant policies and engaged in NFDI in various ways to manage and use research data effectively.

The Helmholtz Information & Data Science Incubator, in particular the HMC and HIFIS platforms, contribute to these networking activities. The Helmholtz Open Science Office organized several internal forums for Helmholtz members to discuss NFDI, their findings will be presented at the Conference on Research Data Infrastructure (CoRDI).

Helmholtz' multifaceted commitment to research data infrastructure is closely related to NFDI activities. The presentation at CoRDI will demonstrate how a large national research data ecosystem can be successfully connected to the NFDI network, highlighting opportunities for future collaboration.

Keywords: Helmholtz Association, Helmholtz Open Science Office, Helmholtz Information & Data Science Incubator, Networking

- Based on the Helmholtz mission, the 18 Helmholtz Centers operate complex scientific-technical infrastructures, such as particle accelerators, satellites or research ships and aircraft which produce a high volume of digital research data. Because of its data-intensive research practices, Helmholtz is a hub for expertise in research data, including aspects such as access to and reuse of research data.
- Due to the rapid digital transformation and the constantly growing volume of data, the requirements towards management and use of research data within and beyond Helmholtz are changing fundamentally. Helmholtz takes this into account through relevant policies in the Centers and a Helmholtz Open Science Policy [1].
- As the National Research Data Infrastructure (NFDI) builds a central infrastructure in this context, numerous NFDI consortia are implemented with significant Helmholtz participation. All Helmholtz Centers have become members of the NFDI e.V. association and several Helmholtz members are engaged in the NFDI Sections.

Beteiligung der Helmholtz-Zentren an der Nationalen Forschungsdateninfrastruktur (NFDI)

GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
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Deutsches Elektronen-Synchrotron DESY

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Helmholtz-Zentrum Hereon
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Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung (AWI)

Max Delbrück Center (MDC)
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Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)
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Helmholtz-Zentrum für Infektionsforschung (HZI)
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Helmholtz-Zentrum Potsdam – Deutsches GeoForschungs- Zentrum GFZ

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Helmholtz-Zentrum für Umweltforschung (UFZ)

Forschungszentrum Jülich
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Helmholtz-Zentrum Dresden-Rossendorf (HZDR)
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Deutsches Zentrum für Luft- und Raumfahrt (DLR)

Deutsches Zentrum für Neurodegenerative Erkrankungen (DZNE)
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GSI Helmholtzzentrum für Schwerionenforschung

CISPA – Helmholtz-Zentrum für Informationssicherheit
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Deutsches Krebsforschungs- zentrum (DKFZ)
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Karlsruher Institut für Technologie (KIT)
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Helmholtz Munich
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NFDI-Konsortien mit Helmholtz-Beteiligung

1: DAPHNE4NFDI
2: DataPLANT
3: FAIRmat
4: GHGA
5: NFDI4BioDiversity
6: NFDI4Cat
7: NFDI4Chem
8: NFDI4DataScience
9: NFDI4Earth
10: NFDI4Health
11: NFDI4Ing
12: NFDI4Microbiota
13: NFDI-MatWerk
14: PUNCH4NFDI
15: Text+
16: FAIRagro
17: NFDI4BIOIMAGE
18: NFDI4Energy
19: NFDI4Immuno
20: NFDI4Objects
21: NFDIxCS

● Alle Helmholtz-Zentren sind Mitglieder im Verein Nationale Forschungsdateninfrastruktur (NFDI) e.V

Figure 1. Participation of Helmholtz Centers in NFDI consortia and in the NFDI Association.

- In addition, the Helmholtz-internal platforms in the Helmholtz Information & Data Science Incubator, in particular HMC and HIFIS, have established strong data-relevant links between the Centers and contribute in many ways to the realization of NFDI, e.g., in the context of Base4NFDI.
- On an international level, Centers are members in EOSC-A and contribute to EOSC-relevant projects. Furthermore, there is a broad engagement in numerous international data-driven scientific projects for example in the context of the European Strategy Forum on Research Infrastructures (ESFRI).
- The Helmholtz Open Science Office promotes discussion about the reuse and reproducibility of research data in Helmholtz and offers a platform for interdisciplinary exchange in this field. To stimulate dialogue on the topic of NFDI in Helmholtz, the Helmholtz Open Science Office organized, among other activities, two forums for Helmholtz members in May and December 2021 (see the reports [2],[3]). A third forum is planned for June 2023. The findings from these events will be incorporated into the presentation at the Conference on Research Data Infrastructure (CoRDI).
- Our presentation at the CoRDI will show how Helmholtz structures interact with the NFDI, providing an example of how a large national research data ecosystem can be

successfully connected to the NFDI network. We will demonstrate how Helmholtz' multifaceted commitment to research data infrastructure is related to NFDI activities and what opportunities we see in this collaboration for the future.

Data availability statement

The submission is not based on data analysis.

Underlying and related material

Not applicable.

Author contributions

Nina Weisweiler: Writing – original draft

Roland Bertelmann, Steffi Genderjahn, and Heinz Pampel: Writing – review & editing

Competing interests

The authors declare that they have no competing interests.

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