

HELMHOLTZ INCUBATOR INFORMATION & DATA SCIENCE

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PhD

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Helmholtz Association

At a glance

- Germany's largest research organization
- Annual budget of ~ €4,7 billion
- ~ 40,000 employees
- World-class science infrastructure
- 19 independent research centers all over Germany.



Our research plays a key role in identifying reliable answers that benefit society, science, and the economy.

Helmholtz Research Mission & Strategy

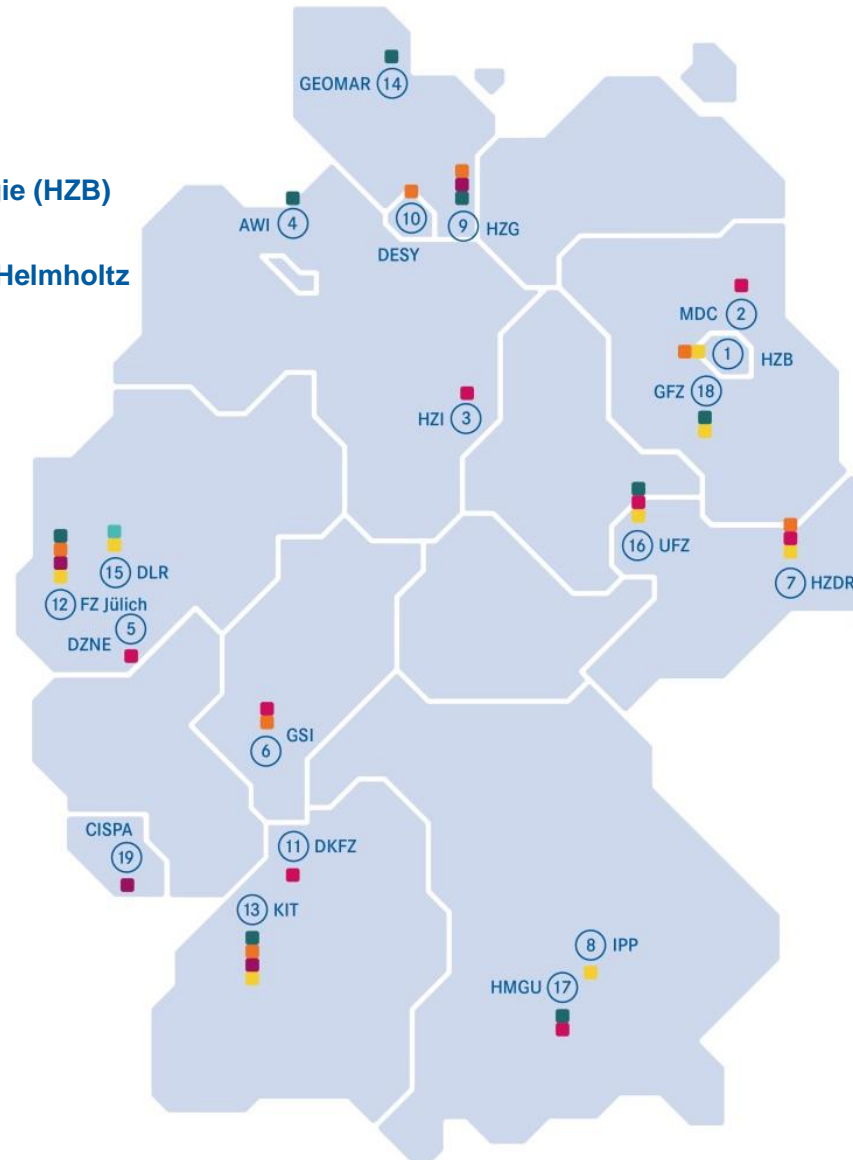
- Systems solutions for grand challenges based on:
 - Scientific excellence
 - Interdisciplinarity and critical mass
 - long term research programs
- Helmholtz provides a highly attractive environment for talents and brilliant brains
- Profound expertise in large scale research infrastructure
- Helmholtz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



ELBE, HZDR // AWI

Helmholtz Research 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. Garching
Max Planck Institute for Plasma Physics (IPP)
(Associate Member)
9. Geesthacht
Helmholtz Center Geesthacht
Center for Material and Coastal Research (HZG)



Research Areas:

Energy

Earth and Environment

Health

Aeronautics, Space and Transport

Matter

Key Technologies
(in the future: Information)

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

Motivation for Information & Data Science @ Helmholtz

- **Highly relevant topic** for the future for all 19 centers, for the 6 research fields and for the whole Association
- Enormous international **competition** and high expectations of society
- Helmholtz has a **high level of expertise** in numerous sub-areas
- Helmholtz generates **Big Data** in all centers and research fields
- **Demand** for disruptive, new ways of information processing, computer science, machine learning, data management, etc.
- High potential for **interdisciplinary cooperation**; connecting know-how between research fields offers huge opportunities
- **Embedded** in numerous other Helmholtz activities and an overarching strategy



Information & Data Science within the Helmholtz Association

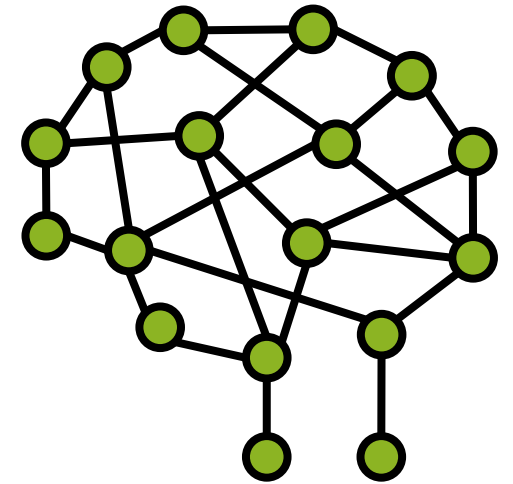


- Helmholtz Incubator as interactive platform and think tank
- Helmholtz Information & Data Science Academy
- Helmholtz Data Federation
- Information & Data Science strategy for all research areas
- New Helmholtz Center on Cyber Security (CISPA)

Helmholtz Incubator Information & Data Science

Overview

- The **Helmholtz Incubator** was founded in 2016 to bring together the community and their diverse competence and provide new impetus
- Development of concepts for new and innovative platforms to address long term challenges in the area of Information and Data Science
- Building up a network and community across centres, foster exchange
- Increase visibility of Helmholtz as a key player in the field of Information & Data Science



Helmholtz Incubator Information & Data Science

Overview of the process

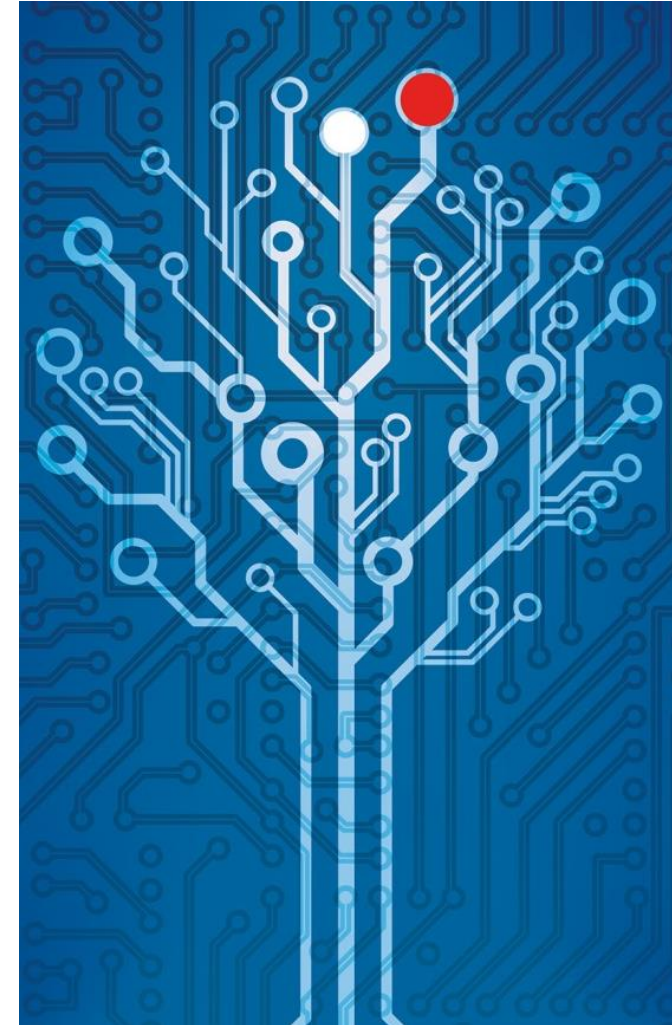
- Excellent researchers and managers from all centres are the key drivers of this initiative
- Advised by distinguished external experts from outstanding companies and renowned research agencies
- Supported by the head office of the Helmholtz Association
- Network
 - so far 6 large-scale workshops to foster networking and brainstorming,
 - several working groups emerged to develop ideas and concepts....
 - **many are now being executed across the whole association**



Helmholtz-Geschäftsstelle, Incubator Conference 2018

Helmholtz Incubator Information & Data Science

- Development of innovative **pilot projects**, 13 projects currently **funded**
- Development of novel **Helmholtz Information & Data Science Schools** with university partners for postgraduate education and research.
- Establishment of **platforms** to address community-wide challenges :
 - Helmholtz Information & Data Science Academy (HIDA)
 - Helmholtz Artificial Intelligence Cooperation Unit (HAICU)
 - Helmholtz Imaging Platform (HIP)
 - Helmholtz Metadata Collaboration Platform (HMC)
 - Helmholtz Federated IT Services (HIFIS)



Helmholtz Incubator Information & Data Science

Combining all activities in an innovative framework

Helmholtz Information & Data Science Framework

HIDA & Schools

Training of doctoral researchers in a network of regional research schools

HAICU

Platform for Machine Learning and Artificial Intelligence

Helmholtz Information & Data Science Incubator

HMC

Metadata and management of research data

HIP

Platform for Imaging

HIFIS

Technologies and systems for Big Data research

Pilot projects

1st round: 5 projects since 2017

2nd round: 8 projects since 2019

Helmholtz Incubator Information & Data Science

Helmholtz Information & Data Science Academy (HIDA)

- **HIDA**
 - First activities: planning of the exchange network, international tech & talent scouting, widespread communication
 - HIDA-Contacts @every Helmholtz centre
 - Team recruitment
 - New offices (Friedrichstraße 171, Berlin), opening planned in Q1/2020
 - www.helmholtz-hida.de
- Since September 2018 six **Helmholtz Information & Data Science Schools** are in place that combine discipline specific knowledge and with innovative Information and Data Science methods

HiDA | **HELMHOLTZ**
Information & Data Science Academy

 **HEIBRIDS**
HELMHOLTZ EINSTEIN INTERNATIONAL
BERLIN RESEARCH SCHOOL IN DATA SCIENCE

DASHH | Data Science in Hamburg
HELMHOLTZ Graduate School
for the Structure of Matter

MARDATA | **HELMHOLTZ**
SCHOOL FOR MARINE
DATA SCIENCE

MUDS | MUNICH SCHOOL FOR
DATA SCIENCE
HELMHOLTZ | TUM | LMU

HDSLEE | **HELMHOLTZ**
SCHOOL FOR DATA SCIENCE
IN LIFE | EARTH | ENERGY

 **HiDSS**
4HEALTH | **HELMHOLTZ**
INFORMATION & DATA SCIENCE
SCHOOL FOR HEALTH

Helmholtz Incubator Information & Data Science

Helmholtz AI Cooperation Unit HAICU

- HAICU central @ HMGU
- HAICU local
 - Energy @ KIT
 - Earth and Environment @ HZG
 - Aeronautics, Space and Transport @ DLR Oberpfaffenhofen
 - Matter @ HZDR
 - Key Technology/Information @ Forschungszentrum Jülich
 - First call for **Helmholtz AI projects** expected in Q4/2019 – Stay tuned!
- Planned voucher system for AI Consultants in Helmholtz
- HAICU Kick-off: 05.03.2020
- www.haicu.de



Helmholtz Incubator Information & Data Science

Helmholtz Federated IT Services HIFIS

- Network of 11 centers, organized in 3 clusters:
 - Cloud (coordination HZB),
 - Network (coordination DESY),
 - Software (coordination HZDR)



Initial phase

- Tour of Helmholtz Centres to define and discuss needs
- Coordination of work packages and more detailed offerings
- More refined work plans within clusters
- Distinguished Scientific Advisory Committee
- www.hifis.net

Helmholtz Incubator Information & Data Science

Helmholtz Imaging Platform HIP

- Concept for Helmholtz Imaging Platform (HIP) was approved September 2018
- Proponents from DESY, MDC und DKFZ were asked to consider a joint concept
- Final approval for revised concept September 2019
- Objectives and concepts of the original proposal framework remain valid and have been further refined.
 - 3 units that further Imaging Science and offer substantial support for the communities
 - Software Support, including a dedicated help desk
 - A coordination unit for the HIP network
 - **HIP projects** for the HIP network (1,5 Mio. Euro p.a.)

Helmholtz Incubator Information & Data Science

Helmholtz Metadata Collaboration HMC

Helmholtz Metadata Collaboration HMC

- Revised concept for the Helmholtz Metadata Collaboration (HMC) was approved in April 2019
- HMC is based on 6 local units (corresponding to the 6 research fields) and a central coordination unit, as well as central services:
 - Earth and Environment @GEOMAR
 - Energy @KIT
 - Key Technologies/Information @FZJ
 - Health @DKFZ
 - Matter @HZB
 - Aeronautics, Space, Transport @DLR
 - Central Services
 - Coordination (AP1) @GEOMAR
 - Central services (AP2) @FZJ+KIT

Helmholtz Incubator Information & Data Science

Who is taking part: Roles and Responsibilities

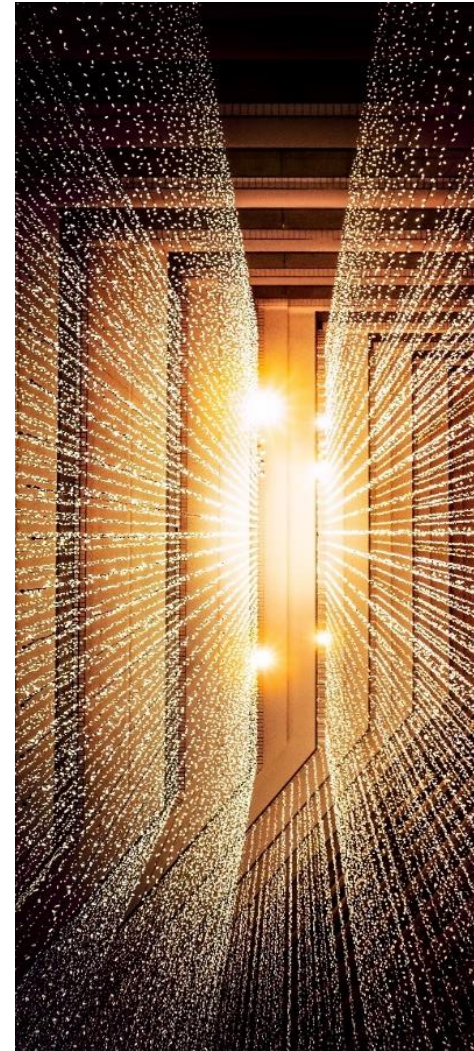
Zentrum	HAICU	HIDA/ HIDSS	HIP	HIFIS	HMC
AWI					
DESY					
DLR					
DKFZ					
FZJ					
GEOMAR					
GFZ					
HMGU					
HZB					
HZDR					
HZG					
HZI					
IPP					
KIT					
MDC					
UFZ					

Coordinating centers (dark blue) und partnering centers (light blue) of each platform

Helmholtz Incubator Information & Data Science

Objectives of this process

- All platforms: Moving from concepts to **action**
- Use the momentum: Exploit the results from the **pilot projects** to the benefit of our research programs and digital strategy
- Develop **our competences** further – grow the network further and increase the visibility on a national and international level
- Invest even more into **education and training in data science**. Invest further and long term into Information & Data Science Schools
- Increase visibility of the Helmholtz Association in this domain



Helmholtz Incubator Information & Data Science

Next steps

- Call for projects: Helmholtz AI projects Oct/Nov 2019
- **7th Incubator Workshop** on the 25.-26th November 2019
- **Kick-Off-Events of HIP und HMC** approx. December 2019
- First stipendiaries of the **HIDA-Trainee Network** during spring 2020
- **HAICU Kick-off**: 05.03.2020
- **Call for projects**: Enabling Metadata Projects and Helmholtz Imaging Projects during Spring 2020
- **Scientific Advisory Committees** meetings during April 2020
- **HIDA Datathon – Topic Climate** and opening of the new **HIDA-Office** during April 2020
- **8th Incubator Workshop** 04-05th June 2020

Thank you! Questions?

Let's stay in touch:
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