

DESY Summer Student Programme 2025

Doing a doctorate at DESY.



Why doing a doctorate at DESY?

- One of the world's leading centre for research on and with particle accelerators (PETRA III, FLASH, European XFEL and in planning: PETRA IV)
- Outstanding scientists
- Offers an exciting interdisciplinary setting
- Cooperates with industry and business to promote new technologies that will benefit society and encourage innovations
- Benefits from the metropolitan regions of the two DESY locations: Hamburg & Zeuthen
- Is directly involved in several graduate schools which offer tailor-made structures, services and scientific excellence to doctoral researchers

General facts on doing a doctorate at DESY

- Most doctoral positions are funded through an employment contract with DESY
 - DESY is your employer
 - Duration of the employment contract at DESY: 3 years (extensions of 6 months possible)

- Alternative option:
Apply for funded doctoral positions at graduate schools in which DESY is involved in

- Alternative option:
Bring your own funding (e.g. a scholarship)

General facts on doing a doctorate at DESY

- In Germany, only universities can award a scientific doctoral degree.
- Every doctoral researcher must be enrolled as a doctoral student at a university (e.g. University of Hamburg, Humboldt University Berlin etc.).
- Enrollment at a university usually takes place after conclusion of an employment contract (e.g. at DESY) = First apply for funding and a doctoral project with a DESY research group and only then enroll at a university.
- When unsure whether a Master's degree will be recognised by the German university, have it checked by that university in advance.
- No tuition fees at state universities in Germany – but a semester fee (UHH 2025: 335 €).

Graduate Schools DESY is involved



- DESY is involved in several graduate schools for doctoral researchers
- These graduate schools offer structured programmes for their members
- DESY always runs graduate schools in co-operation with one or more universities
- The structures, programmes and scientific orientations of the graduate schools are different

Today we present:

- ✓ PIER Helmholtz Graduate School (PHGS)
- ✓ Data Science in Hamburg - Helmholtz Graduate School for the Structure of Matter (DASHH)
and
- ✓ Doctoral opportunities at DESY Zeuthen – with and without a structured programme

How to apply for a doctoral position at DESY



- (1) Make the most of your contacts from the DESY Summer Student Programme: Stay in touch with the research groups and researchers!
- (2) Paid doctoral positions at DESY: https://v22.desy.de/index_eng.html
- (3) Find out about calls for applications for graduate school in which DESY is directly involved and which offer paid doctoral positions.
- (4) Look for funding opportunities by your own country or exchange services such as the DAAD
- (5) Paid doctoral positions at University of Hamburg: <https://www.uni-hamburg.de/en/stellenangebote.html>
- (6) General information on the German education system: DAAD (German Academic exchange Service): <https://www.daad.de/de/>

PIER Helmholtz Graduate School (PHGS)

A Graduate Education Program of DESY in
Cooperation with University of Hamburg

PIER Helmholtz Graduate School (PHGS)

- Graduate Education Program at DESY in Cooperation with Universität Hamburg (UHH)
- Located on Campus Bahrenfeld, Hamburg
- Covers the following research fields
 - Particle and Astroparticle Physics
 - Photon Science
 - Nanoscience
 - Infection and Structural Biology
 - Accelerators
 - Theoretical Physics
 - Artefact Profiling

"BY FOSTERING COLLABORATION OF DESY AND UHH SCIENTISTS ACROSS DIFFERENT FIELDS, PIER HELPS TO OPEN UP NEW AVENUES FOR FUTURE ACHIEVEMENTS IN RESEARCH."



**PROF. DR. FRANCESCA
CALEGARI**

Head of the PIER Executive Board

PIER Helmholtz Graduate School (PHGS)

- All doctoral researchers with an employment contract at DESY Hamburg automatically become members of the PIER Helmholtz Graduate School
- Is open to doctoral researchers who have an employment contract with the University Hamburg
- All doctoral researchers with own funding (e.g. scholarship) who are affiliated with DESY or the University of Hamburg can become members of the PHGS
- PHGS has no own funded doctoral positions
- Registration possible all year long: <https://pier-hamburg.de/education/phgs/membership/>

PIER Helmholtz Graduate School: facts

- Oldest graduate school at DESY – founded in 2012
- Largest graduate school on Campus Bahrenfeld, Hamburg
- Currently 300 members
- More than 60 % international doctoral researchers
- Language of instruction: English

<https://pier-hamburg.de/education/phgs/>



PHGS: language courses



German courses

6 different courses

Level A1.1 (beginner) to B2.2 (advanced)



English courses

Academic writing for doctoral researchers

https://pier-hamburg.de/education/pep/language_courses

PHGS: doctoral programme

- Internationally recognised structured programme in the respective research field(s)
- Scientific supervision on the highest level possible
- Focus on career planning and transferrable skills training
- Networking events
- Leisure activities and social events
- Buddy programme for new international doctoral researchers
- PHGS team is caring about the well-being of each of its members

»THE PHGS IS A GREAT TOOL FOR BROADENING THE SCOPE OF A PHD, FINDING NEW RESEARCH INTERESTS AND CAREER IDEAS, AND LEARNING TRANSFERABLE SKILLS THAT WILL HELP IN ALL FUTURE PLANS«



BLAE STACEY

Member of the PHGS since 2022

Curriculum

The effort of the PHGS curriculum is calculated on the basis of credit points (CP). A successful completion of the curriculum requires 17 credit points: A minimum of 14 CP in the area of professional skills (categories A and B) and a minimum of 3 CP in the area of transferable skills (category C):

- Block seminars: 1 day = 0.5 CP, 2 days = 1 CP, etc.
- Half-day block seminars can also be credited.
- Block courses are credited with a maximum of 10 days/5 CP.
- 1 credit point = 15 x 45 minutes sessions.
- When calculating the credit points, the workload for presentations and posters is already taken into account and is not additionally scored.
- A written confirmation of attendance by the organiser, lecturer or supervisor is required for each course/workshop/conference. Doctoral re-

CATEGORY A

Project-related group seminars and workshops in the main research field

Research group seminars and workshops

Research institute seminars and workshops

Research training groups

Workshops in the main research field inside and outside of Hamburg/Germany

CATEGORY B

Professional qualification in the PIER research fields

Conferences

Lecture weeks inside and outside Germany

PIER Doctoral Seminar

PIER Graduate Week

Programming courses (Python, Matlab, Artificial intelligence, Quantum Computing etc.)

Subject-specific courses from the curricula of Universität Hamburg's master's programmes or

CATEGORY C

Obtaining transferable skills

Career orientation & planning

DESY tour guide

Language courses

Programming skills

Teaching activities at a university

Transferable skills trainings & workshops

PHGS activities: transferrable skills courses (online/onsite)

Communicating Science

- Scientific Writing
- Scientific Presentation
- Blogging, Podcasting
- PIER Doctoral Seminar

Coordination and Management

- Good Scientific Practice
- Project Management
- Supervision and Leadership
- Time- and Self-Management

Career Development

- Application Talk
- Career Orientation for Doctoral Researchers
- Career planning for women
- Individual career counseling
- Startup Bootcamps

Programming

- Basics Python
- Data Analysis
- Python Machine Learning

PHGS activities: PIER Graduate Week

Interdisciplinary lecture and workshop week for doctoral researchers in the PIER research fields

Takes place every year on Campus Bahrenfeld

Scientific courses

Poster Session

Scientific colloquium

Soft skills courses

Industry Talk

Networking

Fun



The poster for PIER Graduate Week 2024 features a central graphic of three overlapping squares in red, blue, and black, with the text '7-11 OCT '24' overlaid. The text on the poster includes the title 'PIER Graduate Week 2024', the subtitle 'Interdisciplinary lecture and workshop week for PhD students', and a list of research fields: Particle & Astroparticle Physics, Nanoscience, Photon Science, and Infection & Structural Biology. It also mentions the location 'CFEL, SR I-V / Campus Bahrenfeld / Hamburg' and provides registration information: 'Programme & registration: pier-hamburg.de/gradweek2024' and 'Registration open until: 31 September 2024'. A QR code is located at the bottom left. On the right side, there is a list of courses and speakers, including 'Course 1: Modern Batteries and Associated Technologies' by Hans-Günther Elias, 'Course 2: Scientific Computing with Python' by Wolfgang Schmitt, and 'Scientific Colloquium: The Physics of Soft Condensed Matter' by Daniel Grier. It also lists 'Industry Talk: Data Science at HZDR/CSC digital' by Michael Krüger and 'Soft skills: Machine Learning with Python' by David Hübner, 'Data Visualization' by Lutz Hübner, and 'Career Counseling' by Lutz Hübner.

PHGS: collaborative activities for women



Women's Career Day

Train your skills, develop your abilities, and increase your network.
Career event for women in physics and natural sciences.
Workshops for postdoctoral researchers and PhD students.

29 + 30 June 2023

Venue:
Center for Free-Electron Laser Science
Building 99 | SR-HV

Registration
<https://indico.desy.de/e/wcd23>

Workshop 1.
Self-Marketing for Increased Visibility in Science | Anna Mombert-Heers

Workshop 2.
Empowerment for Change | Claudia Neus0ss

Keynote talk with Stephen Curry, Imperial College London:
"Excellence or equality in research? We need both."
Moderation: Melissa Graewert | 29 June 2023, 5:30 – 6:30 p.m. | Venue: HARBOR

Logos: PIER, EMFL, DESY, Cluster of Excellence Quantum Universe

dynaMENT

Mentoring for women in natural sciences



**dynaMENT doctorate
&
dynaMENT advanced**

The Team of the PIER Helmholtz Graduate School (PHGS)



Stefanie Tepass
Lead Coordinator



Mirko Siemssen
Coordinator



Sinikka Seidl
Administrative Coordinator

Thank you very much for your attention!

We are looking forward to seeing you again as one of our doctoral researchers!

<https://pier-hamburg.de/education/>

<https://www.linkedin.com/company/70375638/admin/>

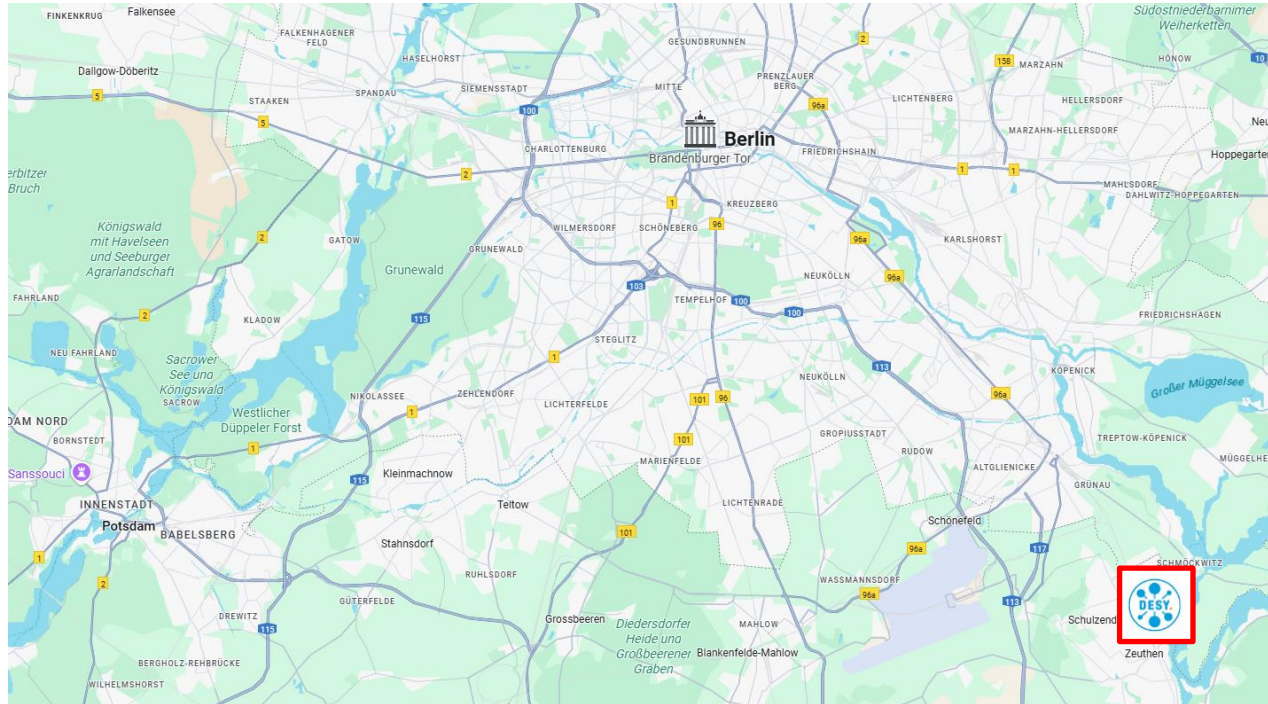
Doctorate in Zeuthen

Silvia Alessandria
26.08.2025

Who am I?

- PhD & Graduate school coordinator
- Equal opportunity officer representative for Zeuthen

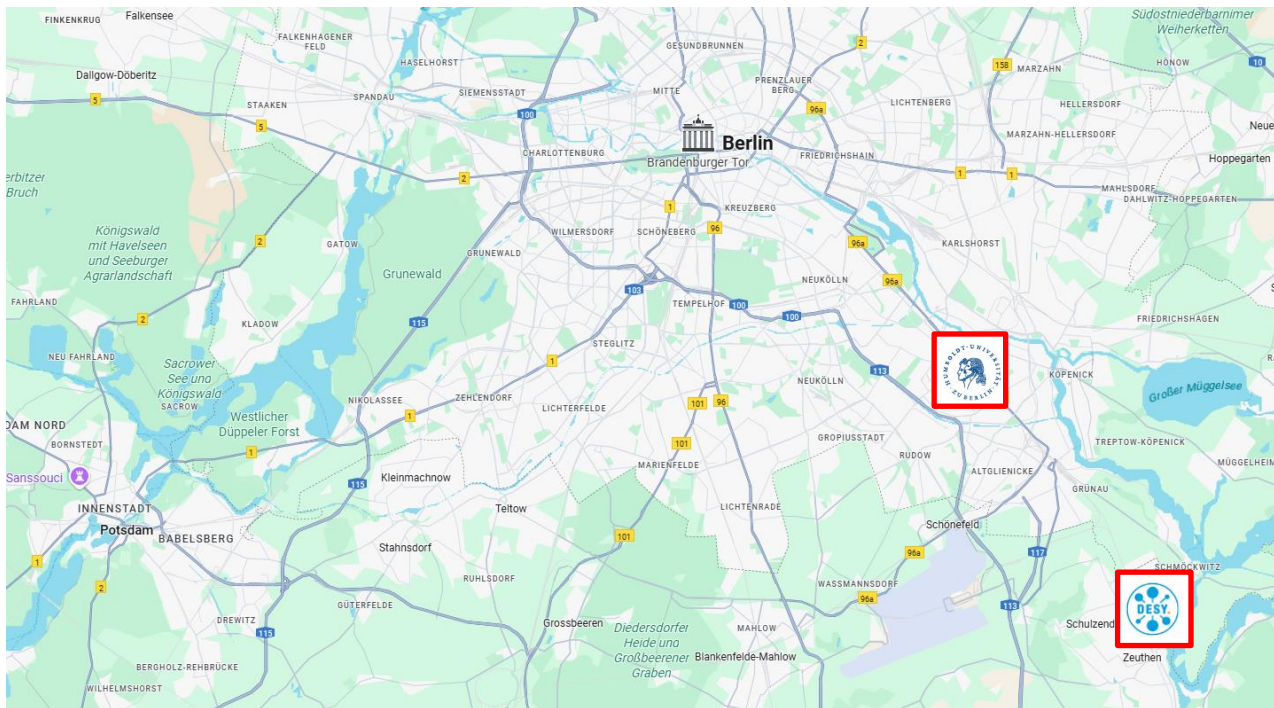
...where is Zeuthen?



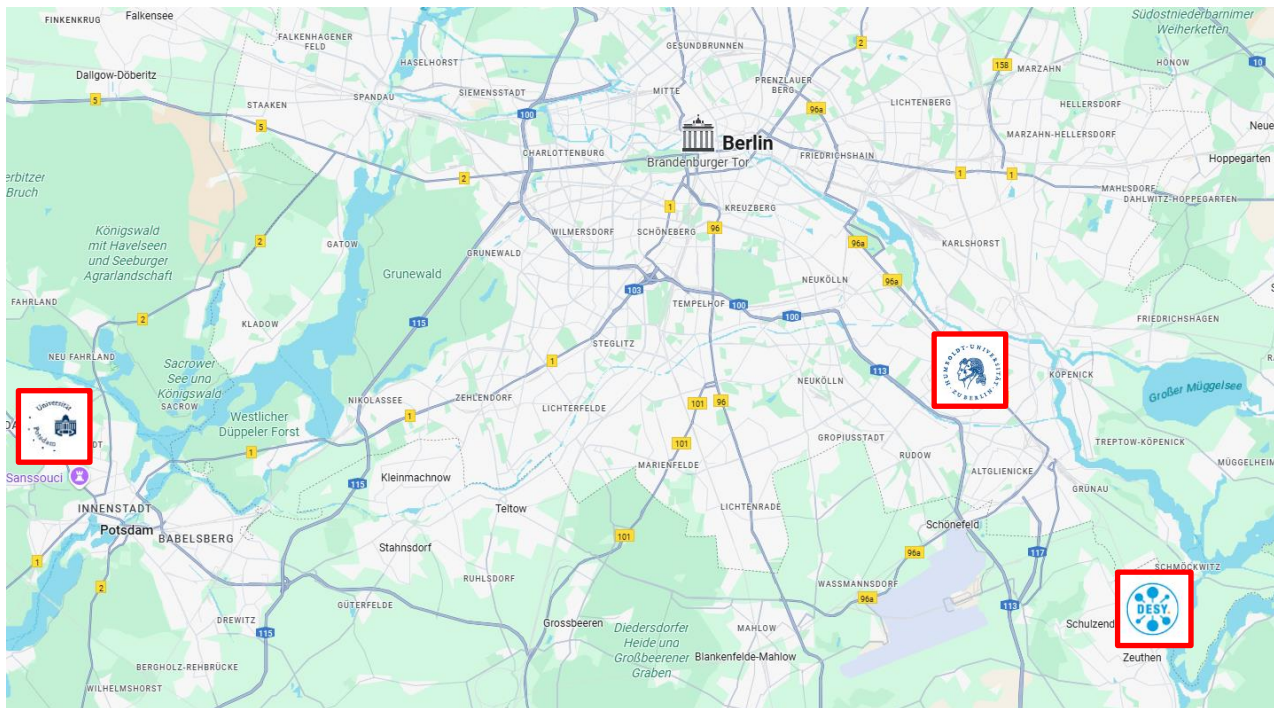
...where is Zeuthen?



...our partners



...our partners



Research areas

- Astroparticle Physics
 - Gamma Astronomie (CTAO science)
 - Neutrino Astronomie (IceCube, Radio)
 - Astroparticle Theory
 - Detector development
- Particle Physics
 - Experimental Particle Physics (ATLAS)
 - Particle Physics Theory
 - Quantum Physics
- Accelerator Physics



Bild: DESY Science Communication Lab

PhD without structured programme

-all mentioned research areas

-currently 37 doctoral researchers

-Enrollment at:

- Humboldt University or
- Potsdam University or
- Friedrich-Alexander University Erlangen-Nürnberg or
- Julius-Maximilians University Würzburg


PhD within structured programme

International Helmholtz-Weizmann Research School on Multimessenger Astronomy (shortly “MMS”)

- Only for research in Astroparticle Physics (Multimessenger Astronomy)
- Partners:
 - DESY, HU, UP, WIS (associates: FAU, RUB)
- Third-party funding for the years 2019-2025
- Currently 28 doctoral researchers
- 21 Alumni
- Continuation of the programme foreseen with own funding



How to apply

| | Without programme | MMS |
|---------|--|---|
| Where | <ul style="list-style-type: none"> Some positions posted on inSPIRE jobs and AAS job register Also possible to send an email to group leaders to ask if they have open positions | <ul style="list-style-type: none"> https://www.multimessenger-school.de/application/ |
| When | <ul style="list-style-type: none"> No specific time |  <ul style="list-style-type: none"> ember |
| Funding | <ul style="list-style-type: none"> If no positions available at the moment a scholarship is needed | <ul style="list-style-type: none"> Funded positions |

Contact

Deutsches Elektronen-
Synchrotron DESY

www.desy.de

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Graduating at DASHH

Dr. Heike Hufnagel Martinez, Dr. Christiane Eehrt

DASHH Coordinators





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

Photon Science
Structural Biology
Materials Science
Particle Physics
Accelerator Science

Data Challenges for Decoding Matter

A New Generation of Instruments at Research Campus Bahrenfeld



Petra III/IV: 100-fold speed-up measurements for each beamline, need in 2026: 10^5 -fold increase in computational power



European XFEL:
current data rate of 25 TB/h, 8-fold scale-up expected



High-Luminosity Large Hadron Collider
HL-LHC (ATLAS, CMS):
hundreds of PB highly complex data
per year

- New generation of devices produces more and more complex data
- Big data analysis is challenging
- We need intelligent algorithms

Data Science in Hamburg - Helmholtz School for the Structure of Matter

- New generation of devices produces more and more complex data
 - Big data analysis is challenging
 - We need intelligent ***interdisciplinary*** algorithms:
 - **Collaboration domain scientists and computer scientists/mathematicians**
- **DASHH concept:**
- *Developing innovative methods in data science, high-performance computing, machine learning, ... to tackle the data challenges for decoding matter*
 - *Educating interdisciplinary data scientists for the future of research*

To promote pioneering research through innovative projects and initiatives

- Schools are collaboration projects led by Helmholtz Center partnering with universities and other research institutes.
- Truly interdisciplinary, PhD projects always combine
 - research questions from applied sciences on one side and
 - mathematics/computer science on the other side.
- 6 schools in Germany, founded in 2019



Enabling Interdisciplinary Research & Collaborations

DASHH Partners: Research Institutes and Universities

HZI HELMHOLTZ
Zentrum für Infektionsforschung



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

Enabling Interdisciplinary Research & Collaborations

DASHH Research Topics

HZI HELMHOLTZ
Zentrum für Infektionsforschung



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

Application Fields

**Photon
Science**

**Structural
Biology**

**Elementary
Particle Physics**

**Materials
Science**

**Accelerator
Science**

Enabling Interdisciplinary Research & Collaborations

DASHH Research Topics

HZI HELMHOLTZ
Zentrum für Infektionsforschung



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Application Fields

Photon
Science

Structural
Biology

Elementary
Particle Physics

Materials
Science

Reproducible
Data Science

Accelerator
Science

Machine Learning
& Data Analysis

Cyber Physical
Systems

Algorithm Design,
Optimization
& Simulation

Software & Data
Engineering

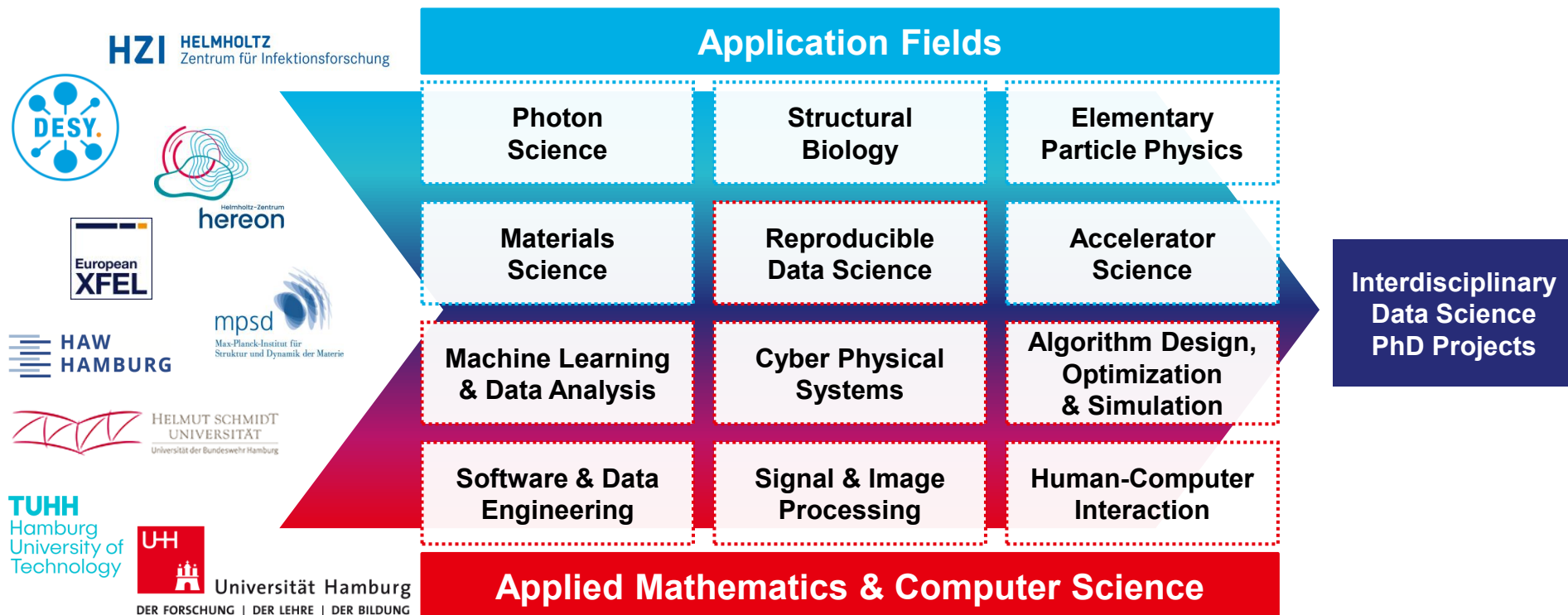
Signal & Image
Processing

Human-Computer
Interaction

Applied Mathematics & Computer Science

Enabling Interdisciplinary Research & Collaborations

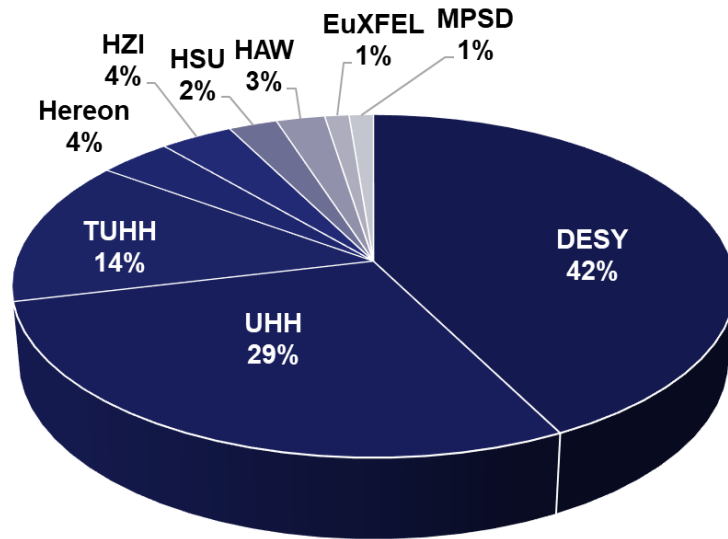
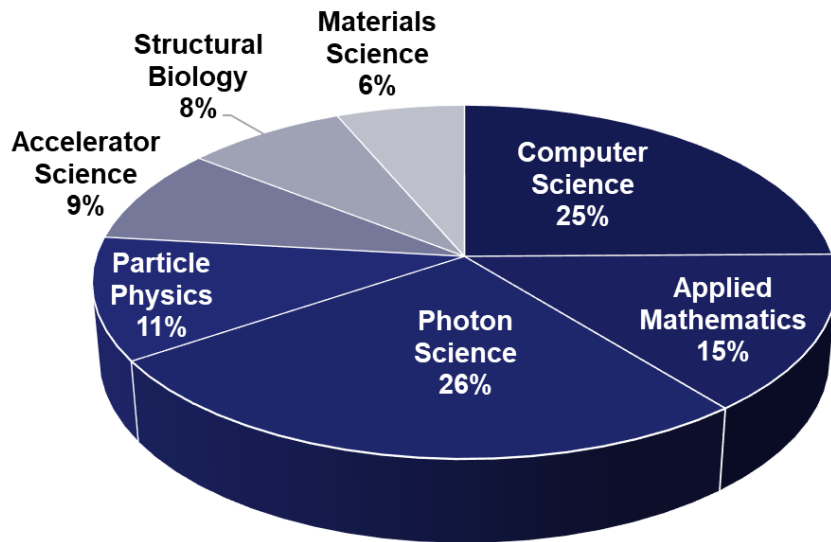
DASHH Research Topics



DASHH – A Collaboration of Strong Partners

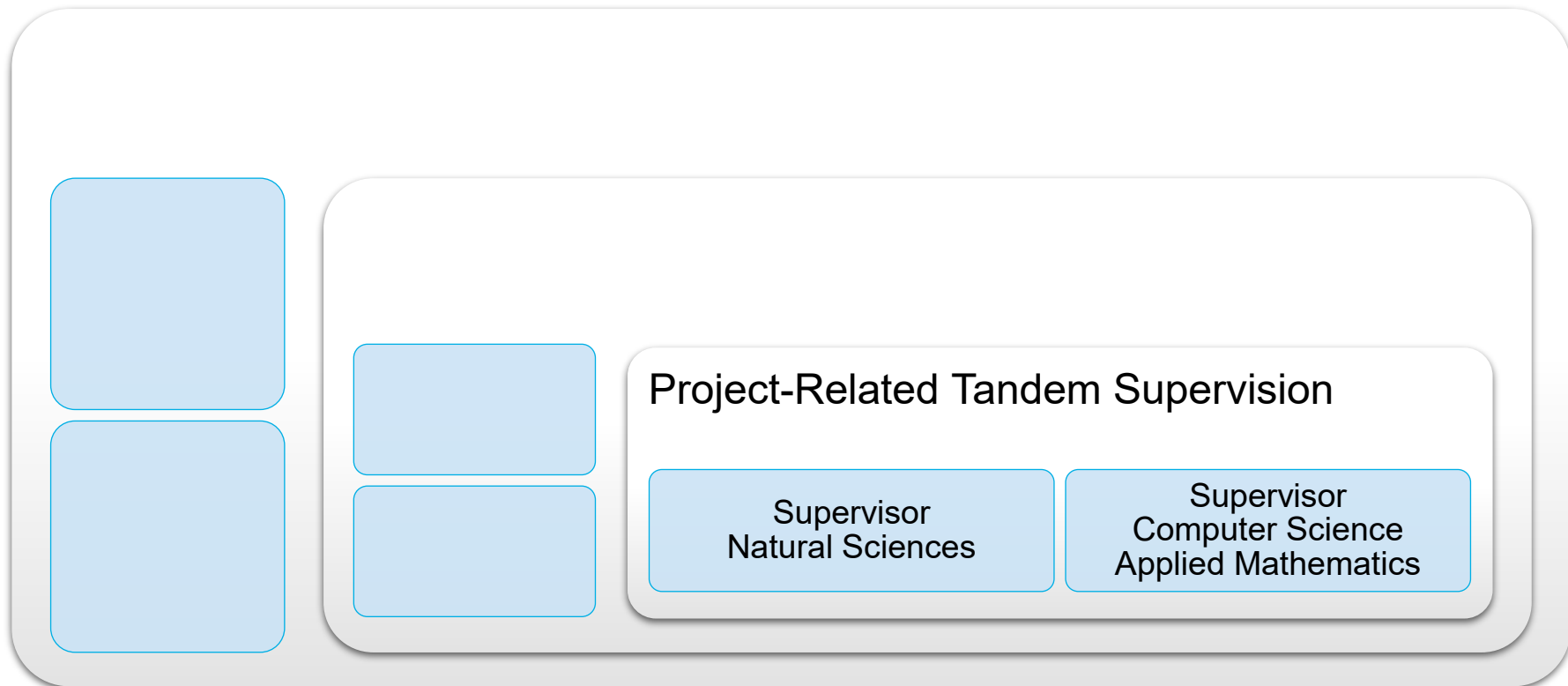
DASHH Project Supervisors

- over 90 Principal Investigators (PIs)
- over 50 DASHH Scientists
- ~ 30 Doctoral Researchers, over 10 alumni



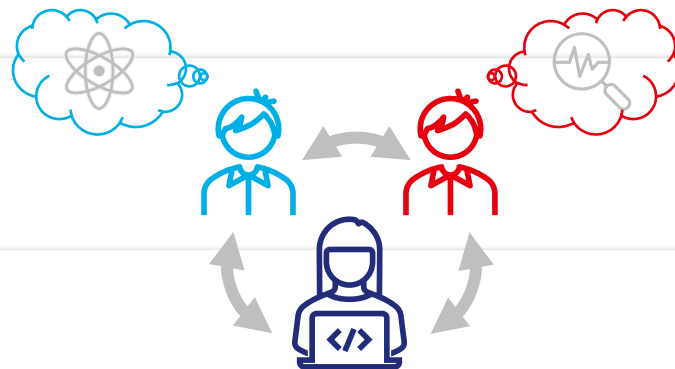
Supervision

Supervision Concept



Supervision

Supervision Concept



Project-Related Tandem Supervision

Supervisor
Natural Sciences

Supervisor
Computer Science
Applied Mathematics

Supervision

Supervision Concept

DASHH Supervision Panel

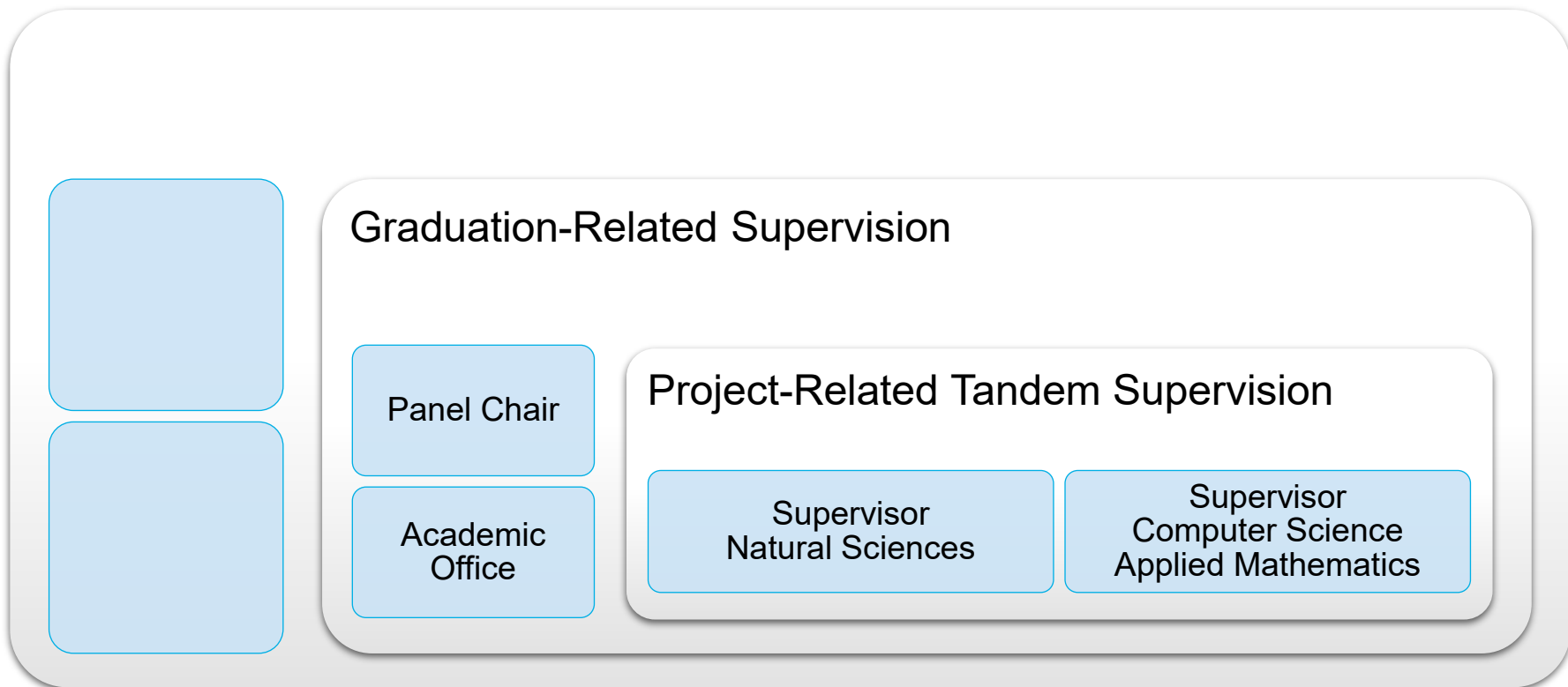
- regular meetings with the Principal Investigators (PIs) from both fields
- offices in both groups
- graduation in one field

Project-Related Tandem Supervision

Supervisor
Natural Sciences

Supervisor
Computer Science
Applied Mathematics

Supervision Concept



Supervision

Supervision Concept

DASHH Supervision Panel

- **Panel Chair** will give an objective assessment of progress and will act as mentor

Graduation-Related Supervision

Panel Chair

Academic
Office

Project-Related Tandem Supervision

Supervisor
Natural Sciences

Supervisor
Computer Science
Applied Mathematics

Supervision Concept

Curriculum-Related and Organizational Support

Doctoral
Researcher
Represent-
atives

DASHH
Coordinators

Graduation-Related Supervision

Panel Chair

Academic
Office

Project-Related Tandem Supervision

Supervisor
Natural Sciences

Supervisor
Computer Science
Applied Mathematics

Supervision Concept

Curriculum-Related and Organizational Support

Doctoral
Researcher
Represent-
atives

Doctoral Researcher Representatives

- doctoral researchers' voice for improvements/adjustments
- participate in regular meetings of DASHH boards and panels

DASHH Coordination

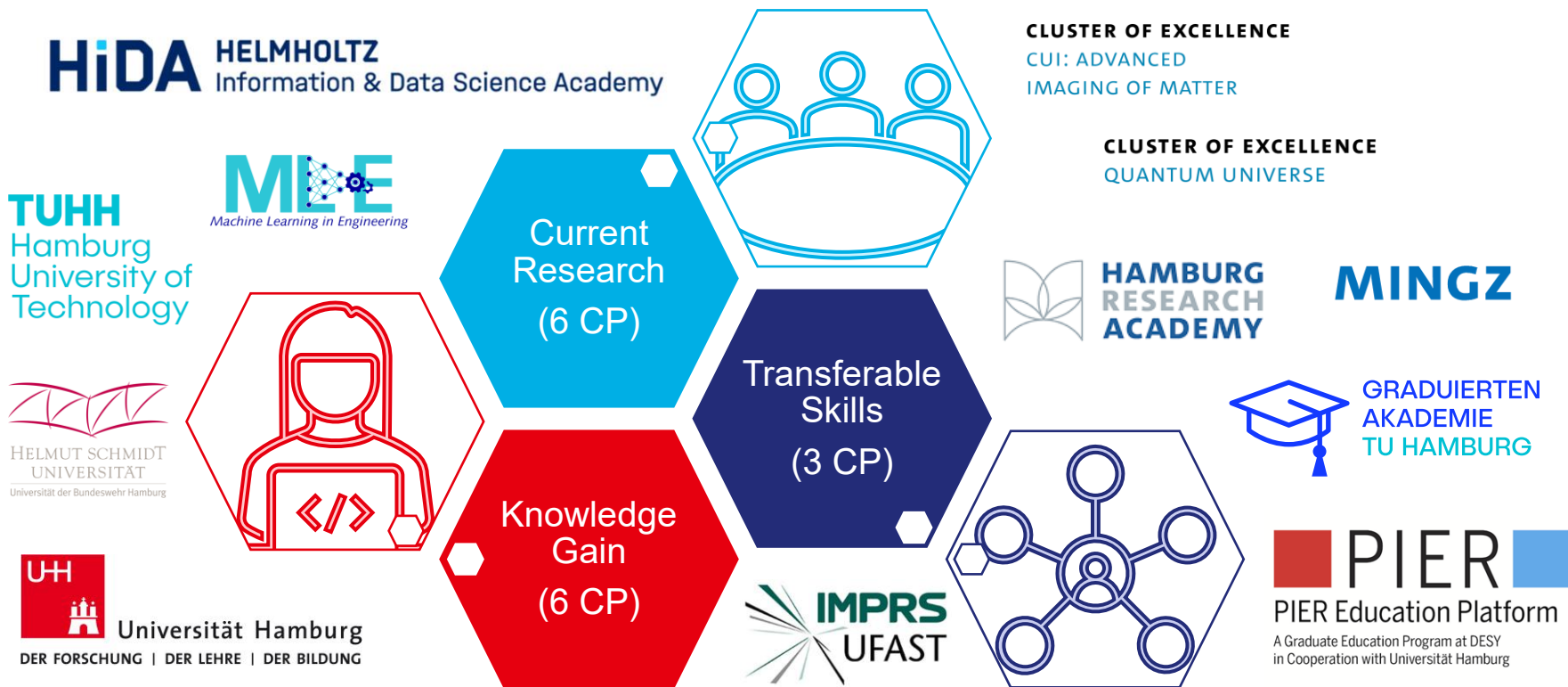
- onboarding meeting
- interim reports after five, eighteen and thirty months
- check-in meeting after nine months
- monthly Get Together and regular PhD Seminars

DASHH
Coordinators

Curriculum

Ensuring Comprehensive Offers

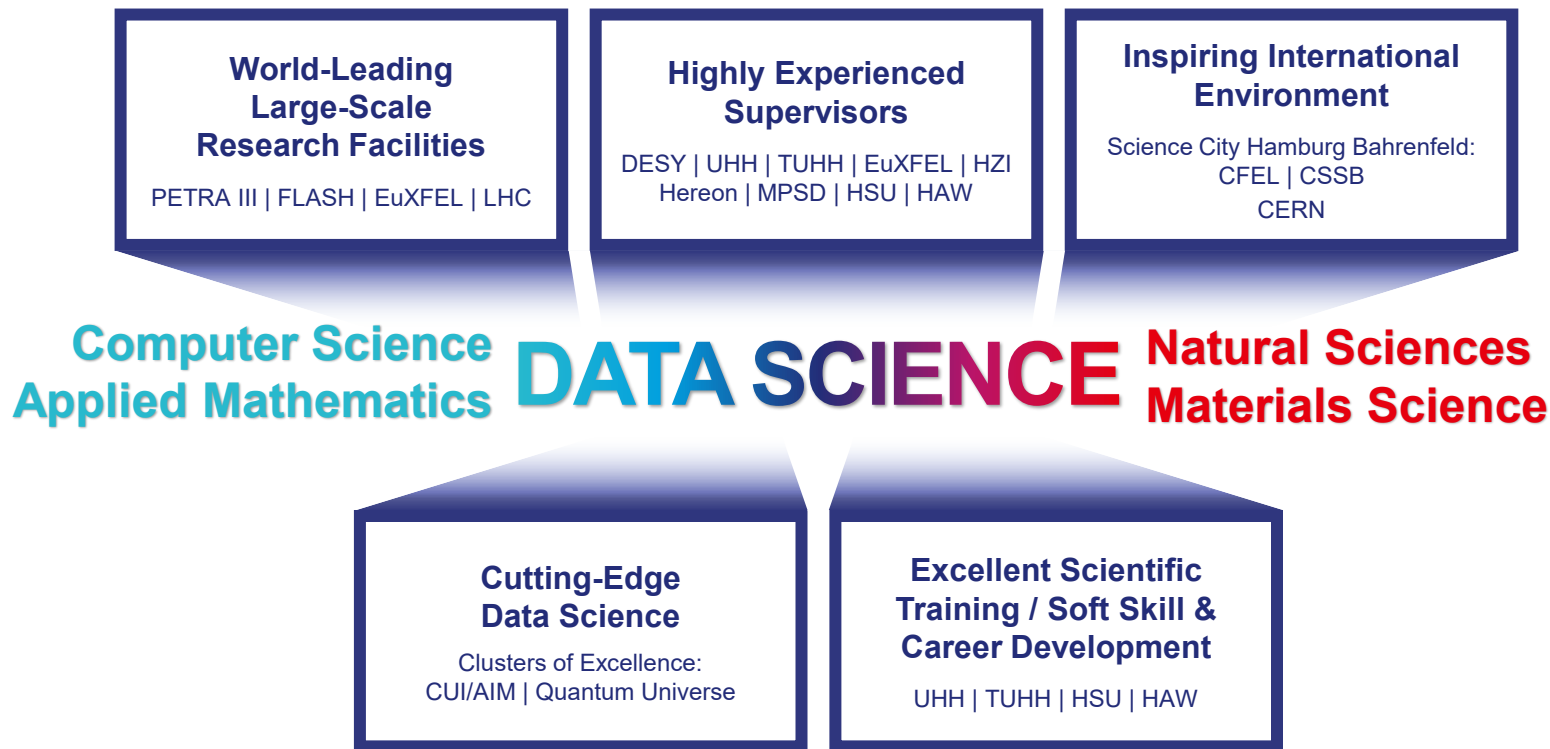
DASHH



Branch C | Current Research – Annual Networking Opportunities

- **DASHH Retreat**
 - DASHH-internal
 - open to whole DASHH community
 - talks & exchange with one additional day for doctoral researchers only





DASHH.

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

Photon Science
Particle Physics
Accelerator Science
Structural Biology
Materials Science

meet

Computer Science &
Applied Mathematics

APPLY NOW

For Our Interdisciplinary
Data Science PhD Projects



hereon



HZI HELMHOLTZ
Centre for Infection Research



HAW
HAMBURG

TUHH
Hamburg
University of
Technology



UH
Universität Hamburg
DER FORSCHUNG | DER LehRE | DER BILDUNG

DASHH.

**New Call for
Applications
opens in
September
2025!**

We are DASHH!

Our Doctoral Researchers



We are DASHH!

Our Doctoral Researchers



Thank you.

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We are DASHH

DASHH

