Presenting DASHH: Data Science in Hamburg – Helmholtz Graduate School for the Structure of Matter
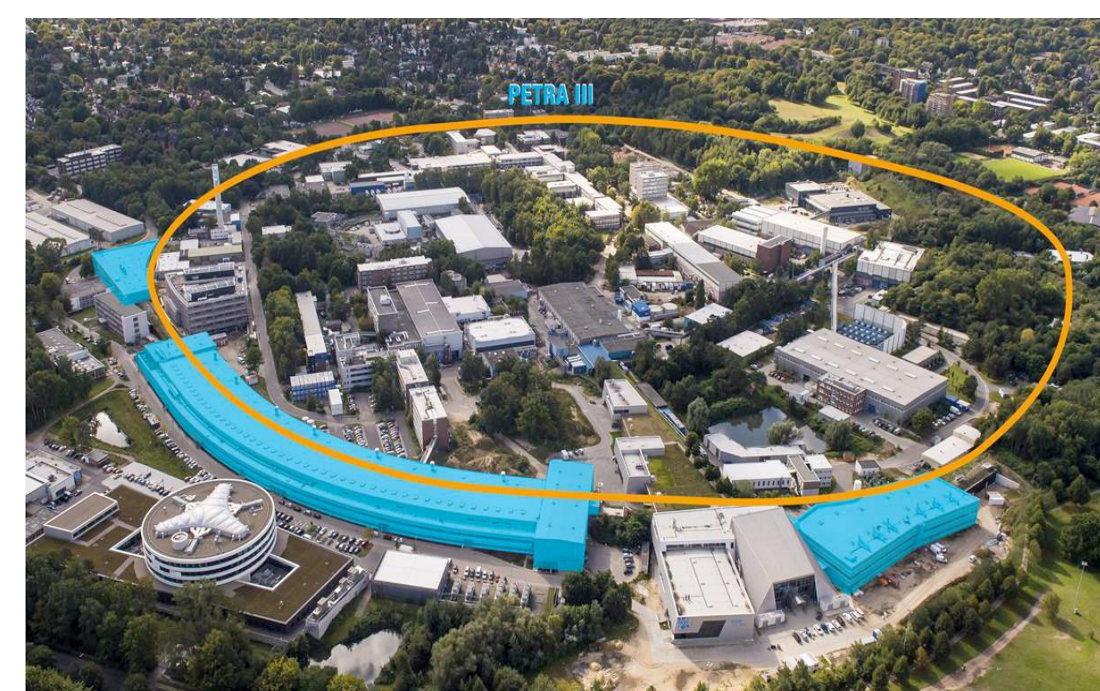
Contact:
Dr. Heike Hufnagel Martinez (DESY), Dr. Christiane Ehrt (UHH),
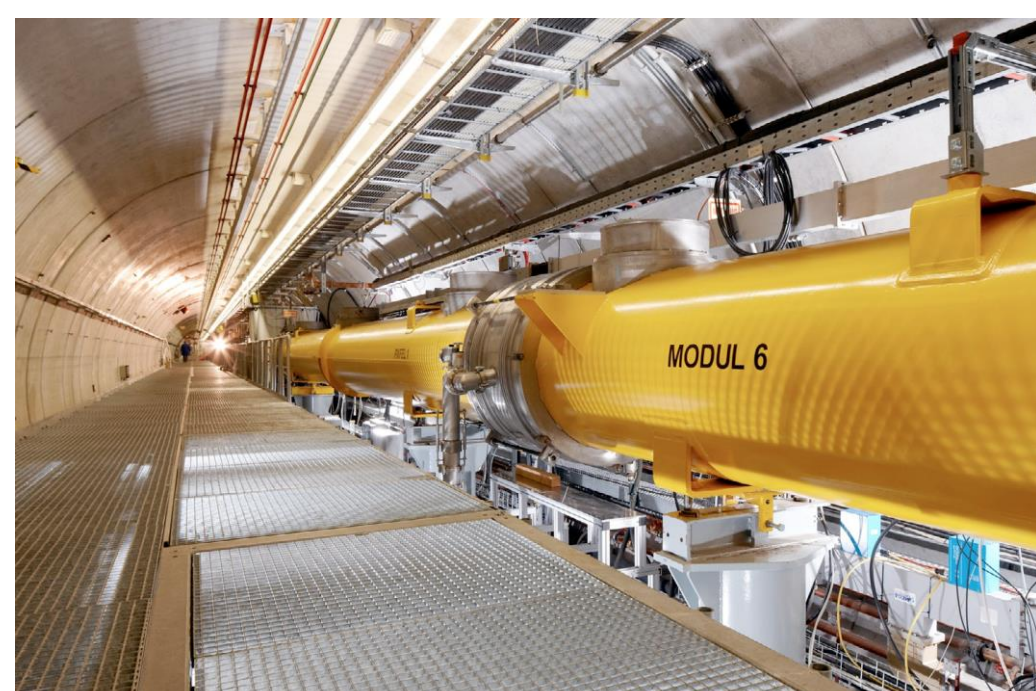DASHH coordinators, dashh-office@desy.de

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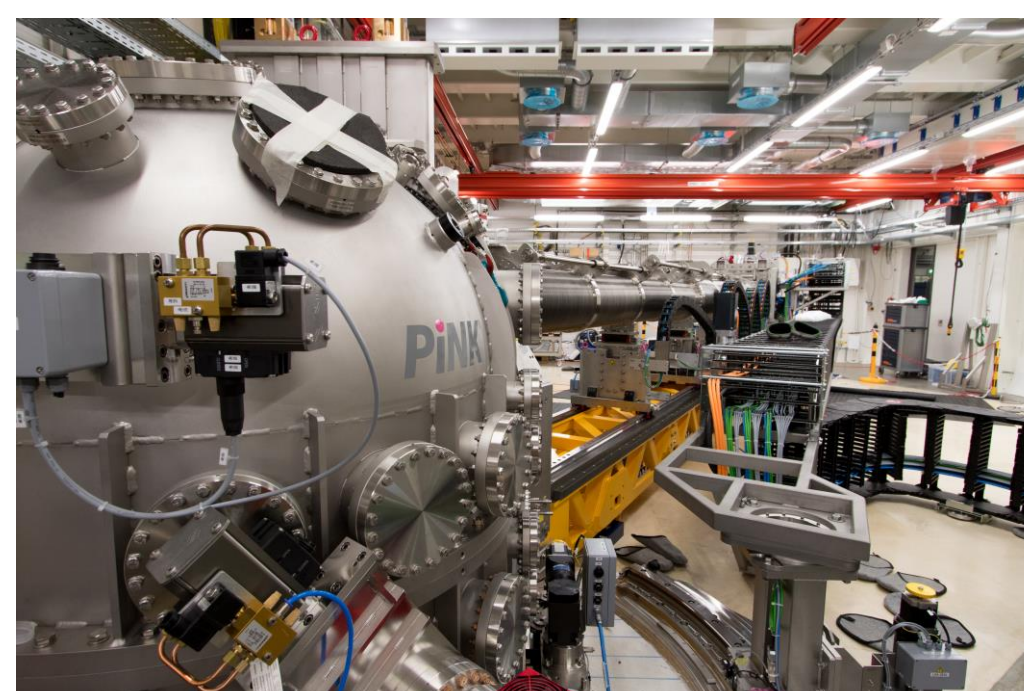for the Structure of Matter

New generation of analytical instruments produces enormous amounts of data to be analyzed and reconstructed

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

DESY: Operation of complex accelerators, **large scale supervisory control systems with > 1 Mio. channels**

European XFEL: 27,000 X-ray pulses/s (5 fs pulses), **current data rate of 25 TB/h, 8-fold scale-up expected**

CSSB: 5 electron cryo-microscopes of the newest generation, **data rate of 4TB/d**

High-Luminosity Large Hadron Collider HL-LHC (ATLAS, CMS), **hundreds of PB highly complex data per year**
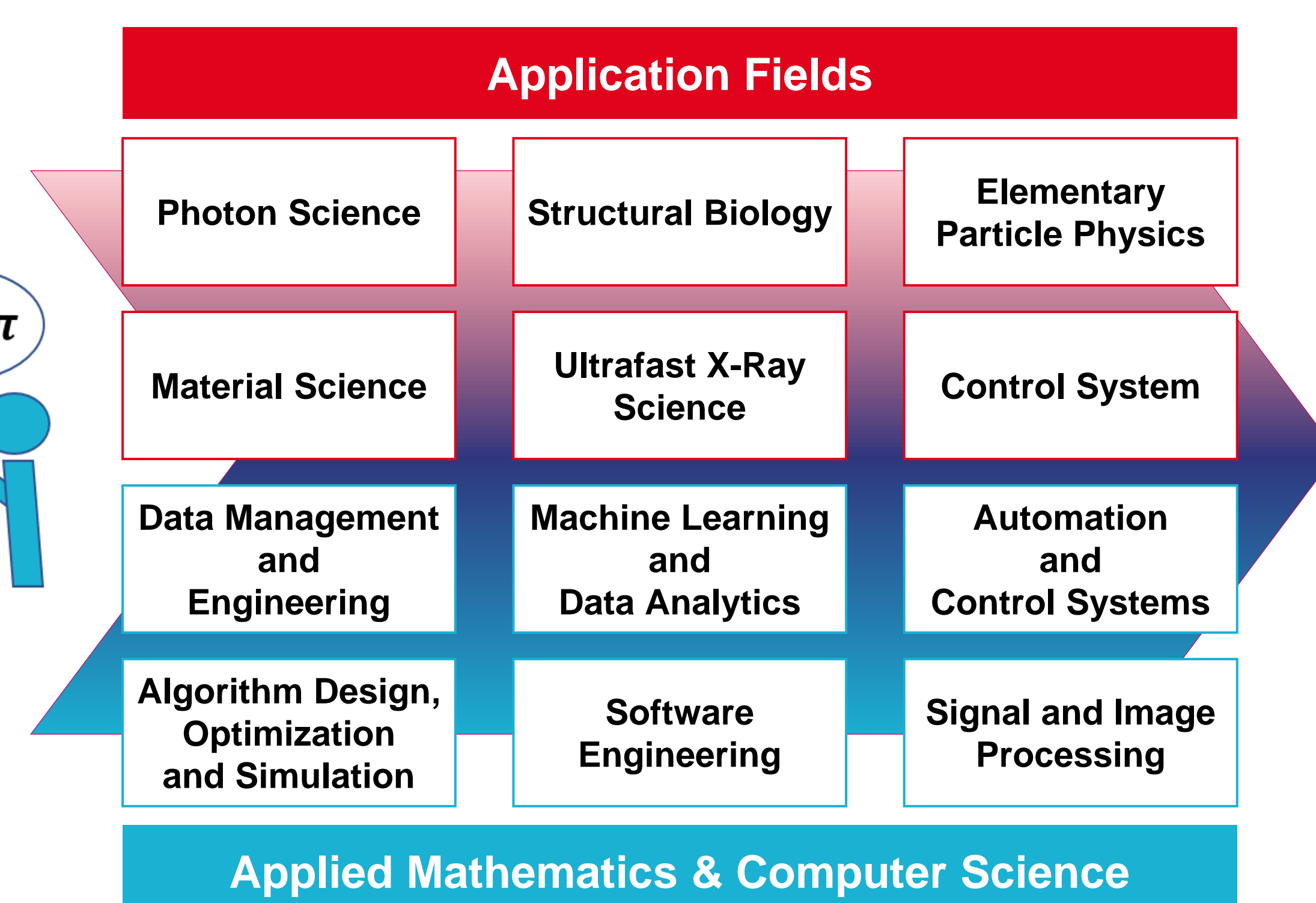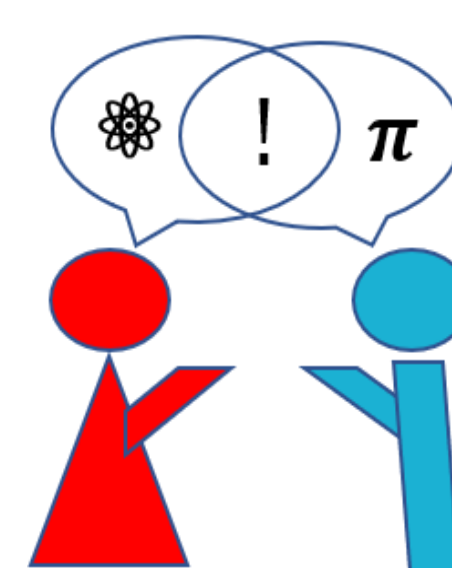
DASHH Objective: Solutions for big data challenges

- We need to develop innovative methods at the interface of natural sciences and applied mathematics/computer science
- We need to educate a new generation of data scientists who know how to do interdisciplinary research

DASHH concept: All PhD students are supervised by one principal investigator from the natural sciences and one principal investigator from mathematics/computer science.

Communication   Collaboration   Innovation

Application Fields

Photon Science	Structural Biology	Elementary Particle Physics
Material Science	Ultrafast X-Ray Science	Control System
Data Management and Engineering	Machine Learning and Data Analytics	Automation and Control Systems
Algorithm Design, Optimization and Simulation	Software Engineering	Signal and Image Processing

Applied Mathematics & Computer Science

Interdisciplinary PhD Projects, DASHH PhD students to become experts in data science

DASHH: a cornerstone of a quickly developing Data Science environment

At DASHH, we harness data, computer and applied mathematical sciences to advance and broaden our understanding of nature. We aim to tackle tomorrow's scientific challenges that come along with large-scale experiments.

DASHH is one of the six Helmholtz Information and Data Science Schools throughout Germany funded in 2019 in the framework of the Helmholtz Innovation and Networking Fund.

People
- 28 DASHH PhD Students
- 76 DASHH Principal Investigators
- 35 DASHH Scientists

Activities
In 2021, 63 events were (co-) organized by DASHH.
- PhD Seminars
- Data Science Colloquium
- Hamburg COVID-19 Series
- Data Science for Science Series
- Data Science Lectures and Courses

Research Areas
- Particle Physics
- Photon Science
- Structural Biology
- Materials Science
- Accelerator Science
- Computer Science/Applied Mathematics
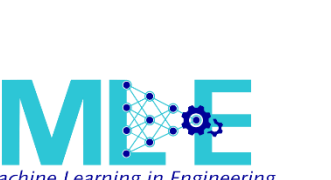
Collaboration and Cooperation

Join DASHH!

Enjoy access to the DASHH activities and events, benefit from the DASHH networking, be part of the Data Science community.

Are you a senior researcher affiliated with one of the DASHH partner institutions with the right to supervise PhD students in one of the DASHH topics?
Become a DASHH Principal Investigator, propose and supervise DASHH projects and benefit from a stringent recruitment process and targeted advertisement yielding excellent candidates.

Are you a PhD student working on a project related to Data Science supervised by a DASHH PI?
Become an associated DASHH PhD student.

Are you a researcher interested in Data Science and affiliated with one of the DASHH partner institutions?
Become a DASHH Scientist, co-supervise DASHH PhD students.

➤ **Contact dashh-office@desy.de to become a DASHH researcher!**

In 2020, **DASHH won the North German Science Award** that recognizes transnational collaborations in science standing out for their scientific excellence.

"DASHH is a particularly good example of collaboration between different institutions and disciplines."
(Rolf Greve, head of the Office for Science and Research at the Hamburg Science Authority)