



# NHR

## Your Academic Supercomputing Infrastructure

**Prof. Dr. Christian Plessl**

Vice Chairman NHR Executive Board

Director Paderborn Center for Parallel Computing, Paderborn University

2025-12-12 – Jahrestagung Komitee für Hadronen- und Kernphysik (KHuK)

# NHR as part of the German HPC infrastructure

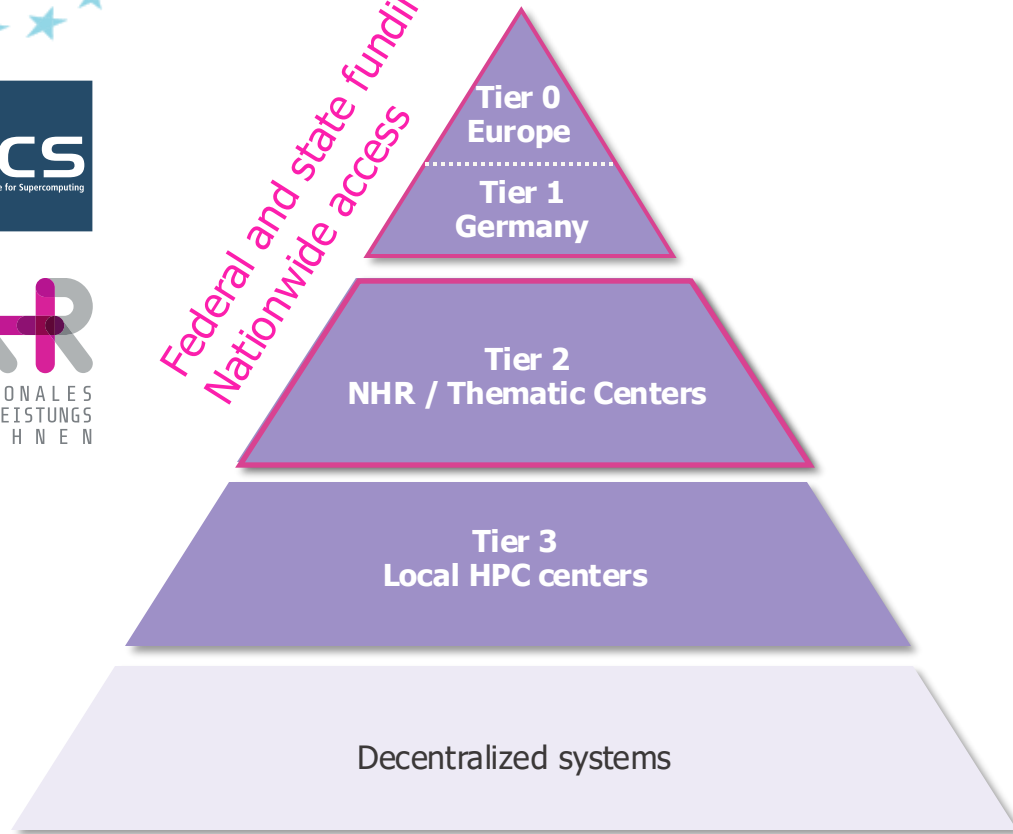


## • Key points

- Joint federal and state funding
- Initial funding of €62.5 million per annum over 10 years
- Transition from regional to competence-oriented
- Nationwide access for all scientists at German universities
- Coverage of all subjects with HPC requirements
- Strengthening of users' methodological skills through coordinated training and continuing education
- Special support for young scientists



Federal and state funding  
Nationwide access



# Members of the NHR Association



- Rheinisch-Westfälische Technische Hochschule Aachen
- Zuse Institute Berlin (ZIB)
- Technical University of Darmstadt
- Dresden University of Technology
- Friedrich Alexander University (FAU) Erlangen-Nuremberg
- GWDG/Georg August University Göttingen
- Karlsruhe Institute of Technology
- Johannes Gutenberg University Mainz for the South-West Consortium (Goethe University Frankfurt, Rhineland-Palatinate Technical University Kaiserslautern-Landau, Johannes Gutenberg University Mainz, Saarland University)
- Paderborn University

## Executive Board

Christian Plessl (Paderborn University)

Gerhard Wellein (FAU Erlangen)

Matthias Müller (RWTH Aachen)

## NHR Office

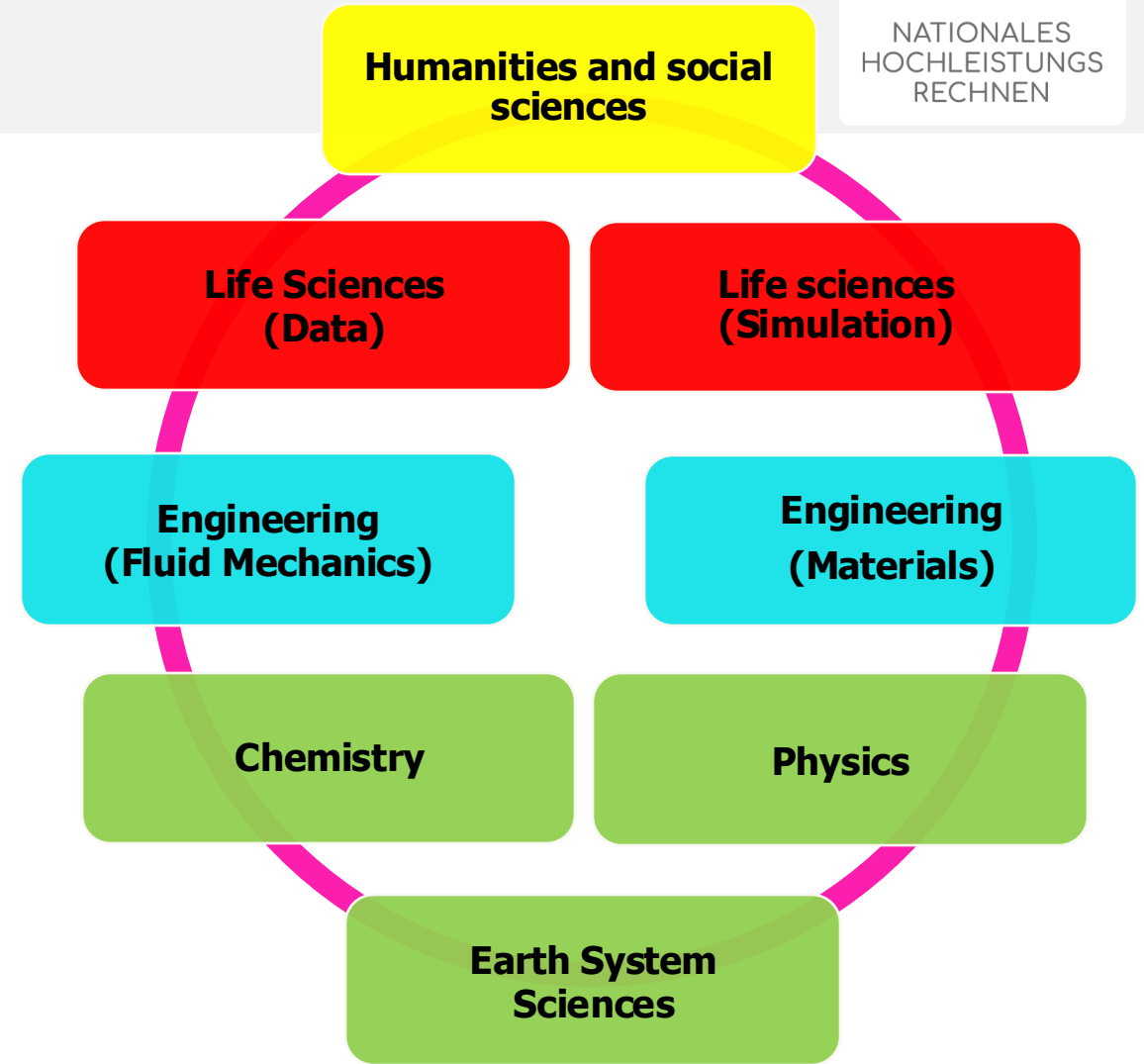
Dörte Sternal (Head)

Franka Derwisch (Head)

\*Südwest: Mainz, Frankfurt, Kaiserslautern, Saarbrücken

# Thematic specialization

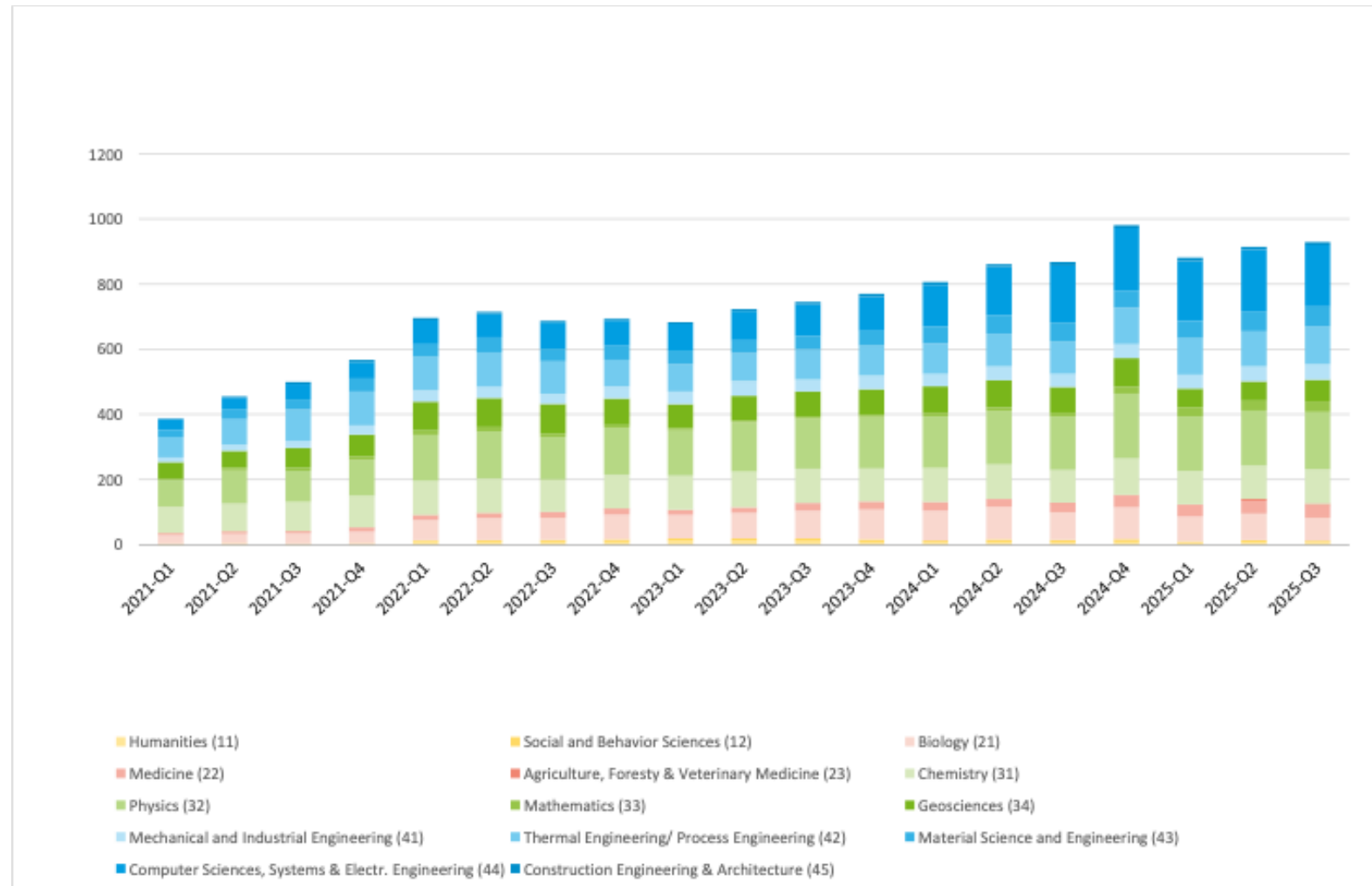
- Coordination of centers to ensure broad and complementary coverage
  - Scientific subjects
  - Methods
  - Technologies
- Goal: Provision of customized hardware, software, support, and training
- One coordinating center per area/topic
  - but no sole representation/responsibility
  - Users can continue to apply to any center for their projects



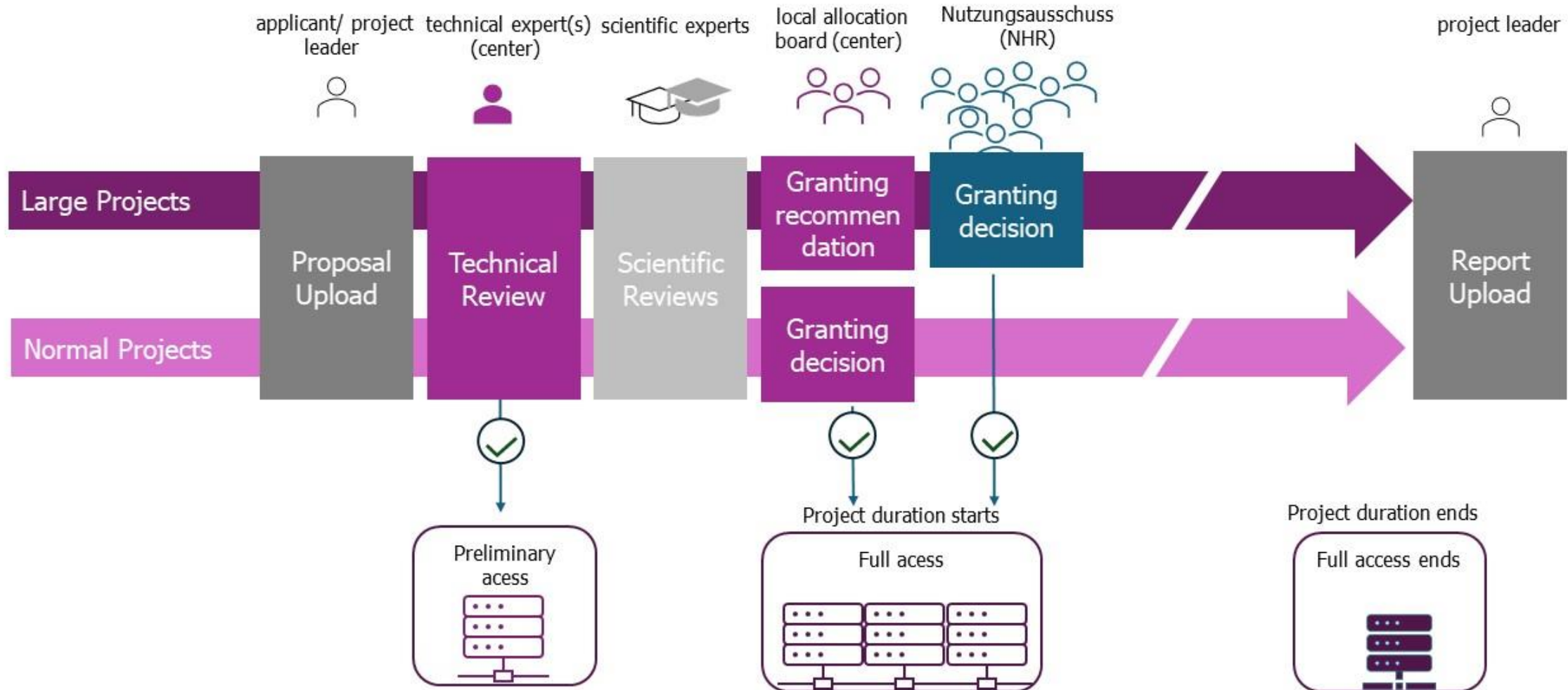
# Overview of Computer Infrastructure (Q4/2025)

	CPU cores (NHR share)	GPUs (NHR share)
Erlangen (NHR@FAU)	60256	542
Göttingen (NHR@Göttingen)	136320	168
Karlsruhe NHR@KIT)	61708	808
Paderborn (PC2)	215174	179
Aachen (NHR4CES@RWTH)	39360	124
Mainz/Frankfurt (NHR@SW)	90624	904
Dresden (NHR@TUD)	72384	416
Darmstadt (NHR4CES@TUDa)	98184	100
Berlin (NHR@ZIB)	146192	200
<b>Total</b>	<b>920202</b>	<b>3441</b>

# Active Projects at NHR (per quarter)



# Project Life Cycle



# Application for computing time (1)

- Resource requests on a project basis
- Central application portal of the centers
- Technical and scientific review by centers and external peer reviewers
- Use is free of charge

1. Overview and preparatory work
2. Project description
  - Scientific objectives
  - Approach, expected results, progress Beyond the state of the art
  - Numerical methods and algorithms that are used, improved, developed
3. Computing resources
  - HW and SW requirements
  - Proof of resource efficiency
  - Estimation of computing time and memory requirements

**Computing time application**  
(somewhat simplified)



# Reducing Barriers for Application



- Simplified (shorter) project description for project with moderate resources
- No or simplified scalability analysis for known research software (domain-specific)
- Simplified / faster review process for projects based on quality-controlled research grant (DFG, BMFTR, EC, ...)
- Default project duration one year but option to apply for multi-year projects (e.g. to match project or PhD/postdoc phase)
- Low barrier fast-track for first time applicants (NHR Starter)

# Requesting computing time (2)

Project category	Application deadline / Project start	Review			Decision-making committee
		Technical review	Scientific quality	Appropriateness of methods and scope of resources	
Evaluation/Test	Rolling	Experts at the NHR Center	–	–	Operators of the NHR Center
Starter (first time applicant)	Rolling	Fast track with specific support from NHR Center and administrative office			Local resource allocation board
Normal with quality-controlled grant (whitelisting)	Rolling	Experts at the NHR Center	–	Peer review by 1 expert	Local resource allocation board
Normal without quality-controlled grant	Rolling	Experts at the NHR center	Peer review by 2 experts		Local resource allocation board
Large	Quarterly	Experts at the NHR Center	Peer review by 2 experts		NHR-wide resource allocation board

**Typical** resource limits  
(as of 12/2025)

## CPU

1-25 mio CPU core-h p.a. (Normal)  
25-100 mio CPU core-h p.a. (Large)

## GPU

1-100 k GPU-h p.a. (Normal)  
100-500k GPU-hp.a. (Large)

# Services Beyond HPC Ressources



## Training program

- Coordinated training program across centers
- Announcement via mailing list [NHR announcements](#) and [website](#)
- Courses on various HPC topics (in 2025 >160 Courses and >3000 participants)

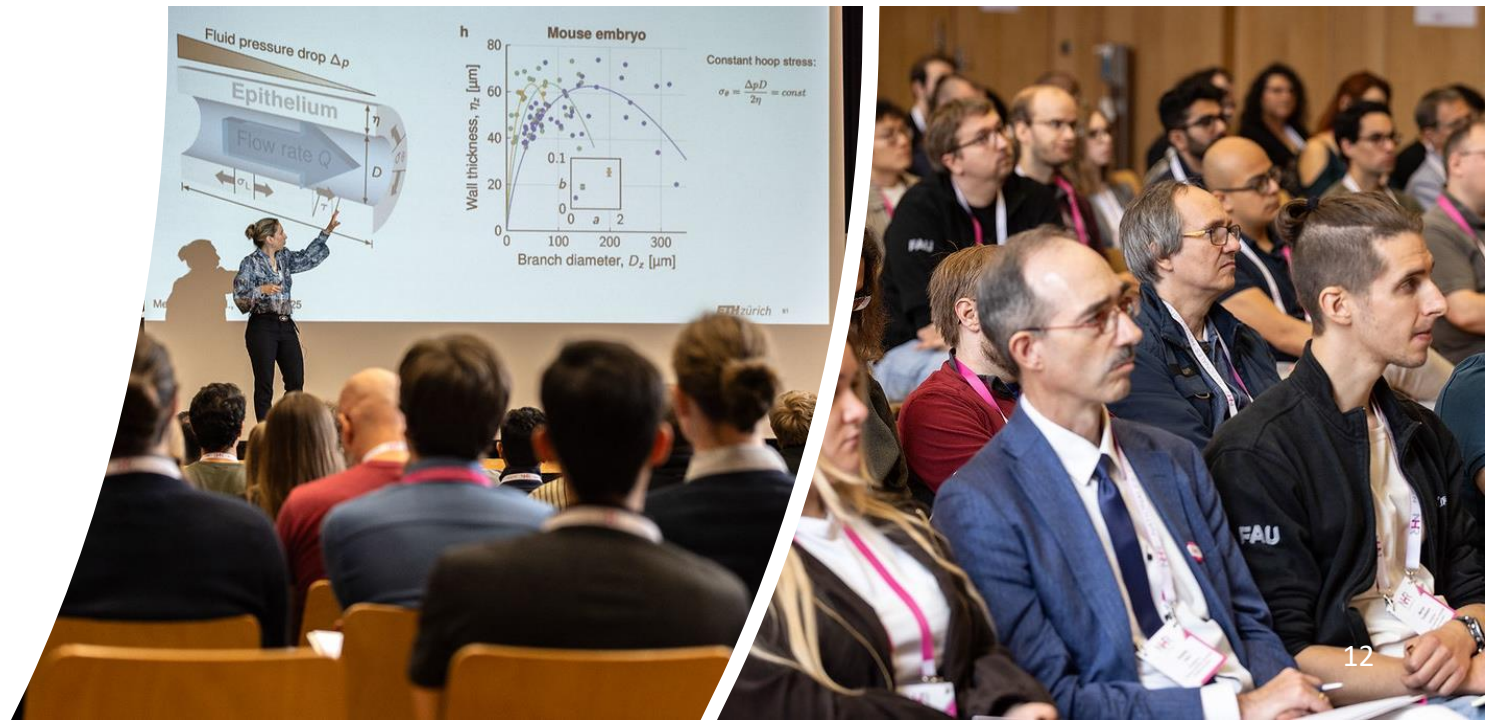
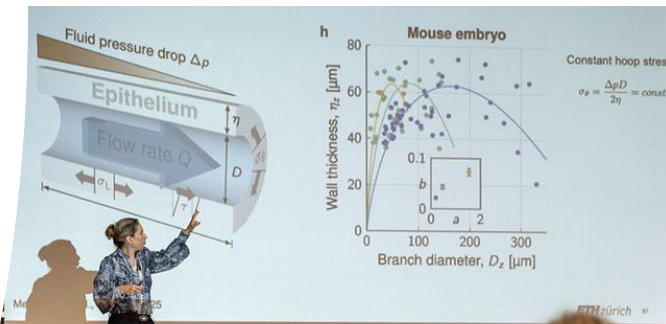
## Consulting & Support

- Technical support (access, compilation, efficient HPC system use)
- SW porting and optimization support
- Application domain-specific support (effective use of simulation software, workflow setup, data management)
- Joint development and research

# NHR Events

## Annual NHR Conference

NHR Conference 2026 in Paderborn  
September 14-17  
Topics: Atomistic Simulation & AI



# Physics Specific Structures



- Focus Area Physics in NHR
  - coordination by Paderborn
  - participating centers: NHR@SW, NHR@FAU, NHR@KIT, NHR@ZIB
  - mailing list for general inquiries: [physics@nhr-verein.de](mailto:physics@nhr-verein.de)
- NHR Center for Computational Physics
  - (almost) yearly symposia, next year probably held as in-person event in Mainz
  - foster community building and scientific exchange

# Further Information



Website <https://www.nhr-verein.de/en/>

Announcement List <https://www.listserv.dfn.de/sympa/subscribe/nhr-announcements>

**Linked in** <https://www.linkedin.com/company/nhr-verein/>

Contact [geschaeftsstelle@nhr-verein.de](mailto:geschaeftsstelle@nhr-verein.de)

With funding from the:



Federal Ministry  
of Research, Technology  
and Space

and the state governments  
participating in the NHR

With funding from the:



Federal Ministry  
of Research, Technology  
and Space

and the state governments  
participating in the NHR