

Overview of the National High-Performance Computing (NHR) Program

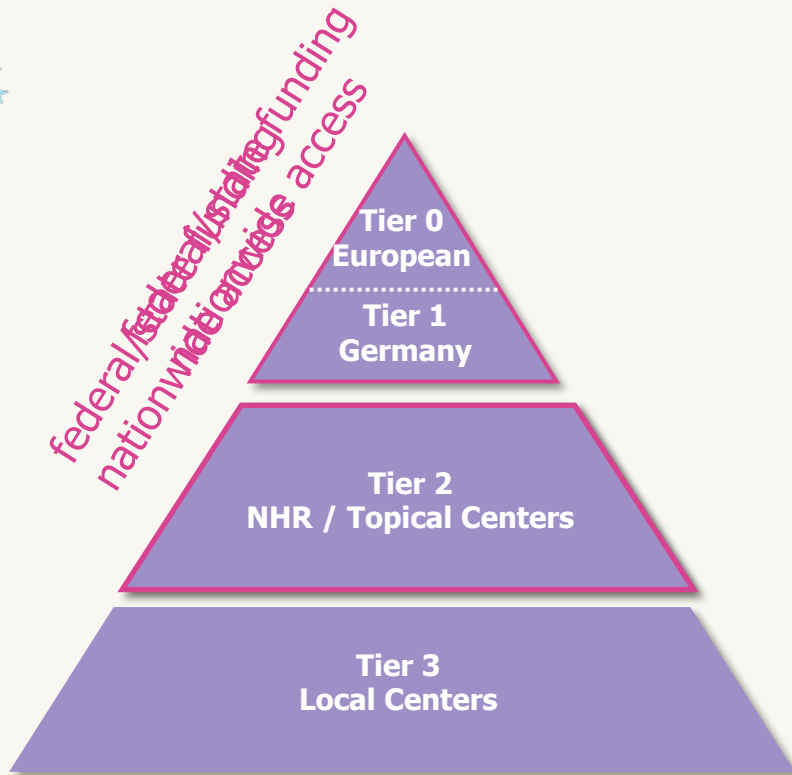
Prof. Dr. Christian Plessl

Paderborn University, Paderborn Center for Parallel Computing

Board Member, NHR e.V.

bwHPC Symposium– November 28, 2022

NHR as Part of German HPC Infrastructure



- Recommendation by Research Council to introduce Tier-2 **National High Performance Computing (NHR)** infrastructure
- Competitive applications in 2020
 - official start: Jan 1, 2021
 - total funding 625M Euro (2021-2030)
 - currently 9 NHR centers
- Key aspects
 - joint federal/state-funding
 - transition **from regional to competence-oriented for nationwide use**
 - free access for all researchers from German universities
 - strengthen **methodological competences** through coordinated training, continuing education of users
 - specific support for **young scientists**

NHR Association

- NHR-Verein e.V. is legal central legal entity of NHR Association
- Board of Directors
 - Prof. Dr. Christof Schütte, ZIB Berlin, chairman
 - Prof. Dr. Gerhard Wellein, FAU Erlangen Nuremberg, vice-chairman
 - Prof. Dr. Christian Plessl, Paderborn University, vice-chairman
- NHR coordinates
 - financial planning / investments of NHR centers
 - training & teaching activities
 - central application portal for compute time and services
- NHR supports
 - joint activities of the centers reaching beyond NHR
 - activities to foster scientific computing and young researchers



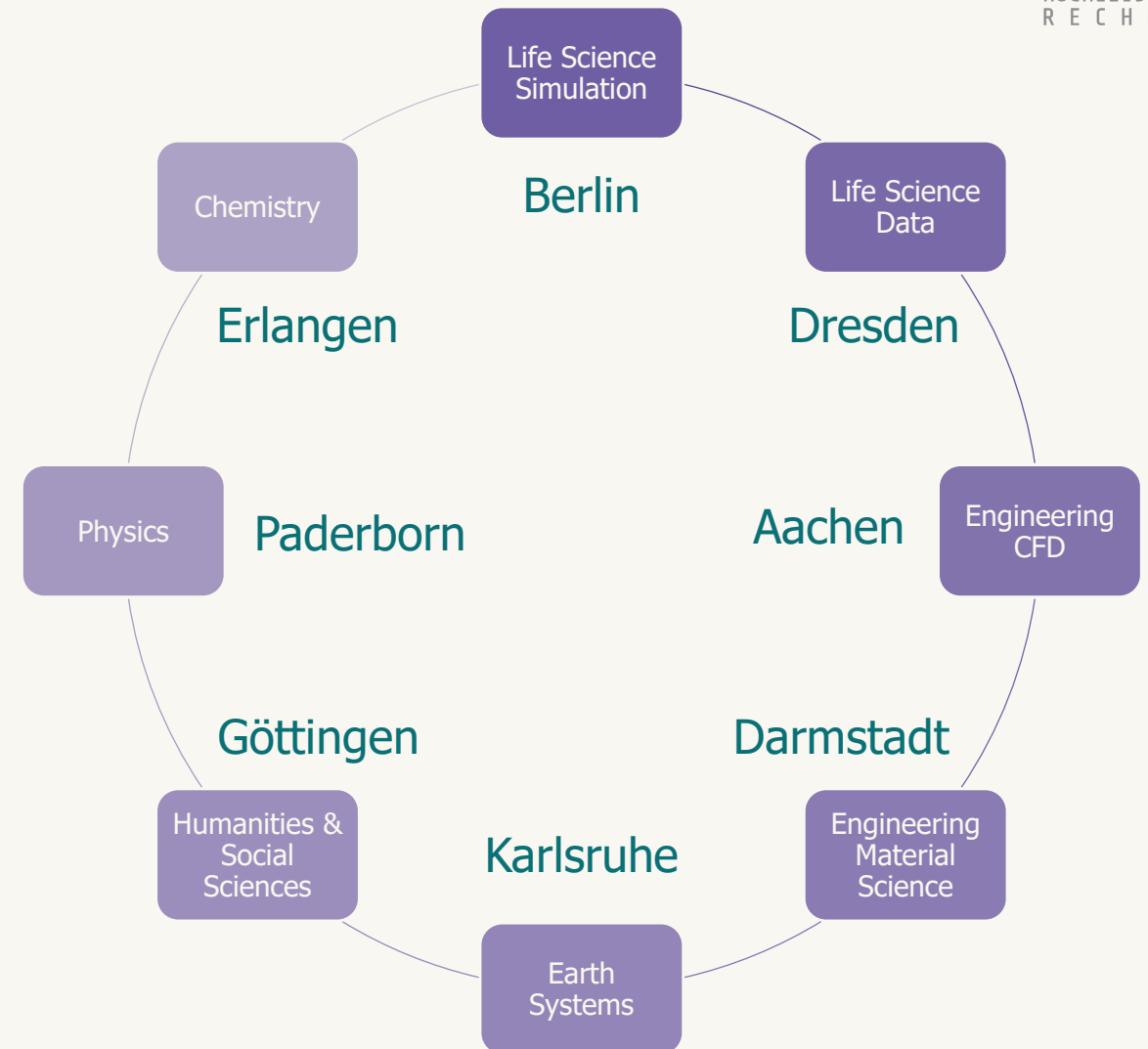
<https://nhr-verein.de>

Joint Activities Funded by NHR Association

- NHR Office (Geschäftsstelle)
 - headed by Dr. Barbara Diederich and Dr. Dörte Sternel
 - first contact point for any request regarding NHR, geschaeftsstelle@nhr-verein.de
 - supporting the boards, coordination of graduate school, administration of NHR-Verein, ...
 - public relations
- Joint computing time allocation
- Infrastructure projects
 - central computing time application portal (JARDS)
- Future projects
 - e.g., performance and cluster monitoring, continuous integration for HPC software, optimized sw-libraries for computational chemistry
- NHR Graduate School

Topic Specialization

- Centers coordinate to provide broad and complementary coverage of
 - science domains
 - methods
 - technologies
- Goal: provide tailored hardware, software, support, training
- One coordinating center per domain/topic
 - but no sole representation / responsibility
 - users can still apply at any center for their projects



NHR Computing Time Allocation

- Computing time on NHR system is allocated by joint NHR Allocation Board (Nutzungsausschuss)
 - common rules for project application
 - quarterly application deadlines for large-scale projects
- First joint allocation by NHR Nutzungsausschuss in Sep 22
 - 29 large scale projects
 - Granted: >400 million CPU hours and >1,5 million GPU hours
- Joint application portal in preparation (JARDS)
 - Start planned for Q2/2023
- Permeability from Tier 1 (Gauss Centre) to NHR (and vice versa)

Cross-Center Activities

- Topic specialization of centers
- First virtual centers being established
 - Atomistic Simulation Center
 - NHR Center for Computational Physics
 - Computational Engineering (NHR4CES)
- NHR Conference
 - Sep 18–22 2023, Berlin
 - scientific exchange between NHR centers and user communities
- Wide range of courses and workshops
 - <https://www.nhr-verein.de/kurse-und-workshops>

NHR Graduate School

- 9 PhD Scholarships per year (all centers)
 - Amount: 2,200 Euro per months over 36 months
- Program includes:
 - Advanced training & annual summer school:
 - Operation and computer architecture
 - Software and HPC methods
 - Application of HPC methods in research fields
 - Secondment:
 - Scholarship holders shall at another NHR center for six months
- Next iteration
 - application deadline ~9/23, start of scholarship 4/24

- First cohort started
 - April 1st, 2022
- Students
 - 2 females
 - 7 males
 - 6 nations

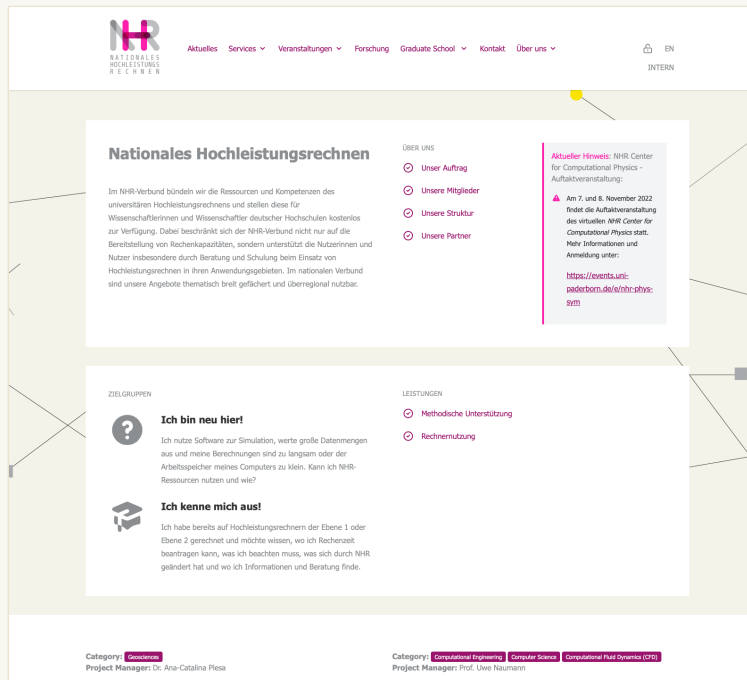


<https://nhr-verein.de/die-graduiertenschule>

Summary: NHR Benefits for Users

- Free access to Tier 2 HPC resources for users from Germany universities
 - joint application portal (planned for Q2/23)
 - common structure of proposal for all NHR centers
 - pragmatic application process
 - e.g. multi-year projects, simplified process for peer-reviewed projects
- Topic and competence-oriented structure
 - users can apply to any NHR center
 - tailored hardware and services
 - specialized support and training offerings
 - cross-center activities for community building

Further Information



The screenshot shows the NHR website homepage. At the top is the NHR logo and a navigation menu with items: Aktuelles, Services, Veranstaltungen, Forschung, Graduate School, Kontakt, Über uns. Below the navigation is a main content area with several sections:

- Nationales Hochleistungsrechnen**: A section describing the NHR consortium's resources and competencies, aimed at supporting researchers at German universities. It includes a list of links: "Über uns", "Unser Auftrag", "Unsere Mitglieder", "Unsere Struktur", and "Unsere Partner".
- Aktueller Hinweis**: A notice about an upcoming event on November 7 and 8, 2022, titled "Findet die Auftaktveranstaltung des virtuellen NHR Center für Computational Physics statt." It provides a link: <https://events.uni-paderborn.de/lehre/phys-sym>.
- ZIELGRUPPEN**: A section with two sub-sections:
 - Ich bin neu hier!**: For users who need software for simulations or large data volumes but find their local computers insufficient.
 - Ich kenne mich aus!**: For users who are already familiar with high-performance computing and want to optimize their workflow.
- LEISTUNGEN**: A section listing services: "Methodische Unterstützung" and "Rechenumsetzung".

At the bottom, there are category tags: "Computational Engineering", "Computer Science", and "Computational Fluid Dynamics (CFD)".

NHR Office

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