Overview of the National High-Performance Computing (NHR) Program
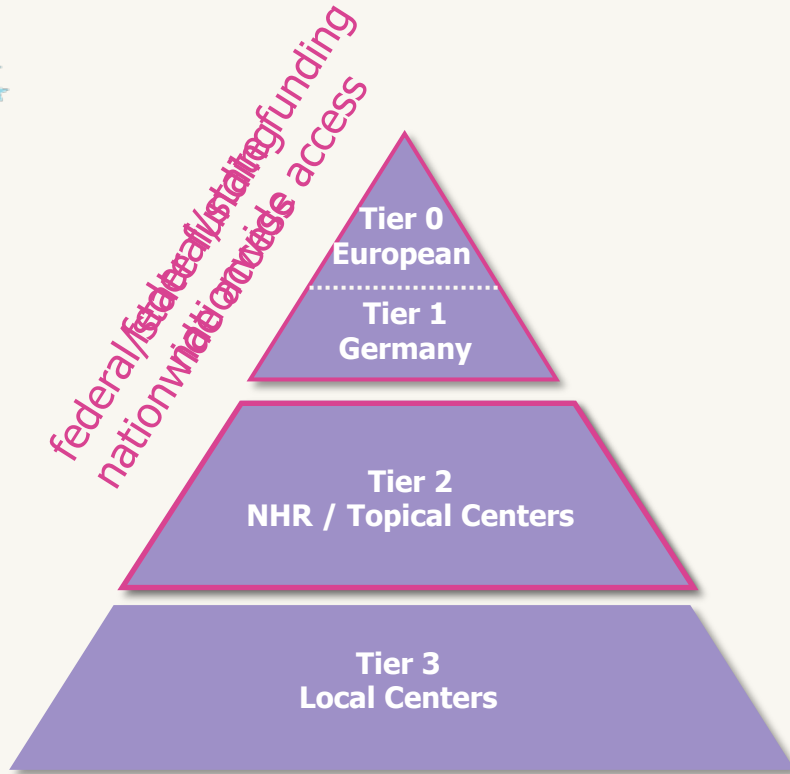
Prof. Dr. Christian Plessl

Paderborn University, Paderborn Center for Parallel Computing

Board Member, NHR e.V.

NHR-Computational Physics Symposium – November 7, 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

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)

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**
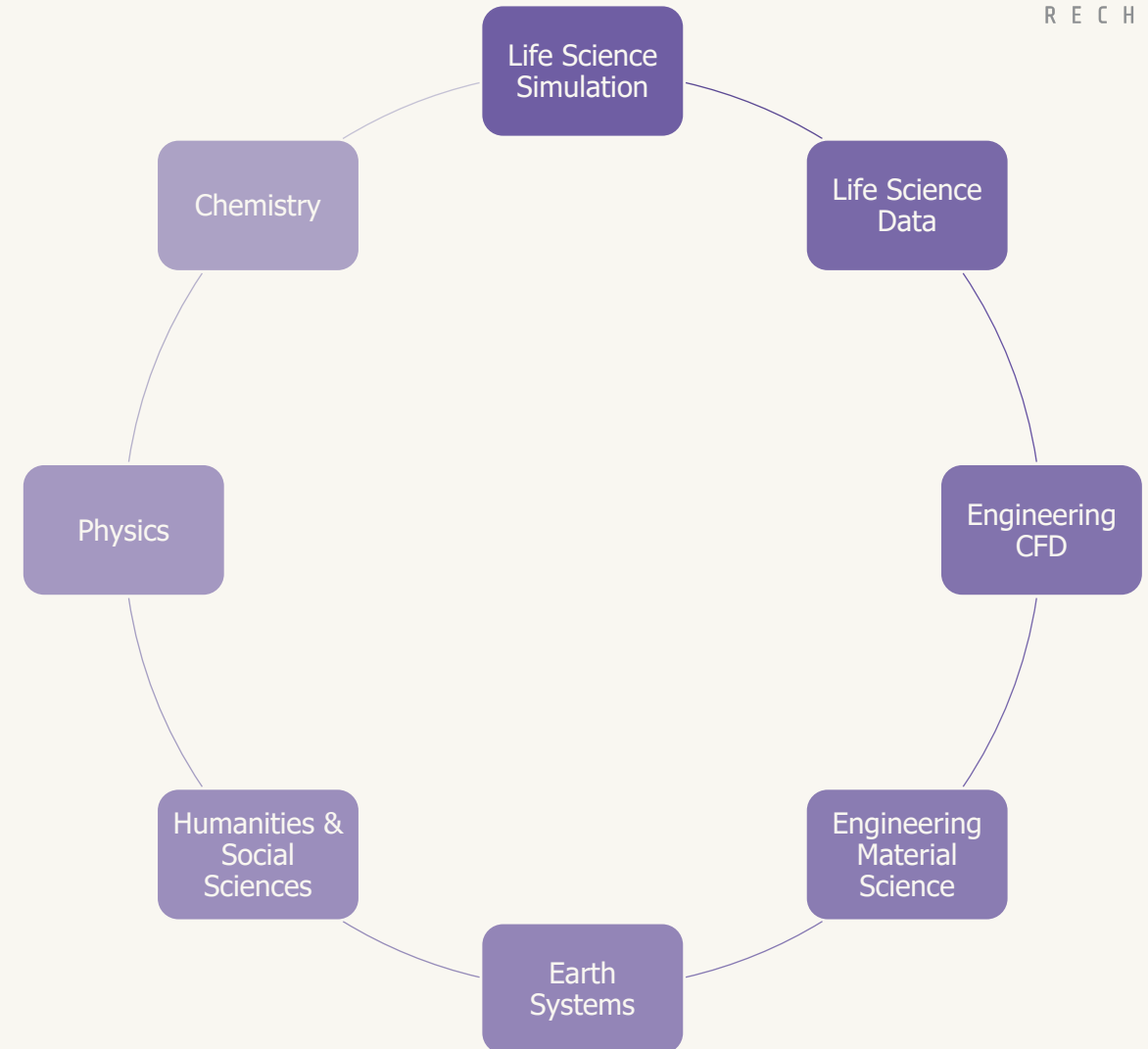 - application deadline ~9/23, start of scholarship 4/24

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

https://nhr-verein.de/die-graduiertenschule
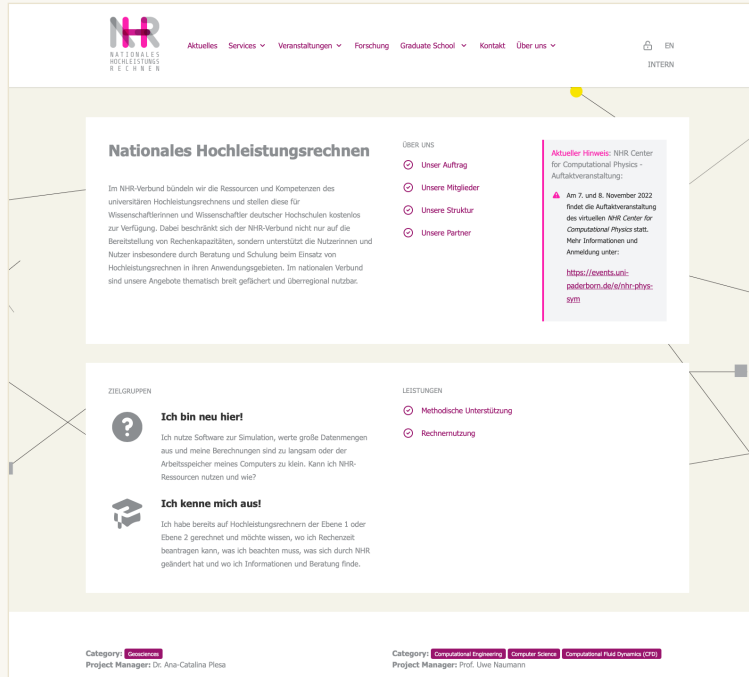
Cross-Center Community Activities

- 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

Life Science Simulation

Life Science Data

Engineering CFD

Engineering Material Science

Earth Systems

Humanities & Social Sciences

Physics

Chemistry

Summary: NHR Benefits for Users

- Free access to Tier 2 HPC resources for users from Germany universities
  - joint application portal (planed 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

NHR Office

Dr. Barbara Diederich &
Dr. Dörte Sternel

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