

hpc.bw (dtec.bw) – Competence Platform for Software Efficiency and Supercomputing

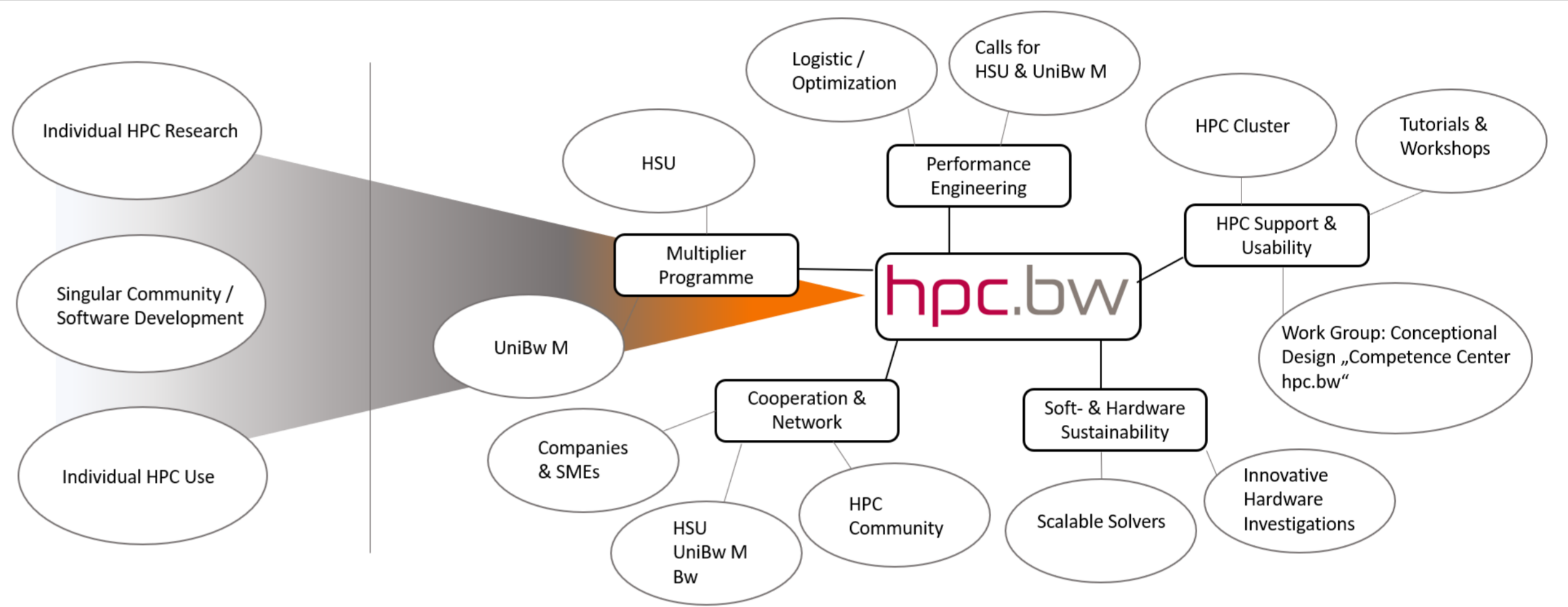
HSU/UniBw H: Prof. Dr. Philipp Neumann, Prof. Dr. Sabine Schmidt-Lauff, Prof. Dr. Andreas Fink, Prof. Dr. Marcus Stiemer; Imane Bechelaoui, Johann Duffek, Piet Jarmatz, Jessica Kleinschmidt, Alexander Kolling, Willi Leinen, Hauke Preuß, Marie Rathmann, Simon Schlumbohm

UniBw M: Prof. Dr. Alexander Popp, Dr. Matthias Mayr; Max Firmbach

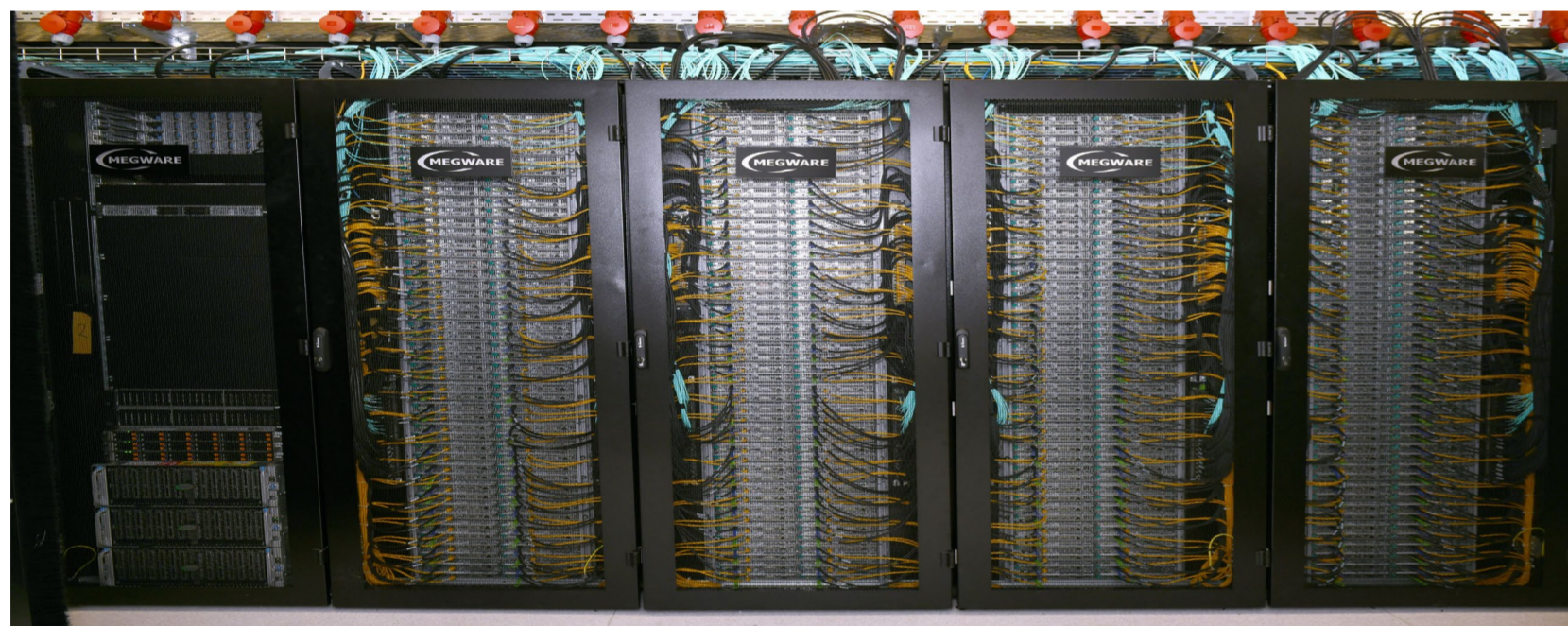
Strengthening innovative research and development through high performance computing (HPC) as an interdisciplinary field

Objectives

- Establishing an **HPC competence platform (HPCCP)** for knowledge transfer, competence acquisition and networking for users without an affinity to computer science, beginners, advanced users and software developers
- Empowering of **research and development** by utilizing discipline-specific HPC
- Deriving new HPC research questions from **discipline-specific problems**
- Promoting **interdisciplinary exchange**
- Promoting of **hardware and software sustainability**



New Supercomputer in Hamburg: *HSUper*

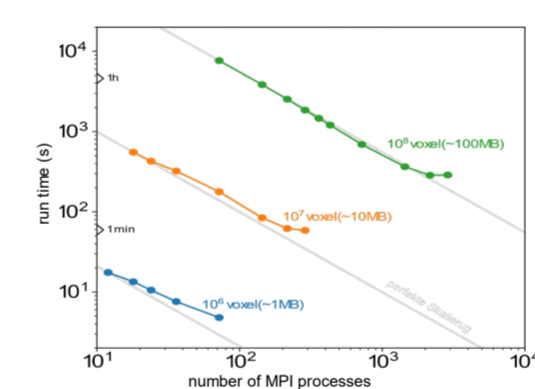
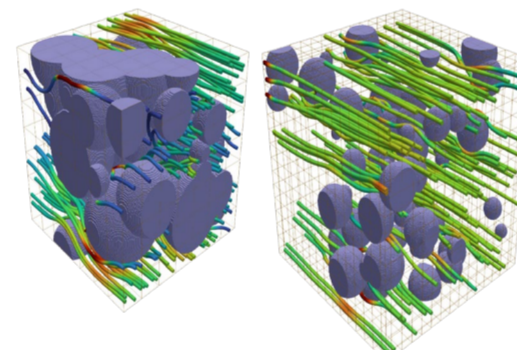


- 581x dual Intel 8360Y (41.832 compute nodes)
- 2x 1-PB-storage system (Ceph, BeeGFS), InfiniBand HDR100
- 571 nodes, dual-socket Intel Icelake (2x36 cores), 256 GB RAM
- 5 nodes, dual-socket Intel Icelake, 1 TB RAM
- 5 nodes, dual-socket Intel Icelake (2x36 cores), equipped with 2 A100 GPUs, 256 GB RAM

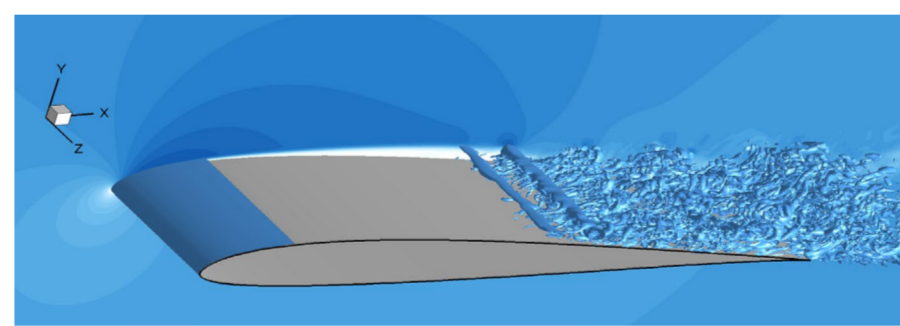
Research areas with HPC needs

- Numerical simulation and development of parallel simulation methods
- Artificial intelligence / machine learning / data analysis
- Bioinformatics problems, e.g. in medicine
- Optimization problems, e.g. in logistics

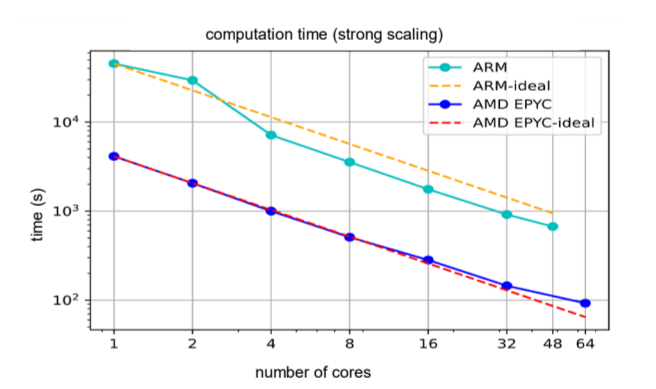
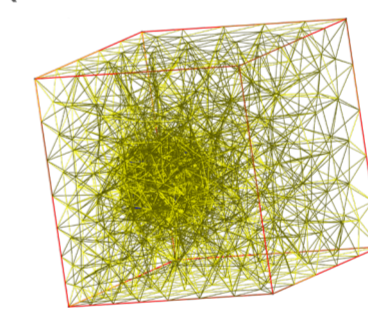
Simulation in the materials sciences (Prof. Kramer)



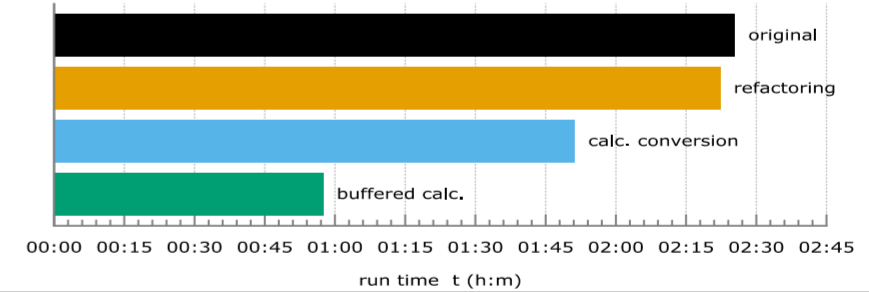
Simulation of turbulent flows (Prof. Breuer)



Molecular-continuum simulation (Prof. Neumann)



Performance engineering for Monte Carlo simulations in thermodynamics (Prof. Meier)



Examples of building block based activities of the HPC Competence Platform

- HPC training for beginners:** Possible contents include introduction to HPC systems, interactive allocation of single compute nodes, compiling, utilizing parallel programming libraries, writing job scripts.
- Podium discussion on the topic of visualization:** Graphical illustration of the topic "Visualization" enables the exploration of data for all target groups. The content is prepared in such a way that active participation of advanced users is expected. People with expertise from different HPC disciplines can be invited to participate in the discussion.
- Video on interdisciplinary HPC research:** Raise the possibility and awareness of interdisciplinary research with HPC. Contents could include HPC and Humanities, HPC and Ethics or HPC and Armed Forces.

Training	Podium discussion	Video
On-site	Hybrid	Digital
Using HPC systems	Visualization	Existence of HPC
Beginners	All target groups	All target groups



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Project-related publication:

Neumann, P./Duffek, J./Kleinschmidt, J./Leinen, W./Breuer, M./Schmidt-Lauff, S./Fink, A./Mayr, M./Firmbach, M./Popp, A. and Auweter, A. (2022): hpc.bw: A Supercomputer with Competence Platform for the Universities of the Federal Armed Forces. In: Schulz, D./Fay, A./Matiaske, W. and Schulz, M. (eds.): dtec.bw-Beiträge der Helmut-Schmidt-Universität. Forschungsaktivitäten im Zentrum für Digitalisierungs- und Technologieforschung der Bundeswehr dtec.bw. Band 1. Hamburg: OpenHSU, pp. 305–310.



Container-based High Performance Computing Center



Website HPCCP



Newsletter Registration



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