

Erlangen Regional
Computing Center



Friedrich-Alexander-Universität
Erlangen-Nürnberg

KONWIHR

Competence Network for Scientific High-Performance Computing in Bavaria

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The Idea

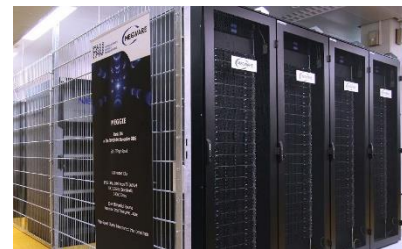
Work closely with a Bavarian computing center to improve runtime and scalability of your code:

- Analyze your code's performance
- Discover bottlenecks
- Parallelize & optimize your code
- Optimize your algorithms
- Evaluate alternative architectures



This means:

- Get funding
- Contact person assigned at either RRZE or LRZ
- Work for some time at the compute center on your project
- Get personal support from HPC experts



The Structure

Funding: Bavarian Ministry for Science and the Arts

Bayerisches Staatsministerium für
Wissenschaft und Kunst



North: FAU (Prof. Gerhard Wellein, Dr. Katrin Nusser), RRZE / NHR@FAU



South: TUM (Prof. Hans-Joachim Bungartz, Gerasimos Chourdakis), LRZ



How To

- Application deadlines: 1st of March / 1st of September
- Types of projects
 - Small (up to 3 months) - 10.000€
 - Large (up to 12 months) - 50.000€
 - Basis projects - 10.000€
 - Establish contacts at further compute centers (currently Regensburg, Würzburg, Deggendorf)
- Details on konwihir.de
- Apply via email to info@konwihir.de
- **At the end:**
 - A project report, including references to any publications
 - A short description and a figure for our website

The screenshot displays the KONWIHR website interface. At the top, the logo 'KONWIHR' is shown in a stylized blue grid font, with the text 'COMPETENCE NETWORK FOR SCIENTIFIC HIGH PERFORMANCE COMPUTING IN BAVARIA' below it. A navigation bar contains links for 'ABOUT KONWIHR', 'HOW TO APPLY', 'PROJECTS' (highlighted with a red circle), and 'CONTACT'. Below the navigation bar, there is a 'News' section with two articles: 'KONWIHR Workshop: New Projects 2019' and 'New issue #93 of Quartl published'. To the right of the news section, there is a 'Partners' section with logos for 'lrz' and 'ICE'. Below the news section, there is a 'Quartl' logo and a link to 'Rechenzentrum Universität Würzburg'. At the bottom of the screenshot, there is a section titled 'Optimizing the Parallel Granular Gas Solver to study the crater formation'. This section includes an 'Applicant' section for Prof. Dr. Thorsten Pöschel, an 'Institute for Multiscale Simulation' at Friedrich-Alexander Universität Erlangen-Nürnberg, and a 'Project Summary' section. The project summary describes the study of granular systems and the development of a granular flow solver. Below the text, there are three images showing the simulation results at different time steps: 'time = 0 second', 'time = 0.5 second', and 'time = 1.0 second'.

Software projects funded through KONWIHR

- **ALF** (finite-temperature auxiliary-field quantum Monte Carlo), via Univ. Würzburg
- **ALPACA** (compressible multiphase flow), via TUM AER
- **deal.II** (FEM), via TUM LNM
- **EMPIRE** (molecular-orbital package), via FAU CCC
- **HyTeG** (FEM, matrix-free geometric multigrid), via FAU LSS
- **LIKWID** (performance tools), via RRZE / FAU
- **MARQOV** (equilibrium spin systems Monte Carlo), via Univ. Würzburg
- **MGLET** (Multi Grid Large Eddy Turbulence), via TUM BGU
- **preCICE** (coupling library for partitioned multi-physics), via TUM SCCS
- **PVSC-DTM** (stencil code generator), via RRZE / FAU
- **SCITE** (mutation histories of somatic cells), via FAU / Univ. Regensburg.
- **SWEET** (PDE solver environment, time integration), via TUM CAPS
- **waLBerla** (Lattice Boltzmann), via FAU LSS

... and more (see <https://www.konwihhr.de/software/>).

Communication

Mailing Lists:

- **KONWIHR projects:** build a community (opt-out)
<https://lists.lrz.de/mailman/listinfo/konwihhr-projects>
- **KONWIHR announcements:** hear the news first (opt-in)
<https://lists.lrz.de/mailman/listinfo/konwihhr-announcements>

Workshop for new projects: discuss goals and find contacts, twice per year

Quartl: the official newsletter of KONWIHR and BGCE, 4x year

<https://www.cs.cit.tum.de/en/sccs/further-activities/quartl/>

Latest Projects - 2022/1

- Improving FAIRness of HPC research data – Prof. Stemmer (Technical University of Munich)
- HPC mixed precision quantization of encoder-decoder deep neural networks – Prof. Kist (FAU)
- Porting of Lattice QCD simulation software to GPUs – Prof. Wettig (University of Regensburg)
- ALPACA in Florence – first steps towards the Ponte Vecchio”: Porting ALPACA to Intel’s upcoming GPU architecture Ponte Vecchio – Dr. Stefan Adami (Technical University of Munich)

- Continuous Benchmarking for the GHODDESS framework – Prof. Köstler (FAU)
- Massively parallel solvers for geophysical flow problems with strong viscosity variations – Nils Kohl (FAU)
- Optimization of the ALF implementation of the auxiliary-field quantum Monte Carlo algorithm: porting to GPUS and symmetry considerations – Prof. Assaad (University of Würzburg)
- Largescale data processing and mass production of cosmicray background simulations for H.E.S.S. – Prof. Christopher van Eldik, Dr. Andreas Specovius (FAU)
- HPC-Stützpunkt at the University of Regensburg – Prof. Wetting (University of Regensburg)