

## JSC Guest Student Programme 2015 - GSP rocks JUQUEEN

The Jülich Supercomputing Centre (JSC) is one of Europe's leading HPC centres providing HPC expertise for computational scientists at European universities, research institutions, and industry. A variety of training and educational activities are organised by JSC on a regular basis. One of these activities is the annual Guest Student Programme (GSP) lasting for ten weeks each summer. The participants receive extensive training on cutting edge hardware as well as HPC-related software and algorithms. The acquired theoretical knowledge is turned into hands-on skills by coached work on novel and challenging scientific projects. For many students, the programme has been the foundation of a career in HPC and the basis of fruitful long-term collaborations with their advisers. Some students even return to JSC as PhD candidates focusing on highly parallel applications. Over the past 15 years, 157 students participated in the GSP and this year another 12 got the opportunity to join researchers at JSC. During the highly competitive selection procedure 76 applicants tried to obtain one of the limited number of guest student positions. The selection committee received applications from 24 countries spanning a wide range of scientific domains, e.g. physics, chemistry, computer science, and mathematics.

This year's GSP took place from August 3 to October 9. It was supported by CECAM (Centre Européen de Calcul Atomique et Moléculaire) and sponsored within the IBM University programme. The first two weeks were dedicated to various courses on parallel programming up to advanced level. The lectured HPC techniques range from the usage of MPI on distributed-memory cluster systems to GPGPU programming with CUDA as well as threading via OpenMP. They were complemented by crash courses on LaTeX and revision control techniques with GIT. Equipped with this vital knowledge the participants were ready to focus on the scientific part of the GSP. The range of scientific projects was as diverse as the user community on the hosted supercomputers, covering neuroscience, fluid and molecular dynamics, and safety research. Also represented was fundamental research in elementary particle physics, and mathematical algorithms. The main platforms for code development and simulation were the CPU/GPU system JURECA and the leadership Blue Gene/Q system JUQUEEN. Next year's GSP will start on August 1, 2016. It will be officially announced in January 2016 and is open to students from natural sciences, engineering, computer science, mathematics and the computer science related branches of neuroscience. For applicants it is mandatory, to have received the Bachelor but not yet the Master degree. The application deadline is March 31, 2016. Additional information of the previous years is available online at [www.fz-juelich.de/jsc/gsp](http://www.fz-juelich.de/jsc/gsp).

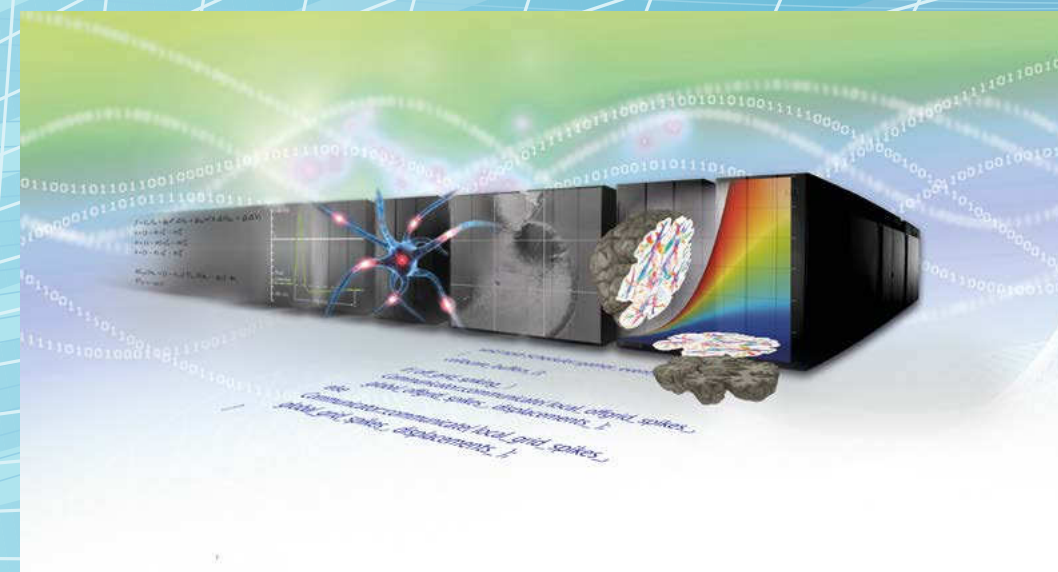
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## Supercomputing for Neuroscientists: How HPC can help your Neuroscience Projects



Computational neuroscience is developing an interest in problems of increasing complexity and scale, leading to the evolution of projects such as the "Human Brain Project" (HBP) [1] and the "1000 Brains Study" [2] which will include computationally intensive simulations and the analysis of huge data sets. However adapting current software developed for local clusters to the supercomputing environment is often a challenge for the originating labs. The Simulation Laboratory Neuroscience [3] at the Jülich Supercomputing Centre (JSC) aims to bridge the gap between these two environments with a regular series of workshops bringing together HPC experts with computational neuroscientists.

Last year, the SimLab Neuroscience began this process with the "Bernstein Network – Simulation Lab Neuroscience" HPC workshop [4], which led to the

porting of several projects to JSC HPC systems. On November 3 of this year, the SimLab presented Supercomputing for Neuroscientists: How High Performance Computing can help your neuroscience projects, a workshop directed towards the German and European neuroscience communities covering:

- Introduction to HPC
- Current neuroscience projects on supercomputers
- Application process and access to supercomputers
- Participants' projects.

Experts in HPC from the SimLab gave presentations on supercomputer architectures, scaled algorithms and massively parallel algorithms. Other experts from the JSC and Jülich's Institute of Neuroscience and Medicine showcased projects that have already