

JSCNews

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JSC Contributes to "Human Brain Project"

The European Commission has officially announced the selection of the Human Brain Project as one of its two FET Flagship projects (Future and Emerging Technologies). The new project will unite European efforts to address one of the greatest challenges of modern science: understanding the human brain.

The goal of the Human Brain Project is to pull together all our existing knowledge about the human brain and to reconstruct the brain, piece by piece, in supercomputer-based models and simulations. The models offer the prospect of a new understanding of the human brain and its diseases and of completely new computing and robotic technologies. Federating more than 80 European and international research institutions, the Human Brain Project is planned to last ten years (2013-2023). It will be coordinated at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, by neuroscientist Prof. Henry Markram.

Forschungszentrum Jülich is one of the partners. Jülich's scientists will contribute their expertise primarily in the areas of the structure and function of the brain, as well as supercomputing and simulation. A major contribution to the project will be Jülich's know-how and infrastructure in the field of supercomputing. However, today's supercomputers do not possess sufficient capacity to process the vast volume of data on

the human control centre that is available worldwide or prepare it for computer simulation. Experts from JSC, together with cooperation partners, are developing a new generation of exaflop computers and suitable software. Prof. Thomas Lippert, head of JSC, expects the Human Brain Project to enable information technology to make a giant leap forward. As part of the Human Brain Project, he is responsible for the supercomputing activities and the future Human Brain supercomputer, which will be installed at the Jülich Supercomputing Centre by 2020. "We will develop faster and more powerful computers in order to simulate increasingly detailed models of the brain. New findings on the function of the brain will in turn open up new perspectives in data processing," Lippert says.

More information on the project can be found at <http://www.humanbrainproject.eu>.

Simulation Lab Neuroscience Launched

The Simulation Laboratory Neuroscience at JSC was officially launched in an opening event on 14-15 January 2013. It will support the computational neuroscience community in leveraging high-end supercomputing resources such as JUQUEEN for their research. Like all other Simulation Labs in Jülich, the support mission of the Simulation Lab Neuroscience is grounded in its own research work, with a special focus on the methodological aspects.

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Under the supervision of Prof. Abigail Morrison (IAS-6), about ten neuroscientists, computer scientists, mathematicians and physicists work together and with external groups on highly interdisciplinary tasks such as building large-scale models and databases of brain structure, function and connectivity, developing simulation, database and virtual reality technology, developing algorithms and workflows for data acquisition and analysis, and porting and optimizing scientific codes for supercomputers.

The Simulation Lab Neuroscience is a central element of the Helmholtz Portfolio Theme "Supercomputing and Modeling for the Human Brain", through which it receives the majority of its funding. As part of the Portfolio Theme, it will also contribute to the European "Human Brain Project". Additional funding for the Simulation Lab comes from the Jülich Aachen Research Alliance (JARA). A special relationship has been established with the German National Bernstein Network Computational Neuroscience, funded by the Federal Ministry of Education and Research (BMBF) and connecting more than 200 research groups in Germany and beyond. The Simulation Lab Neuroscience contributes its expertise in simulation and database technology to the network as the "Bernstein Facility for Simulation and Database Technology".

In the opening event, the Simulation Lab Neuroscience was officially introduced to the scientific community. The event was attended by representatives of the Bernstein Network, the Helmholtz Association, and JARA-HPC. It gave an overview of the existing and planned activities combining neuroscience and HPC in Jülich and beyond, and featured a series of neuroscientific talks by renowned international speakers from the field. More information about the Simulation Lab can be found at <http://www.fz-juelich.de/ias/jsc/slns>. (Contact: Dr. Boris Orth, b.orth@fz-juelich.de)

EUDAT Safe Data Replication Service Ready

The EUDAT project aims to establish a collaborative data infrastructure across Europe to serve the needs for common data services required in different scientific user communities. The first EUDAT service is now ready for production after roughly one year of preparation by the Safe Data Replication Service Task Force under the leadership of JSC.

The service guards scientific "big data" against data loss in long-term archiving and preservation by replicating datasets across EUDAT members, and also optimizes the data access especially for those groups of scientists that share the same multi-GByte/TByte/PByte datasets. Each replicated data object can be identified with a persistent identifier (PID) to support the process of permanently identifying the same dataset in different storage and file systems. This helps to avoid unnecessary duplication of large datasets, which with "big data" have become a more serious issue, and it also enables unique data references (e.g. for publications).

The service is also a convenient way of bringing "big data" closer to powerful supercomputers at JSC and its European partners for compute-intensive data analysis. The service is currently used by large scientific communities, such as the European Plate Observatory System (EPOS), the European Network for Earth System Modeling (ENES), and the Common Language Resources and Technology Infrastructure (CLARIN).

(Contact: Morris Riedel, m.riedel@fz-juelich.de)

Calls for Computing Time Applications

The Gauss Centre for Supercomputing (GCS) has issued its ninth call for large-scale projects. Proposals from publicly funded German academic and research institutions are eligible. Projects are classified as "large scale" if they require more than 2% of the potentially available CPU cycles on a member centre's high-end system. Available systems are the IBM Blue Gene/Q system JUQUEEN in Jülich, the IBM iDataPlex system SuperMUC in Garching, and the CRAY XE6 installation HERMIT in Stuttgart. Further details can be found at <http://www.gauss-centre.eu/computing-time/call>.

Also, applications can now be made for regular simulation projects on JUQUEEN and on the general-purpose supercomputer JUROPA at JSC. For more information, see <http://www.fz-juelich.de/ias/jsc/computingtime>.

Finally, researchers in Aachen and Jülich can apply for computing time on the JARA-HPC Partition via <http://www.jara.org/de/research/jara-hpc/partition/>.

All applications should be submitted by 28 February 2013 at the latest.

(Contact: Dr. Walter Nadler, w.nadler@fz-juelich.de)

Events

Workshop on Hybrid Particle-Continuum Methods in Computational Materials Physics

Date: 4-7 March 2013

Venue: Rotunda, Jülich Supercomputing Centre

Info: <http://www.fz-juelich.de/ias/jsc/HYBRID2013>

Scientific Python

Instructors: Dr. Olav Zimmermann, Dr. Jan Meinke, JSC

Date: 18-20 March 2013, 09:00-16:30

Venue: Ausbildungsraum 2, Jülich Supercomputing Centre

Registration: o.zimmermann@fz-juelich.de, ext. 1520

Parallel I/O and Portable Data Formats

Instructors: Wolfgang Frings, Dr. Michael Stephan, Dr. Florian Janetzko, JSC

Date: 18-20 March 2013, 09:00-16:30

Venue: Ausbildungsraum 1, Jülich Supercomputing Centre

Info: <http://www.fz-juelich.de/ias/jsc/events/parallelio>

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