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New Division "HPC in Neuroscience" at JSC

A new division, HPC in Neuroscience, was established at JSC in March of this year to strengthen and focus JSC's activities at the interface of computational neuroscience and high-performance computing. These activities include major contributions to the Helmholtz portfolio theme "Supercomputing and Modelling for the Human Brain (SMHB)", through which the division receives the majority of its funding, and to the "Human Brain Project (HBP)", one of two European FET Flagships recently selected by the European Commission. The division is headed by Dr. Boris Orth.

Within the portfolio theme SMHB and the HBP in particular, but also in local projects and within JARA-HPC, the division works closely with groups from the neighbouring Institute of Neuroscience and Medicine (INM) at Jülich and with the Virtual Reality Group at RWTH Aachen University. It hosts the new Simulation Lab Neuroscience under the scientific direction of Prof. Abigail Morrison (INM/IAS), which was founded in January to support the neuroscience community in leveraging HPC resources for their research. As the first Bernstein Facility for Simulation and Database Technology, this SimLab contributes its expertise to the National Bernstein Network Computational Neuroscience, Germany.

The division carries out research and development in the fields of data analysis, modelling, simulation, visualization and HPC methods in computational neuroscience, and supports the neuroscience community in these fields through the Simulation Lab Neuroscience. Additional planned focus areas include data management, hardware co-design work with the JSC's Exascale Labs, and the use of special HPC architectures for computational neuroscience. Finally, the division coordinates the portfolio theme SMHB and manages the High-Performance Computing Platform sub-project of the Human Brain Project.
(Contact: Dr. Boris Orth,
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New Project CEC

In January, JSC became a partner in a joint research project funded by the Federal Ministry of Economics and Technology (BMWi) and Siemens AG. Besides Siemens – the project coordinator – and JSC, the consortium includes seven research institutes in the fields of power-plant technology and materials science. The aim of the project is to develop new combustion technologies for climate-friendly power generation. The focus is on modern gas turbine technology, which plays an important role in the present transformation of the energy system into a sustainable system based on renewable energy sources. The validation of the gas turbine combustion technologies will be carried out in a new test centre known as the "Clean Energy Center" (CEC), which is currently being built by Siemens in Ludwigsfelde near Berlin.

JSC will provide an implementation of the open source software OpenFOAM for the

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solution of continuum mechanics and fluid dynamics problems, which will be ported to the Blue Gene/Q architecture. The main goal of the JSC work package is to reduce performance and scaling bottlenecks in OpenFOAM to enable large simulations on JUQUEEN, in particular to model a complete annular combustion chamber of a gas turbine.
(Contact: Prof. Johannes Grotendorst, *j.grotendorst@fz-juelich.de*)

HOPSA - A Leap Forward in Parallel Program Optimization

In cooperation with Russian and European project partners, JSC researchers developed a much improved integrated tool infrastructure to monitor and optimize HPC application codes. The EU-Russia FP7 project HOPSA (HOlistic Performance System Analysis) pursued a different approach than that usually taken: for the first time in an HPC context, the search for bottlenecks and program tuning took into account both application and system data. Up to now, application developers have optimized their codes and system administrators have tuned their systems independently of each other. Program optimization is more important than ever. In view of ever more powerful supercomputers, which allow ever more complex simulations, it becomes more difficult to monitor program execution and to locate performance bottlenecks. The HOPSA project (*http://www.hopsa-project.eu*), in which JSC was the coordinator of the EU partners, was successfully concluded after two years of funding from the EU and the Russian Ministry of Education and Science, and was very positively reviewed in April.
(Contact: Dr. Bernd Mohr, *b.mohr@fz-juelich.de*)

JSC at ISC'13

The International Supercomputing Conference ISC'13 will take place from 16 June to 20 June 2013 in Leipzig. JSC, together with its partners in the Gauss Centre for Supercomputing (GCS), HLRS (Stuttgart) and LRZ (Garching), will present its wide-ranging supercomputing activities at the GCS booth #741.

In particular, JSC will showcase LLview, the comprehensive interactive monitoring software for supercomputers developed in-house, demonstrating live the operation of various supercomputers worldwide. In addition, JSC will also show the LLview monitoring components of the Eclipse PTP development environment for supercomputing applications. A wide spectrum of scientific results obtained with its supercomputers JUGENE, JUQUEEN, and JUROPA will be exhibited in videos and animations. Finally, JSC's participation in European Exascale Projects will be another hot topic.

JSC staff will give several talks and tutorials and will also be present at the PRACE (#725) and the UNICORE (#751) booths. Detailed information about JSC's participation can be found at *http://www.fz-juelich.de/ias/jsc/events/isc13*.
(Contact: Dr. Walter Nadler, *w.nadler@fz-juelich.de*)

UNICORE Summit 2013

The UNICORE Summit is a unique opportunity for UNICORE users, developers, administrators, researchers, service providers and managers to meet. This year it will be held as a satellite event at the ISC Conference in Leipzig on 18 June 2013. The goal of the UNICORE Summit is to exchange and share experiences, new ideas, and latest research results on all aspects of UNICORE. Since the first Summit in 2005, the organisers have received and reviewed a significant amount of distinguished contributions. Those selected and presented, complemented by invited talks, guarantee exciting Summits and lively discussions about the state-of-the art and the future of UNICORE, Grids, and distributed computing in general. Further information can be found at *http://www.unicore.eu/summit/2013/*.
(Contact: Valentina Huber, *v.huber@fz-juelich.de*)

Young Scientist Award for Carsten Karbach

During the PARS Workshop recently held in Erlangen, Carsten Karbach received the award "Nachwuchspreis der PARS-GI-Fachgruppe" for the presentation of work from his master's thesis on a highly configurable and efficient simulator for job schedulers on supercomputers. The simulator extends the LLview monitoring system and the monitoring components in Eclipse/PTP, both developed at JSC, by including an efficient prediction component displaying future batch system usage. We congratulate Carsten Karbach on receiving the prize.

Events

Programming in C++ (C++11) for C programmers
Instructor: Dr. Sandipan Mohanty, JSC
Date: 13-15 May and 21-23 May 2013, 9:00-16:30
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
Registration: *s.mohanty@fz-juelich.de*, ext. 2526

Introduction to the programming and usage of the supercomputing resources at Jülich
Instructors: Representatives of IBM, Intel and ParTec, JSC staff members
Date: 16-17 May 2013, starting at 13:00 on 16 May
Venue: Hörsaal, Jülich Supercomputing Centre
Registration: *jsc-conferences@fz-juelich.de*

If you would like to receive regular information on our events, please send an e-mail to *jsc-events-join@fz-juelich.de*.

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