JÜLICH
FORSCHUNGSZENTRUM

JSCNews
Jülich
Supercomputing
Centre

No. 208 • Oct. 2012

JUQUEEN: Expansion to 5 Petaflops

After the decommissioning of JUGENE and extensive infrastructural alteration work, especially regarding the supply of demineralized water, the next step was taken in the planned configuration of JUQUEEN: In September, 16 additional Blue Gene/Q racks were delivered as part of the GCS funded partition, positioned at their final destination in the machine hall and installed. After all tests of this new partition had been successfully completed, production of the 8-rack JUQUEEN was switched to these new 16 racks in one maintenance day in mid-October. The following week, the current 8 racks were also moved to their final destination and reinstalled. At the end of October, the two partitions will be integrated into one hardware system containing 24 racks, which will probably require two more maintenance days. This combined system will reach a peak performance of 5,033 petaflops. For the exact maintenance dates, please see the system status message of JUQUEEN.

Starting in early November, two thirds of the system will be available for national (GCS/NIC) and European (PRACE) users, while one third is reserved for researchers working at Forschungszentrum Jülich or in the HPC branch of the Jülich-Aachen Research Alliance (JARA).

The last step of the JUQUEEN configuration is planned for early 2013. Four more Blue Gene/Q racks (GCS/NIC) and new storage hardware and software for $WORK with improved space, performance and functionality will be installed.
(Contact: Klaus Wolkersdorfer, *k.wolkersdorfer@fz-juelich.de*)

JSC at SC12 in Salt Lake City

SC12, the premier international exhibition and conference on high-performance computing, networking, storage, and analysis, will take place in Salt Lake City, Utah, USA, from 10 to 16 November 2012, where JSC will present its supercomputing activities at booth #707. JSC staff will demonstrate scientific simulations on supercomputers and the supercomputing tools LLView, Scalasca, and UNICORE developed in-house.

JSC's activities on energy-efficient supercomputing will also be showcased, particularly its new petaflop supercomputer JUQUEEN and its involvement in the European Exascale Project DEEP. JSC staff will also be on hand continuously at the PRACE booth (#1243).

As part of the conference programme, JSC staff will give a tutorial on "Supporting Performance Analysis and Optimization on Extreme-Scale Computer Systems", co-organize a workshop on "Extreme-Scale Performance Tools", present talks, and will participate in numerous special interest group sessions ("Bird-of-a-Feather", BoF). In particular, JSC is co-organizing the session on "Exascale Research – The European Approach". JSC staff member Dr. Bernd Mohr will chair this year's awards

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session. For up-to-date information on JSC's activities at SC12 see: http://www.fz-juelich.de/ias/jsc/events/sc12.
(Contact: Dr. Walter Nadler, *w.nadler@fz-juelich.de*)

HD(CP)^2 - A New Climate Science Project

At the start of October, JSC became a partner in the new BMBF project "High Definition Clouds and Precipitation for Climate Prediction" or "HD(CP)^2" for short. Atmospheric clouds and precipitation are meso-scale phenomena which cannot be modelled explicitly on a global scale. Global climate simulations show significant biases in precipitation patterns which are related to insufficient parametrization of these processes. The HD(CP)^2 project partners will develop a highly scalable regional weather model which will be used to provide a series of ultra-high resolution summer-season hind-casts over Germany. Aiming for a horizontal grid spacing of approximately 100 metres, the new model will help to explore the grey scales or terra incognita of cloud and precipitation modelling. Combining these simulation results and observational data from networks and supersites all over Germany will help to improve cloud and precipitation parametrization and lead to better climate predictions in the future. The Simulation Laboratory "Climate Science" at JSC will contribute to software integration, parallelization, and optimization. The 45 partners involved in HD(CP)^2 will receive funding of € 11 million for the first phase of the project.
(Contact: Dr. Lars Hoffmann, *l.hoffmann@fz-juelich.de*)

Stellar Disappearing Act Unravelled

The paper 'Towards the field binary population: influence of orbital decay on close binaries' (Astronomy & Astrophysics 543, 2012, A126) co-authored by Christina Korntreff, PhD student in the Computational Science division of JSC, was recently highlighted in Nature online news. The article reports on the unexpected finding that many stars may have been born as two separate stars – a binary system, which merged into a single system during the first million years of their life. The original article by Korntreff et al. describes the development of binary populations from their initial state within a stellar cluster to their final state in the stellar field.

Most stars form in clusters, where two important dynamical processes influence the binary population: i) gas-induced orbital decay of embedded binary systems and ii) destruction of soft (wide) binaries in three-body interactions. The paper focuses on the process of orbital decay, which has been largely neglected so far.

Using a combination of analytical calculations and dynamical N-body modelling, the authors show that as the cluster evolves, short-period binaries are merged to single stars by the gas-induced orbital decay, while the dynamical evolution in the cluster destroys long-period binaries. The combination of these two equally important processes explains how the binary population in a cluster environment evolves into the binary population observed.

The Nature news article can be found at:
http://www.nature.com/news/double-stars-succumb-to-fatal-attraction-1.11483
(Contact: Christina Korntreff, *c.korntreff@fz-juelich.de*)

Events

Workshop: Cooperative Quantum Dynamics and Its Control
Date: 29-31 October 2012
Venue: Rotunda, Jülich Supercomputing Centre
Info: *http://www.fz-juelich.de/ias/jsc/events/cqdc12*

UNICORE - uniform access to the supercomputer systems
Instructor: Michael Rambadt, JSC
Date: 5 November 2012, 09:00-12:00
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
Registration: *unicore-info@fz-juelich.de*

Introduction to the programming and usage of the supercomputing resources at Jülich
Instructors: Representatives of IBM, Intel and ParTec, JSC staff members
Date: 22-23 November 2012, starting 22 November, 13:00
Venue: Hörsaal, Jülich Supercomputing Centre
Registration: *jsc-conferences@fz-juelich.de*

Introduction to parallel programming with MPI and OpenMP
Instructor: Dr. Rolf Rabenseifner, HLRS Stuttgart
Date: 26-28 November 2012, 9:00-18:00
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
Registration: *http://java.hlrs.de/ParProgWS_Registration/*

Workshop: Improve your multi-threaded application through a memory-related performance analysis
Instructors: Mats Nilsson, Royd Lüdtke, Rogue Wave Software, Inc.
Date: 4 December 2012, 9:30-16:30
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
Info: *http://www.fz-juelich.de/ias/jsc/events/threadspotter*
Registration: *vogt@roguewave.com*

Introduction to Parallel Computing
Instructor: Dr. Bernd Mohr, JSC
Date: 12 December 2012, 13:00-17:00
Venue: Hörsaal, Jülich Supercomputing Centre

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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