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JSC Becomes Full Member of JLESC

On 9 January 2015, JSC became a full member of the Joint Laboratory on Extreme Scale Computing (JLESC). The Joint Laboratory brings together researchers from the Institut National de Recherche en Informatique et en Automatique (Inria, France), the National Center for Supercomputing Applications (NCSA, USA), Argonne National Laboratory (ANL, USA), Barcelona Supercomputing Center (BSC, Spain), and JSC. RIKEN (Japan) will also be integrated into the JLESC within the coming weeks. Since this is truly a high-level consortium in supercomputing, JSC felt greatly honoured by being invited to join as a full partner.

The objectives of JLESC are to initiate and facilitate international collaborations on state-of-the-art research related to computational and data-focused simulation and analytics at extreme scales. JLESC promotes original ideas, publications, research, and open-source software, and aims to address the most critical issues in advancing computing from petascale to extreme scales. JLESC research topics include parallel programming models, numerical algorithms, parallel I/O and storage systems, data analytics, heterogeneous computing, resilience, and performance analysis.

The collaborative work within JLESC is organized in joint projects between two or more partners. These include reciprocal research visits, joint publications and software releases. The results of these projects are discussed during biannual workshops, where new ideas and collaboration opportunities are also presented. The next event will take place in Barcelona from 29 June to 1 July 2015, followed by a two-day summer school on big data.

JSC is represented in JLESC by Steering Committee member Prof. Thomas Lippert and by Dr. Robert Speck, one of the Executive Directors. For more information visit the official JLESC website at http://publish.illinois.edu/jointlab-esc.
(Contact: Dr. Robert Speck, *r.speck@fz-juelich.de*)

EUDAT2020 – Building a Collaborative Data Infrastructure

EUDAT2020 is a European project funded in the H2020 framework programme. The project will be launched in March 2015 with a duration of three years, a budget of € 20 million, and 33 partners. It builds on the foundations laid by the first EUDAT project, which covered both access and deposit, from informal data sharing to long-term archiving, and addressed the identification, discoverability, and computability of both long-tail and big data.

EUDAT2020 brings together a unique consortium of e-infrastructure providers, research infrastructure operators, and researchers from a wide range of scientific disciplines who work together to address the new data challenge. Many research communities face a "rising tide of data". They are aware that they will require new approaches to data management and that data preservation, access, and sharing should be supported in a much better way than it is today.

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EUDAT2020's vision is to enable European researchers and practitioners from all research disciplines to preserve, find, access, and process data in a trusted environment as part of a Collaborative Data Infrastructure (CDI) constructed as a network of collaborating, cooperating centres. The CDI combines the richness of numerous community-specific data repositories with the permanence and persistence of some of Europe's largest scientific data centres.

One of the main ambitions of EUDAT2020 is to bridge the gap between research infrastructures and e-Infrastructures through an active engagement strategy, using the communities that are already in the consortium as EUDAT beacons and integrating others through new partnerships.

JSC is one of the scientific data centres that form the backbone of the CDI. For data processing, JSC focusses on the integration of EUDAT data services in its supercomputing infrastructure and the cooperation between EUDAT2020 and PRACE. JSC offers data services for long-tail data, archival storage for data repositories of research infrastructures, and support for research communities.
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ORPHEUS – Fire Safety in the Underground

February 2015 saw the start of the ORPHEUS project, which is being funded by the Federal Ministry of Education and Research (BMBF) for 36 months. The consortium is coordinated by JSC and consists of 13 partners: Bundesanstalt für Materialforschung und -prüfung, IBIT, Imtech, Institut für Industrieaerodynamik, Ruhr-Universität Bochum and the associated partners Berliner Feuerwehr, Berliner Verkehrsbetriebe, Deutsche Bahn, Hekatron, Karstadt, NVIDIA, and Team HF. The project kick-off meeting will take place at Jülich on 12 March.

The objective is the optimization of smoke management and evacuation strategies in underground train stations. This covers technical as well as interorganizational aspects.

The first of the three main parts consists of validation experiments in an operational metro station. Outside of operating hours, real fire experiments will be carried out in a fully monitored station in Berlin. The data obtained (e.g. velocity, temperature, and tracer gas concentrations) will be used to validate CFD models. The second part aims to investigate novel smoke management systems and evacuation aspects. Small-scale physical experiments and numerical simulations of smoke and heat propagation in underground stations will form the basis for the project studies. In this context, JSC will develop new mesh-adaptive methods to focus computational effort on numerically relevant subdomains of extensive buildings. Additionally, the pedestrian simulation model JuPedSim, developed in-house at JSC, will be expanded to include psychological decision models and the capability to be coupled to fire simulation models. The third part covers the interaction between the operators, emergency services, and third parties (e.g. shops). Analysis of past events and interviews with those involved will allow a communication pattern analysis (e.g. with respect to warnings and emergency calls). In this regard, JSC's contribution is a real-time smoke propagation prognosis model which may be used by the emergency services. The project website will soon be available at *http://www.orpheus-projekt.de*.
(Contact: Dr. Lukas Arnold, *l.arnold@fz-juelich.de*)

JUQUEEN Extreme Scaling Workshop

In conjunction with this year's JUQUEEN Porting and Tuning Workshop, which is part of the PRACE Advanced Training Centres curriculum, JSC continued its series of Blue Gene Extreme Scaling Workshops from 5 to 6 February 2015. Seven application teams were invited to stay for two days and work on the scalability of their codes, with dedicated access to the entire JUQUEEN system for a period of 30 hours. Most of the teams' codes overlapped thematically with JSC Simulation Laboratories or were part of an ongoing collaboration with one of the SimLabs. The teams came from the fields of climate science (ICON from DKRZ, and MPAS-A from KIT and NCAR), engineering (FEMPAR from UPC, and ex_nl/FE^2 from the University of Cologne and TU Freiberg), fluid dynamics (psOpen and SHOCK both from RWTH Aachen University), and neuroscience (CoreNeuron from the EPFL Blue Brain Project) and were supported by JSC SimLabs and cross-sectional teams, with technical support from IBM and JUQUEEN administrators. Within the first 24 hours of dedicated access to all 28 racks, all seven teams had adapted their codes and datasets to exploit the massive parallelism and restricted node memory for successful executions using all 458,752 cores. They also demonstrated excellent strong or weak scalability which qualified all but one team for the High-Q Club. A total of 370 'large' jobs were executed using 12 of the 15 million core hours of compute time allocated for the workshop.

Detailed results for each code, provided by the application teams themselves, and an analysis comparing them to the 16 existing High-Q Club codes can be found in the JSC technical report FZJ-JSC-IB-2015-01: *https://juser.fz-juelich.de/record/188191/files/FZJ-2015-01645.pdf*
(Contact: Dr. Brian Wylie, *b.wylie@fz-juelich.de*)

Events

Parallel I/O and Portable Data Formats
Instructors: JSC staff members
Date: 16-18 March 2015, 09:00-16:30
Venue: Jülich Supercomputing Centre, Ausbildungsraum 1
Registration: *http://www.fz-juelich.de/ias/jsc/events/parallelio*

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