Workshop Recent Advances in Parallel Programming Languages at LRZ

Since the standards of parallel programming languages are becoming more and more complex and extensive, it can be hard to stay up to date with recent developments. LRZ has thus invited leading HPC experts to give updates of recent advances in parallel programming languages during a 1-day workshop on June 8, 2015 at LRZ. The workshop attracted more than 50 participants. Languages covered during the workshop were MPI, OpenMP, OpenACC and Coarray Fortran. The workshop started with a talk about the planned extensions to the parallel syntax and semantics of Coarray Fortran as specified in ISO/IEC TS 18508 by Dr. Reinhold Bader, group leader of the HPC group at LRZ and member of the Fortran standardization working group WG5. Dr.-Ing. Michael Klemm, Intel representative in the OpenMP Language Committee, revisited the history of OpenMP, which dates back to 1997. He further presented features of the current OpenMP version 4.0 like offloading and SIMD support and provided an outlook on OpenMP 4.1 and OpenMP 5.0.

Dr. Mandes Schönherr (Cray Inc.) gave a short introduction into OpenACC, a language that provides an efficient way to offload intensive calculations from a host to an accelerator device using directives. Finally, Dr. Rolf Rabenseifner from HLRS, who has been a member of the MPI-2 Forum since 1996 and is also in the steering committee of the MPI-3 Forum, gave an overview over the new MPI shared memory programming model and new methods within the MPI standards 3.0 and 3.1. The latter had been approved by the MPI Forum just 4 days before the workshop. The slides of the workshop are available at http://www.lrz.de/services/compute/courses/x_lecturenotes/Parallel_Programming_Languages_Workshop/. Based on the very positive feedback during the workshop LRZ intends to organise a similar event in 2017.

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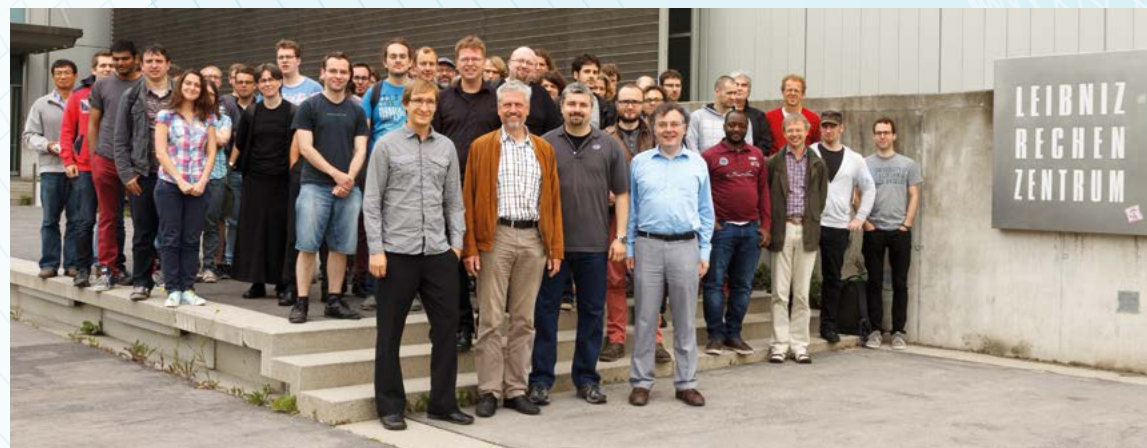• Volker Weinberg

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Figure 1: Participants of the workshop Recent Advances in Parallel Programming Languages at LRZ. The speakers Dr. Mandes Schönherr (Cray Inc.), Dr. Rolf Rabenseifner (HLRS), Dr.-Ing. Michael Klemm (Intel Corp.) and Dr. Reinhold Bader (LRZ) are standing in the first row.

Workshop on Computational Solar and Astrophysics Modelling

This 5-day summer school took place from 14-18, September and introduced young researchers (advanced master students, PhDs, and junior postdoctoral researchers) to modern open-source numerical astrophysics models with a heavy emphasis on hands-on tutorial sessions. After introductory morning lectures, participants worked with three different open-source software packages to learn about their typical applications and evaluate their performance aspects on the FZ-Jülich super-computer systems. Participants made use of the MPI-AMRVAC framework covering plasma dynamics in the solar atmosphere and into the heliosphere. For fully kinetic plasma modelling of e.g. the Earth's magnetosphere, the code iPic3D was made available, a C++, MPI-parallelized, implicit moment Particle-In-Cell solver. Participants were also given an introduction to the open source Swift cosmological particle hydrodynamics code, which has implementations of both SPH and the weighted particle hydrodynamics scheme Gizmo, together with a gravity implementation based on both fast-multipoles and a tree-code. The school was restricted to 28 highly motivated early-career scientists, supported by a Belgian Belspo-funded Inter-university Attraction Pole CHARM (http://wis.kuleuven.be/CHARM) connecting helio-spheric to astrophysical communities.

Further information:
http://www.fz-juelich.de/ias/jsc/csam-2015

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