

Leaping forward with HPC Education

To receive an in-depth training in HPC architectures and large-scale numerical simulations, fellows of the European Marie Curie training network HPC-LEAP (High Performance Computing in Life sciences, Engineering and Physics) [1] and other students attended a 3-week school at Jülich Supercomputing Centre (JSC). The goal of the school was not only to improve practical skills of young numerical scientists, but to provide them with good understanding of computer architectures as well as knowledge about today's and future supercomputers.

This European Joint Doctorates (EJD) program started in September 2015 and brings together 16 partners from all over Europe and is coordinated by Cyprus Institute.

Fellows of an EJD are supervised by multiple academic institutions and receive a joint degree. The European Commission has established this new form of training networks to promote international and interdisciplinary collaboration in doctoral training in Europe.

HPC-LEAP follows this spirit and brings together applications experts from different research areas, experts for mathematical methods and algorithms as well as experts for HPC architectures and technologies. As disruptive evolution in computer technologies is required for attaining exascale performances, it requires interdisciplinary approaches to enable future computational scientists to use these technologies for their research. The collaborative network

also includes commercial operators like HPC solution providers as IBM, NVIDIA and Eurotech as well as numerical service providers as OakLab. The application areas featured in HPC-LEAP include turbulent flows, lattice Quantum Chromodynamics and computational biology.

At the school [2] experts from JSC, other Jülich institutes and from outside held lectures on computer architectures, parallel algorithms, performance analysis, modeling and optimization, MPI and OpenMP programming, GPU programming, visualization, parallel I/O and mathematical libraries. To promote thinking outside the box, the program was augmented by lectures on novel HPC architectures, brain simulation and scalable material research. During various exercises students could practice their new knowledge. The students were challenged by projects, where small teams worked on the parallelization and optimization of different numerical tasks. All students left JSC enthusiastic about the opportunities of using supercomputers for their research.

References

- [1] <https://hpc-leap.eu/>
- [2] <http://indico-jsc.fz-juelich.de/e/HPC-LEAP>

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