Contribution ID: 52

Quantum Advantage for High Performance Computing

Tuesday, 18 March 2025 09:10 (35 minutes)

After years of anticipation, quantum computing is finally here as evidenced by many ongoing projects around the world. In June 2024, the Leibniz Supercomputing Centre (LRZ) publicly demonstrated how a job run on a supercomputer is assisted by a superconducting quantum accelerator. Although this was only the first public demonstration, it gives a clear indication of the potential of hybrid quantum computing. Supercomputers, which are the most powerful machines on the planet, will use integrated quantum computers whenever quantum computation is advantageous. This talk will provide an update on quantum activities at the LRZ, where 3 quantum computers are already working in conjunction with HPC systems, while 2 more are approaching. Obviously, the current first version prototypes need to be transformed into production systems, while quantum computing itself is on its way to maturity. This will require not only improved quantum hardware, but also advances in quantum software and quantum-HPC integration.

Dieter Kranzlmueller is full professor of computer science at the Ludwig-Maximilians-Universitaet Muenchen (LMU), chairman of the board of the Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities, member of the board of the German national Gauss Centre for Supercomputing (GCS) and member of the board of directors of the Center for Digital Technology & Management (CDTM). He serves as a founding member of the IT:U Linz, board member of the Heidelberg Institute for Theoretical Studies (HITS), member of the Senate of the national research data infrastructure (NFDI), and member of the strategic advisory board of DFN, the german Research and Education Network. He chairs the MNM-Team (Munich Network Management Team), which is engaged in networks and distributed systems in general, and networks, grids, clouds and HPC in particular.

Presenter: KRANZLMULLER, Dieter (LMU Munich)

Session Classification: Opening Ceremony & Keynote Session I