

New High-performance Computer for Research at KIT

System for Complex Applications and Data Management in Top Research Is Financed from Federal and State Funds



The new high-performance computer for research will be located at the Steinbuch Centre for Computing (SCC) at KIT. (Photo: David Bühn)

The Federation and the State of Baden-Württemberg will provide total funding in the amount of nearly EUR 26 million from 2013 to 2015 for the setup of a high-performance computer for research (ForHLR) at Karlsruhe Institute of Technology (KIT). This decision was taken by the Joint Science Conference (GWK) in Berlin today. ForHLR shall allow for the processing of complex application problems of unprecedented orders of magnitude in the fields of the environment, energy, nanostructures, nanotechnologies, and materials sciences.

ForHLR will meet the increasing demand for supercomputing capacity in the research areas mentioned. "High-performance computing resources have become an indispensable aid in top research. We are very glad about the approval of our proposal submitted in close coordination with the High-performance Computing Center Stuttgart and the other high-performance computing centers in Germany," says Professor Wilfried Jüling, Chief Science and Information Officer

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of KIT. “This system will enable researchers to more rapidly develop novel solutions.”

ForLHR is an energy-efficient petaflop system with an associated visualization component. One petaflop corresponds to a billion calculation operations per second. The high-performance computer is to contribute in particular to the in-depth understanding of science and engineering problems and to methodological progress in the simulation and visualization of complex systems. Methodological research at KIT will optimally support the efficient use of the system. Apart from pure computing power, data supply is of major importance. Integrated concepts are required for the management of scientific data over their complete lifecycle. This is the key element of the research and IT strategy of KIT.

With the help of the computing power of ForHLR and improved simulation methods, KIT scientists plan to address central issues of environmental research, including global warming, its feedback on regional climate fluctuations, complete integration of the local water cycle from the biosphere to the atmosphere, as well as propagation and detailed effects of air pollutants. Environmentally compatible energy generation, energy distribution, and energy storage are directly related to environmental research and represent another major area of KIT research. In connection with the energy turnaround, this area is of highest relevance to society. Studies will focus on low-pollutant and low-noise engines and turbines. Here, in-depth understanding of simulated and measured flow phenomena, chemical combustion processes, and material vibrations is required. The success and efficiency of this and other new technologies will depend decisively on the development and manufacture of novel materials. The new high-performance computer for research is also planned to be used for the investigation of functional materials and nanostructures.

Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. KIT focuses on a knowledge triangle that links the tasks of research, teaching, and innovation.

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