

# DEEP Project at CeBIT 16

The Jülich Supercomputing Centre (JSC) presented the innovative technology developed within the EU research project DEEP [see page 64] at this year's CeBIT. The advantages the system brings to scientific and industrial applications were at display at the shared booth "Innovationsland NRW" in hall 6.

With 3,300 exhibitors from 70 different countries and more than 200,000 attendees in 2016, CeBIT is still the world's largest and most international computer expo. It is considered a barometer of current trends and a measure of the state of the art in information technology. DEEP therefore increased the visibility for its impressive achievements in the fields of hardware, software and application development and greatly benefited from the large and diverse audience at CeBIT.

One important field of research in DEEP, and one of the greatest challenges facing future supercomputers, is the need for reducing the overall energy consumption in HPC systems. The costs of cooling the individual computer components could become completely prohibitive. Because of that DEEP tested two cooling systems: direct water cooling and liquid immersion cooling.

The large DEEP Prototype – a machine with 500 PFLOP/s peak performance – operates with direct water cooling and is up and running at JSC. At Hannover, additionally to an electronic board from the DEEP Prototype, the researchers showcased the GreenICE Booster: a smaller prototype that explores an innovative and very efficient immersive cooling system.

In the GreenICE the electronic assemblies are immersed in a special high-tech liquid which evaporates even at moderate temperatures. The phase transition from liquid to gaseous maximizes the cooling effect. This means that no waste heat is given off into space and the energy requirements for cooling are cut to about one percent of the overall system consumption.

The GreenICE prototype, in which electronic components seem to "boil", was a crowd puller for the CeBIT audience, who had the chance to learn about this and other technological achievements of the DEEP project.

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Figure 1: Estela Suarez (JSC, left) explaining the DEEP project to Minister Svenja Schulze (right) from the Ministry for Innovation, Science and Research of NRW. (Copyright: MIWF/Schweizer)