

## **New Hybrid Magnet System for Structure Research at Highest Magnetic Fields and Temperatures in the Millikelvin Region**

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The Helmholtz Centre Berlin (HZB) is a user facility for the study of structure and dynamics with neutrons and synchrotron radiation with special emphasis on experiments under extreme conditions. Neutron scattering is uniquely suited to study magnetic properties on a microscopic length scale, because neutrons have comparable wavelengths and, due to their magnetic moment, they interact with the atomic magnetic moments. At HZB a dedicated instrument for neutron scattering at extreme magnetic fields and low temperatures is under construction, the Extreme Environment Diffractometer ExED. It is projected according to the time-of-flight principle for elastic and inelastic neutron scattering and for the special geometric constraints of analysing samples in a high field magnet. The new magnet will not only allow for novel experiments, it will be at the forefront of development in magnet technology itself. With a set of superconducting and resistive coils a maximum field above 30 T will be possible. To compromise between the needs of the magnet design for highest fields and the concept of the neutron instrument, the magnetic field will be generated by means of a coned, resistive inner solenoid and a superconducting outer solenoid with horizontal field orientation. To allow for experiments down to Millikelvin Temperatures the installation of a dilution cryostat with a closed cycle precooling stage is foreseen.