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## SAPHiR, the instrument for neutron science at high P and T

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SAPHiR, the Six Anvil Press for High Pressure Radiography and Diffraction is a new instrument at the FRM II dedicated to neutron science at extreme pressure and temperature conditions. The three-axis multianvil press has a combined pressing force of 2400 tons (24 MN) and can perform experiments at up to 15 GPa in samples with volumes of 10-30 mm<sup>3</sup>. Applications include phase transformations at high P and T, reaction kinetics, crystallography of hydrogen bearing high pressure phases, high resolution radiography, and rheological measurements for solid state physics, chemistry, material and geoscience. SAPHiR will use a thermal neutron beam that is focussed on the sample position by an elliptic neutron guide. The detector system consists of wave-length-shifting-fibre detectors in the backscatter regime and helium-3 detector banks at 90° from the incident beam and in the forward scatter regime. The WLSF detectors combine a superior position resolution with a good detector efficiency > 50 %, which allows measurements with a  $\Delta d/d$  resolution in the 10<sup>-3</sup> range. The <sup>3</sup>He detectors are composed of 660 individual PSD tubes that combine a high detection efficiency with a low gamma sensitivity. In combination the detector system can measure d-values of ~0.6 –15 Å. User access will commence once the infrastructure in the eastern neutron guide hall is completed.

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