

Who cares about Magnetism at Extreme Conditions?

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Synchrotron radiation and the ESRF-EBS project in particular is highly suited to exploring the magnetic properties of materials at extreme conditions, for example at high pressure. Samples are generally small, only a few tens of microns or less in diameter, and may contain heterogeneities that provide additional clues to their history or behaviour. Temperature can also be varied, either raised or lowered, to further explore the extreme conditions realm. Nuclear resonance offers unique possibilities to probe magnetism at extreme conditions through its high sensitivity to the alignment of electron spins. The nuclear resonance beamline ID18 at ESRF offers a number of techniques that can be applied at extreme conditions, including nuclear forward scattering and its energy domain equivalent, synchrotron Mössbauer source spectroscopy. So who cares about such possibilities? The presentation will explore many of the answers to this question that span research fields from theoretical physics to astrophysics to geophysics as well as practical aspects to consider when planning experiments.