

# «Strongly correlated electron systems under high pressure and other extreme conditions»

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Strongly correlated electron systems harbour some of the most fascinating properties of matter, such as strongly renormalized energy scales, and unusual electronic and magnetic properties. Among these the most striking is perhaps unconventional superconductivity, often co-existing with antiferromagnetic or ferromagnetic order, where the pairing mechanism is based on magnetic excitations rather than the usual electron-phonon interaction. High pressure is an extremely important parameter for the study of these systems as it can be used to modify the microscopic interactions and easily explore the different ground states of the rich and complex phase diagrams of these systems. Especially it can be used to tune a system exactly to the instability between different phases where many fascinating properties occur. The study of these systems often requires the association of 2 other extreme conditions, which are very low temperatures and high magnetic fields. These are challenging conditions for xray studies. I will show mainly the complementary measurement techniques under high pressure that have revealed the physics of these systems, and which may be useful for many of you even in very different subjects. I will also show some examples where synchrotron studies have brought valuable contributions to strongly correlated electrons and discuss future potential prospects