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Ultrafast lattice, electron and spin dynamics

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X-ray methods are powerful to study lattice, electron and spin properties of materials and get information on the dynamics by spectroscopic techniques in the steady state. In recent years, X-ray Free Electron Lasers extended the view on the dynamics to the ultrafast time scale, as these sources provide us with ultrashort fs x-ray pulses that extend spectroscopic techniques into time domain, allowing us to approach the intrinsic timescales of the lattice, the spins and certain electronic excitations in real time. Here, I will give examples how fs x-ray pulses can view ultrafast dynamics by pump-probe experiments to address new phenomena (questions) and how they complement (or can be complemented with) regular synchrotron based X-ray experiments.

About the speaker:
Urs Staub is the leader of the Microscopy and Magnetism group within the Photon Science division of the Swiss Light Source, which operates the X-Treme and SIM beamlines including the RESOXS endstation. His scientific research is currently focused on fundamental questions on the interplay of the crystal structure with the electronic and magnetic properties of advanced materials. His expertises include neutron, x-ray scattering and absorption spectroscopy, and ultra-fast studies at XFEL facilities, such as SwissFEL x-ray free-electron laser.

Presenter: Prof. STAUB, Urs (Swiss Light Source, Paul Scherrer Institute)

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