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ELECTRON AND SPIN CORRELATIONS IN COMPLEX MATERIALS ON nm LENGTH AND fs TIME SCALES

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BESSY is operating Europe's largest third generation synchrotron user facility for the VUV and soft X-ray range. A brief description of the facility will be given, accompanied by highlights of research in the field of magnetic and correlated electron materials. The high brightness of the source enables studies with highest spatial, spectral and temporal resolution. Microscopy applications of magnetic systems are quite important since the soft X-ray range covers 3*d* transition metal L-edges. Soft X-ray resonant magnetic scattering is a unique tool for probing electronic and magnetic ordering phenomena on the nm length scale. High resolution angle resolved photoemission spectroscopy allows unprecedented insights into quasiparticle interactions in complex materials. Ultrafast time resolved studies of laser induced phase transitions are enabled by the <1 ps pulse length in the low-a mode of operation or by using the 100 fs pulses delivered by the fs slicing facility.