

Literature covered by Seminar „Modern Condensed Matter Spectroscopy”

Laser-ARPES

- *Very high resolution photoelectron spectroscopy*, S. Hüfner, Springer (2007)
- *Visualizing electronic structures of quantum materials by angle-resolved photoemission spectroscopy*, H. F. Yang, Nat. Rev. Mater. **3**, 341 (2018)
- *Spin-orbit splitting of the Shockley surface state on Cu(111)*, A. Tamai et al., Phys. Rev. B **87**, 075113 (2013)
- *Observation of topological superconductivity on the surface of an iron-based superconductor*, P. Zhang et al., Science **360**, 182 (2018)

Photoemission orbital tomography

- *Reconstruction of molecular orbital densities from photoemission data*, Puschnig et al., Science **326**, 702 (2009)
- *Imaging the wave functions of adsorbed molecules*, Lüftner et al., Proc. Natl. Acad. Sci. U.S.A. **111**, 605 (2014)
- *Complete determination of molecular orbitals by measurement of phase symmetry and electron density*, Wießner et al., Nat. Commun. **5**, 4156 (2014)
- *Tracing orbital images on ultrafast time scales*, R. Wallauer et al., Science **371**, 1056 (2021)

Spin-resolved ARPES (*) (Lasse Münster)

- *Measuring spin polarization vectors in angle-resolved photoemission spectroscopy*, F. Meier, H. J. Dil, and J. Osterwalder, New J. of Phys. **11**, 125008 (2009)
- *Highly efficient multichannel spin-polarization detection*, M. Kolbe et al., Phys. Rev. Lett. **107**, 207601 (2011)
- *Efficient spin resolved spectroscopy observation machine at Hiroshima Synchrotron Radiation Center*, T. Okuda et al., Rev. Sci. Instr. **82**, 103302 (2011)

Time-resolved ARPES

- *Collapse of long-range charge order tracked by time-resolved photoemission at high momenta*, T. Rohwer et al., Nature **471**, 490 (2011)
- *Beyond the molecular movie: Dynamics of bands and bonds during a photoinduced phase transition*, C. W. Nicholson et al., Science **362**, 821 (2018)
- *Subcycle observation of lightwave-driven Dirac currents in a topological surface band*, J. Reimann et al., Nature **562**, 396 (2018)

Time-resolved electron imaging techniques

- *All-optical control and metrology of electron pulses*, C. Kealhofer et al., Science **352**, 429 (2016)
- *Optically excited structural transition in atomic wires on surfaces at the quantum limit*, T. Frigge et al., Nature **544**, 207 (2017)
- *Ultrafast nanoimaging of the order parameter in a structural phase transition*, T. Danz, T. Domröse, and C. Ropers, Science **371**, 371 (2021) oder: *Phase ordering of charge density waves traced by ultrafast low-energy electron diffraction*, S. Vogelgesang et al., Nat. Phys. **14**, 184 (2018)

Optical second harmonic generation

- *Electronic nematic phase transition in the spin-orbit coupled metal $\text{Cd}_2\text{Re}_2\text{O}_7$* , J. W. Harter, Science **356**, 295 (2017)
- *Directional ultrafast charge transfer in a $\text{WSe}_2/\text{MoSe}_2$ heterostructure selectively probed by time-resolved SHG imaging microscopy*, J. Zimmermann et al., Nanoscale Horizons **5**, 1603 (2020)

Time-resolved THz Spectroscopy

- *Ultrafast photocurrents at the surface of the three-dimensional topological insulator Bi_2Se_3* , T. Braun et al., Nat. Comm. **7**, 13259 (2016)
- *Tracking the ultrafast motion of a single molecule by femtosecond orbital imaging*, T. Cocker et al., Nature **539**, 263 (2016)
- *Ultrafast transition between exciton phases in van der Waals heterostructures*, P. Merkl et al., Nat. Mater. **18**, 691 (2019)