

# Ultrafast control of orders and couplings in solids

**Michael A. Sentef**<sup>1</sup>

*1 Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany  
E-mail: michael.sentef@mpsd.mpg.de*

I will discuss recent progress in modeling nonequilibrium dynamics in solids driven by laser pulses. Examples include light-enhanced superconductivity in electron-phonon systems with modulated electronic bandwidth [1], control of competing superconducting and charge orders with photon frequencies near a gap resonance [2], light-enhanced electron-phonon coupling of IR active modes via nonlinear coupling [3], and light-controlled Floquet-Weyl fermions in 3D Dirac materials [4]. I will finally try to give an outlook of opportunities in light-matter interaction for future prospects in laser-engineered materials science.

## References

- [1] M. A. Sentef et al., PRB 93, 144506 (2016)
- [2] M. A. Sentef et al., PRL 118, 087002 (2017)
- [3] M. A. Sentef, arXiv:1702.00952
- [4] H. Hübener et al., Nature Communications 8, 13940 (2017)