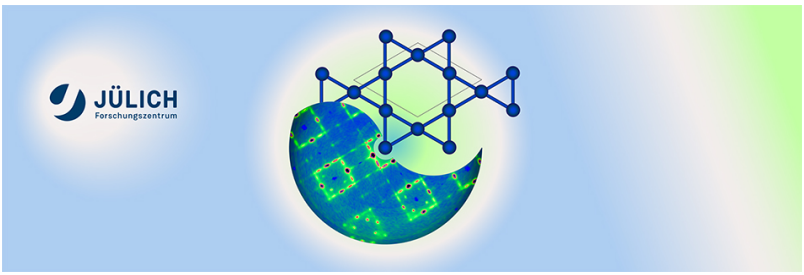


Beitrag ID: **85** Typ: **Talk**

# Phonon spectroscopy in Quantum Materials –x-rays and neutrons

*Mittwoch, 8. Oktober 2025 16:45 (15 Minuten)*

Interacting degrees of freedom in solids underlie new emergent ground states and competing phases with potential for new functionalities. Vibrations of the atomic lattice, i.e. phonons, can couple to electrons, magnetic, or orbital degrees of freedom. In particular, electron-phonon coupling (EPC) received a lot of attention as a microscopically understood origin of superconductivity. Furthermore, EPC has recently been in the focus of investigations of materials with competing phases such as cuprates and layered transition-metal dichalcogenides. On the other hand, research on chiral phonons, i.e., vibrational modes carrying a finite magnetic angular momentum, reports interesting phono-magnetic effects and establishes a direct coupling between lattice vibrations and spin excitations.
Here, I will review some of our recent lattice dynamical investigations of quantum materials, highlight effects of strong coupling to the electronic and magnetic degrees of freedom as well as discuss experimental details. In particular, I will highlight the complementary nature of neutron and x-ray scattering investigations in different experimental setups including high pressure.

**Autor:** WEBER, Frank (Karlsruhe Institute of Technology)

**Vortragende(r):** WEBER, Frank (Karlsruhe Institute of Technology)

**Sitzung Einordnung:** Quantum materials

**Track Klassifizierung:** Quantum materials under extreme conditions