Colloquium on Solid-State Physics

Department of Physics
SS 2023

Thursday, 06st July 2023, 17.15 h
Lecture Hall III, Department of Physics, Garching

Postpandemic Tool for Quantum Materials and vice-versa

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Abstract:
Raman scattering, invented at the end of the last pandemic, can provide a wealth of information on the fractional, magnetic, lattice, and charge excitations at the heart of quantum materials and devices. After a brief overview of the technique and its power, I will focus on our recent discovery of the Axial Higgs Mode via Quantum interference. Here, a new quasi-particle emerges from the combination of quantum geometry and strong correlations. This demonstrates the power of Raman to reveal the vector properties of a low energy mode and heralds the discovery of the first unconventional charge density wave and multi-component symmetry-breaking transition. Time permitting, I will discuss our efforts to use quantum materials in biosensing to help prevent the next pandemic.

There will be coffee, tea, and cookies in front of the lecture hall at 17.00 h