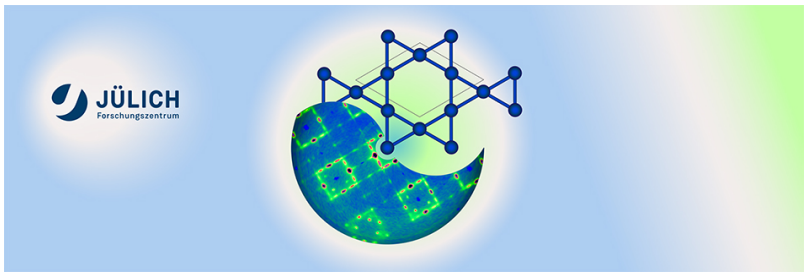

Beitrag ID: **80** Typ: **Poster**

Low-Temperature Lattice Dynamics of $KTaO_3$

Dienstag, 7. Oktober 2025 17:55 (8 Minuten)

$KTaO_3$ is a prototypical quantum paraelectric material that lies near a quantum critical point, where a second-order ferroelectric transition is suppressed by quantum fluctuations. Such systems provide unique opportunities to investigate emergent phenomena, including ferroelectricity and superconductivity, which can be induced by slight compositional changes. The study of low-temperature lattice dynamics in these materials is crucial for understanding their quantum critical behavior, especially through their structural susceptibilities and order parameters.
In this work, we present a comprehensive investigation of the lattice dynamics in $KTaO_3$ using cold neutron triple-axis and thermal neutron time-of-flight spectroscopy, complemented by x-ray diffraction and density functional perturbation theory (DFPT) calculations. Our results aim to clarify the nature of quantum paraelectricity in $KTaO_3$ and address open questions regarding its low-temperature properties and proximity to ferroelectric order.

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Sitzung Einordnung: Poster session

Track Klassifizierung: Quantum materials under extreme conditions