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JOHANNES GUTENBERG UNIVERSITÄT MAINZ

# Theory of Condensed Matter: Hard Condensed Matter

Nov. 6, 2018 at 2 p.m.
Galilei Room, 01-128 (Staudinger Weg 9)

Markus Drescher
Universitt Hamburg

## The Theory of Inelastic Tunneling Spectroscopy in Superconductors

Tunnelling spectroscopy has been proven to be a powerful means to determine fundamental properties of superconductors such as the density of states, with scanning tunnelling microscopy (STM) allowing for a high spatial resolution. However, data from STM experiments can in general only be understood comprehensively by taking into account both elastic and inelastic tunnelling processes. In inelastic tunnelling events, the tunnelling of the electron leads additionally to the excitation or annihilation of collective bosonic modes such as phonons in the sample.
We extend the theory of STM spectroscopy in superconductors by assuming that both the sample and the tip are in the superconducting regime and explore the characteristics of the system if inelastic tunnelling is taken into account. Besides applying a constant voltage between sample and tip, we also consider an alternating sinusoidal voltage, leading to Shapiro-like effects.
All interested are cordially welcome!

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