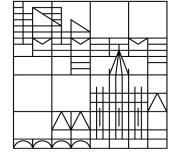


# Theoretical Physics

# Colloquium

Universität  
Konstanz



Mo 18.11.24  
13:30 Uhr  
P 603

**Dr. Raffael L. Klees**

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**Host:**  
**Prof. Wolfgang Belzig**

**Organization:**  
**Javier del Pino**

## Mapping the Interference of Yu-Shiba-Rusinov States

The understanding of the interplay between magnetism and superconductivity is a longstanding and fundamental question in condensed matter physics. On the atomic scale, the interaction of magnetic impurities with Cooper pairs on a superconducting surface gives rise to sharp spin-polarized in-gap resonances known as Yu-Shiba-Rusinov (YSR) bound states. Like electron interference patterns in normal metals, YSR states exhibit periodic textures around magnetic impurities, which often fall below the resolution limits of even the most advanced scanning tunneling microscopy (STM) techniques.

In this talk, I will discuss recent experimental advancements in STM-based measurements that reveal rich spatial and energy features, such as the observation of interference patterns between pairs of YSR states. I will present our latest efforts to develop an effective theoretical model that captures the essence of these experimental observations, paving the way for deeper insights into exotic superconducting and topological phenomena.

**Reference:** A. Odobesko et al., Sci. Adv. 10, eadq6975 (2024)