

# WIENER PHYSIKALISCHES KOLLOQUIUM

## TU-WIEN - UNIVERSITÄT WIEN

### SS 2016

Einladung zum Vortrag von

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## Unconventional superconductivity probed by scanning tunneling microscopy and Spectroscopy

In this talk, I will present recent results on the unconventional superconductor LiFeAs obtained by scanning tunneling microscopy/spectroscopy (STM/STS). STM/STS is an important probe for studying such superconductors. On the one hand it provides the possibility to directly measure important parameters of the superconducting state such as the magnitude of the order parameter and – in the presence of a magnetic vortex lattice – its spatial variation from which the coherence length can be extracted. On the other hand, the so-called quasiparticle interference (QPI) which arises from quasiparticle scattering of impurities (i.e. Friedel oscillations) can be probed directly, yielding momentum resolved information on the quasiparticle scattering. LiFeAs belongs to the class of iron arsenide superconductors which have been discovered in 2008. This material possesses very clean and charge neutral cleaved surfaces without a surface state and is thus perfectly suited for STM/STS. Apart from fundamental superconducting parameters our data reveal the unconventional nature of superconductivity in this compound which manifests in an unusual temperature evolution of superconductivity [1], and unusual quasiparticle scattering [2,3]. I will discuss these findings in the context of further experimental data and theoretical results.

[1] P. K. Nag, R. Schlegel, D. Baumann, H.-J. Grafe, R. Beck, S. Wurmehl, B. Büchner, C. Hess, arXiv:1509.03431

[2] C. Hess, S. Sykora, T. Hänke, R. Schlegel, D. Baumann, V. B. Zabolotnyy, L. Harnagea, S. Wurmehl, J. van den Brink, B. Büchner, Phys. Rev. Lett. 110, 017006 (2013)

[3] T. Hänke, S. Sykora, R. Schlegel, D. Baumann, L. Harnagea, S. Wurmehl, M. Daghofer, B. Büchner, J. van den Brink, C. Hess, Phys. Rev. Lett. 108, 127001 (2012)

**18. April 2016, 17:30 hrs**

(ab 17 Uhr Kaffee)

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