



# EINLADUNG zum IFP-SEMINAR

## Optical investigation of pressure induced superconducting state in iron pnictide superconductors

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Host: Andrei Pimenov  
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Wiedner Hauptstraße 8-10, 1040 Wien  
Seminarraum DC rot 07 (roter Bereich, 7. OG)

### Abstract:

Iron pnictide superconductors are multiband high temperature superconductors that show a magnetically ordered spin-density-wave (SDW) state in their parent compound. Studies showed that the superconducting (SC) state emerges with either chemical doping [1] or external pressure [2]. External pressure is a clean way to introduce superconductivity, while one can avoid the complications arise from the dopants. Hence, the investigation of the superconducting state under pressure can give valuable information of the intrinsic properties of iron pnictides.

In this talk, I will show our recent temperature dependent optical reflectivity data taken on  $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$  single crystals with  $x = 0$  and  $0.2$  up to  $5$  GPa. Our results showed the gradual suppression of the SDW state with increasing pressure. With further increase of the external pressure, a SC state is visible in the phase diagram. Our results showed that at a certain pressure range, SDW and SC states coexist. Moreover, the detailed analysis of the superconducting state give evidences to the possible spin-fluctuation mediated superconductivity under pressure in iron pnictide superconductors.

[1] M.S. Torikachvili et al., Phys. Rev. Lett., 101, 057006 (2008)

[2] E. Colombier et al., Phys. Rev. B, 79, 224518 (2009)