



Thursday, September 13<sup>th</sup> 2018 - 15:00  
CFEL Seminar Room V, Bldg. 99

## Jimin Zhao

Institute of Physics, Chinese Academy of Sciences, Beijing, China

### Ultrafast quasiparticle dynamics and electron-phonon coupling in single-layer FeSe/SrTiO<sub>3</sub> and (Li<sub>0.84</sub>Fe<sub>0.16</sub>)OHFe<sub>0.98</sub>Se

Distinctive superconducting behaviors between bulk and monolayer FeSe make it challenging to obtain a unified picture of all FeSe-based superconductors. Here, we investigate the ultrafast quasiparticle dynamics of an intercalated superconductor (Li<sub>1-x</sub>Fe<sub>x</sub>)OHFe<sub>1-y</sub>Se, which is a bulk crystal but shares a similar electronic structure with single-layer FeSe on SrTiO<sub>3</sub>. We obtain the electron-phonon coupling (EPC) constant  $\lambda$  ( $0.24 \pm 0.03$ ), which well bridges that of bulk FeSe crystal and single-layer FeSe/SrTiO<sub>3</sub> [1]. Moreover, we find that such a positive correlation between  $\lambda$  and superconducting  $T_c$  holds among all known FeSe-based superconductors, even in line with reported FeAs-based superconductors. Our observation indicates possible universal role of EPC in the superconductivity of all known categories of iron-based superconductors, which is a critical step towards achieving a unified superconducting mechanism for all iron-based superconductors.

#### References:

[1] Y. C. Tian, W. H. Zhang, F. S. Li, Y. L. Wu, Q. Wu, F. Sun, G. Y. Zhou, L. L. Wang, X. C. Ma, Q. K. Xue, Jimin Zhao, *Ultrafast dynamics evidence of high temperature superconductivity in single unit cell FeSe on SrTiO<sub>3</sub>*, PRL 116, 107001 (2016).

Host: Andrea Cavalleri

