



### Seminar

## Dynamics of a holon-doublon fluid in a photoexcited Mott Insulator

**Prof. Dr. Jure Demsar**

*Institut of Physics,*

*Johannes Gutenberg-University Mainz, Germany*

**Time: 3:00 pm, Sept 29, 2017 (Friday)**

**时间: 2017年9月29日 (周五) 下午3:00**

**Venue: Room W563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

### Abstract

We use broadband spectrally resolved fs-pump-probe spectroscopy to study the evolution of the optical conductivity in the charge-transfer (CT) insulator  $\text{La}_2\text{CuO}_4$  upon photo excitation with UV photons across the CT gap. The measurements are performed in the spectral range of 0.5 - 2.6 eV with an excitation density spanning several orders of magnitude (up to 0.15 photons/Cu-atom). Apart from the light induced renormalization of the CT gap, photoexcitation results in a photoinduced mid-infrared (MIR) peak centered at 0.6 eV, closely matching the MIR peak induced by chemical doping. The relaxation dynamics of photodoped charge excitations (holons and doublons) is found to depend on photoexcitation density. The experimental results are confronted with the existing models of charge dynamics in light-induced Mott insulators.

### About the speaker

**Jure Demsar** is a professor at Johannes Gutenberg-University Mainz, German. His research interests include: ultrafast phenomena in quantum matter, light driven phase transitions, time-energy-spin resolved electron spectroscopy, time-domain THz spectroscopy, femtosecond electron diffraction and spectroscopy. He is well known for developing and employing ultrafast optical spectroscopy to the study of strongly correlated electronic materials, including heavy fermions, charge and spin density wave systems, conventional/unconventional superconductors, quantum magnets.