



## Physics of Josephson Plasma in High- $T_c$ Copper Oxides

**Prof. S. Uchida**

*Department of Physics, University of Tokyo  
AIST, Tsukuba  
IOP, Beijing*

**Time: 2:00pm, April. 3, 2017 (Monday)**

**时间: 2017年4月3日 (周一) 下午2:00**

**Venue: w563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

### Abstract

In the normal state of high- $T_c$  copper oxides (cuprates), the charge transport in the interlayer  $c$ -axis direction is highly incoherent. Below  $T_c$  the  $c$ -axis transport becomes coherent, because Cooper pairs formed within each  $\text{CuO}_2$  layer can tunnel between layers via Josephson coupling. Associated with the establishment of the interlayer phase coherence of the superconducting order parameter, collective phase fluctuation modes, called Josephson plasma modes, appear in the THz frequency range of optical spectrum. The Josephson plasma modes are used as an experimental evidence of superconductivity, and tell us unique (mysterious) physics of high- $T_c$  cuprates.

### About the Speaker

Shin-ichi Uchida is a professor Emeritus at the Department of Physics, University of Tokyo, (since 2015). His research interests include: infrared optical spectroscopy, charge transport, and material synthesis of high- $T_c$  copper oxides and iron arsenides. He published over 660 papers during 1976-2017, including 27 Nature, 12 Science, and 70 Phys. Rev. Lett. [more than 40,000 citations and h-index 100]. Prizes include the Kamerlingh Onnes Prize 2006, etc.