

**C.N.R. - ISTITUTO DI FOTONICA e NANOTECNOLOGIE**  
**CSMFO Lab.**

## **Seminar Announcement**

Wednesday, 06<sup>th</sup> December, 3pm.

Sala Grande Palazzina B via alla Cascata 56/C

### **Boson peak investigation of glassy materials by terahertz time-domain spectroscopy**

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*The boson peak (BP) has been one of the unsolved problems on glass physics, and it appears in the THz region as a universal excitation. The BP is famously detected by inelastic neutron or X-ray scattering, low-frequency Raman scattering, and low-temperature specific heat measurements. On the other hand, there have been few experimental investigations by far-infrared spectroscopy, although the technique is complementary method of Raman spectroscopy.*

*Recently, we showed that THz time-domain spectroscopy is suitable technique for the detection of the BP [M. Kabeya, T.M. et al., Phys. Rev. B 2016]. One of the advantages of the THz spectroscopy is the ability to determine the absolute value of the infrared light-vibration coupling coefficient ( $C_{IR}$ ).*

*In this lecture, we evaluate the  $C_{IR}$  of the glassy glucose using Taraskin's universal model [S. N. Taraskin et al., Phys. Rev. Lett. 2006]. We will see that the large absorption in the vicinity of the BP of the glassy glucose is caused by both the "light mass" effect and the disordered charge distribution.*

**Research fields:** THz spectroscopy; Boson peak; Rattling phonon; Ferroelectrics; Superconductivity  
**Brief CV:**

2011 March – Assistant Professor, Division of Materials Science, University of Tsukuba, Japan

2010 April – 2011 February Post-doctoral fellow, Institute for Molecular Science, Japan

2010 March Ph.D. in Physics, Department of Physics, Tohoku University, Japan