



### Seminar

#### Topological photonic crystals

**Ling Lu**

Physics Department of Massachusetts Institute of Technology

**Time: 3:00pm, August 7, 2015 (Friday)**

**时间: 2015年8月7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

Due to the recent discovery of topological insulators, it has been recognized that topology is indispensable in distinguishing phases of matter. Similarly, new optical material systems are being discovered with non-trivial topologies of their wavefunctions in the momentum space, whose interfaces support novel states of light with unprecedented properties such as the robustness to disorder and fabrication imperfections.

In this talk, I will show the photonic (Bosonic) analogues of 2D quantum anomalous Hall effects, 3D topological Weyl and Dirac semimetals and topological crystalline insulators. Specifically, I will present our recent experiments on large Chern numbers (up to four), first observation of Weyl points in gyroids and the first photonic single-Dirac-cone surface state with a  $Z_2$  index. These new degrees of freedom in band topologies promise wide exciting opportunities in both fundamental physics and technological outcomes.

#### About the speaker

Ling Lu is currently a postdoc in the Physics Department of Massachusetts Institute of Technology working with Prof. Marin Soljačić and John Joannopoulos. He obtained his bachelor in Physics in 2003 from Fudan University in Shanghai, China. He did his Masters in Physics and Electrical Engineering and Ph.D. in Electrical Engineering in 2010, all at University of Southern California in Los Angeles. His thesis work, advised by Prof. John O'Brien, was on photonic crystal nanocavity lasers. Collaborating with Prof. Liang Fu, his current research focuses on topological photonics.