



### Special Seminar

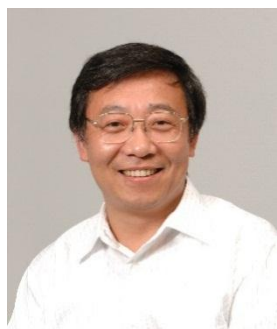
#### Leap of Topological Physics: Learning from Honeycomb Structure

拓扑物理学的发展：蜂窝结构带来的启示

**Xiao Hu**

*International Center for Materials Nanoarchitectonics (WPI-MANA)*

*National Institute for Materials Science (NIMS), Tsukuba, Japan*



**Time: 2:00pm, Oct. 17, 2017 (Tuesday)**

**时间: 2017年10月17日 (周二) 下午2:00**

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

**地点: 北京大学物理楼, 西563会议室**

#### Abstract

Honeycomb lattice plays an extremely important role in fostering topology physics as known from the Haldane model and the Kane-Mele model [1]. Recently, we propose a way to achieve all-dielectric topological photonics starting from honeycomb structure. We identify a pseudospin degree of freedom in electromagnetic (EM) modes hosted by honeycomb lattice, which can be explored for establishing topological EM states with time-reversal symmetry [2]. We demonstrate theoretically the nontrivial topology by showing photonic band inversions, and counter-propagating edge EM modes. I will show recent experimental results of microwaves which confirm our theory. The idea can also be applied for other bosonic systems such as phonons as well as electronic systems. Recent progresses and perspectives of the present approach will be discussed.

References:

[1] H.-M. Weng, R. Yu, X. Hu, X. Dai and Z. Fang, *Adv. Phys.* vol. 64, 227 (2015).

[2] L.-H. Wu and X. Hu: *Phys. Rev. Lett.* vol. 114, 223901 (2015).

#### About the speaker

胡晓教授从事理论物理研究，曾先后在日本东京大学、东北大学、美国国家标准技术研究所(NIST)等研究机构从事教学科研工作。1996年加盟日本国立物质材料研究机构，2011年入选中组部千人计划。他在铜氧化物高温超导Abrikosov磁通格子的融化相变，本征约瑟夫森结THz电磁波辐射，拓扑超导马约拉纳准粒子探索，新奇拓扑光子晶体和拓扑绝缘体的理论设计等研究领域取得了一系列原创性成果。至今已在*Advances in Physics*, *Advanced Materials*, *Superconductor Science and Technology*等重要期刊发表综述文章。