



SPECIAL OSE SEMINAR SERIES

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Toward All-Dielectric Topological Photonics

-- Exploring the Geometry Effect of Honeycomb Lattice --

Thursday, May 25, 2017 at P&A, Rm. 190 from 11:00 AM – 12:30 PM

Abstract

Honeycomb lattice plays an extremely important role in the course of development of topology physics [1]. Recently, we propose an all-dielectric topological photonic crystal derived from honeycomb structure. We identify a pseudo spin degree of freedom in electromagnetic 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 inversion, and counter-propagating edge EM wave. I will show the recent experimental confirmation of this idea with microwaves [3]. Without requiring gyromagnetic, bi-anisotropic or piezo-magnetic materials, this topological photonic crystal can be fabricated easily and potentially is compatible to electronics. Finally I will discuss future perspective [4,5].

Reference:

- [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)
- [3] Y.-T. Yang, J.-H. Jiang, X. Hu and Z.-H. Hang: arXiv.1610.07780
- [4] L.-H. Wu and X. Hu: Sci. Rep. vol. 6, 24347 (2016)
- [5] T. Kariyado and X. Hu: arXiv.1607.08706

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