



State Key Laboratory of
Terahertz and Millimeter Waves
(City University of Hong Kong)



Seminar On

A New Generation of Photonic Crystals

By

Prof Che Ting Chan

Hong Kong University of Science and Technology

Date : 20 November 2018 (Tuesday)

Time : 10:50 am – 11:50 am

Venue : Room 15-202, 15/F, State Key Laboratory of Terahertz and Millimeter Waves,
Lau Ming Wai Academic Building, City University of Hong Kong

Abstract

Photonic crystals with twisting micro-structures can be used to realize non-resonant metamaterials with multiple index ellipsoids centered at arbitrary nonzero k -points and topological materials with topological Weyl points. All natural and artificial materials have one index ellipsoids centered at $k=0$. This is consistent with the fact that the photon momentum has to go to zero as frequency goes to zero. However, some metallic photonic crystals with subwavelength helical structures can possess more than one index ellipsoids centered at arbitrary nonzero k -points. The centers of the index ellipsoids in momentum space are determined by the connectivity of the metallic elements. Different from the majority of metamaterials which derive their properties from an array of subwavelength resonators, the functionality of the metamaterial is derived from the topology of the structure, not from resonances of individual resonators. We will also show that twisting structures can also be used to realize Weyl points. Weyl points, as analogue of magnetic monopoles in momentum space, have captured much attention recently in various branches of physics. One-way edge modes are found on the boundary of these systems. In the microwave regime, such structures can be fabricated using planar fabrication technology.

Biography

Prof Che Ting Chan received his PhD degree from the University of California at Berkeley in 1985. He is currently Daniel C K Yu Professor of Science, Chair Professor of Physics at HKUST, the Director of Center for Metamaterial Research and the Director of Research Office of HKUST.

*** ALL ARE WELCOME ***

Enquiries:

Professor Chi Hou Chan, State Key Laboratory of Terahertz and Millimeter Waves
Tel.: (852) 3442 9360 Fax: (852) 3442 0353 Email: eechic@cityu.edu.hk