



EE 500 GRADUATE COLLOQUIUM

Spring 2014

You are cordially invited to

**“Metamaterials and Metasurfaces: Principle,
Structure, Functionality, and Application”**

By

Dr. Hou-Tong Chen

Center for Integrated Nanotechnologies

Los Alamos National Laboratory

Date: March 20, 2014

Time: 4:00 pm

Location: 160 Willard Bldg.

Abstract

The control of electromagnetic radiation lies at the core of many modern technologies. Naturally occurring materials provide only limited electromagnetic response, insufficient for emerging technologies with increasingly demanding requirements. During the past decade metamaterials have been developed to accomplish many exotic phenomena and functionalities that are otherwise difficult or impossible to realize. In this talk, I will introduce the concept of metasurfaces – two-dimensional metamaterials, including their operation principle, structure design, emergent functionality, and application. Particular focus will be our recent series of works in few-layered ultrathin planar metamaterials/metasurfaces that can accomplish fascinating functionalities including arbitrary control of reflection and diffraction, absorption and emission, phase and amplitude dispersion, state of polarization, and wavefront shaping. I will further discuss that enhanced and active functionalities can be accomplished through the integration of functional materials within the metamaterial/metasurfaces structures. The discussed works are mainly in the terahertz frequency range where metamaterials/metasurfaces can make major contribution in solving the materials issues that have prevented the development of terahertz devices and components for many promising applications.

Biography

Hou-Tong Chen received his BS and MS degrees from the University of Science and Technology of China in 1997 and 2000, respectively, and PhD degree from Rensselaer Polytechnic Institute in 2004, all in physics. Between 05/2005 and 05/2008 he was a postdoctoral research associate in Los Alamos National Laboratory (LANL). Since 06/2008 he has been a technical staff member in the Center for Integrated Nanotechnologies (CINT) at LANL, a Department of Energy/Office of Science Nanoscale Science Research Center (NSRC) jointly operated by Los Alamos and Sandia National Laboratories as a national user facility. Hou-Tong's research interests are in metamaterials and terahertz science and technology. He has co-authored over 50 publications in peer-reviewed journals including *Science*, *Nature*, *Nature Photonics*, and *Physical Review Letters*, which have been totally cited over 2200 times according to ISI Web of Science. He has delivered nearly 50 invited presentations in international conferences as well as colloquia and seminars in research institutions. Hou-Tong received LANL Achievement Awards in 2013 and 2007 and LANL Patent Recognition in 2012. He has been serving as a member of the Editorial Committee in *International Journal of Terahertz Science and Technology* and *Frontiers of Optoelectronics*. He also served many conferences and workshops in the organizing committee, advisory committee, or technical program committee.