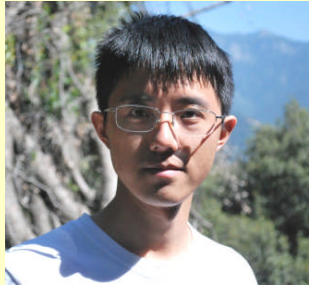


Columbia University Optics and Quantum Electronics Seminar

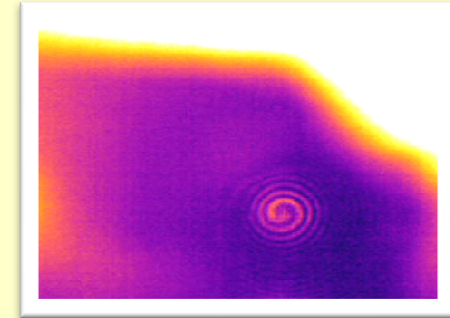


“A Quest into the Invisible”

Dr. Nanfang Yu
Harvard University

Date/Time: Monday, November 5th, 11 – 12 noon

Location: Sindeband East 414/CEPSR



Abstract: Infrared science and technology are uniquely positioned to address many of today's challenges related to health, environment and security. This talk will describe the physics of a few novel optical and optoelectronic devices for mid-infrared and terahertz (far-infrared) light.

I will introduce the concept of meta-interface, which is based on optical phase discontinuity and can mold optical wavefronts into arbitrary shapes. The meta-interface is used to generate anomalous beams characterized by generalized laws of reflection and refraction, and optical vortex beams that carry orbital angular momentum.

I will also talk about plasmonics-enhanced high-performance infrared lasers. In particular, I will explain how integrated designer plasmonic structures are used to greatly reduce the beam divergence and to improve the power output of terahertz quantum cascade lasers.

Bio: Nanfang Yu is a research associate in the School of Engineering and Applied Sciences at Harvard University. He received the Ph.D. degree in Engineering Sciences from Harvard University in 2009, and the B.S. degree in Electronics from the Department of Electronics at Peking University, Beijing, China, in 2004. His research interests include nanophotonics and device physics.

Dr. Yu has worked extensively on plasmonics, metamaterials, and mid-infrared and terahertz semiconductor lasers. He has published over 30 articles in peer-reviewed scientific journals, including first-author papers in *Science*, *Physical Review Letters*, *Nature Materials*, and *Nature Photonics*. He has filed six US patents, written three book chapters, and has given more than 10 invited presentations at international conferences. He enjoys drawing with charcoal and pastel, and cooking Szechuan-style food.

Dr. Yu will join the Department of Applied Physics and Applied Mathematics at Columbia next spring. He will build a lab devoted to study infrared optics and optoelectronic devices to address today's challenges in security, energy and health care.

Hosted by Prof. R.Osgood • For further information: call 212 854 4462