# INTRODUCTION TO OPTICAL PRINCIPLES

**TUESDAY JULY 22, 2008** **ROOM 1805 NORTH CLASSROOM BUILDING**
**9 AM – 1 PM** **CU - DENVER**

- $250 per person for CPIA / CAPT Center members
- $300 per person for all others
- Does not include parking, meals (cafeteria & Starbucks nearby)
- Class size limited to 10 students to make sure there is hands on experience for every student. If the class fills, there will be a waiting list.
- If there are not at least 6 people registered by July 15, classes will be cancelled and there will be full refunds made. If an individual may cancel for any reason before 5 pm July 14, 2008. CPIA will pass through the refund processing fee, which will not exceed 5% of the total cost of the class for all cancellations.
- After July 15 there are no refunds available for any reason.

## COURSE OUTLINE

This course discusses several important principles of optical engineering that can be applied to daily optical engineering practices. Principles will be explained from the practical prospective and examples of how to apply these principles will be given, such as interpreting the data sheets of manufactures. There will be experimental demonstration to help visualize how these principles works. No prior photonic background is required. This 4-hour course is designed for engineers or technical personnel who want to understand optical principles with a practical approach. Topics intended to be covered in this class include:

- Coherence: different between conventional light sources and laser
- Interference and interferometer
- Optical reflection, refraction, transmission and absorption of materials
- Refractive index, material birefringence and optical polarization
- Optical spectral range: x-ray, ultraviolet, visible, infrared and terahertz
- Optical scattering
- Imaging systems and optical aberration
- Optical waveguides and fibers

## ABOUT THE INSTRUCTOR

Tim Lei is an assistant professor in the Department of Electrical Engineering at the University of Colorado Denver. He is an expert in ultrafast lasers and nonlinear optical spectroscopic techniques. He is currently developing some optical diagnostic equipment to find cancers without biopsies. In the past, he has successfully traced molecular motions on metal surfaces with fast optical pulses and has studied potential inorganic molecules that can be used to generate hydrogen directly from sunlight with optical techniques. He teaches graduate level optics classes, such as optical engineering and bio-optics, regularly in UC-Denver.