

# Developments in Optics and Optical Components



Join us for a Webinar on May 29, 2013  
at 1 PM EDT

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Free Webinar

Speakers:

Dr. Robert R. McLeod  
Associate Professor  
Electrical, Computer and Energy Engineering  
University of Colorado at Boulder



#### "3-D Gradient-Index Polymer Optics"

Gradient index (GRIN) optics are traditionally fabricated via diffusion of a liquid species through a solid host material such that the refractive index depends on the local concentration of the diffusing species. In this talk, McLeod will describe materials and lithography processes that enable the fabrication of GRIN optics with arbitrary 2-D and 3-D structure covering scales from ~200 nm to cm. The key is a photopolymer material in which diffusion is locally controlled by a photo-initiated polymerization reaction. By proper selection of monomers and processing conditions, index change up to 0.1 has been demonstrated. Unusual lens function (e.g. extended depth of focus) and 3-D photonic devices will be used to illustrate the process.

Patrice Genevet  
Research Associate  
Professor Federico Capasso's Group  
Harvard University



#### "Photonic Metasurfaces"

Recent nanotechnology advances have stimulated new approaches across disciplines including photonics, energy harvesting and biophysics. Genevet will give an overview of the recent contributions of Federico Capasso's group to the field, with special emphasis on the development of ultrathin nanostructured optical components. The wavefront of light can be controlled without relying on gradual phase shifts accumulated during propagation, but instead with abrupt phase discontinuities introduced into the light path over the scale of a wavelength. Interfaces decorated by resonant nanostructures to generalize the classical laws of reflection and refraction will also be considered. The versatility of these interfacial phase discontinuities can be exploited to create ultrathin devices that focus light, function as waveplates, and even generate optical field with complex wavefronts.

**Title:** *Developments in Optics and Optical Components*

**Date:** Wednesday, May 29, 2013

**Time:** 1:00 PM - 2:00 PM EDT (New York Time)

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