

**Optics/Chemistry/Materials Science Presents:**

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## **Electronically Tunable Metamaterials and Metasurfaces**

### **Abstract:**

Progress in understanding resonant subwavelength structures has fueled an explosion of interest in fundamental processes and nanophotonic devices. The carrier density and optical properties of photonic nanostructures are typically fixed at the time of fabrication, but field effect tuning of the potential and carrier density enables the photonic dispersion to be altered, yielding new approaches to energy conversion and tunable radiative emission. While the emissivity is normally a fixed material-dependent quantity, modulation of the carrier density enables tuning of the complex dielectric function and the emissivity of infrared emitter, enabling modulation of radiative emission at constant temperature. We experimentally demonstrate tunable electronic control of blackbody emission frequency and intensity in graphene metasurfaces using field effect tuning of the graphene carrier density. We also describe designs for metasurfaces based on patch antenna arrays that allow field effect tunability of the reflection amplitude and phase of the incoming field.

**Date:** Wed., October 28, 2015 • **Time:** 12:00pm • **Location:** Lander

Auditorium, University of Rochester, Hutchison Hall 140, 120 Trustee Rd.

**Refreshments will be served**