# 2018 Fall Chem 501 Seminar

*Dr. Stephen Kuebler*

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Thursday – October 11, 2018

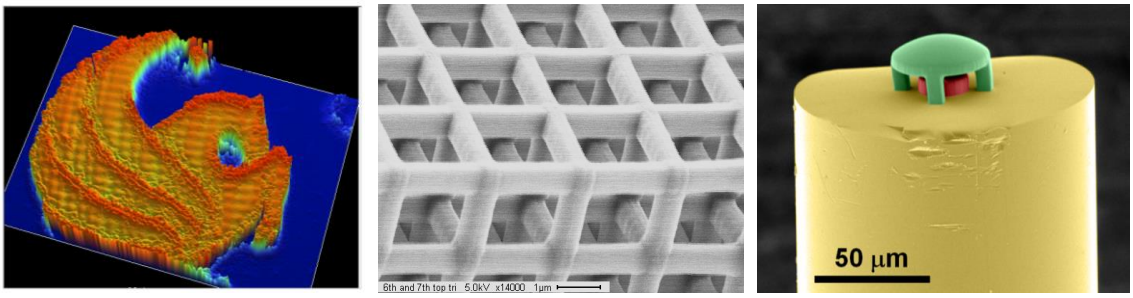
Refreshments 3:25pm, Buehler 513
Lecture at 3:45pm, Buehler 555

[http://sciences.ucf.edu/chemistry/people/kuebler-stephen/](http://sciences.ucf.edu/chemistry/people/kuebler-stephen/)

Hosted by: Dr. John Brantley

## *"Functional Optical Devices Created by Laser-Based Nanoscale 3-D Printing"*

Nanophotonics involves the development of fundamental science, materials, and applications that leverage the interaction of light and matter on the nanometer to micrometer length scales. This growing and highly interdisciplinary field involves chemistry, materials science, physics, engineering, and bio-science. In this presentation Dr. Kuebler will introduce the field of nanophotonics and describe some work done by his group in this area. The talk will focus on the development of materials and processes for multi-photon lithography (MPL) and show how they have used MPL to create functional nanophotonic devices. He will also show how his team has used MPL to create micro-optics on the tip of optical fibers and spatially-variant photonic crystals that can bend light through extremely sharp turns. These devices can be used to create new integrated photonic devices, including low-profile sensors.




Micro-structures created by students in the Kuebler Group using multi-photon lithography (MPL). (**Left**) 3D micron-scale rendering of the UCF crest, imaged by reflectance interferometry. (**Center**) Scanning electron micrograph of a functional 3D photonic crystal that can be used to control light on the micro-scale. (**Right**) Compound micro-lens (green and red) fabricated on the tip of an optical fiber (yellow).

*Stephen M. Kuebler joined the faculty at the University of Central Florida in August of 2003 as an Assistant Professor through a joint appointment with the Department of Chemistry and CREOL, The College of Optics and Photonics. Kuebler earned a BS degree in chemistry and a BA degree in German from Tulane University. He was awarded a Marshall Scholarship and an NSF Graduate Fellowship to pursue graduate research in chemistry at the University of Oxford. There he earned the DPhil degree for his studies of the third-order nonlinear optical properties of molecular materials with Professors Robert G. Denning and Malcolm L. H. Green. Before joining UCF, Kuebler worked as a postdoctoral researcher at Caltech and later at the University of Arizona with Professors Joseph W. Perry and Seth R. Marder investigating the photophysics, photochemistry, and applications of two-photon absorbers. In 2008 he was awarded an NSF CAREER Award and promoted to Associate Professor. His broader interests include the physical and chemical properties of optical and electronic materials and their development for new technologies. His group's research has been supported by NSF, DARPA, the Petroleum Research Fund, Lockheed-Martin, Prime Photonics, Florida High-Tech Corridor Council, Florida Space Research Institute, and the Florida Space Grant Consortium.*