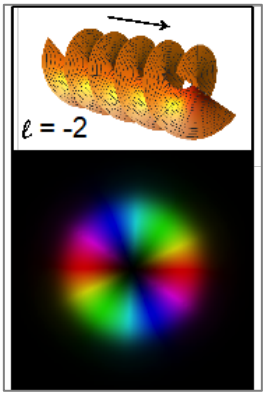
College of Natural Sciences & Mathematics
UNIVERSITY OF DENVER

**Physics & Astronomy Colloquium**
**October 8, 4:00pm, Olin 105**

## Dr. Mark Siemens

Professor and Chair of the Department of Physics and Astronomy at the University of Denver (DU)




# Light with a Twist

We normally think of light as traveling straight between points in space, but beams of light can rotate as they travel. In the simplest rotating beams, the electromagnetic fields of circularly polarized light rotate with propagation and this “spin angular momentum” has been well understood for more than 100 years. But less than 30 years ago, the “orbital angular momentum” form of rotation was discovered that leads to a “vortex” beam with a helical phase.

This talk is especially geared toward graduate and undergraduate students interested in research. Specifically, in this talk I will 1.) provide a tutorial explaining the basic concepts of twisted light, 2.) discuss very simple methods for generating and measuring the orbital angular momentum of light, and 3.) highlight some of our recent research with twisted light. Finally, I will make a silly analogy for how vortex motion in laser beams can advise your future research career.

**Bio:**

Dr. Mark Siemens is a Professor and Chair of the Department of Physics and Astronomy at the University of Denver (DU). His research group controls the spatial and temporal shape of lasers to explore quantum hydrodynamics and entanglement-enhanced spectroscopy. He is the faculty advisor for DU’s Society of Physics Students, which is locally and nationally recognized for their physics outreach.