Departments of Physics Colloquium

Light with a twist: an introduction to twisted light with orbital angular momentum

Dr. Mark Siemens

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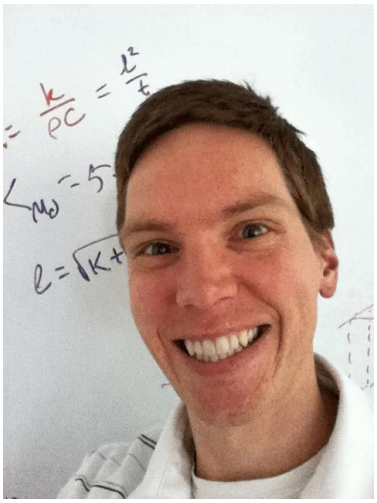
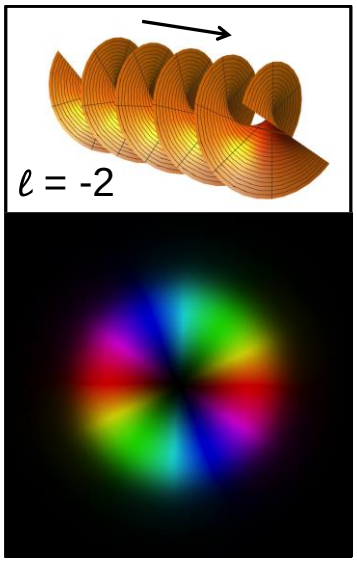


Friday, April 29, 2016
1:30 – 2:30 PM
Venue: GL100A, MMC

Abstract: 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, individual light particles (photons) spin as they travel and this "spin angular momentum" has been well understood for about 100 years. But less than 20 years ago, the "orbital angular momentum" form of rotation was discovered that leads to a "vortex" beam with a helical phase. These crazy-quantum vortex beams have many exciting applications, including controlling tiny micromachines, measuring star rotation, enabling super-high-resolution imaging, and allowing communication with theoretically-unlimited bandwidth.



Conventional methods for generating and measuring twisted light involved either expensive and fixed-wavelength optics or computer-controlled electro-optics such as a spatial light modulator. 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 exciting potential technical and scientific uses of twisted light.

Biography: Dr. Mark Siemens is an Assistant Professor in the Department of Physics and Astronomy at the University of Denver (DU). His research group controls the spatial and temporal shape of lasers to probe and control basic excitations and transport in nanostructures. He is the faculty advisor for DU's Society of Physics Students, which is locally and nationally recognized for their physics outreach.

The event is free and open to the public.

Future seminars can be found at http://physics.fiu.edu/seminars/

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