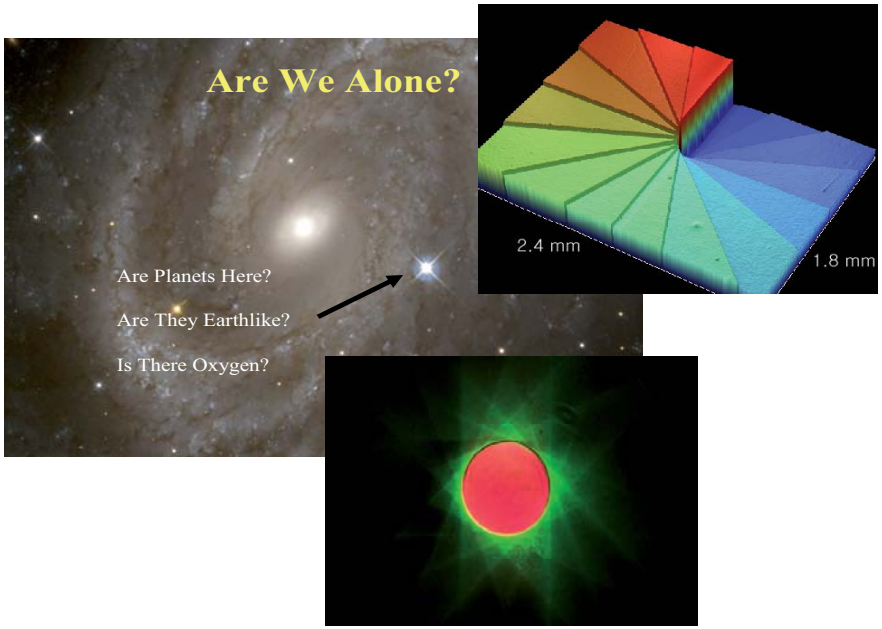
The Institute of OPTICS

Colloquium

UNIVERSITY of ROCHESTER

Optical Vortices and the Hunt for Habitable Planets



Grover Swartzlander,
College of Optics
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PhD in ECE, Johns Hopkins 1990
Worchester Polytech 1993-2001
Arizona 2001 -

This talk will will describe optical vortices and the use of the optical vortex coronagraph to, in effect, turn off the light of a star without affecting the light from an orbiting planet.

10:30 am, Friday, October 26, 2007
Sloan Auditorium
Goergen Building
Refreshments follow

Note Special Day and Time

Optical Vortices and the Hunt for Habitable Planets

Grover Swartzlander
College of Optical Sciences
University of Arizona

The search for habitable planets orbiting distant stars is complicated by the glare of the parent star, which is roughly ten billion times as luminous as the planet. This presents a significant obstacle in the search for spectral biomarkers such as oxygen and water. The optical vortex coronagraph is a promising scheme to, in effect, turn off the star light without affecting the planet light. After introducing the physics of optical vortices, I will describe our experimental effort to achieve high contrast imaging in the lab and on a telescope.

Grover Swartzlander explores physical optics phenomena that are analogs of hurricanes. Called "optical vortices" these intriguing waves are of interest to both scientists and engineers. The unique properties of these waves open new questions about wave-particle duality, coherence, and angular momentum. What is more, they open new opportunities in imaging science, wave-matter interactions, and astronomy. Most recently his group has explored ways to observe planets beyond our solar system using an optical vortex phase lens to block light from the parent star. Grover Swartzlander attended Johns Hopkins (PhD), Purdue (MS), and Drexel (BS) Universities. He was a physics professor at Worcester Polytechnic Institute for eight years and has been at the Optical Sciences Center since 2001. He is a Fellow of the Optical Society of America, and is currently a topical editor for the prestigious journal, Optics Letters.