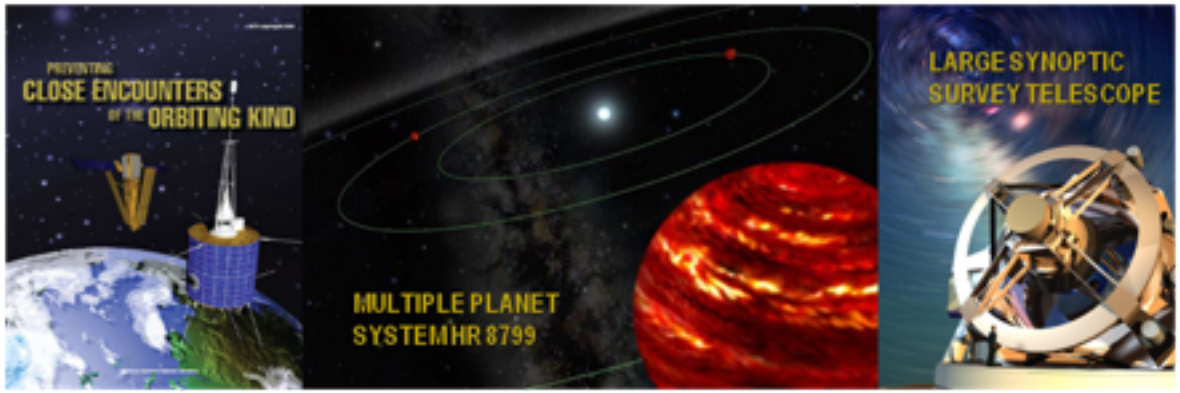
The Institute of OPTICS

Colloquium

UNIVERSITY OF ROCHESTER

Adaptive, Active and Intelligent Optical Imaging Systems



Dr. Scot Olivier
Lawrence Livermore National Laboratory

BS Princeton, EE, Computer Science and Applied Physics
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LLNL 1991-

The lecture will review three different types of adjustable optical imaging systems currently being developed to address the study of planetary systems around nearby stars, the prevention of collisions involving satellites orbiting the earth, and the mapping of the visible universe. It also will describe new concepts in active control of large, wide-field astronomical telescopes.

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3:00 pm, Apr 18, 2011
Sloan Auditorium, Goergen 101
Refreshments served

HAJIM SCHOOL OF ENGINEERING & APPLIED SCIENCES

Adaptive, Active and Intelligent Optical Imaging System

Dr. Scot Olivier
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Abstract

Improvements in the ability of optical systems to adjust their properties in various ways is enabling a range of new imaging applications from the study of planetary systems around nearby stars to the prevention of collisions involving satellites orbiting the earth to the mapping of the visible universe. In this talk, I will review three different types of adjustable optical imaging systems currently being developed to address these three applications. First, I will discuss advances in astronomical adaptive optics, the high-speed adjustment of optical systems incorporated into astronomical telescopes to compensate for rapidly changing aberrations caused by atmospheric turbulence, which are poised to enable a comprehensive survey of planetary systems around nearby stars. Second, I will describe new concepts in active control of large, wide-field astronomical telescopes to compensate for aberrations caused by variations in telescope orientation and temperature, which will be utilized to help produce a new digital map of the visible universe. Third, I will explain a novel method for the intelligent use of a network of small satellites to better determine the trajectories of satellites and debris orbiting the earth in order to help prevent future collisions in space.

Biography

Dr. Olivier is the Associate Physics Division Leader for Applied Physics at Lawrence Livermore National Laboratory (LLNL) with management oversight of multiple research groups engaged in the application of a wide range of forefront science and technology to problems of national importance. His own research has covered a broad range of topics over the past 2 decades, including breakthroughs in astronomical instrumentation, biomedical imaging, remote sensing and laser beam control. He is currently responsible for the development of new LLNL space missions, involving collaborations with multiple laboratories, universities, companies and government agencies. Dr. Olivier is a Fellow of SPIE – the International Society for Optical Engineering. He has published over 120 scientific and technical papers and has won multiple international awards for technical innovation.