Thursday, October 14th
Scaife Hall Auditorium
Room 125

4:30 p.m.
Refreshments at 4:00 p.m.

Terapixel Imaging

Abstract:

The physical limit for the number of pixels per color channel per frame in an optical imager is approximately equal to the aperture area in square microns. While this limit is essentially achieved in megapixel scale cell phone cameras, the limit of 100 megapixels for cm apertures, 10 gigapixels for 10 cm apertures and 1 terapixel for meter apertures is far beyond current practice.

These pixel counts may be further increased by factors of 100-10,000 in spectral and 3D imagers. At the physical limit, a practical imager may easily deliver >1 terapixel per second. Imagers that scale to the physical limit must overcome challenges in the design of lenses, electronic focal planes and image processing units. This talk reviews efforts to overcome these challenges through the DARPA MOSAIC program.

David Brady
Michael J. Fitzpatrick
Professor of Photonics
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David Brady is the Michael J. Fitzpatrick Professor of Photonics at Duke University, where he leads the Duke Imaging and Spectroscopy Program.

Brady's contributions to computational imaging system development include lensless white light imaging, optical projection tomography, compressive holography, reference structure tomography and coded aperture snapshot spectral imaging.

He is currently the principal investigator for the DARPA Multiscale Optical Sensor Array Imaging Camera (MOSAIC) project, which aims to build compact streaming gigapixel scale imagers.

He is the author of Optical Imaging and Spectroscopy (Wiley, 2009) and is a Fellow of IEEE, SPIE and OSA.

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