

## **Siddharth Ramachandran, Boston University**

**Title:** Light That Spins: Applications From Microscopy to Telecommunications

**Abstract:** In the last decade, perhaps the most extensively studied complex beam-shape of light is the class of vortex beams, which possess phase or polarization singularities. These beams have several potential scientific and technological applications, such as laser-based electron and particle acceleration, single-molecule spectroscopy, higher-dimensional quantum encryption, optical tweezers that can apply torques, and metal machining. A recently developed fiber that resembles an anti-guide, which closely mirrors the field profile of optical vortices, has enabled their stable generation and propagation in optical fibers, for distances up to kilometres for the first time. Since fibers are well known for their ability to offer nonlinear and dispersive tailoring of light, this opens the door to studying, and exploiting, nonlinear phenomena with such beams. This talk will discuss these intriguing possibilities enabled by fiber propagation of beams that have long been considered interesting, but hitherto unstable in nature.

**Biography:** Dr. Siddharth Ramachandran obtained his Ph.D. in Electrical Engineering from the University of Illinois, Urbana-Champaign, in 1998. Thereafter, he joined Bell Laboratories as a Member of the Technical Staff and subsequently continued with its spin-off, OFS Laboratories. After a decade in industry, Dr. Ramachandran has moved back to academics, and is now an Associate Professor in the department of Electrical Engineering at Boston University.

Prof. Ramachandran's research focuses on the optical physics of guided waves. He has authored over 150 refereed journal and conference publications, more than 35 invited talks, plenary lectures and tutorials, 2 book-chapters, and has been granted over 30 patents. For his contributions in the field of fiber-optics, he was named a Distinguished Member of Technical Staff at OFS Labs in 2003, and a fellow of the *Optical Society of America* (OSA) in 2010. He served as a topical editor for *Optics Letters* from 2008-2011, and is currently an associate editor for the *IEEE Journal of Quantum Electronics*, in addition to serving on numerous conference and grant-review committees in the field of optics and applied physics.