OPTICAL SCIENCE & ENGINEERING
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OSE SEMINAR SERIES

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Designer Optical Fibers: It's not just about the waveguide anymore

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CHTM, Rm. 101 from 3:30 PM – 4:30 PM

Abstract:
The performance of modern optical fibers has largely plateaued in a number of technological areas, with the limitations typically taking the form of a maximum allowable optical power. These barriers frequently result from the appearance of some parasitic nonlinear phenomenon. As a result, this has inspired a recent thrust in specialty fiber design, but one that is rooted mainly in conventional optical wave propagation methodologies. Unfortunately, the vast majority of these new, and often extremely complicated, waveguide concepts offer only incremental improvements to the systems utilizing them. In this presentation I will discuss a new way of thinking about these limitations, and how it can lead to disruptive and transformative enhancements to optical fiber performance. Ultimately, the ideal fiber, as defined within the context of this talk, is one that allows light to propagate free from nonlinear power limiters.

Biography:
Dr. Dragic is an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign. He has over 100 archival journal and conference papers in a wide range of subjects, covering components and glass science up to complete electro-optical systems, including fiber lasers, LIDAR, and distributed sensing systems. He holds 14 US patents, with several pending, in the area of optical fiber technology and has been active in this area for close to 20 years. Notably, in 1999 he introduced a fiber with a tailored transverse acoustic velocity profile for SBS suppression. Also notably, he has developed models for the calculation of glass physical characteristics including Brillouin gain coefficient, Pockels coefficients, acoustic and optical properties, among others, as they would apply to optical fiber. These models have led to the very first prediction of glass compositions wherein longitudinal Brillouin scattering can be eliminated as a physical process. Dr. Dragic's fiber design approach can best be described as one that marries conventional waveguide engineering with material science. Dr. Dragic is a senior member of the Optical Society of America, International Society of Optical Engineering, and member of the IEEE Photonics Society.

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