TCSUH Special Seminar

Prof. Yongfeng Lu
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Monday February 2, 2015
HSC 102
12:00 – 1:00 p.m.

Spectrally, Spatially, and Temporally Controlled Laser Processing and Characterization of Functional Materials

ABSTRACT

Lasers can be used to deliver energy with extremely wide spectral, spatial, and temporal ranges. These laser properties have provided many opportunities for material science and engineering. In this presentation, I will introduce my research activities in processing and characterizing nanostructured materials in various forms, including diamond, carbon nanotubes, carbon nano-onions, graphene, gallium nitride, and biomedical materials. Laser-matter interactions can be spatially, spectrally, and temporally controlled and optimized to produce and characterize nanomaterials with desired nanostructures. This talk will cover a few topics on diamond growth using multi-energy processing, 2D and 3D nanofabrication of devices and structures, as well as laser spectroscopy, spectrometry, and 3D chemical imaging. I will also introduce my recent work that vibrational modes of precursor molecules play important roles in combustion and material synthesis, leading to an assumption that temperature may not be the unique parameter governing thermally driven chemical processes.

BIO

Dr. Yongfeng Lu is currently the Lott Distinguished Professor of Engineering at the University of Nebraska-Lincoln (UNL). He received his bachelor degree from Tsinghua University (China) in 1984 and M.Sc. and Ph.D. degrees from Osaka University (Japan) in 1988 and 1991, all in electrical engineering. From 1991 to 2002, he was a faculty in the ECE Department at National University of Singapore. He joined the Department of Electrical Engineering at UNL in 2002. He has more than 20 years of experience in processing and characterization of micro/nanostructured materials. His group has research projects funded by NSF, AFOSR, ONR, DTRA, DOE, DOT, NCESR, NRI, private companies, and other foundations in Japan, with research expenditures of $20 million in the past a few years. His research has led to a number of commercialization and product developments. Dr. Lu has authored or co-authored over 300 journal papers and 350 conference papers. He has been elected to SPIE fellow, LIA fellow, and OSA fellow. He served as the President of the Laser Institute of America in 2014. He has also served as chair and general chair for major international conferences in the field including the general congress chair for the International Congress of Applications of Lasers and Electro-Optics in 2007 and 2008, and general co-chair for LASE in Photonics West 2014 and 2015.

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