ICTAS NEW HORIZONS SEMINAR SERIES

Innovation frameworks and functional electrodynamics in nano-, bio-, and meta-materials

Rising complex challenges to our environment, health, security, and economy in a global market call for new strategies for research that synthesize foundational principles and proven best practices with nascent discoveries and innovative new approaches. This presentation considers evolving university-government-industry partnerships to translate discovery to marketable innovations and examines the potential of emerging electrodynamic structures with unprecedented functionality in self-assembled biomimetic nanoscale metamaterials.

ABOUT THE SPEAKER

Keith Roper
Program Leader, NSF Engineering Research Centers
University of Arkansas

D. Keith Roper is the Program Leader for the Engineering Research Centers and the Network for Computational Nanotechnology at the National Science Foundation. He holds the Charles W. Oxford Professorship of Emerging Technologies in the Ralph E. Martin Department of Chemical Engineering at the University of Arkansas. His lab examines advanced functionalities offered by active electrodynamics to next-generation nano-, bio-, and meta-materials. His research examines discoveries that enable interactions between subatomic particles that are critical to information and energy flows in material and biological systems to be engineered in order to combat epidemic disease and accelerate secure and sustainable information processing. Recent advances are in optical and electron microscopy and spectroscopy, advanced computation, and nanolithography of nanoplasmonic metamaterials and polymer thin films. From 2012-2014, he was Program Director in the Education Engineering and Centers Division at the National Science Foundation. From 2010-2012 he was Assistant Director of Microelectronics-Photonics Graduate Program at the University of Arkansas. He consults with university, industry, and government leaders in developing university-industry-government partnerships to translate discovery to marketable innovations. Since 2000 he has held faculty appointments in chemical engineering and materials science and engineering at the University of Utah and the University of Arkansas. From 1994-2000 he developed processes for cell culture, fermentation, recovery, and analysis of protein, nucleic acid, bacterial polysaccharide, and adenoviral-vectored antigens at Merck & Co. He received a Ph.D. from the University of Wisconsin–Madison and a B.S. degree (magna cum laude) from Brigham Young University. He consults industries in areas related to biotechnology (e.g., virus binding, Millipore Corp.), biopharmaceuticals (e.g., photodynamic cancer therapeutic, Frontier Scientific, Inc.), chemicals, optoelectronics, and energy. He has authored or coauthored more than 68 technical articles and published proceedings, two textbooks, two book chapters, three U.S. patents, one E.P. patent, and six U.S. patent applications. He was instrumental in developing one viral and three bacterial vaccine products, sixteen Good Manufacturing Process documents, and multiple bioprocess equipment designs.

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2-4 pm, 310 Kelly Hall

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