

The NSF NNCI – A Distributed National Network Supporting Nanotechnology Discovery, Applications and Convergence

Kevin Walsh, Ph.D.

Associate Dean of Research and Graduate Studies
University of Louisville Speed School of Engineering



Abstract: The National Science Foundation (NSF) National Nanotechnology Coordinated Infrastructure (NNCI) is a geographically distributed network of 16 sites throughout the United States with state-of-the-art nanotechnology facilities, equipment, and support staff. The NNCI provides researchers from academia, small and large companies, and government with access to university user facilities with leading-edge fabrication/characterization tools, instrumentation, and expertise within all disciplines of nanoscale science, engineering, and technology. The 16 NNCI sites and their 13 partners (university, college, national lab, and non-profit foundation) provide access to more than 2,200 tools located in 69 distinct facilities. This talk will describe the NNCI and its impact on our nation's research, education, and workforce development. In addition, one of the NNCI sites will be highlighted which focuses on the convergence of nanotechnology with emerging advanced manufacturing technologies, such as aerosol jet printing, 3D printing, two photon lithography and roll-to-roll printing. An autonomous robotic multiscale manufacturing system, called NEXUS, will be presented which integrates a variety of advanced manufacturing technologies over several length scales.

Bio: **Kevin Walsh** is the Associate Dean of Research and Graduate Studies for the University of Louisville Speed School of Engineering. He is also the Samuel T. Fife Endowed Professor of Electrical and Computer Engineering (ECE) and the founder of the UofL Micro/NanoTechnology Center, which is part of the National Science Foundation NNCI (National Nanotechnology Coordinated Infrastructure). Dr. Walsh has published over 150 technical papers in the areas of micro/nanotechnology, sensing technologies, semiconductors, microelectronics, and MEMS (micro-electro-mechanical systems), and his research group has received over \$35M of external research funding from DoD, DOE, NSF, NASA, NIH and industry. Prof. Walsh has 12 awarded patents and is the co-founder of 4 technical start-up

companies. Dr. Walsh has taught over 20 different courses, advised over 30 completed theses, and has twice been presented with the school's top Research Award. In 2014, he was inducted into the National Academy of Inventors