

**2019 NSF NANOSCALE SCIENCE AND ENGINEERING
GRANTEES CONFERENCE: PROGRESS IN NANOTECHNOLOGY**

Panel: Nanotechnology Education and Outreach

Overview of Nanoscale Science and Engineering (NSE) Education Programs at NSF

Abby Ilumoka, NSF/HER



Abstract

Nanoscale science and engineering (NSE) has been an area of national and global strategic interest for the last 3 decades. We are surrounded by the results of revolutionary advances in NSE research including faster computer chips, drug delivery systems and resilient materials. NSE research and education must continue to be purposefully coupled. In order to further consolidate the advancements made in NSE research, support for NSE needs to be expanded in the education realm, specifically formal and informal education at all levels of society. Students in K-12, undergraduate and graduate students at US institutions need access to instruction and facilities for NSE in order to develop a genuine appreciation for the importance of novel nanoscale materials and devices, their impact on human health and well-being, and the multitude of potential career opportunities available in the industry. Nanotechnology education for the general public must continue to be supported through informal education programs that focus on benefits to human and environmental health.

NSE education is continuing to evolve as a robust and agile enterprise led by educators, industry practitioners and professional organizations working collaboratively to ensure that a diverse group of students is attracted, recruited and retained in NSE for the long-term to galvanize the US economy and benefit society. At NSF, NSE education is funded primarily through the directorate for Education and Human Resources (EHR). Just over 80 grants were awarded in the last 5 years (i.e. FY14 – FY19) ranging from large collaborative efforts (>\$3million) supporting Regional Centers of Excellence in Nanotechnology to smaller grants (<\$100,000) for curriculum development and conferences. These educational grants have been awarded to institutions in 15 different states from California to New York, Minnesota to Oklahoma, Texas and the District of Columbia. Institution types vary from R1 public institutions with high research activity to minority serving institutions, science museums and community colleges focused on technician training. PI supported are diverse in gender, race and ethnicity. This presentation will provide an overview of EHR grant programs that support NSE education as well as types and notable characteristics of projects funded. Insights about where potential gaps exist in the portfolio will also be shared.

Bio note

Abiodun (Abby) Ilumoka, Program Director

Ph.D. Electrical Engineering, Imperial College London, England

Dr. Abby Ilumoka received the Bachelor of Science degree in Physics and Chemistry from the University of Aston in Birmingham, England in 1976, the Master of Science degree in Electronics from the University of Southampton, England in 1978 and the Ph.D. in electrical engineering from Imperial College London, England in 1982. Following this, she continued with postdoctoral work at Imperial College and later lectured at Brunel University, Uxbridge, UK.

International work experience was further enriched in Nigeria at Telecommunications Consulting and Services Inc., Lagos and the University of Ilorin, Nigeria.

In 1992, she joined the faculty at the College of Engineering, University of Hartford in Connecticut, where she taught for 23 years. Her research interests have ranged from engineering education to microelectronic circuit optimization and artificial intelligence-based complex adaptive systems design. She has authored 80 journal publications and conference articles and received research and teaching grants from government and corporate sources rising to the rank of full professor in 2003. In 2007, she received the Connecticut Women of Innovation Award for outstanding leadership & technology innovation. In 2008, Dr. Ilumoka successfully founded the University of Hartford STEM UP! program – a comprehensive pre-college STEM immersion program designed to identify strategies that overcome barriers to women and under-represented minorities in engineering. She was later honored by the Connecticut Women's Hall of Fame as "one of the best of A New Century of Women in Science" for her leadership efforts to mentor young women and minorities in Connecticut. As one of the state's most distinguished engineers, she was inducted into the Connecticut Academy of Science and Engineering (CASE) the prestigious non-profit that provides science and technology advice to state government and the Connecticut General Assembly.

Abby currently serves as program director for engineering education in the Division of Undergraduate Education (DUE) at NSF and manages the Department of Defense-funded ASSURE portfolio of the foundation-wide NSF Research Experiences for Undergraduates program.