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Nano Congress 2020: The national nanotechnology coordinated infrastructure and its role in meeting the workforce nanotechnology demands in the US - Nancy Healy - Georgia Institute of Technology

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The United States has invested heavily in nanoscale science and engineering over the last 20 years. In 2001, the National Nanotechnology Initiative (NNI) was established and was reauthorized in 2003 by the 21st Century Nanotechnology Research and Development Act. Over this period, the US has supported Nanotechnology R&D and education with $29 billion in support. As part of the nano R&D, the National Science Foundation established nationwide user facilities beginning in 1997 the the National Nanotechnology User Network (NNUN) and which is represented by the 16 site National Nanotechnology Coordinated Infrastructure (NNCI). In addition to supporting nanoscale research, these user facilities have also developed numerous education programs to help address the NNI's Strategic Plan Goal #3: Develop and sustain educational resources, a skilled workforce, and a dynamic infrastructure. This presentation will discuss strategies that have been successful in developing a workforce pipeline from K through gray under the NSF-funded user facilities, especially those of NNCI. No discussion of nanotechnology education and workforce development would be complete without reference to the National Science Foundation funding of numerous nanotechnology education programs focusing on developing a nano-enabled workforce and an educated public that supports the safe development of nanotechnologies. This presentation will present examples of successful programs that have had nationwide impact not just under the NNUN - NNCI continuum but also other programs such as the Nanotechnology Applications and Career Knowledge program at Pennsylvania State University and the now sun-setted Nanoscale Informal Science Education Network. Biography From 2004 to 2017 Nancy Healy served as Education Director of the National Nanotechnology Infrastructure Network, National Nanotechnology Coordinated Infrastructure (NNCI) and Southeastern Nanotechnology Infrastructure Corridor. Prior to this, she was a program manager at the S.C. Commission on Higher Education focusing on K-12 science and math K-12 issues. From 1977 to 1994, she held academic positons at the University of South Carolina. She has a B.S. in Zoology from the University of Rhode Island and M.S. and Ph.D. in Geological Sciences from the University of South Carolina. Currently, she is retired but continuing her work at Georgia Institute of Technology.

President spending demand incorporates a $225 million (83%) expansion in the government's interest in nanotechnology innovative work. The Administration is making this major new activity, called the National Nanotechnology Initiative (NNI), a top science and innovation need. The rising fields of nanoscience and nanoengineering – the capacity to definitely move matter - are prompting phenomenal comprehension and authority over the crucial structure squares of every single physical thing. These improvements are probably going to change the way nearly everything – from antibodies to PCs to vehicle tires to objects not yet envisioned – is structured and made.

"On the off chance that I were requested a region of science and building that will undoubtedly create the advancements of tomorrow, I would highlight nanoscale science and designing." This activity sets up Grand Challenges to subsidize interdisciplinary research and training groups, including focuses and arranges, that work for major, long haul goals. A portion of the potential achievements that might be conceivable include: - Shrinking the whole substance of the Library of Congress in a gadget the size of a sugar solid shape through the extension of mass stockpiling hardware to multi-terabit memory limit that will expand the memory stockpiling per unit surface a thousand overlap; - Making materials and items from the base up, that is, by building them up from particles and atoms. Base up assembling should require less material and contaminate less; - Developing materials that are multiple times more grounded than steel, yet a small amount of the weight for making a wide range of land, ocean, air and space vehicles lighter and more eco-friendly; - Improving the PC speed and proficiency of minute transistors and memory chips by elements of millions creation the present Pentium IIIs appear to be moderate; - Using quality and medication conveyance to distinguish destructive cells by nanoengineered MRI differentiate specialists or target organs in the human body; - Removing the best contaminants from water and air and to advance a cleaner domain and consumable water; - Doubling the vitality effectiveness of sun oriented cells.

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