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Materials science – Transforming the future, from aerospace to medicine

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Abstract

The All along, human civilization has been shaped by innovations in materials science. As we passed the stone-age and moved into the bronze and iron ages, humans figured out how to attach sharpened blades to grips and handles to innovate tools such as knives and axes. That revolutionized agriculture and resulted in the establishment of cities and countries. Metallurgical technology led to Important changes in weapons technology and ultimately, around 4,000 years later, to the industrial revolution. The discovery of the electron led to the development of the vacuum tube, the solid state transistor, and to microelectronics in general. Silicon electronics was initially developed for high-frequency radar receivers in the World War II. Every breakthrough in materials science has changed the world and the way we interact with it. Materials Science touches every walk of life from Energy to Medicine. Over the past decades, advanced composites, smart nanocomposites, multiferroics, biocompatible, biomimetic and living materials, smart stimuli-responsive reconfigurable materials which can provide shape adaptation on demand are just a few examples of how Materials Science is revolutionizing human civilization. Materials science can save the planet with fundamental breakthroughs in every field of science and technology. True breakthroughs that will change the world for the future cannot be through improvements to existing materials, devices and technologies; rather, they will come from researchers pushing the boundaries of knowledge in new directions for applications that are yet to be identified. This talk discusses a wide array of materials for energy harvesting, sensing, aerospace and biomedical applications.

Biography

Latha Nataraj is a Materials Scientist at the U.S. Army Research Laboratory (ARL) after receiving her Ph.D in Electrical Engineering from the University of Delaware in 2011. Prior to her tenure at ARL, she was a Hardware Engineer at Unisys Corporation working on microprocessor design for multiprocessor servers. Latha has worked on the fabrication and characterization of a variety of nanomaterials for energy harvesting, multifunctional, and sensing applications. She has several publications in reputed journals and a book chapter in the area of fabrication and characterization of nanomaterials for their electronic and optical properties and energy harvesting capabilities, seminars, technical presentations, invited lectures, and keynote speeches at international conferences and institutions. She has served on several review panels for proposals and journals. Currently, her research focus is stimuli-responsive reconfigurable materials.

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