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Future Needs and Opportunities in Nanotechnology for Aerospace Applications – A NASA Perspective

Weight, performance and durability are critical drivers for any aerospace system. Reduced vehicle and system weight can enable reduced fuel consumption and emissions (aircraft), reduced launch costs and complexity (spacecraft) and increased payload capacity. Performance improvements can enhance vehicle and mission capability. System and vehicle durability are important since they impact mission safety and effectiveness. Nanotechnology has the potential to help address each of these concerns by enabling such developments as lightweight, multifunctional materials; low-power and low-volume sensors with high selectivity and sensitivity; radiation-hard, fault-tolerant electronics; and higher output energy generation and storage devices. NASA has developed a 20-plus-year plan for the development of nanostructured materials and devices and their insertion into NASA missions. This presentation will provide a perspective on future needs identified in the roadmap and a few examples of current research activities focused on meeting those needs.

ABOUT THE SPEAKER

Michael Meador is Nanotechnology Project Manager for NASA's Game Changing Technologies Program and is NASA's liaison to the Nanoscale Science, Engineering and Technology Subcommittee, the coordinating body for the National Nanotechnology Initiative. In 2010, he led a NASA-wide team in developing the Nanotechnology Space Technology Roadmap, a 20+ plan for the development and insertion of nanotechnology in future NASA missions. From 1988-2011 he was the Chief of the Polymers Branch at the NASA Glenn Research Center. Mike received his B.A. in Chemistry from Ithaca College (1978) and a PhD in Physical Organic Chemistry from Michigan State University (1983) and joined the NASA Lewis (now Glenn) Research Center in 1983 as a research chemist in the Tribology Branch. He was the recipient of the NASA Equal Employment Opportunity Medal in 2002 for his efforts to increase the participation of students and faculty at minority serving institutions in NASA materials research. Meador is an Adjunct Professor and member of the External Advisory Board in the Department of Materials Science and Engineering at Clemson University and is a member of the Advancement Council for the College of Polymer Science and Engineering at the University of Akron. He is on the Editorial Advisory Boards for High Performance Polymers and Nanotech Briefs, and is Member at Large for the ACS Division of Polymer Chemistry. He has published over 70 technical papers and holds 6 US Patents in topics related to high performance polymers, nonlinear optical materials and nanostructured polymeric materials.

THURSDAY, APRIL 10, 2014

2:00 - 3:30 pm, 310 Kelly Hall

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