



NSF Sponsored Workshop on Nanotechnology and MEMS Education



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In February 23, 2004, the Microelectronic Engineering department and the Office of Cooperative Education and Career Services at Rochester Institute of Technology (RIT) hosted a workshop on Nanotechnology and Microelectromechanical Systems (MEMS) Education. This activity was partially supported by the National Science Foundation (NSF) under the planning grant for departmental-level curriculum reform, EEC 0342703. The workshop was part of an initiative at RIT to develop new undergraduate Co-Op based Nanotechnology and MEMS concentrations within the established program.

The objective of the workshop was to raise the awareness among educational institutions, K-12 to University, in the Greater Rochester Area of the emergence of disruptive technology, such as Nanotechnology and MEMS. The workshop was attended by over 80 people, including 13 participants from Pittsford Middle School and Rush-Henrietta High School. Representatives from Cornell NanoScale Science and Technology Facilities and University of Maryland were also there. Various Industries, such as Xerox Corporation, Texas Instrument, Integrated Nanotechnology, and Zonare Medical System, Inc. contributed in highly interactive discussion and presentations. In addition, the event also generated a lot of interest within the RIT community marked by the involvements of College of Engineering, College of Science, College of Applied Science and Technology, and College of Liberal Arts.

The workshop was organized in four sessions. The plenary session presented the history of MEMS research and education at RIT, a critical view on interdisciplinary engineering, an overview of the National Nanotechnology infrastructure network, and the shaping of public policy in the field of nanotechnology. The second session was dedicated to the dissemination of knowledge of the subject in K-12 education. Mr. Robert Rountree, a science teacher at Pittsford Middle school and a RET, shared about the NanoCamp conducted at the RIT Microelectronic Engineering fabrication facilities. Mr. Joe Simson, a chemistry teacher at Rush-Henrietta High School, gave some practical ideas in how to incorporate nano-scale science to high school chemistry curriculum.

Furthermore, the third session focused on the subject of nanotechnology research and course development at university-level education. The topic discussed includes synthesis of nano-particles, nano-crystalline materials and characterization, nanoelectronic devices, the application of

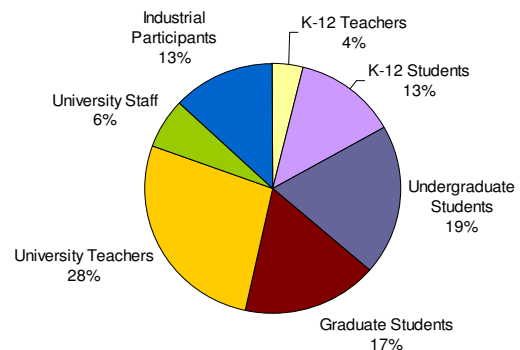


Fig. 1. The breakdown of the overall participants

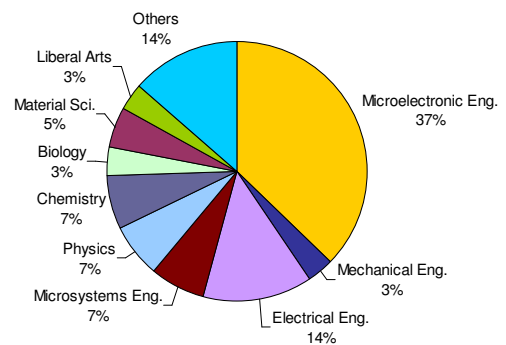


Fig. 2. The breakdown based on discipline

nanomaterials for power application, and bionanotechnology. Finally, the fourth session was dedicated to the research and curriculum development in MEMS.

A small workshop directed towards the middle and high school students was conducted. They learned and gained a sense of how small is a micron and a nanometer by utilizing scanning electron microscope (SEM) to view micron-sized transistors and various MEMS devices, such as micro-gears.

This workshop was unique in a sense that it brought together educators from K-12, college, university, and industrial participants to share their perspectives and knowledge on the field of Nanotechnology and MEMS. This workshop should encourage future synergistic collaboration between government, industrial, and education institutions in the area to fuel research initiative and rapid dissemination of knowledge at every level of education. This workshop was conducted successfully and had met its objective.



Fig.3. Educators from K-12 to university participated in NSF Sponsored Nanotechnology and MEMS Education Workshop.



Fig. 4. Middle and High School Students learned about scanning electron microscope (SEM).

For more information on the nanotechnology initiatives at RIT, please visit:

<http://www.microe.rit.edu/research/nanotechnology>

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