



Micro and Nano Systems Research in the NSF/ECCS

Context: Opportunities and Examples

Dr. Yogesh B. Gianchandani

Electrical Engineering and Computer Science

University of Michigan, Ann Arbor

This talk will begin with a review of the research support structure in the Engineering Directorate at the National Science Foundation. The presentation will be from the perspective of the Micro and Nano Systems in the ECCS Division. Trends in incoming proposals and success rates will be presented. Interdisciplinary funding mechanisms, in particular, the recently introduced Emerging Frontiers in Research and Innovation (EFRI) solicitation, will be reviewed.

In the past two decades, microsystems research has diversified substantially beyond the initial successes of silicon-micromachined pressure sensors and accelerometers. Medical applications and environmental sensing are still providing significant impetus in current research, but the silicon devices tend to have embedded electronics, and the use of polymers and application to liquid-phase analytes is much more commonplace. Future years will likely bring yet more diversity in manufacturing and transduction methods.

If there is time, I will also try to summarize some of the microsystems research in which my group is engaged. One broad topic is how microplasmas and microdischarges can assist in both microfabrication and sensing methods. Another is how thermal transduction can be exploited in motionless pumping of liquids and gases.



Yogesh B. Gianchandani received a B.S., M.S, and a Ph.D. all in electrical engineering, with a focus on microelectronics and MEMS. He is presently a Professor at the University of Michigan, Ann Arbor, with a primary appointment in the Electrical Engineering and Computer Science Department and a courtesy appointment in the Mechanical Engineering Department. He is temporarily serving at the National Science Foundation, as the program director within the Electrical, Communication, and Cyber Systems Division (ECCS). Dr. Gianchandani was previously at the University of Wisconsin, Madison. He also held industry positions, working in the area of integrated circuit design. Dr. Gianchandani's research interests include all aspects of design, fabrication, and packaging of micromachined sensors and actuators and their interface circuits. He has published more than 200 papers in journals and conferences, and has more than 30 US patents issued or pending. He was a Chief Co-Editor of Comprehensive Microsystems: Fundamentals, Technology, and Applications, published in 2007. He serves several journals as an editor or a member of the editorial board, and served as a General Co-Chair for the IEEE/ASME International Conference on Micro Electro Mechanical Systems (MEMS) in 2002.

Friday, November 21, 2008

11:00-12:00pm Room 227 Mudd

Lunch served at 12:00pm in ME lobby