

SEMINAR
Department of Mechanical Engineering
Columbia University, New York

**MEMS AND NANO TECHNOLOGY FOR THE HANDHELD, PORTABLE
ELECTRONIC AND THE AUTOMOTIVE MARKETS**

Dr. Albert P. Pisano

Department of Mechanical Engineering,
University of California, Berkeley, USA

Thursday, March 29, 2007

Room 233 Mudd

11-12 pm

Abstract:

Large consumer markets, such as the market for handheld, portable electronic devices and the market for automobiles, rely on new technologies to meet more demanding goals for cost, performance, size, weight and power. The role of both MEMS and nano technology in these large markets will be described. MEMS technology is already a mature technology in the automotive field, but new MEMS devices, as well as new nano sensors show promise to revolutionize automotive technology by making possible the measurement of new physical quantities that have never been directly measured in the automotive field before. For automotive applications, the primary factors are cost and performance. For handheld, portable electronic devices, both MEMS and nano technology will be used for increasing the functionality of the wireless communication, but then be applied to providing additional functionality. For these electronic applications, the primary factors are performance, size and power. A wide variety of examples will be given as the overall trends in these markets are described and illustrated.

Biography

Albert ("Al") P. Pisano currently serves as Professor and Chair of the Department of Mechanical Engineering at the University of California at Berkeley, having been appointed to that position in July 2004. He joined the University of California in 1983. He was elected to the National Academy of Engineering in 2001. At UCB, Professor Pisano holds the FANUC Chair of Mechanical Systems in the Department of Mechanical Engineering, with a joint appointment to the Department of Electrical Engineering and Computer Science. Professor Pisano's research is all carried out in the BMAD (Berkeley MEMS Analysis and Design) Laboratory, which specializes in cutting edge research in micro electromechanical systems (MEMS). For specific information on projects, please visit the website www-bsac.eecs.berkeley.edu/groups/bmad. He has previously served as Director of the Electronics Research Laboratory, the largest organized research unit on the UC Berkeley campus (with over \$73 million in research funds each year). He currently serves as a Director of the Berkeley Sensor & Actuator Center (BSAC). Professor Pisano received his B.S., M.S. and Ph.D. (1981) degrees from Columbia University in the City of New York in Mechanical Engineering. Prior to joining the faculty at UC Berkeley, he held research positions with Xerox Palo Alto Research Center, Singer Sewing Machines Corporate R&D Center, and General Motors Research Labs. From 1997-1999, he served as Program Manager for the MEMS program at the Defense Advanced Research Projects Agency (DARPA) in Arlington, VA, where he expanded the MEMS research portfolio to 83 contracts awarded nationwide with a total MEMS research expenditure in excess of \$163 million distributed over 3 fiscal years. His research interests and activities at UC Berkeley include MEMS for a wide variety of applications, including RF components, power generation, drug delivery, strain sensors, biosensors and disk-drive actuators. Professor Pisano is the co-inventor listed on 20 patents in MEMS and has authored or co-authored more than 190 archival publications. Since 1983 he has graduated 33 Ph.D. and 64 MS students. He is a founder in five start-up companies in the area of transdermal drug delivery, transvascular drug delivery, sensorized catheters, MEMS manufacturing equipment and MEMS RF devices.