

MEMS *Micro Electro Mechanical Systems*Guest speakers: **Alissa Fitzgerald and Anthony Flannery**

This unique talk presents:

- A gentle introduction to MEMS (MEMS primer for those new to the field)
- An in depth talk about a specific MEMS application: Large-scale Integrated Mirror Array for Optical Communications

Driven by the dot-com era need for communications bandwidth, Micro-Optical Electrical Mechanical Systems (MOEMS) promised new advantages for telecommunication companies. While market conditions caused many of the ventures in this area to fall short of investor expectations, many new advances were made in the area of MEMS fabrication and design during the optical MEMS bubble. Presented here is the large-scale integration of electronics with MOEMS mirrors. A novel design was conceived in which integrated electronics driving 1200 mirrors dissipates only 2W, or under 400 μ W per electrode. The process includes a novel bulk micromachining process and electronic integration through wafer bonding.

When: September 27, 2005 6: 00 to 8:30 PM

Donation: This event is **FREE**. You do not need to be a member to attend. We suggest a \$2 donation to help cover refreshment costs. Please RSVP to k.chin@ieee.org.Agenda: 6:00-6:30pm Networking and refreshments
6:30-7:15pm Intro/Primer on MEMS, Alissa Fitzgerald of A.M Fitzgerald & Associates
7:30-8:15pm Large-scale Integrated Mirror Array for Optical Communications, Anthony Flannery of InvensenseWhere: Stanford University's CISX Auditorium (Center for Integrated Systems Extension)
Directions at: <http://www-cis.stanford.edu/misc/directions.html>**About the Speakers:****Anthony F. Flannery Jr.**

Mr. Flannery received his B.A. in chemistry from Princeton University. He received his MSEE at Stanford University. At Stanford his research focused on the development of PECVD silicon carbide for environmentally hardened chemical and pressure sensors. Other significant accomplishments include the use of dry film lithography for non-planar substrates, stress control in deposited films, and laser ablation for patterning on MEMS substrates. In June of 2003 he joined the founding team of Invensense. Invensense successfully raised \$8 million in April of 2004. As Director of Development, he was co-inventor of a novel silicon bulk micromachining process which included a hermetic seal achieved by wafer bonding with a custom ASIC. Prior to Invensense, he was with Transparent Networks where he managed the successful development of the world's largest integrated mirror array for optical communications.

Alissa Fitzgerald

As the founder of A. M. Fitzgerald & Associates, Alissa Fitzgerald provides technical consulting services to clients ranging from one-person start-ups to companies in the Fortune 500. Her areas of expertise include mechanical design and analysis for advanced applications; sensor systems; MEMS design and fabrication; materials science; and reliability testing. She has worked on projects as diverse as MEMS sensors for spacecraft and medical applications, condition-based maintenance systems for military helicopters, and the study of hot electron injection into PECVD dielectrics. She has been employed by the Jet Propulsion Laboratory, Orbital Sciences Corporation, Signal Processing Associates, and Sensant Corporation. Dr. Fitzgerald received her bachelor and master degrees from the Massachusetts Institute of Technology and her doctorate from Stanford University. Dr. Fitzgerald has numerous journal publications and holds two patents. She is a member of the American Society of Mechanical Engineers and the Materials Research Society and has been a reviewer for the Journal of MicroElectroMechanical Systems, Sensors & Actuators: A, and the Materials Research Society Symposium Proceedings.