

# CCEC Seminar

## Wireless Sensors for Semiconductor Manufacturing

**Professor Kameshwar Poolla**  
*Professor of Mechanical Engineering and EECS*  
*University of California, Berkeley*

**Friday, April 8th, 2005**

**3:00 - 4:00 pm**

**Engineering I Room 2162**

### **ABSTRACT:**

The time has come the Walrus said,  
To speak of many things,  
Of Silicon chips, and sensing tricks,  
And the joy entrepreneurship brings.  
Of thermal maps, and even Profit perhaps.

In this talk, we describe our efforts in developing a new class of wireless sensors for use in semiconductor manufacturing. These sensors are fully self-contained with on board power, communications, and signal processing electronics. They externally resemble standard silicon wafers compatible with standard cassette-to-cassette robotics, and thus require no equipment modification for deployment. The sensors offer unprecedented spatial and time resolution, making them suitable for equipment diagnostics and design, and for process optimization and control.

We begin by discussing the objectives, components, and history of our research program. We then describe in detail our efforts in developing metrology for lithography and plasma etch applications. These include temperature, etch-rate, and thermal flux sensors.

We will illustrate the applications of these sensors in IC processing. We then discuss our initial work in developing a new class of sensors based on electrical impedance tomography. Finally, we describe our efforts at commercializing this technology.

### **About the Speaker:**

Kameshwar Poolla received his B.Tech. degree from the Indian Institute of Technology, Bombay in 1980, and the Ph.D. degree from the University of Florida, Gainesville in 1984, both in Electrical Engineering.

He has served on the faculty of the Department of Electrical and Computer Engineering at the University of Illinois, Urbana from 1984 through 1991. Since then, he has been at the University of California, Berkeley where he is now serving as Professor in the Departments of Mechanical Engineering and Electrical Engineering and Computer Sciences. Dr. Poolla is a co-founder of OnWafer Technologies where he currently serves as Chief Scientist.