

UCSB to Collaborate with Japan's National Institute for Advanced Industrial Science and Technology For the Development of Nanoscale Devices

Santa Barbara, Calif. ? November 30, 2006 ? The University of California, Santa Barbara has agreed to a renewable three-year research collaboration with the National Institute for Advanced Industrial Science and Technology (AIST), of Japan.

The collaboration focuses on thermal issues in nanoscale devices and will be led on the UCSB side by Kaustav Banerjee, an associate professor of electrical and computer engineering and by Kazuhiko Endo of the Nanoelectronics Research Institute at AIST. The collaborative research targets electrothermal modeling and characterization of an emerging category of nanoscale devices with an ultra-thin vertical channel?known as FinFET.

According to Banerjee, increasing power dissipation and resulting thermal problems pose a major limitation to our ability to further scale down nanoscale CMOS transistors that form the building blocks of nearly all integrated circuits used in commercial applications. While FinFET devices have shown tremendous potential for overcoming CMOS scaling limitations beyond the 22 nm node due to their superior electrostatics, thermal management in these ultra-scaled structures is an increasing concern. The challenges are made worse due to the existence of materials with poor thermal conductivity and the physical confinement of the device geometries that lead to increased self-heating. This results in performance and reliability degradation. Electrothermal modeling and characterization of these devices is critical for optimizing their electrical performance and reliability.

The Nanoelectronics Research Institute in AIST is a leader in the fabrication of advanced FinFET structures, while Banerjee's group at UCSB is renowned for thermal management issues in nanometer scale devices and circuits. The collaboration is expected to generate exciting opportunities that will have important technical implications, particularly for the semiconductor industry.

About the College of Engineering:

The College of Engineering at UC Santa Barbara is considered a global leader in bioengineering, chemical and computational engineering, materials science, nanotechnology and physics. UCSB boasts five Nobel Laureates (four in sciences and engineering) and one winner of the prestigious international Millennium Technology Prize. Our students, professors and staff thrive in a uniquely-successful interdisciplinary and entrepreneurial culture. Our professors' research is among the most cited by their peers, evidence of the significance and relevance of their work.

Released by Barbara Bronson Gray

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