Grants Fund New Nanoelectronics Research at NSF Centers

Semiconductor Research Corporation (SRC), the world's leading university-research consortium for semiconductors and related technologies, joined today with the National Science Foundation (NSF) to fund $2 million in supplemental grants for nanoelectronics research.

Researchers at six major NSF Centers in leading U.S. universities will contribute to the goal of discovering a new digital switching mechanism using nanoelectronic innovations as a replacement for the transistor – the foundational building block of computing technology for decades.

"The semiconductor industry continues to actively work on developing a new device that will fuel the industry's leadership in the nanoelectronics era, and the NSF-NRI projects bring together our country's top researchers to help drive critical research that not only affects our U.S. national competitiveness, but also economies worldwide," said Jeff Welser, director of the Nanoelectronics Research Initiative (NRI) for SRC.

Until recently, manufacturers were able to double the number of transistors on a chip at half the power for each transistor by shrinking them smaller and smaller in each new generation of semiconductor technology. However, it is becoming increasingly difficult to continue decreasing the power needed to switch transistors off and on, making it difficult to continue the pace of product innovation from scaling alone. New breakthroughs ranging from basic materials science to advanced devices and circuit architecture will be required, making the partnership between NSF and industry a natural fit for this work.

"These investments in nanoelectronics align closely with NSF's support for engineering and scientific research that furthers discovery," said Lawrence Goldberg, senior engineering advisor at NSF. "We believe these supplemental grants, which support graduate students and postdoctoral associates, will create innovative technologies and help find a solution to this significant issue facing the semiconductor industry today."

The joint NSF-NRI supplemental grants were awarded to teams at six NSF Centers in nanoelectronics research:

Columbia Nanoscale Science and Engineering Center (NSEC), directed by James Yardley at Columbia University, working with T. Heinz, P. Kim, K. Shephard and J. Hone.
Princeton Center for Complex Materials, directed by Nai-Phuan Ong, a Materials Research Science and Engineering Center (MRSEC) at Princeton University, working with E. Tutuc and N.P. Ong.

Q-Spins: Quantum and Spin Phenomena in Nanomagnetic Structures, directed by Evgeny Tsymbal, a MRSEC at University of Nebraska-Lincoln, working with K. Belashchenko, C. Binek and P. Dowben.
Center for Nanoscale Science, directed by Thomas Mallouk, a MRSEC at Pennsylvania State University, working with T. Mayer and S. Datta.
Center for Probing the Nanoscale, directed by Kathryn Moler, a NSEC at Stanford University, working with H.-S. Philip Wong.
· Center for Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems, directed by John Rogers, a NSEC at University of Illinois-Urbana-Champaign, working with E. Pop and J. Rogers.

These six NSF-NRI supplemental grants expand and strengthen the commitment to this public-private partnership program, which is in its fifth year with a total of 30 such awards.

Companies participating in NRI are AMD, GLOBALFOUNDRIES, IBM, Intel Corporation, Micron Technology and Texas Instruments. These companies will assign researchers to collaborate with the university teams. Strong interactions with the NSF-supported centers will be instrumental in NRI reaching its goal of demonstrating the feasibility of novel computing devices in simple computer circuits during the next five to 10 years.

About SRC-NRI

The Nanoelectronics Research Initiative is one of three research program entities of SRC. Celebrating 28 years of collaborative research for the semiconductor industry, SRC defines industry needs, invests in and manages the research that gives its members a competitive advantage in the dynamic global marketplace. Awarded the National Medal of Technology, America’s highest recognition for contributions to technology, SRC expands the industry knowledge base and attracts premier students to help innovate and transfer semiconductor technology to the commercial industry. For more information, visit http://nri.src.org [1].

About NSF

The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2010, its budget is about $6.9 billion. NSF funds reach all 50 states through grants to nearly 2,000 universities and institutions. Each year, NSF receives over 45,000 competitive requests for funding, and makes over 11,500 new funding awards. NSF also awards over $400 million in professional and service contracts yearly. For more information, visit http://www.nsf.gov [2].

NSF Center web sites, for reference:
· Columbia Nanoscale Science and Engineering Center, at Columbia University http://www.cise.columbia.edu/nsec/research/ [3]
· Princeton Center for Complex Materials, at Princeton University --

http://www.princeton.edu/~pccm/ [4]
· Q-Spins: Quantum and Spin Phenomena in Nanomagnetic Structures, at University of Nebraska-Lincoln -- http://www.mrsec.unl.edu/ [5]
· Center for Nanoscale Science, at Pennsylvania State University -- http://www.mrsec.psu.edu/research/irg3.asp [6]
Center for Probing the Nanoscale, at Stanford University -- http://www.stanford.edu/group/cpn/ [7]
· Center for Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems, at University of Illinois-Urbana-Champaign -- http://www.nano-cemms.uiuc.edu/ [8]

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http://www.ecnmag.com/news/2010/10/grants-fund-new-nanoelectronics-research-nsf-centers

Links:
[1] http://nri.src.org
[2] http://www.nsf.gov
[3] http://www.cise.columbia.edu/nsec/research/
[4] http://www.princeton.edu/~pccm/
[5] http://www.mrsec.unl.edu/
[6] http://www.mrsec.psu.edu/research/irg3.asp
[7] http://www.stanford.edu/group/cpn/
[8] http://www.nano-cemms.uiuc.edu/