



## **Semiconductor Research Corporation and National Science Foundation Award \$20 Million to Fund U.S. University Research on Nanoelectronics for 2020 and Beyond**

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 \$20 million for 12 four-year grants on nanoelectronics research.

These 12 interdisciplinary research teams at 24 participating U.S. universities will contribute to the goal of discovering a new switching mechanism using nanoelectronic innovations as a replacement for today's transistor—the foundational building block of computing technology that has driven not only the semiconductor industry, but the country's IT-driven economy for decades.

This competition, Nanoelectronics for 2020 and Beyond (NEB, NSF 10-614), is a component of the National Nanotechnology Initiative Signature Initiative with the same title."

The joint NSF-NRI grants were awarded to the following projects in nanoelectronics research and can be viewed in detail at the accompanying links:

- Scalable Sensing, Storage and Computation with a Rewritable Oxide Nanoelectronics Platform, directed by Jeremy Levy at University of Pittsburgh.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124131>
- Integrated Biological and Electronic Computation at the Nanoscale, directed by Timothy Lu at MIT.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124247>
- Developing a Graphene Spin Computer: Materials, Nano-Devices, Modeling, and Circuits, directed by Roland Kawakami at University of California at Riverside.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124601>
- Meta-Capacitance and Spatially Periodic Electronic Excitation Devices (MC-SPEEDs), directed by Jonathan Spanier at Drexel University.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124696>
- Hybrid Spintronics and Straintronics: New Technology for Ultra-Low Energy Computing and Signal Processing Beyond the Year 2020, directed by Supriyo Bandyopadhyay at Virginia Commonwealth University.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124714>
- Charge-Density-Wave Computational Fabric: New State Variables and Alternative Material Implementation, directed by Alexander Balandin at University

of California at Riverside.

<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124733>

- Ultimate Electronic Device Scaling Using Structurally Precise Graphene Nanoribbons, directed by Paulette Clancy at Cornell University.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124754>
- Nanoelectronics with Mixed-valence Molecular QCA, directed by Craig Lent at University of Notre Dame.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124762>
- Scalable Perpendicular All-Spin Non-Volatile Logic Devices and Circuits with Hybrid Interconnection, directed by Jian-Ping Wang at University of Minnesota at Twin Cities. <http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124831>
- Physics-Inspired Non-Boolean Computation Based on Spatial-Temporal Wave Excitations, directed by Wolfgang Porod at University of Notre Dame.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124850>
- Novel Quantum Switches Using Heterogeneous Atomically Layered Nanostructures, directed by Philip Kim at Columbia University.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1124894>
- Superlattice-FETs, Gamma-L-FETs and Tunnel-FETs: Materials, Circuits and Devices for Fast, Ultra-Low Power, directed by Mark Rodwell at University of California at Santa Barbara.  
<http://nsf.gov/awardsearch/showAward.do?AwardNumber=1125017>

NSF Divisions participating in this competition are the Division of Electrical, Communications and Cyber Systems (ECCS) in the Directorate for Engineering, the Division of Materials Research (DMR) and the Division of Chemistry (CHE) in the Directorate for Mathematical and Physical Sciences, and the Division of Computing and Communications Foundations (CCF) in the Directorate for Computer and Information Science and Engineering,

Companies participating in NRI are GLOBALFOUNDRIES, IBM, Intel Corporation, Micron Technology and Texas Instruments. These companies assign researchers to interact with the university teams. This kind of university-industry engagement will be instrumental in order for NRI to reach its goal of demonstrating the feasibility of novel computing devices in simple computer circuits during the next five to 10 years.