



Monthly Newsletter for June 2011

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R E S E A R C H I N I T I A T I V E

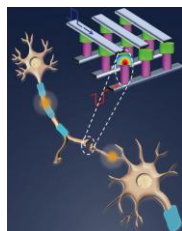
Dr. Jeffrey Welser, Director

NRI Community News



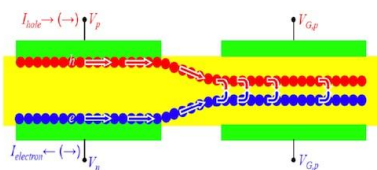
[University of Virginia Partners with Peer Institutions, Industry and the Commonwealth to Launch ViNC.](#)

The University of Virginia, in partnership with the College of William & Mary and Old Dominion University, has launched the **Virginia Nanoelectronics Center**, or **ViNC**, to advance research aimed at developing next-generation electronics. The center is supported by the Nanoelectronics Research Initiative, one of three research program entities of the Semiconductor Research Corporation. The initiative is funded by major semiconductor companies, Micron Technology, Intel, IBM, Texas Instruments and GLOBALFOUNDRIES, as well as the National Institute of Standards and Technology



[Stanford's Brain-Inspired Computing with Nanoelectronic Programmable Synapses.](#)

Duygu Kuzum, a postdoctoral researcher, is first author of a paper where she and her colleagues from H.-S. Philip Wong's Nanoelectronics Group at Stanford University demonstrate a new single element nanoscale device, based on the successfully commercialized phase change material technology, emulating the functionality and the plasticity of biological synapses.



[SWAN Researchers Simulate Graphene Transistors for Tomorrow's Electronic Devices.](#)

One of the solutions being pursued to continue to improve performance is the adoption of new device architectures or new materials. Dr. Bhagawan Sahu, a Research Physicist at The University of Texas at

Austin, is part of a nationwide search composed of hundreds of scientists and engineers at universities, research centers, and technology companies. Their goal: to find new nanoscale materials and effects that can be used to replace silicon transistors by the year 2020.

NRI Community Upcoming Events



[NCN Summer School: Electronics from the Bottom Up](#)

Location: Purdue University, West Lafayette, IN

When: **July 18-22, 2011** (Registration Deadline: **June 30, 2011**)

NCN's Electronics from the Bottom Up (EBU) is an innovative educational initiative co-sponsored by Intel, NCN, and Purdue University – to introduce students to new ways of thinking about electronic materials and devices. New concepts and approaches, emerging from current research on nanoscience, are applied to nonequilibrium problems like nanoscale

NRI Community Upcoming Events (cont'd)

transistors, energy conversion devices and bio-sensors. Lectures are designed to be broadly accessible to students with a BS in engineering, physics, and chemistry. The goal is to provide students with a deeper understanding of how structures at the atomistic and nanoscale affect performance at the micro and macroscopic scales. EBU shows students how a broad understanding of fundamental concepts helps understand cutting edge research in nanoscience and technology. *Attendance is limited to fifty participants.* [Register Now](#)

NRI Calendar of Upcoming Events

June 27: **NRI-NSF Liaison Team Visit to Penn State.** Team Members only.

June 28: **e-Workshop: Spin Wave Logic Devices and Architectures,** via WebEx 4pm EST

June 28: **SWAN Architecture Presentation** 1pm EST (contact [Kerry Bernstein](#) for more information)

July 5: **NRI-NSF Liaison Team Visit to Columbia.** Team Members only.

July 6: **NRI-NSF Liaison Team Visit to Princeton.** Team Members only.

July 6: **NRI Technical Program Group Meeting.**

July 13: **NRI Governing Council Meeting.**

July 26: **e-Workshop: Mixed Technology Architectures,** via WebEx

August 16, 17 & 18: **MIND Onsite Review** (preceded by the **NRI Architecture & Benchmarking Workshop**). Workshop on Tuesday, August 16, Review on Wednesday and Thursday, August 17 & 18. Both events will be held at McKenna Hall, Notre Dame, South Bend, IN. [REGISTRATION IS NOW OPEN!](#)

SAVE THE DATE! The Center Reviews and NRI Annual Review dates are set, put them on your calendar now so you won't forget. More info to come:

SWAN Onsite Review (preceded by **Techcon**): Review on Wednesday and Thursday, September 14 & 15 at the AT&T Conference Center in downtown Austin, TX.

INDEX Onsite Review: Wednesday and Thursday, September 21 & 22 at CSNE at SUNY-Albany, Albany, NY.

WIN Onsite Review: Thursday & Friday, October 7 & 8 at UCLA, Los Angeles, CA.

NRI Annual Review: Tuesday, Wednesday & Thursday, October 25, 26 & 27 at the Crowne Plaza Hotel in Rockville, MD (a few off-ramps south of NIST).

New Publications

Don't forget to submit your new publications to NRI regularly – see the “University Requests” section below for more information. Following are all publications submitted since May 14, 2011. *Remember that anything marked as a Pre-Publication should NOT be shared outside of the NRI member community.*

**Pre-publication – do not distribute outside of NRI.*

WIN CENTER – 1 publication, 3 pre-pub

[*Multi-Frequency Magnonic Logic Circuits for Parallel Data Processing](#)

[*Non-Volatile Magnonic Logic Circuits Engineering](#)

[*Formation and Device Application of Ge Nanowire Heterostructures via Rapid Thermal Annealing](#)

[Multi-Frequency Magnonic Logic Circuits for Parallel Data Processing](#)

INDEX CENTER – 1 publication, 4 pre-pubs

[*Graphene Nanoribbons: From Chemistry to Circuits](#)

[*Using Graphene Based Electron 'Optics' for High Efficiency Switching](#)

[*All-Spin Logic Device with Inbuilt Non-Reciprocity](#)

[*Domain Wall Induced Magnetoresistance in a Superconductor/Ferromagnet Nanowire](#)
[AC and DC Current-induced Motion of a 360° Domain Wall](#)

SWAN CENTER – 2 publication, 2 pre-pubs

[*Spike Timing-Dependent Synaptic Plasticity Using Memristors and Nano-crystalline Silicon TFT](#)

[*Ambipolar Nano-crystalline-silicon TFTs with Submicron Dimensions and Reduced Threshold Voltage Shift](#)

[Carbon-Based Supercapacitors Produced by Activation of Graphene](#)

[Effective Mobility of Single-Layer Graphene Transistors as a Function of Channel Dimensions](#)

[Hydrogenated Amorphous Silicon Nanowire Transistors with Schottky Barrier Source/Drain Junctions](#)

[Hebbian Learning in Spiking Neural Networks with Nano-crystalline silicon TFTs and Memristive Synapses](#)

MIND CENTER – 1 publications, 7 pre-pubs

[*III-V Tunnel Field-Effect Transistors](#)

[*Enhanced Valence Force Field Model for the Lattice Properties of Allium Arsenide](#)

[*NEMO5: A Parallel Multiscale Nanoelectronics Modeling Tool](#)

[*Interface Trap Density Metrology from Sub-threshold Transport in Highly Scaled Undoped Si n-FinFETs](#)

[*Enhancement of Thermoelectric Efficiency by Uniaxial Tensile Stress in n-Type GaAs Nanowires](#)



New Publications (cont'd)

MIND

[*Studies of Intrinsic Hot Phonon Dynamics in Suspended Graphene by Transient Absorption Microscopy](#)

[*Fundamentals and Current Status of Steep-Slope Tunnel Field-Effect Transistors Design and Optimization of Magnetic-Electrical Interfaces for NML Circuit Output](#)

University Requests

Pub Submission: it's your duty! Please send them to [Allison](#) when you *first* send in your paper to the publication for review and she will do the rest! No usernames or passwords to remember, just attach the pub, hit "SEND" and you will be in compliance with your Center's contract. Of course, it's up to our university members to get those pubs into us so please send us your papers and presentations. We might even start a contest for most pubs!

Any student or Postdoctoral Researcher participating in SRC research is required to register for an SRC web account, whether they are directly funded by the contract or leveraged from another source. That's right, if you are an NRI supported student all you have to do is follow these simple directions on the new SRC website:

Students or Postdoctoral researchers new to SRC:

- Go to the SRC website at <https://www.src.org/app/account/sign-in/> to register for a web account including completing the academic information portion of the form. We recommend that all students upload their resume. Our member companies have recruiters that look at this site first when they have positions to fill.

Student or postdocs who have previously been on SRC research:

- Update your graduation date, advisor, research task # and resume at <https://www.src.org/app/account/edit/education/>

Please be sure *all* your NRI students and post-docs are registered on the website and that their information (particularly *graduation date*) is current. For questions or help contact leeann.clewell@src.org

Should you have any questions, ideas, information to share, website issues or just want to talk about NRI, please call or email [Allison](#) at 919-941-9433, she will be happy to help!

If you no longer are interested in receiving the NRI Newsletter, please reply to this email saying so and you will be removed from the list.