



Monthly Newsletter for April 2012

a n o e l e c t r o n i c s
R E S E A R C H I N I T I A T I V E

Dr. Jeffrey Welser, Director

NRI in the News



INDEX Graduate Research Assistant Wins Excellence Award. Congratulations to Shaloo Rakheja who received the Graduate Research Assistant Excellence Award from the School of Electrical and Computer Engineering at the Georgia Institute of Technology. This award consists of a \$500 check and a plaque that she will receive at the ECE Award Ceremony on April 25. Shaloo's research on the latency and energy costs of communicating novel state variables has been funded by INDEX and Intel PhD Fellowship.

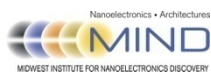


MIND Researchers Announce Breakthroughs in the Development of TFETs. Researchers at Penn State and the University of Notre Dame have announced breakthroughs in the development of tunneling field effect transistors (TFETs), a semiconductor technology that takes advantage of the quirky behavior of electrons at the quantum level. Prof. Suman Datta and Doctoral Student Dheeraj Mohata both from PennState are pictured. Read the entire article at [PennState Live](#).

NRI Review Season 2012

SAVE THE DATE!

NOTE: New days and dates for INDEX and the NRI Annual Review.



MIND Onsite Review: August 14, 15 & 16 (including the Benchmarking Workshop on the 14th) at McKenna Hall, Notre Dame.



SWAN Onsite Review: September 12 & 13, following TECHCON, at The Commons at the J. J. Pickle Research Center, Austin.



INDEX Onsite Review: Tuesday and Wednesday, September 25 & 26 at CSNE at SUNY-Albany, Albany, NY.



WIN Onsite Review: Thursday, October 4 at UCLA, Los Angeles, CA.



NRI Annual Review: Tuesday, Wednesday & Thursday, *November 6, 7 & 8* in the Washington D.C. area.

NRI Community Upcoming Events



IEEE NANO 2012: 12th IEEE International Conference on Nanotechnology

Heat Dissipation in Nanocomputing

Heat dissipation is a critical challenge for post-CMOS nanocomputing circuits and systems. A new technical track on Heat Dissipation in Nanocomputing has been added to the technical program for IEEE NANO 2012. The TPC subcommittee for this track encourages submissions related to all aspects of this critical issue - from the fundamental to the practical - including but not limited to:

- Logical Irreversibility, Landauer's Principle, and Nanocomputing
- State Variables and Heat Dissipation
- Energy Efficient Nanodevices and Circuits
- Novel Low Power Nanocomputing Paradigms (e.g. reversible nanocomputing)
- Heat Dissipation, Thermal Noise, and Soft Errors in Nanocircuits
- Architectural Strategies for Low Power Nanocomputing
- Heat Removal Strategies and Limits

When: August 20-23, 2012

Where: The International Convention Centre, Broad Street, Birmingham, UK

Abstract Deadline: April 16, 2012 [more information](#)

Full Submission: June 20, 2012



IEEE International SoC Conference

Andrew Marshall (Texas Instruments) is chairing a special session on emerging technologies at this year's System on Chip conference. The session is soliciting original, unpublished work in digital, analog and RF circuit and device developments in spin logic, multiferroics, graphene, carbon nanotube, FinFET, nanopillars, TFET, Spintronic Logic Devices, Quantum Coherence, Phase transition switches, Straintronics, Superlattice-FETs, Spin Transfer Torque Devices, Magnetic Logic, graphene and SOI.

When: September 12-14, 2012

Where: Sheraton at the Falls/Niagara Convention Center, Niagara Falls, NY

Abstract Deadline: ~~April 16, 2012~~ Extended to **APRIL 30**

Full Submission: April 23, 2012

Please click on the link for Registration, cost and additional information: <http://www.ieee-socc.org/>

NRI Community Upcoming Events (cont'd)



70th Device Research Conference

For the last seven decades, the Device Research Conference has brought together leading scientists, researchers, and graduate students from varied disciplines in academia and industry to share their latest research and discoveries in the field. The university setting of the conference encourages open technical discussion on recent breakthroughs and advances in device research, and provides a great atmosphere for social events. The technical program consists of invited, oral, and poster presentations. In addition, the conference will hold three evening rump sessions aimed at engaging the audience in vigorous discussions on important challenges and questions facing the device research community. The Device Research Conference has a tradition of strong graduate student participation. This is recognized by offering student travel support and a Best Student Paper Award.

When: June 18 – 20, 2012

Where: Penn State University, University Park, PA

Abstract Deadline: CLOSED

Please click on the link below for Registration, cost and additional information:

www.deviceresearchconference.org

NRI Calendar of Upcoming Events

April 24: [e-Workshop: Graphene PN Junction Devices](#) (Prof. Ji Ung Lee, Univ. Albany-SUNY)

May 3: [CMU NEB2020 Liaison Team Visit](#) (Team Members Only)

May 4 (Friday): TPG Meeting

May 8: [e-Workshop: Issues with Characterizing Transport Properties of Graphene Field Effect Transistors](#) (Prof. Eric Vogel, Georgia Tech)

May 15 (Tuesday): GC Meeting

May 16: [Univ. of Minnesota NEB2020 Liaison Team Visit](#) (Team Members Only)

May 22: [e-Workshop: Jeremy Levy from the University of Pittsburgh on a topic yet to be determined.](#)

May 29: [Univ. of Nebraska-Lincoln MRSEC Liaison Team Visit](#) (Team Members Only)

May 30: [Northwestern MRSEC Liaison Team Visit](#) (Team Members Only)

May 31: **Notre Dame NEB2020 Liaison Team Visits** (Team Members Only)
[Prof. Porod's group](#) in the morning, [Prof. Lent's group](#) in the afternoon.

New Publication

Please submit your pubs! It is your contractual obligation to NRI. 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 March 19, 2012. *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 – 0 publication, 1 pre-pub

**[Cascade-like Signal Propagation in Chains of Concave Nanomagnets](#)*

INDEX CENTER – 0 publication, 0 pre-pubs

SWAN CENTER – 2 publication, 0 pre-pubs

†[Scaling of Al\(2\)O\(3\) Dielectric for Graphene Field-effect Transistors](#)

†[Direct Measurement of the Fermi Energy in Graphene Using a Double-Layer Heterostructure](#)

in conjunction with Princeton University

MIND CENTER – 0 publications, 4 pre-pubs

**[Exploration of Vertical MOSFET and Tunnel FET Device Architecture for Sub 10nm Node Applications](#)*

**[Transistors with Chemically Synthesized Layered Semiconductor WS₂ Exhibiting 10⁵ Room Temperature Modulation and Ambipolar Behavior](#)*

**[Demonstration of Improved Heteroepitaxy, Scaled Gate Stack and Reduced Interface States Enabling Heterojunction Tunnel FETs with High Drive Current and High On-Off Ratio](#)*

**[AlGaSb/InAs Tunnel Field-Effect Transistors](#)*

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.