



Monthly Newsletter for January 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



Call for NRI/Hans Coufal Fellowship due February 15, 2012. All NRI students are welcome to apply. We would also encourage our professors and industry members who have had contact with a noteworthy student to investigate this as well. [More information here.](#)

[Center Year-End Reports](#) available now on SRC website.



INDEX Center Student Wins APS Outstanding Dissertation Award

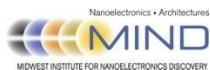
Purdue University, part of the INDEX Center, Graduate Student Srikant Srinivasan has been awarded the 2012 Outstanding Dissertation in Magnetism Award from the American Physical Society (APS), Topical Group on Magnetism (GMAG). As part of this award he will be giving an invited presentation at the APS March 2012 meeting in Boston. His PhD thesis is titled "All Spin Logic: Multi-magnet Networks interacting via Spin Currents."

These award recognize students who have conducted outstanding research leading to their dissertation, and consist of an invited talk in an appropriate session at the APS March Meeting, a \$500 prize to the student, and up to \$250 toward his/her travel expenses to the APS March Meeting. He is advised by Professor Supriyo Datta.

NRI Review Season 2012

SAVE THE DATE!

The Center Reviews for 2011 may be done, but we've got 2012 lined up already!



MIND Onsite Review: August 14, 15 & 16 (including a Workshop) 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: Wednesday and Thursday, September 19 & 20 at CSNE at SUNY-Albany, Albany, NY.



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



NRI Annual Review: Tuesday, Wednesday & Thursday, October 30, 31 & Nov. 1 in the Washington D.C. area.

NRI Community Upcoming Events



nanoHUB – Fundamentals of Nanoelectronics

Two 5-week classes taught by **Prof. Supriyo Datta** based on unique courses developed by him whose videotaped lectures posted on the nanoHUB have attracted 75,000+ viewers since 2004.

When: begins **January 23, 2012** *Register quickly!*

Where: on line (password and log-in sent after registration)

Cost: \$30 per course

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

<https://nanohub.org/groups/purdue>



DAC 2012

Abstracts must be submitted by November 29th, 2011. Final manuscripts (6 pages, with up to 4 additional pages of supplementary material) are due on December 5th, 2011. Papers that encompass novel and unpublished NRI-related research efforts are encouraged!

The call for contributions can be found at: <http://www.dac.com/call+for+contributions.aspx>

When: June 3-7, 2012

Where: Moscone Center, San Francisco, CA

Abstract Deadline: CLOSED

Please click for [Registration, Hotel Logistics and Technical Program information](#).

NRI Calendar of Upcoming Events

January 11: TPG Meeting

January 18: GC Meeting

January 24: [e-Workshop: Novel STT Device and Circuit Scheme to Enable All-Metallic Logic](#)

February 1: TPG Meeting

February 22: [e-Workshop: Straintronics: Ultra Low-power Nanomagnetic Computing with Multiferroics](#)

Thank you to all the NRI PIs for their enthusiasm over the NRI e-Workshop Series, we have enough for two per month this year! We still have three dates open: March 6, July 10 and October 16. Please drop Allison an email if you'd like to take one of the spots.

New Publication

NOTE: All the NRI [Center Year-End Reports](#) are currently available on the website.

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 November 16, 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 – 3 publication, 1 pre-pub

[**Computing in Thermal Equilibrium With Dipole-Coupled Nanomagnets*](#)

[*A Body-Voltage-Sensing-Based Short Pulse Reading Circuit for Spin-Torque Transfer RAMs \(STT-RAMs\)*](#)

[*Low Writing Energy and Sub Nanosecond Spin Torque Transfer Switching of In-plane Magnetic Tunnel Junction for Spin Torque Transfer Random Access Memory*](#)

[*Thermal Stability Characterization of Magnetic Tunnel Junctions Using Hard-axis Magnetoresistance Measurements*](#)

INDEX CENTER – 0 publication, 2 pre-pubs

[**APS-GMAG Dissertation Award talk: All Spin Logic*](#)

[**System-Level Optimization and Benchmarking of Graphene pn Junction Logic System Based on Empirical CPI Model*](#)

SWAN CENTER – 4 publication, 0 pre-pubs

[*Atomic Layer Deposited Al₂O₃ Dielectrics Using Ozone Functionalization of Graphene*](#)

[*Ozone Functionalization of Graphene for Atomic Layer Deposition \(ALD\) of Dielectrics: in-situ Studies Investigation of Tunneling Current in SiO\(2\)/HfO\(2\) Gate Stacks for Flash Memory Applications \(with MIND Center\)*](#)

[*Graphene Moire Patterns Observed by Umklapp Double-Resonance Raman Scattering*](#)

MIND CENTER – 6 publications, 10 pre-pubs

[**Performance of AlGaSb/InAs TFETs with Gate Electric Field and Tunneling Direction Aligned*](#)

[**Wafer-Scale Graphene Nanoribbons for Tunnel FET Applications*](#)

[**Scaling Length Theory of Double Gate Inter-band Tunnel Field Effect Transistor*](#)

[**Switching Behavior of Lithographically Fabricated Nanomagnets for Logic Applications*](#)

[**Making Non-Volatile Nanomagnet Logic Non-Volatile*](#)

[**Fabrication of Top-gated Epitaxial Graphene Nano-ribbon FETs Using Hydrogen-silsesquioxane \(HSQ\)*](#)

[**InGaAs/InP Tunnel FETs with a Subthreshold Swing of 93 mV/dec and I\(ON\)/I\(OFF\) Ratio near 10\(6\)*](#)

[**Demonstration of MOSFET-Like On-Current Performance in Arsenide/Antimonide Tunnel FETs with Staggered Hetero-junctions for 300mV Logic Applications*](#)

[**Influence of Cross-section Geometry and Wire Orientation on the Phonon Shifts in Ultra-scaled Si Nanowires*](#)

[**Shape and Orientation Effects on the Ballistic Phonon Thermal Properties of Ultra-scaled Si Nanowires*](#)



[Nanoelectronics Research Initiative](#)

[Interface Traps and Low Subthreshold Swing in III-V Tunnel FETs](#)

[Fulfilling Digital Logic Requirements by Tunnel Transistors](#)

[Strain Effects on the Phonon Thermal Properties of Ultra-scaled Si Nanowires](#)

[Half-cycle Atomic Layer Deposition Studies of HfO\(2\) on GaSb Surfaces \(with FCRP MSD Center\)](#)

[Atomistic Nanoelectronic Device Simulations with Sustained Performances up to 1.44 PFlop/s](#)

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.