

## NCN Nanophotonics and Metamaterials

NCN-SLC holds an NCN Student Research Symposium (NSRS) in Spring/ Summer each year. The purpose is to bring together students from the various research groups working on nanoscience and computational disciplines and provide a forum for sharing of ideas and knowledge.

### NCN Student Research Symposium 2009 (NSRS 2009)

This year NSRS was held on June 16, 2009 in conjunction with the NCN Annual Site Visit. There were 17 presentations, 12 posters and about 40 attendees, with an average attendance of 20 in each presentation.

#### Topics:

Theoretical and experimental research related to Nanoscience/ technology and computational science useful for simulations in this area.

#### Full Schedule:

The full schedule with the presentation abstracts is available in this pdf document:  
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8:30 am – 9:30 am

#### Continental Breakfast

(MRGN Lobby, Purdue University)

#### Presentation Session I – Devices

(MRGN 129, Purdue University)

9:30 am – 9:45 am

Behdash Behin-Aein

#### *1.1 Proposal for an All-Spin Transistor with Built-In Memory*

9:45 am – 10:00 am

Neerav Kharche

#### *1.2 Simulation study and tool development for ultra-scaled In-As HEMTs*

10:00 am – 10:15 am

Dionisis Berdebes

#### *1.3 Analysis and characterization of graphene-on-substrate devices*

10:15 am – 10:30 am

Shuaib Salamat

**1.4 Importance of Diameter Distributions for Directly-Bridging CNT Array transistors**

10:30 am – 10:45 am

Break

10:45 am – 11:00 am

Xiaoguang (Leo) Liu

**1.5 Evanescent-mode Cavity Based Tunable RF MEMS Resonators and Filters**

11:00 am – 11:15 am

Himadri Pal

**1.6 Simulation study of Schottky barrier III-V MOSFETs**

11:15 am -11:30 am

Jing Ouyang

**1.7 Design of multimode three-dimensional photonic crystal cavities for enhanced anti-Stokes Raman scattering**

11:30 am – 11:45 am

Fengyuan (Thomas) Li

**1.8 Online Modeling and Simulation Tool for a MEMS Thermal Actuator by Integrating Distributed and Lumped Analyses**

11:45 am – 12:00 noon

Jean Michel Sellier

**1.9 A tool for 1D heterostructures: 1DHetero**

**Lunch and Poster Exhibit**

12:00 noon-1:30 pm

**(MRGN Lobby, Purdue University)**

Nicholas Adam Valley, “SERS and SEHRS of Large Molecules and Molecule-Nanoparticle Complexes”

Daniel Kiracofe, “VEDA: Virtual Environment for Dynamic AFM”

Deepanjan Datta, “Spin Torque: Manifestation and Benchmark”

Alex Haas, “Loss Mechanisms Resulting from the Distributed Emitter Effect in Concentrator Solar Cells”

Himadri Pal, “Simulation study of Schottky barrier III-V MOSFETs”

Yunan Zheng, “Active Media FDTD Nanophotonic Device Simulator”

Tomekia Simeon, “NCN@NU: Research and Education Nanotech”

John Wilcox, “A Case Study of System Power Efficiency Loss Mechanisms in a Multijunction, Spectral Splitting, Concentrator Solar Cell System”

Amrit Palaria

Lutfi Siddiqui

Abhijeet Paul

Neerav Kharche

## **Presentation Session II – Properties of Materials for Devices**

**(MRGN 129, Purdue University)**

1:30 pm – 1:45 pm

Ya Zhou

**2.1 Thermal conduction in metallic nanostructures via molecular dynamics**

1:45 pm – 2:00 pm

Dhanoop Varghese

**2.2 Multi-probe Interface Characterization of  $In_{0.65}Ga_{0.35}As/Al_2O_3$  MOSFET**

2:00 pm – 2:15 pm

Lutfi Siddiqui

**2.3 A bottom-up approach to thermoelectricity and its application to molecular thermoelectric devices**

2:15 pm – 2:30 pm

Ravi Pramod Vedula

**2.4 Characterization of amorphous silica using molecular dynamics**

2:30 pm – 2:45 pm

Break

2:45 pm – 3:00 pm

Abigail Hunter

**2.5 Phase Field Micro-Mechanical Model (PFMM): Performance Analysis and Interface Effects in the Plastic Response of FCC Crystalline Materials**

3:00 pm – 3:15 pm

Abhijeet Paul

**2.6 Application of Tight-Binding based VCA model to Si-Ge systems**

3:15 pm – 3:30 pm

Yumi Park

**2.7 Strain relaxation in Si/Ge/Si nanoscale bars from molecular dynamics simulations**

3:30 pm – 3:45 pm

Amrit Palaria

**2.8 Orthogonal tight binding for bandstructure of strained Si/ strained Ge/ strained Si hetero nanowires**

## Call for Abstracts

Flier: (file:nsrs\_poster\_09.pdf not found). Please email a short abstract (150 words) to [ncn.slc.amrit@gmail.com](mailto:ncn.slc.amrit@gmail.com) or to [aeislam@purdue.edu](mailto:aeislam@purdue.edu). Only electronic versions in MS Word or pdf formats shall be considered. The deadline for abstract submission is 11:59 PM CST on **Wednesday, June 10, 2009**. **Please note that the abstract is for the presentation only and a full length paper is NOT required.** There will be a total of 20 presentations, evenly divided between the two sessions. A computer with MS Powerpoint and projector shall be provided. The accepted presenters shall be notified by June 12, 2009 and they are highly encouraged to email a copy of the Powerpoint slides for their presentations by June 15, 2009 to avoid delays on the day of the symposium. Each speaker shall be provided a maximum of 15 mins for their presentation and question/ answer session. We recommend 11 mins of presentation and 4 mins of Q/A, but this distribution is solely at the speaker's discretion.

## Call for Posters

All students who will exhibit posters to the NCN Site Visit Team on June 17 are recommended to also participate in the Poster Session on Jun 16, which will act as a dry run for their posters. Other students are invited to exhibit posters showcasing their research. You can bring the posters along with you on Jun 16. We will have a stand and board ready for you. However, you need to RSVP to [ncn.slc.amrit@gmail.com](mailto:ncn.slc.amrit@gmail.com) by 11:59 PM CST on **Friday, June 12, 2009** that you wish to exhibit a poster at the symposium. **Here is the template for the poster:** (file:2009\_ncn\_poster\_template\_landscape.ppt not found).

## Note to Presenters

To avoid delays on the day of the Symposium, please email a copy of your ppt slides to [ncn.slc.amrit@gmail.com](mailto:ncn.slc.amrit@gmail.com). Please name your file as **NSRS\_Presenter\_Serial**.

**Example:** Presentation with serial number 3.1 by Mr. Smart One would be sent as: NSRS\_Smart\_3.1.ppt or NSRS\_Smart\_3\_1.ppt

## NCN Student Research Symposium 2008 (NSRS 2008)

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The first NSRS in 2008 was a success with very exciting and high quality research presentations from students across Purdue.

**Date:** May 27 2008 (Tuesday), 10:00am ~ 3:30pm

**Venue:** Burton D. Morgan Center for Entrepreneurship (MRGN 121), Purdue University

**Agenda and abstracts:** (file:nsrs\_2008\_agenda\_abstracts\_final.pdf not found)