

**2<sup>ND</sup> WORKSHOP ON MULTIFUNCTIONAL NANOMATERIALS (WMN)**  
**9<sup>TH</sup> WORKSHOP ON FRONTIER IN ELECTRONICS (WOFE-2015)**

**DECEMBER 15-18, 2015, CARIBE HILTON HOTEL  
SAN JUAN, PR, USA**

**SCIENTIFIC PROGRAM**

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# WMN & WOFE-15 Scientific Program

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# WMN & WOFE-15 Scientific Program

## Invited Speakers

**Dr. Manijeh Razeghi**

Northwestern University  
Evanston, IL 60208, USA

**Dr. Djafar K. Mynbaev,**

City University of New York, NY, USA

**Dr. Akihiko Yoshikawa**

Chiba University, Japan

**Dr. Meredith L. reed**

US Army Research Laboratory, MD, USA

**Dr. Jean Heremans**

Virginia Tech, VA, USA

**Dr. F. Andrieu**

S T Microelectronics, Crolles, France

**Dr. W. Knap**

CNRS & Montpellier University, Montpellier, France  
Polish Academy of Sciences Warsaw, Poland

**Dr. Lucas Czornomaz**

IBM Zurich Research Laboratory, Switzerland

**Dr. Ashwin. K. Pradhan**

Norfolk State University, Norfolk, VA, USA

**Dr. S. Rupper**

Army Research Office, USA

**Dr. K. Kukushima**

Tokyo Institute of Technology, Japan

**Dr. David Tománek**

Michigan State University,  
East Lansing, MI, USA

**Dr. Christian Binek,**

University of Nebraska-Lincoln, USA

**Dr. Rama K. Vasudevan**

Oak Ridge National Laboratory, TN, USA

**Dr. Dimitris Tsoukalas**

National Technical University of Athens  
Athens, Greece

**Dr. James E. Butler**

Russain Academy of Sciences, Russia

**James C. M. Hwang,**

Lehigh University, PA, USA

**Dr. Douglas B. Chrisey**

Tulane University, New Orleans, LA

**Dr. S. Rudin**

Army Research Office, USA

**Dr. D. Veksler**

NIST, USA

**Dr. F. Andreiu**

CEA/LETI, France

## WMN & WOFE-15 Scientific Program

Tuesday, December 15, 2015	
3:00pm – 6:00pm	Registration-- Main Lobby
Wednesday, December 16, 2015	
7:00 am-8:00 am	Registration and Breakfast-- Flamingo Foyer
8:00 am -8:10 am	Opening Remarks: Flamingo A & B- R. Palai
<b>Session I: Optoelectronic Materials &amp; Devices-- Flamingo A &amp; B</b> <b>Chair: M. Shur &amp; XX</b>	
8:10 am- 9.10 am <b>(Plenary Talk)</b>	<b>Optoelectronics for any occasion with modern band structure engineering</b> <u>Manijeh Razeghi</u> Center for Quantum Devices, Northwestern University, Evanston, IL 60208, USA
9:10 am- 9:40 am <b>(Invited Talk)</b>	<b>Optical communications: At the turning point</b> <u>Djafar K. Mynbaev</u> , City University of New York, NY, USA
9:40 am- 10:10 am <b>(Invited Talk)</b>	<b>Systematic Study on Dynamic Atomic Layer Epitaxy (D-ALEp) of InN on/in GaN Matrix and Its Extension for Whole III-N (AlN/GaN/InN) system</b> <u>Akihiko Yoshikawa</u> , Chiba University, Japan
10:10 am-10:30 am	Break-- Flamingo Foyer
10:30am-11:00am <b>(Invited Talk)</b>	<b>Multiscale Modeling for the Design and Advancement of Electronic Materials</b> <u>Meredith L. Reed</u> CAM Multiscale Modeling of Electronic Materials CRA, US Army Research Laboratory, 2800 Powder Mill Rd, Adelphi, Md 20783
11:00am-11:30am <b>(Invited Talk)</b>	<b>Electron quantum interference, electromagnetic mapping, and their uses</b> <u>Jean Heremans</u> Virginia Tech, VA, USA
11:30am-11:50am	<b>Optoelectronic switch based on intrinsic dual Schottky diodes in ambipolar MoSe<sub>2</sub> field-effect transistors</b>

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	<p><b>Nihar R. Pradhan</b><sup>1</sup>, Zhengguang Lu<sup>1</sup>, Daniel Rhodes<sup>1</sup>, Dmitry Smirnov<sup>1</sup>, Efstratios Manousaki<sup>1,2,3</sup> and Luis Balicas<sup>1,*</sup></p> <p><sup>1</sup>National High Magnetic Field Lab, Florida State University, 1800 E. Paul Dirac Drive, Tallahassee, Florida 32310, USA</p> <p><sup>2</sup>Florida State University, Department of Physics, Tallahassee, FL 32306, USA</p> <p><sup>3</sup>Department of Physics, University of Athens, Panepistimioupolis, Zografos, GR-157 84 Athens, Greece.</p>
11:50am-12:10pm	<p><b>Photoluminescence Modeling of AlGaIn Epilayers and Heterostructures with Optical and Electrical Damage</b></p> <p><b>A. Dobrinsky</b><sup>1</sup>, Max Shatalov<sup>2</sup>, Michael Shur<sup>3</sup></p> <p><sup>1</sup>Sensor Electronic Technology, Loudonville, NY 12211</p> <p><sup>2</sup>Sensor Electronic Technology, Columbia SC, 29209</p> <p><sup>3</sup>Rensselaer Polytechnic Institute, Troy, NY 12180</p>
12:10 noon-1:30pm	<b>Lunch -- Flamingo C &amp; D</b>
<p><b>Session II: Emerging Technology &amp; Devices</b></p> <p><b>Chair:</b></p>	
1:30 pm -2:00 pm (Invited Talk)	<p><b>Context and Future Prospects of UTBB FDSOI Technology</b></p> <p><b>F. Andrieu</b>, S. Morvan, R. Berthelon*, M. Vinet, M. Haond*</p> <p>CEA-LETI, Minatec campus, 17 rue des Martyrs, 38054 Grenoble, France;</p> <p>* STMicroelectronics, 850 rue Monnet, F-38926 Crolles, France</p>
2:00 pm -2:30 pm (Invited Talk)	<p><b>Terahertz Plasma FETs from Basic Physics to First Fast Terahertz Scanners</b></p> <p><b>W. Knap</b><sup>1,2</sup>, D.Coquillat<sup>1</sup>, N.Dyakonova<sup>1</sup>, F.Teppe<sup>1</sup>, M.Sypek<sup>3</sup></p> <p><sup>1</sup>Charles Coulomb Laboratory, CNRS &amp; Montpellier University, Montpellier, France</p> <p><sup>2</sup>High Pressure Institute Polish Academy of Sciences Warsaw, Poland</p> <p><sup>3</sup>Optical Information Processing Laboratory, Warsaw University of Technology, Poland</p>
2:30 pm -3:00 pm	<b>Hybrid III-V/SiGe technology platform for CMOS and</b>

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<b>(Invited Talk)</b>	<p><b>beyond</b>  <u>Lukas Czornomaz</u>, Veeresh Deshpande, Vladimir Djara, Eamon O'Connor, Marilyne Sousa, Daniele Caimi, Heinz Siegwart and Jean Fompeyrine          IBM Zurich Research Laboratory, Saumerstrasse 4, 8803 Ruschlikon, Switzerland</p>
<b>3:00 pm-3:20 pm</b>	<b>Break- Flamingo Foyer</b>
3:20am-3:40am	<p><b>Nanocarbon Materials: From Fuel Cells to DNA Sensing</b>  <u>Carlos R. Cabrera</u>  <i>Department of Chemistry, Molecular Sciences Research Center, University of Puerto Rico at Río Piedras          San Juan, Puerto Rico 00936-8377</i></p>
3:40am-4:10am <b>(Invited Talk)</b>	<p><b>Artificial Nanostructures for high-performance Biosensing Devices</b>  <u>A. K. Pradhan</u>, and Bo Xiao,          Department of Engineering and Center for Materials Research, Norfolk State University, Norfolk, VA 23454 USA</p>
4:10am-4:30am	<p><b>Ti-and Li-Doped ZnO Nanoparticles as Novel Direct Generator of Singlet Oxygen for Potential Biomedical Applications</b>          Milton A. Martinez Julca<sup>1,3</sup>, Ivonnemary Rivera<sup>2,3</sup>, <u>Oscar Perales-Perez</u><sup>3</sup>, Sonia Bailon<sup>4</sup>  <sup>1</sup>Department of Physics, University of Puerto Rico, Mayaguez, PR, USA  <sup>2</sup>Department of Chemical engineering, University of Puerto Rico, Mayaguez, USA  <sup>3</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayaguez, USA  <sup>4</sup>Department of Chemistry, University of Puerto Rico, Mayaguez, PR, USA</p>
4:30 pm -5:00 pm <b>(Invited Talk)</b>	<p><b>Unexpected electronic properties of layered semiconductors beyond graphene</b>  <u>David Tománek</u>          Physics and Astronomy Department, Michigan State University,</p>

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	East Lansing, MI 48824, USA
5:00pm-5:30pm (Invited Talk)	<b>The Effect of Ungated Regions on the Response of Partially Gated Field Effect Transistors Used as Plasmonic Terahertz Detectors</b> <b>G. Rupper<sup>a</sup></b> , S. Rudin <sup>a</sup> , and M. Shur <sup>b</sup> <sup>a</sup> U.S. Army Research Laboratory, Adelphi, Maryland 20783, USA <sup>b</sup> Rensselaer Polytechnic Institute, Troy, New York 12180, USA
5:30pm-6:00pm (Invited Talk)	<b>Wave Propagation and Plasma Instability in Gate-Controlled Two-Dimensional Conduction Channels.</b> <b>S. Rudin<sup>a</sup></b> , G. Rupper <sup>a</sup> , M. Reed <sup>a</sup> , and M. Shur <sup>b</sup> <sup>a</sup> U.S. Army Research Laboratory, Adelphi, Maryland 20783, USA <sup>b</sup> Rensselaer Polytechnic Institute, Troy, New York 12180, USA

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Thursday, December 17, 2015	
7:00 am-8:00 am	<b>Registration and Breakfast-- Flamingo Foyer</b>
<b>Session III: Multifunctional &amp; Spintronics Materials &amp; Devices -- Flamingo A &amp; B</b> <b>Chair:</b>	
8:00 am- 8:30 am (Plenary Talk)	<b>Voltage-controlled exchange bias in lithographically patterned heterostructures</b> <b><u>Christian Binek</u></b> , W. Echtenkamp, M. Street, A. Mahmood, J. Wang, K. Belashchenko, P. Dowben Department of Physics & Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, USA
8: 30am- 9:00 am (Invited Talk)	<b>Big-Data Scanning Probe Microscopy: Insights and Physics from Mesoscopic and Atomic-Level Studies on Complex Oxides</b> <b><u>R. K. Vasudevan</u></b> <sup>1</sup> , H. Dixit <sup>1</sup> , A. Tselev <sup>1</sup> , S. Zhang <sup>2</sup> , N. Bassiri-Gharb <sup>3</sup> , P. Ganesh <sup>1</sup> , A. P. Baddorf <sup>1</sup> and S. V. Kalinin <sup>1</sup>  <sup>1</sup> Center for Nanophase Materials Sciences, and Institute for Functional Imaging of Materials, Oak Ridge National Laboratory, Oak Ridge TN 37831, USA <sup>2</sup> Department of Materials Science and Engineering, Materials Research Institute, Pennsylvania State University, University Park, PA, 16802, USA <sup>3</sup> School of Materials Science and Engineering, and G.W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA
9: 00am- 9:20 am	<b>Towards High-Voltage MOSFETs in Ultrathin FDSOI</b> A. Litty, S. Ortolland, <b><u>S. Cristoloveanu</u></b> <sup>1</sup> STMicroelectronics, Crolles, France <sup>2</sup> IMEP-LAHC, Grenoble Institute of Technology, Minatec, France
9.20am-9:50am (Invited Talk)	<b>Mechanism Study of Reversible Resistivity Change in Oxide Thin Films</b> <b><u>Seungbum Hong</u></b> <sup>a</sup> , Seo Hyoung Chang <sup>a</sup> , Charudatta Phatak <sup>a</sup> , Blanka Magyari-Kope <sup>b</sup> , Yoshio Nishi <sup>b</sup> , Soma Chattopadhyay <sup>c,d</sup> and Jung Ho Kim <sup>d</sup>



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	<p><sup>a</sup>Materials Science Division and <sup>d</sup>Advanced Photon Source, Argonne National Laboratory, Lemont, IL</p> <p><sup>b</sup>Department of Electrical Engineering, Stanford University, Stanford, CA</p> <p><sup>c</sup>Elgin Community College, 1700 Spartan Drive, Elgin, IL</p>
9:50am-10:10am	<p><b>Valley splitting and polarization by the Zeeman effect in monolayer transition-metal dichalcogenides</b></p> <p>J. Ludwig<sup>1,2</sup>, Z. Lu<sup>1,2</sup>, Z. Li<sup>1</sup>, <b>D. Smirnov<sup>1*</sup></b>, Y. Li<sup>3</sup>, T. Low<sup>3</sup>, A. Chernikov<sup>3</sup>, X. Cui<sup>3</sup>, G. Arefe<sup>3</sup>, Y. D. Kim<sup>3</sup>, A. M. van der Zande<sup>3</sup>, A. Rigosi<sup>3</sup>, H. Hill<sup>3</sup>, J. Hone<sup>3</sup>, T.F. Heinz<sup>3</sup></p> <p><sup>1</sup>National High Magnetic Field Laboratory, Tallahassee, Florida 32312, USA</p> <p><sup>2</sup>Florida State University, Department of Physics, Tallahassee, FL 32306, United States</p> <p><sup>3</sup>Columbia University, New York, New York 10027, USA</p>
10:10 am-10:30 am	<b>Break-- Flamingo Foyer</b>
10:30am- 10:50 am	<p><b>Synthesis and study of magnetic and transport properties of La<sub>0.5</sub>Sr<sub>0.5</sub>MnO<sub>3</sub> Thin Films</b></p> <p>Kamlesh Yadav<sup>1,2</sup>, H. K. Singh<sup>3</sup>, K. K. Maurya<sup>3</sup> and <b>G. D. Varma<sup>1*</sup></b></p> <p><sup>1</sup>Department of Physics, Indian Institute of Technology Roorkee, Roorkee-247667, India</p> <p><sup>2</sup>Centre for Physical and Mathematical Sciences, Central University of Punjab, Bathinda-151001, India</p> <p><sup>3</sup>National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi-110012, India</p>
10:50 am-11:10 am	<p>Magnetolectric coupling in multiferroics bulk and single crystal</p> <p><b>Ratnakar Palai</b></p> <p>Department of Physics, University of Puerto Rico, San Juan, Puerto Rico 00931, USA</p>
11:10 am-11:30 am	<p><b>Charge and Spin Transport in in Multiferroic Tunnel Junctions with Ferroelectric Barriers</b></p> <p><b>Julian Velev<sup>1</sup></b>, Alan Kalitsov,<sup>1</sup> Artur Useinov,<sup>2</sup> and Nicholas Kioussis<sup>2</sup></p>

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	<p><sup>1</sup> Department of Physics, California State University, Northridge, California 91330-8268, USA</p> <p><sup>2</sup> Department of Physics, University of Puerto Rico, San Juan, Puerto Rico 00931, USA</p>
11:30 am-11:50 am	<p><b>Magnetic Switching and Spin Filtering in An Edge-State Device Based on HgTe Waveguides</b></p> <p><b>Feng Zhai</b><sup>1,2</sup>, Xuanping Jin<sup>2</sup> and Junqiang Lu<sup>1</sup></p> <p><sup>1</sup>Department of Physics, University of Puerto Rico, Mayaguez, USA</p> <p><sup>2</sup>Department of Physics, Zhejiang Normal University, Jinhua, China</p>
11:50 am-12:10pm	<p><b>Direct H<sub>2</sub> generation under illumination of GaN-based structures</b></p> <p><b>M. Gouzman</b><sup>1</sup>, H. Helava<sup>2</sup>, S. Luryi<sup>1</sup>, Yu. Makarov<sup>2</sup>, A. Usikov<sup>2</sup>.</p> <p><sup>1</sup>Sensor CAT at Stony Brook University, Stony Brook, NY 11794-3717</p> <p><sup>2</sup>Nitride Crystals Inc., 181 E Industry Court, Suite B, Deer Park, NY 11729, USA</p>
12:10 pm-1:30pm	<b>Lunch -- Flamingo C &amp; D</b>
<b>Session IV: Novel Materials &amp; Devices-- Flamingo A &amp; B</b>	
<b>Chair:</b>	
1: 30 pm- 2:00 pm (Invited Talk)	<p><b>Understanding the formation of conductive filaments in RRAM through the design of experiments and simulations</b></p> <p><b>Dimitris Tsoukalas</b>,</p> <p>Department of Applied Physics, National Technical University of Athens</p> <p>Heroon Polytechniou 9, 15780 Athens, Greece</p>
2:00pm-2:20pm	<p><b>Magnetism and superconductivity of Eu-doped silicon clathrates Ba<sub>8-x</sub>Eu<sub>x</sub>Si<sub>46</sub> (x = 0, 0.5 and 1) synthesized under high-temperature and high-pressure</b></p> <p><b>Yang Li</b>, Jose Garcia, Hengyi Du, Junqiang Lu and Kejie Lu</p> <p>School of Engineering, University of Puerto Rico at Mayaguez, Mayaguez, Puerto Rico 00681-9000, USA</p> <p>Lihua Liu and Bensheng Song</p>

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	Department of Physics, University of Science and Technology Beijing, Beijing 100083, China
2:20 pm-2:40pm	<b>Neutron Radiation Hardness of Wide Bandgap Semiconductors and Devices</b> <b>Ke-Xun Sun</b> , Mike Gacusan, Mario Valles, Dale Karas, Remis Gaska, Max Shatalov, Ron Nelson, and Charles Yeaman,
2:40 pm-3:00pm	<b>Magnetism and defects modulation in monolayer FeSe</b> <b>Junqiang Lu</b> Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico
<b>3:00pm-3:20pm</b>	<b>Break-- Flamingo Foyer</b>
3:20pm-3:50pm (Invited Talk)	<b>SOI Technologies from Microelectronics to Microsystems: Meeting the More than Moore Roadmap Requirements</b> <b>Jean-Pierre Raskin</b> Université catholique de Louvain (UCL) Institute of Information and Communication Technologies, Electronics and Applied Mathematics (ICTEAM) Place du Levant, 3, Maxwell Building, B-1348 Louvain-la-Neuve, Belgium
3:50pm-4:10pm	<b>Magnetism and defects modulation in monolayer FeSe</b> <b>Junqiang Lu</b> Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico
4:10pm-4:40pm (Invited Talk)	<b>Oxide-based nonvolatile memory technology</b> <b>Dmitry Veksler</b> <sup>1</sup> , Gennadi Bersuker <sup>2</sup> <sup>1</sup> National Institute of Standards and Technology, Gaithersburg, MD 20899, U.S.A. <sup>2</sup> The Aerospace Corporation, Los Angeles, CA 90245, U.S.A
4:40pm-5:10pm (Invited Talk)	An Electrically Driven THz Modulator with over 20 dB Dynamic Range N. Karla*, K. Reichela*, H.-T. Chenb, A. J. Taylorb, I. Brenerc, A. Benzc, J. Renoc, R. Mendisa*, and <b>D. M. Mittlemana*</b> <sup>a</sup> Rice University, Dept. of Electrical and Computer Engineering, MS 378, Houston, TX 77251, USA

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	<p>b Center for Integrated Nanotechnologies, Los Alamos National Laboratory, PO Box 1663, MS K771, Los Alamos, NM 87545, USA</p> <p>c Center for Integrated Nanotechnologies, Sandia National Laboratories, PO Box 5800, MS 1082, Albuquerque, NM 87185, USA</p> <p>*Current address: Brown University, School of Engineering, 184 Hope St., Providence RI 02912 USA</p>
<b>5:10pm-7:30pm</b>	<p><b>Poster Session</b></p> <p><b>Chair:</b></p>
<b>7:30pm- 10:00pm</b>	<p><b>Dinner and Best Poster Award Presentation- Flamingo C &amp; D</b></p>
P1	<p><b>Wide Band Gap Semiconductor Boron Nitride Nanosheets for Deep-UV Photo-Detection Applications</b></p> <p><b>Muhammad Sajjad<sup>1</sup></b>, Wojciech M. Jadwisieniczak<sup>2</sup>, Peter Feng<sup>1</sup>, B. R. Weiner<sup>3</sup> and G. Morell<sup>2</sup></p> <p><sup>1</sup>Department of Physics, College of Natural Sciences, University of Puerto Rico, San Juan, PR 00936-8377 USA</p> <p><sup>2</sup>School of Electrical Engineering and Computer Science, Ohio University, Athens, OH 45701 USA</p> <p><sup>3</sup>Department of Chemistry, College of Natural Sciences, University of Puerto Rico, San Juan, PR 00936-8377 USA</p>
P2	<p><b>Study on the Optical and Electrical Properties of Tetracyanoethylene Doped Bilayer Graphene Stacking for Transparent Conducting Electrodes</b></p> <p><b>Tej B. Limbu<sup>1,2</sup></b>, Frank Mendoza<sup>1</sup>, Rajesh Katiyar<sup>1</sup>, Brad R. Weiner<sup>1,3</sup>, Gerardo Morell<sup>1,2</sup></p> <p><sup>1</sup>Institute for Functional Nanomaterials, San Juan, PR, 00931 USA</p> <p><sup>2</sup>Physics, University of Puerto Rico, Rio Piedras, San Juan, PR, 00931 USA</p> <p><sup>3</sup>Chemistry, University of Puerto Rico, Rio Piedras, San Juan, PR, 00931 USA</p>
P3	<p><b>Flexible Structural and Electronic Properties of Pentagonal B<sub>2</sub>C Monolayer via External Strain: A Computational Investigation</b></p> <p><b>Fengyu Li</b>, Kaixiong Tu, Haijun Zhang, Zhongfang Chen*</p> <p>Department of Chemistry, The Institute for Functional Nanomaterials, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931, USA</p>

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P4	<p><b>Quantitative structure-activity relationship (QSAR) models for predicting the adsorption of organic pollutants on carbon nanotubes (CNTs)</b> <b>Ya Wang</b><sup>1,2</sup>, Jingwen Chen<sup>1</sup>, Zhongfang Chen<sup>2</sup></p> <p><sup>1</sup>Key Laboratory of Industrial Ecology and Environmental Engineering (MOE), School of Environmental Science and Technology, Dalian University of Technology, Linggong Road 2, Dalian 116024, China</p> <p><sup>2</sup>Department of Chemistry, University of Puerto Rico, San Juan, PR, USA</p>
P5	<p><b>Adaptable Wireless Nanosensor for Bacteria Identification Based on Au/graphene</b> <b>Carlos Mejía</b><sup>1</sup>, Coral Ramos<sup>1</sup>, Juan C. Villalobos-Santos<sup>2,6</sup>, Zuania Cordero<sup>2</sup>, Patricia Figueroa<sup>1</sup>, Khaled Habiba<sup>3</sup>, Rafael Velázquez<sup>3</sup>, Frank Mendoza<sup>3,6</sup>, Javier Avalos<sup>5,6</sup>, Darinel Ortiz<sup>1</sup>, Brad R. Weiner<sup>4,6</sup>, Gerardo Morell<sup>3,6</sup></p> <p><sup>1</sup>Department of Biology, University of Puerto Rico, Bayamon, PR, USA</p> <p><sup>2</sup>Department of Biology, University of Puerto Rico, San Juan, PR, USA</p> <p><sup>3</sup>Department of Physics, University of Puerto Rico, Bayamon, PR, USA</p> <p><sup>4</sup>Department of Physics, University of Puerto Rico, San Juan, PR, USA</p> <p><sup>5</sup>Department of Chemistry, University of Puerto Rico, San Juan, PR, USA</p> <p><sup>6</sup> Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, PR, USA</p>
P6	<p><b>Biosensor prototype based on carbon nanotubes and graphene for the detection and treatment of cancerous cells</b> <b>Giovanni Caro</b><sup>1</sup>, Coral Ramos<sup>2</sup>, Patricia Figueroa<sup>2</sup>, Abelardo Colón<sup>8</sup>, Kenny García<sup>7</sup>, Axel Arroyo<sup>6</sup>, Carlos Mejía<sup>2</sup>, André Marra<sup>1</sup>, Marcia Fernández<sup>1</sup>, Nelson Álvarez<sup>1</sup>, Wilmarie Vázquez<sup>2</sup>, Yarib Berríos<sup>5</sup>, Javier Avalos<sup>3,9</sup>, Darinel Ortiz<sup>2</sup>, Rafael Velázquez<sup>4</sup>, Juan C. Villalobos-Santos<sup>2</sup>, Ismael Jimenez<sup>5</sup>, Gerardo Morell<sup>4,9</sup>, Brad Weiner<sup>6,9</sup></p> <p><sup>1</sup>Department of Biology, University of Puerto Rico, San Juan, PR, USA</p> <p><sup>2</sup>Department of Biology, University of Puerto Rico, Bayamon, PR, USA</p> <p><sup>3</sup>Department of Physics, University of Puerto Rico, Bayamon, PR, USA</p> <p><sup>4</sup>Department of Physics, University of Puerto Rico, San Juan, PR, USA</p> <p><sup>5</sup>Department of Electronics, University of Puerto Rico, Bayamon, PR, USA</p> <p><sup>6</sup>Department of Chemistry, University of Puerto Rico, San Juan, PR, USA</p>

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P7	<p><b>Oxidative Etching of Hexagonal Boron Nitride Toward Nanosheets with Defined Edges and Holes</b>  <b>Yunlong Liao</b>            Department of Physics, University of Puerto Rico, Río Piedras Campus, San Juan, PR 00936, USA</p>
P8	<p><b>Computational studies and designs of the graphene-like MXene photocatalysts</b>  <b>Haijun Zhang</b>, Yandong Ma, Zhongfang Chen            Department of Physics, University of Puerto Rico, Río Piedras Campus, San Juan, PR 00936, USA</p>
P9	<p><b>Pronounced photovoltaic response from multi-layered transition-metal dichalcogenides PN-junctions</b>  <b>Shahriar Memaran</b>,§,† Nihar R. Pradhan,§ Zhengguang Lu, §,† Daniel Rhodes,§,† J. Ludwig,§,† Q. Zhou,§,† Omotola Ogunsolu,↵ Pulickel M. Ajayan,⊗ Dmitry Smirnov,§ Luis Balicas, §,*            § National High Magnetic Field Lab, Florida State University, 1800 E. Paul Dirac Dr. Tallahassee, FL 32310, USA. † Department of Physics, Florida State University, Tallahassee, Florida 32306, USA.            ↵ Department of Chemistry &amp; Biochemistry, Florida State University Tallahassee, FL 32306- 4390 USA.            ⊗ Department of Mechanical Engineering and Materials Science, Rice University, Houston, TX 77005-1892, USA.</p>
P10	<p><b>Quantum Spin Hall Insulators in Strain-modified Arsenene</b>  <b>Haijun Zhang</b>, Yandong Ma, Zhongfang Chen            Department of Physics, University of Puerto Rico, Río Piedras Campus, San Juan, PR 00936, USA</p>
P11	<p><b>Thermoelectric and Transport Properties of a Single Tin Selenide Nanowire</b>  <b>Jose A. Hernández-Pérez</b> and Luis F. Fonseca            Department of Physics, University of Puerto Rico - Rio Piedras, San Juan, PR 00931, USA</p>
P12	<p><b>FeB<sub>6</sub>H<sub>6</sub> Aggregates: from simple Building Blocks to Graphene Analogue</b>  <b>Jianhua Hou</b><sup>a,b</sup> and Zhongfang Chen<sup>b*</sup>            a. School of Materials Science and Engineering, Changchun University of Science and Technology, Changchun 130022, People's Republic of China</p>

## WMN & WOFE-15 Scientific Program

	<p>b. Department of Chemistry, Institute for Functional Nanomaterials, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931, USA.</p>
P13	<p><b>Effect of Na doping on the Optical and Dielectric properties of Wide Band-Gap NiO</b>  D. C. Joshi<sup>1</sup>, <b>K. Dasari</b><sup>2</sup>, S. Nayak<sup>1</sup>, P. Suresh<sup>3</sup>, R. Palai<sup>2</sup>, Md. Qureshi<sup>4</sup> and S. Thota<sup>1,*</sup>  <sup>1</sup>Department of Physics, Indian Institute of Technology, Guwahati-781039, Assam, India  <sup>2</sup>Department of Physics, University of Puerto Rico, San Juan, PR 00936-8377, USA  <sup>3</sup>Department of Physics, Indian Institute of Science, Bangalore-560012, Karnataka, India  <sup>4</sup>Department of Chemistry, Indian Institute of Technology, Guwahati-781039, Assam, India</p>
P14	<p><b>Synthesis, Electrical, optical, and magnetoelectric properties of rare earth doped ZnO</b>  <b>R. Masso-Ferret</b><sup>1</sup>, F. Aponte<sup>1</sup>, A. K. Pradhan<sup>2</sup>, Wojciech Jadwisieniczak<sup>3</sup>, R. Palai<sup>1</sup>  <sup>1</sup>Department of Physics, University of Puerto Rico, San Juan, PR 00936  <sup>2</sup>Department of Engineering, Norfolk State University, Norfolk, VA 23504  <sup>3</sup>School of Electrical Engineering and Computer Science, Ohio University, Athens, OH 45701</p>
P15	<p><b>Point defects and their influence on the magnetic properties of ZnO thin films grown by reactive magnetron sputtering</b>  <b>Adrian Camacho-Berrios</b><sup>1</sup>, Víctor Pantojas<sup>2</sup>, Wilfredo Otaño<sup>2</sup>  <sup>1</sup>University of Puerto Rico Rio Piedras campus,  <sup>2</sup>University of Puerto Rico Cayey camp</p>
P16	<p><b>Synthesis of AAO template assisted ordered ZnO nanowires and ZnO/rGO nanocomposites and study of their gas sensing behaviors</b>  Nagesh Kumar<sup>1</sup>, Jyoti<sup>1</sup>, B. K. Gupta<sup>2</sup> and <b>G. D. Varma</b><sup>1*</sup>  <sup>1</sup>Department of Physics, Indian Institute of Technology Roorkee, Roorkee-247667, India  <sup>2</sup> National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi-110012, India</p>

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P17	<p><b>Morphology-Induced MRI Relaxivity in Nanostructured Fe<sub>2</sub>O<sub>3</sub></b>  <b>Juan Beltran-Huarac</b><sup>1,2</sup>, Bibek Thapa<sup>1,2</sup>, Daysi Diaz-Diestra<sup>1,3</sup>, Jabril Vilmenay<sup>1,2</sup>, Zeng Huadong<sup>4</sup>, Brad R. Weiner<sup>1,3</sup>, Gerardo Morell<sup>1,2</sup>  <sup>1</sup>Molecular Sciences Research Center, University of Puerto Rico, San Juan, PR 00926, USA  <sup>2</sup>Department of Physics, University of Puerto Rico, San Juan, PR 00936, USA  <sup>3</sup>Department of Chemistry, University of Puerto Rico, San Juan, PR 00936, USA  <sup>4</sup>McKnight Brain Institute, University of Florida, Gainesville, FL, 32611</p>
P18	<p><b>Photoluminescence Study on ZnO/GaN Interface Defect States</b>  M. Wiggs, R. Mundle, <b>Monee Roul</b> and Aswini Pradhan  Center for Materials Research and Department of Engineering, Norfolk State University, Norfolk, VA 23504</p>
P19	<p><b>Optical Nonlinearity of VO<sub>2</sub> and V<sub>2</sub>O<sub>3</sub></b>  <b>J. Figueroa</b>, L. Chevres, A. Rúa, F. Fernández, S. Lysenko*  Department of Physics, University of Puerto Rico, Mayaguez, Puerto Rico, 00681</p>
P20	<p><b>Point defects and their influence on the magnetic properties of ZnO thin films grown by reactive magnetron sputtering</b>  <b>Adrian Camacho-Berrios</b><sup>1</sup>, Víctor Pantojas<sup>2</sup>, Wilfredo Otaño<sup>2</sup>  <sup>1</sup>University of Puerto Rico Rio Piedras campus,  <sup>2</sup>University of Puerto Rico Cayey campus</p>
P21	<p><b>Effect of 'Na' doping on the Structural, Dielectric and Electronic characteristics of Wide Band-Gap NiO</b>  <b>D. C. Joshi</b><sup>1</sup>, <b>K. Dasari</b><sup>2</sup>, S. Nayak<sup>1</sup>, P. Pramanik<sup>1</sup>, P.Suresh<sup>3</sup>, R. Palai<sup>2</sup> and S. Thota<sup>1</sup>  <sup>1</sup>Department of Physics, Indian Institute of Technology, Guwahati-781039, Assam, India  <sup>2</sup>Department of Physics, University of Puerto Rico, San Juan, PR 00936-8377, USA  <sup>3</sup>Department of Physics, Indian Institute of Science, Bangalore-560012, Karnataka, India</p>
P22	<p><b>Studies of dielectric, magnetic and ferroelectric properties of novel multiferroic material PCZTFT at room temperature</b></p>



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	<p><b>D. Barrionuevo</b>, N. Ortega, and R. S. Katiyar          Department of Physics and Institute of Functional Nanomaterials,          University of Puerto Rico, San Juan, Puerto Rico 00931-3343 USA</p>
P23	<p><b>Synthesis and Multiferroic Properties of BiFeO<sub>3</sub>/CoFe<sub>2</sub>O<sub>4</sub> composite structure</b>  <b>S. Rojas Flores</b><sup>1</sup>, D. Barrionuevo<sup>2</sup>, M.S. Tomar<sup>1</sup>  <sup>1</sup>Department of Physics, University of Puerto Rico, Mayaguez, Puerto Rico, 00681</p>
P24	<p><b>Electronic Structure Calculations of BaTiO<sub>3</sub></b>  <b>Juan Pastrana</b> and Junqiang Lu          Department of Physics and Institute for Functional Nanomaterials,          University of Puerto Rico</p>
P25	<p>Effect of La and Gd Co-Doping on Multiferroic Properties and Electrical Insulation in BiFeO<sub>3</sub>  <b>Mehmet S. Bozgeyik</b>*<sup>1,2</sup>, Dhiren Kumar Pradhan<sup>1</sup>, Shalini Kumari<sup>1</sup>, Rajesh K. Katiyar<sup>1</sup>, and Ram S. Katiyar<sup>1</sup>  <sup>1</sup> Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico 00931-3334, USA  <sup>2</sup> Department of Physics, Faculty of Science and Literature, Kahramanmaraş Sutcu Imam University, Kahramanmaraş, 46100, TURKEY</p>
P26	<p><b>Effect of Thickness and Temperature on piezoresponse of Ni Substituted Pb(Zr<sub>0.20</sub>Ti<sub>0.80</sub>)O<sub>3</sub> Thin Films</b>  <b>Shalini Kumari</b><sup>1</sup>, Dhiren K. Pradhan<sup>1</sup>, Rama K. Vasudevan<sup>2</sup>, Evgheni Strelcov<sup>2</sup>, Nora P. Ortega<sup>1</sup>, Ashok Kumar<sup>3</sup>, Sergei V. Kalinin<sup>2</sup>, Ram S. Katiyar<sup>1</sup>  <sup>1</sup> Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico 00931-3334, USA  <sup>2</sup>Center for nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN 37831 USA  <sup>3</sup>National Physical Laboratory (CSIR) Delhi, India.</p>
P27	<p><b>Effect of Temperature, Humidity and Thickness on tip induced polarization switching of Single Phase Multiferroic Thin Films</b>  <b>Dhiren K. Pradhan</b><sup>1</sup>, Rama K. Vasudevan<sup>2</sup>, Evgheni Strelcov<sup>2</sup>, Shalini Kumari<sup>1</sup>, Venkata S. Puli<sup>3</sup>, Sergei V. Kalinin<sup>2</sup>, Ram S. Katiyar<sup>1</sup>  <sup>1</sup> Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico 00931-3334, USA</p>

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P28	<p><b>Ferromagnetic/Ferroelectric/Ferromagnetic Spin Capacitors for Magnetoelectric Devices</b></p> <p><b>Fernando Aponte</b>, Luis Fonseca, and Ratnakar Palai Department of Physics, University of Puerto Rico, San Juan, PR, USA</p>
P29	<p><b>The Role of Ytterbium in Growth of InGaN NRs with High Indium Content by MBE</b></p> <p>Jingzhou Wang <sup>1</sup>, Kiran Dasari<sup>2</sup>, Ratnakar Palai<sup>2</sup>, <b>Wojciech M. Jadwisieniczak</b><sup>1</sup></p> <p><sup>1</sup> School of Electrical Engineering and Computer Science, Ohio University, Athens OH 45701, U.S.A. <sup>2</sup> Department of Physics, University of Puerto Rico, San Juan, PR 00936, U.S.A.</p>
P30	<p><b>Structural, Optical and Magnetic properties of transition metal (Mn, Co, Ni) implanted highly crystalline GaN thin films grown by MBE</b></p> <p><b>K. Dasari</b><sup>1</sup>, J. Hernandez<sup>1</sup>, J. Wang<sup>2</sup>, W. Jadwisieniczak<sup>2</sup>, L. Fonseca<sup>1</sup>, and H. Hannu<sup>3</sup>, R. Palai<sup>1</sup></p> <p><sup>1</sup> Department of Physics, University of Puerto Rico, San Juan, Puerto Rico, US 00936 <sup>2</sup> School of electrical and computer sciences, Ohio State University, Athens, Ohio, US <sup>3</sup> Whiri Physical Laboratory, Department of Physics, University of Turku, Turku, Finland, FIN-20014</p>
P31	<p><b>Fabrication and Electronic Spin applications of Silicides Nanowires</b></p> <p><b>Ángel R. Ruiz-Reyes</b>, José Hernández-Pérez, Luis F. Fonseca Department of Physics, University of Puerto Rico, San Juan, PR/USA 00936-8377</p>
P32	<p><b>Enhanced MRI Relaxivity in Superparamagnetic Iron Oxide Nanoribbons Supported on Chemically Reduced Graphene Oxide</b></p> <p><b>Bibek Thapa</b><sup>1,2,3</sup> Daysi Diaz-Diestra <sup>1,2,3</sup> Juan Beltran-Huarac<sup>1,2,3</sup>, Huadong Zeng<sup>4</sup>, Brad R. Weiner<sup>1,2,3</sup> and Gerardo Morell<sup>1,2,3</sup></p>

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P33	<p><b>Effect of Ligand Interaction on the Aqueous Stabilization of Superparamagnetic Iron Oxide Nanoribbons: Towards Enhanced T<sub>2</sub>-MRI Contrast</b></p> <p><b>Bibek Thapa</b><sup>1,2,3</sup> Daysi Diaz-Diestra<sup>1,2,3</sup> Juan Beltran-Huarac<sup>1,2,3</sup>, Huadong Zeng<sup>4</sup>, Brad R. Weiner<sup>1,2,3</sup> and Gerardo Morell<sup>1,2,3</sup></p> <p>1Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00936, USA</p> <p>2Molecular Sciences Research Center, University of Puerto Rico, San Juan, PR 00926, USA</p> <p>3Department of Physics and Department of Chemistry, University of Puerto Rico, San Juan, PR 00931, USA</p> <p>4Advanced Magnetic Resonance Imaging and Spectroscopy Facilities, University of Florida, Gainesville, FL 32611, USA</p>
P34	<p><b>Conduction Mechanism in BiFeO<sub>3</sub>-GdMnO<sub>3</sub> Multiferroic nanocomposites</b></p> <p><b>Jaime Santillan</b><sup>1</sup>, D. Pradhan<sup>2</sup>, R. Palai<sup>1</sup></p> <p>1Department of Physics, University of Puerto Rico, San Juan, PR, USA</p> <p>2National Institute of Technology, Rourkela, Indian</p>
P35	<p><b>Subpicosecond detection of terahertz radiation by plasmonic field effect transistors</b></p> <p><b>A. Muraviev</b>, A. Gutin, G. Rupper, S. Rudin, X. Shen, Y. Yamaguchi, G. Aizin and M.S. Shur</p> <p>Department of Electrical, Computer, and Systems Engineering Rensselaer Polytechnic Institute Troy, New York 12180, USA</p>
P36	<p><b>The performance of high-frequency and high-power zinc oxide based electron devices and its sensitivity to variations in the unknown material parameters</b></p>

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	<p><b>Poppy Siddiqua</b><sup>1</sup>, Michael S. Shur<sup>2</sup>, Stephen K. O'Leary<sup>3</sup>  <sup>1</sup>School of Engineering, The University of British Columbia, Kelowna, British Columbia V1V 1V7, Canada  <sup>2</sup>Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, Troy, New York 12180, USA  <sup>3</sup>School of Engineering, The University of British Columbia, Kelowna, British Columbia V1V 1V7, Canada</p>
P37	<p><b>Structural, magnetic, and dielectric properties of Bi<sub>1-x</sub>Dy<sub>x</sub>FeO<sub>3</sub></b>  <b>K. Dasari</b>, R. Martinez, R. S. Katiyar, and R. Palai          Department of Physics, University of Puerto Rico, San Juan, PR, USA</p>
P38	<p><b>Effects of Ag-GQD Nanocomposite on Electroporated Bacterial Growth of S. Aureus</b>, P. aeruginosa Coral Ramos<sup>1</sup>, Juan C. Villalobos-Santos<sup>2,6</sup>, Barbara Avalos-Cavero<sup>2</sup>, Andrea Ferrer<sup>2</sup>, Axel Arroyo<sup>4</sup>, Kenny García<sup>2</sup>, Patricia Figueroa<sup>1</sup>, Khaled Habiba<sup>3</sup>, Rafael Velázquez<sup>3</sup>, Javier Avalos<sup>5,6</sup>, Brad R. Weiner<sup>4,6</sup>, Gerardo Morell<sup>3,6</sup>  <sup>1</sup>Department of Biology, University of Puerto Rico, Bayamon, PR, USA  <sup>2</sup>Department of Biology, University of Puerto Rico, San Juan, PR, USA  <sup>3</sup>Department of Physics, University of Puerto Rico, San Juan, PR, USA  <sup>4</sup>Department of Chemistry, University of Puerto Rico, San Juan, PR, USA  <sup>5</sup>Department of Physics, University of Puerto Rico, Bayamon, PR, USA  <sup>6</sup>Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, PR, USA</p>
P39	<p><b>Synthesis, Characterization and Electrochemical Analysis of Composite Cathode Material 0.5Li<sub>2</sub>MnO<sub>3</sub>-0.25LiMn<sub>2</sub>O<sub>4</sub>-0.25LiNi<sub>0.5</sub>Mn<sub>0.5</sub>O<sub>2</sub> for LIB applications.</b>  <b>Mónica López de Victoria</b>, Jifi Shojan, Loraine Torres, Rajesh Katiyar, Ram S. Katiyar          Department of Physics, University of Puerto Rico, San Juan, Puerto Rico</p>
P40	<p><b>Resistive switching and associated photovoltaic effect in planar BiFeO<sub>3</sub> for nonvolatile memory application,</b>  <b>Rajesh K. Katiyar</b><sup>1,2</sup>, Yogesh Sharma<sup>1,2</sup>, Shojan P. Pavunny<sup>1,2</sup>, Gerardo Morell<sup>1,2</sup>, Brad R. Weiner<sup>1,3</sup> and Ram S. Katiyar<sup>1,2</sup>.  <sup>1</sup>Department of Physics, University of Puerto Rico, San Juan, Puerto Rico, PR 00936, USA</p>

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P41	<p><b>Carbon-doped BN Nanosheet: an Efficient Metal-Free Electrocatalyst for the Oxygen Reduction Reaction</b></p> <p><b>Jingxiang Zhao</b>,<sup>†‡</sup> Zhongfang Chen<sup>‡,*</sup></p> <p><sup>†</sup> Department of Chemistry, Harbin Normal University, Harbin, 150025, China</p> <p><sup>‡</sup> Department of Chemistry, Institute of Functional Nanomaterials, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931, USA</p>
P42	<p><b>Electric field control of the resistance of multiferroic tunnel junctions with magnetoelectric antiferromagnetic barriers</b></p> <p><b>P. Merodio</b>,<sup>1</sup> A. Kalitsov,<sup>1</sup> M. Chshiev,<sup>2</sup> and J. Velev<sup>1,2</sup></p> <p><sup>1</sup>Department of Physics, University of Puerto Rico, San Juan, Puerto Rico 00931, USA</p> <p><sup>2</sup>SPINTEC, CEA/CNRS/UJF-Grenoble 1/Grenoble-INP, INAC, 38054 Grenoble, France</p>
P43	<p><b>Spin Torque Oscillators based magnetic tunnel junctions</b></p> <p><b>K. J. Merazzo</b><sup>1,2,3,4</sup>, A. Ruiz-Calaforra<sup>1,2,3</sup>, J. Hem<sup>1,2,3</sup>, A. Purbawati<sup>1,2,3</sup>, A. Jenkins<sup>5</sup>, R. Lebrun<sup>5</sup>, P. Bortolotti<sup>5</sup>, R. Ferreira<sup>6</sup>, L. Vila<sup>1,2</sup>, E. Jimenez<sup>1,2,3</sup>, V. Cros<sup>5</sup>, M.-C. Cyrille<sup>1,4</sup>, U. Ebels<sup>1,2,3</sup></p> <p><sup>1</sup>Univ. Grenoble Alpes, F-38000 Grenoble, France</p> <p><sup>2</sup>CEA, INAC, F-38000 Grenoble, France</p> <p><sup>3</sup>CNRS, SPINTEC, F-38000 Grenoble, France</p> <p><sup>4</sup>CEA-LETI MINATEC-CAMPUS, 17RUE DES MARTYRS, 38054 GRENOBLE</p> <p><sup>5</sup>Unité Mixte de Physique CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, 91767 Palaiseau, France</p> <p><sup>6</sup>International Iberian Nanotechnology Laboratory (INL), 4715-31 Braga, Portugal</p>
P44	<p><b>Metamorphic InAsSb<sub>x</sub>/InAsSb<sub>y</sub> heterostructures- new materials for infrared photonics</b></p> <p><b>Y. Lin</b>, G. Belenky, L. Shterengas, D. Donetsky, G. Kipshidze, S. Suchalkin, W. L. Sarney, and S. P. Svensson</p> <p>Department of ECE, Stony Brook University, NY 11794-2350</p> <p>U.S. Army Research Laboratory, 2800 Powder Mill Rd, Adelphi, MD 20783</p>

## WMN & WOFE-15 Scientific Program

Friday, December 18, 2015	
7:00 am-8:00 am	<b>Registration and Breakfast-- Flamingo Foyer</b>
<b>Session III: 2D and Energy Materials and Devices-- Flamingo A &amp; B</b> <b>Chair:</b>	
8:00am- 8:30 am (Invited Talk)	<b>Delta Doped Diamond Layers with Boron</b> <b><u>James E. Butler,</u></b> Russain Academy of Sciences, Russia
8:30am- 9:00 am (Invited Talk)	<b>Phosphorene Transistors – Transient or Lasting Electronics?</b> <b><u>James C. M. Hwang</u></b> Lehigh University, PA, USA
9: 30am- 10:00 am (Invited Talk)	Photovoltaic characterization of ultra-thin silicon and nanowire solar cells, <b><u>K. Kakushima,</u></b> Tokyo Institute of Technology, Japan
10:00 am-10:15 am	<b>Break-- Flamingo Foyer</b>
10:15am- 10:35 am	<b>Graphene Oxide Thin Film for Non-volatile Memory Devices</b> <b><u>Surinder P. Singh</u></b> <sup>1a</sup> , Ajit K. Mahapatro <sup>2a</sup> , Pooja Shaini <sup>2</sup> , Manjri Singh <sup>1</sup> , and Ram P. Tandon <sup>2</sup> 1 Electron and Ion Microscopy, CSIR-National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi 110012, India 2 Department of Physics and Astrophysics, University of Delhi, Delhi 110007, India
10:35 am-10:55 am	<b>Discovery and Innovation of Inorganic Graphene Analogues by Computations</b> <b><u>Zhongfang Chen</u></b> Department of Chemistry, University of Puerto Rico, San Juan, PR 00931, USA
10:55 am-11:15 am	<b>Syntheses of large-scale, high-quality 2D wide-band-gap semiconductor nanosheets for high-performance deep ultraviolet photo detectors</b> <b><u>Peter Feng,</u></b> Department of Physics, College of Natural Sciences, University of Puerto Rico, San Juan, PR 00936, USA

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11:15 am-11:35 am	<b>Large-area bilayergraphene synthesis in the hot filament chemical vapor deposition reactor</b> Frank Mendoza, Tej B. Limbu, Brad R. Weiner, <b>Gerardo Morell</b> , Institute for Funtional Nanomaterials, University of Puerto Rico, Department of Physics, University of Puerto Rico, Rio Piedras, Department of Chemistry, University of Puerto Rico, Rio Piedras, San Juan, PR
11:35am-12.05pm (Invited Talk)	<b>Mid-infrared Metasurface Made of Composite Right/Left Handed Transmission Line</b> <b>Zhijun Liu</b> <sup>1</sup> , Yi Luo <sup>1</sup> , Jie Ma <sup>1</sup> , Yadong Jiang <sup>1</sup> , and Jimmy Xu <sup>1,2</sup> <sup>1</sup> <i>School of Optoelectronic Information, University of Electronic Science and Technology of China, Chengdu, Sichuan, China</i> <sup>2</sup> <i>School of Engineering, Brown University, Providence, RI, USA</i>
12:05 pm- 12:10 noon	Closing Remarks - M. Shur