

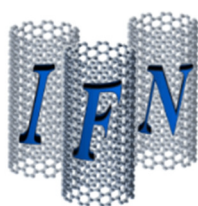
2015 WORKSHOP ON MULTIFUNCTIONAL NANOMATERIALS (WMN-15)

JANUARY 14-16, 2015, CARIBE HILTON HOTEL
SAN JUAN, PR, USA

SCIENTIFIC PROGRAM

www.multifunctionalnanomaterials.org

Sponsored by



Organizing Committee

Chair

Dr. Ratnakar Palai

University of Puerto Rico, San Juan, PR

Email: r.palai@upr.edu

Committee Members

Dr. Zhongfang Chen

University of Puerto Rico, San Juan, PR

Email: zhongfangchen@gmail.com

Dr. Maxime J.-F. Guinel

University of Puerto Rico, San Juan, PR

Email: maxime.guinel@upr.edu

Dr. Gerardo Morell

University of Puerto Rico, San Juan, PR

Email: gmorell@gmail.com

Dr. Julian Velez

University of Puerto Rico, San Juan, PR

Email: jvelez@gmail.com

Dr. Haiyan Wang

Program Director

National Science Foundation

Email: hawang@nsf.gov

Invited Speakers

Dr. Douglas B. Chrisey

Tulane University, New Orleans, LA
Email: douglasbchrisey@gmail.com

Dr. Sandwip Dey

Arizona State University, Tempe, AZ
Email: sandwip.dey@asu.edu

Dr. Volkmar Dierolf

Lehigh University, Bethlehem, PA
email: vod2@lehigh.edu

Dr. Wojciech M. Jadwisieniczak

Ohio University, Athens, OH
Email: jadwisie@ohio.edu

Dr. Geunhee Lee

University of Texas at Dallas, TX
Email: gxl130330@utdallas.edu

Dr. Jing Li

Rutgers University, New Brunswick,
NJ
Email: Jingli@chem.rutgers.edu

Dr. Caroline A. Ross

Massachusetts Institute of
Technology (MIT), Cambridge, MA
Email: caross@mit.edu

Dr. Gopalan Srinivasan

Oakland University, Rochester, MI
Email: srinivas@oakland.edu

Dr. Anirudha V. Sumant

Center for Nanoscale Materials
Argonne National Laboratory, IL
Email: sumant@anl.gov

Dr. Michael Shur

Rensselaer Polytechnic Institute (RPI),
Troy, NY
Email: shurm13@gmail.com

Dr. Evgeny Tsymbal

University of Nebraska, Lincoln, NE
Email: tsymbal@unl.edu

WMN-15 Scientific Program

Wednesday, January 14, 2015	
3:00pm – 6:00pm	Registration-- Main Lobby
Thursday, January 15, 2015	
7:00 am-8:00 am	Registration and Breakfast-- Flamingo Foyer
8:00 am -8:10 am	Opening Remarks: R. Palai – Flamingo A & B
Session I: Multiferroic and Spintronic Materials-- Flamingo A & B Chair: Caroline Ross and Evgeny Tsymbal	
8:10 am- 8:55 am (Invited Talk)	Multiferroic Composites: Recent Advances and Future Possibilities. <u>Gopalan Srinivasan</u> , Physics Department, Oakland University, Rochester, MI
8:55 am- 9:40 am (Invited Talk)	Ferroelectric and Multiferroic Tunnel Junctions <u>Evgeny Tsymbal</u> <i>Department of Physics and Astronomy, University of Nebraska, Lincoln, NE</i>
9:40 am- 10:25 am (Invited Talk)	Self assembled Nanocomposite Multiferroic Oxides. <u>Caroline A. Ross</u> , Massachusetts Institute of Technology (MIT), Department of Materials Science and Engineering, MA
10:25 am-10:40 am	Break-- Flamingo Foyer
10:40 am-11:00 am	Rare earth based III-Nitride Nanostructures for room temperature spintronic and optoelectronic applications <u>Ratnakar Palai</u> , Department of Physics, University of Puerto Rico, San Juan, PR
11:00 am-11:45 am (Invited Talk)	Magneto-optical Properties of Rare Earth Ions in Gallium Nitride and Lithium Tantalate: The Role of Defects and Strain. <u>Volkmar Dierolf</u> , Lehigh University, Physics Department, 16 Memorial Drive East, Bethlehem, PA
11:45 am-12:05 am	Debate on origin of ferromagnetism in pure and transition doped ZnO <u>Wilfredo Otaño</u> ¹ , Adrian Camacho-Berrios ² ¹ University of Puerto Rico Cayey campus, ² University of Puerto Rico Rio Piedras campus, San Juan, PR
12:05 pm-1:30pm	Lunch -- Flamingo C & D
Session II: Multiferroic and Spintronic Materials- Flamingo A & B Chair: Douglas B. Chrisey and Gopalan Srinivasan	
1:30 pm -2:15 pm (Invited Talk)	Rare Earth Doped Multifunctional Nanostructures: Opportunities & Challenges <u>Wojciech Jadwisieniczak</u> , Ohio University, School of EECS, 363 Stocker Center, Athens, OH
2:15 pm-2:35 pm	Ferroelectric/multiferroic tunnel junctions for multifunctional applications <u>Ram S. Katiyar</u> ¹ , D. Barrionuevo ¹ , N. Ortega ¹ , L. Zhang ² , A. Sokolov ²

WMN-15 Scientific Program

	<p>¹Department of Physics and Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, PR ²University of Nebraska, Lincoln, NE</p>
2:35 pm- 2:55pm	<p>Multiferroic Properties of Nanocomposite $\text{CoFe}_2\text{O}_4/\text{Bi}_{3.1}\text{La}_{0.9}\text{Ti}_3\text{O}_{12}$ Structures Arun Kumar, Segundo Rojas, and M. S. Tomar Department of Physics, University of Puerto Rico, Mayagüez, Puerto Rico, PR</p>
2:55pm-3:15 pm	<p>Spin manipulation in some ferroelectric non lead based oxide systems Mukesh Kumari, Ratnamala Chatterjee Department of Physics, Indian Institute Technology (IIT) Delhi, India</p>
3:15 pm-3:30 pm	<p>Break- Flamingo Foyer</p>
3:30pm-6:30pm	<p>Poster Presentation- Flamingo Foyer Chair/Judge: Gopalan Srinivasan, Michael Shur, and Douglas B. Chrisey</p>
P1	<p>X-Ray Photoelectron Spectroscopy and Raman scattering studies of ALD alumina coated ZnTe nanowires Kallol Pradhan¹, Satyaprakash Sahoo¹, J. H. Peng³, H. Yu³, S. K. Dey^{2,3}, R. S. Katiyar¹ ¹Department of Physics, University of Puerto Rico, San Juan, PR 00936 ²Materials Science and Engineering Program and ³Department of Electrical Engineering, Arizona State University, Tempe, AZ</p>
P2	<p>Intrinsic Noise from Neighboring Bases in the DNA Transverse Tunneling Current Jose R. Alvarez¹, Dmitry Skachkov¹, Steven E. Massey², Junqiang Lu³, Alan Kalitsov^{1,4}, and Julian P. Velev^{1,5} ¹Department of Physics, Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico ²Department of Biology, University of Puerto Rico, San Juan, Puerto Rico 00931 ³Department of Physics, Institute for Functional Nanomaterials, University of Puerto Rico, Mayaguez, Puerto Rico ⁴Materials for Information Technologies Center, University of Alabama, Tuscaloosa, Alabama 35487, USA ⁵Department of Physics, University of Nebraska, Lincoln, Nebraska 68588-0111, USA</p>
P3	<p>Improved Switching Behavior of Electrophoretically Deposited Graphene Oxide Films Embedded with Gold Nanoparticles Geetika Khurana¹, Pankaj Misra², Nitu Kumar¹, Sudheendran Kooriyattil¹, James F. Scott³, and Ram S. Katiyar¹ ¹Institute of Functional Nanomaterials and Department of Physics, University of Puerto Rico, Rio Piedras, San Juan, PR 00936-8377, USA ²Laser Materials Processing Division, Raja Ramanna Centre for Advanced Technology, Indore 452 013 (M.P.), India. ³Department of Physics, Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE,</p>

WMN-15 Scientific Program

	United Kingdom
P4	<p>Critical magnetic fields of superconducting aluminum-substituted $Ba_8Si_{42}Al_4$ clathrate</p> <p>Yang Li, Jose Garcia, Giovanni Franco, <i>Department of Materials Science and Engineering, University of Puerto Rico at Mayaguez, Mayaguez, PR 00681-9044, USA</i></p>
P5	<p>Synthesis of ZnO and CuO nanowires for study of thermoelectric properties</p> <p>Jaime Santillan and R.Palai <i>Department of Physics, University of Puerto Rico, San Juan, PR</i></p>
P6	<p>Large Area Bilayer Graphene Synthesis by HFCVD for Transparent Conductive Electrodes</p> <p>Tej B. Limbu^{1,2}, Frank Mendoza¹, Oscar Resto², Brad R. Weiner^{1,3}, Gerardo Morell^{1,2} ¹Institute for Functional Nanomaterials, San Juan, Puerto Rico, U. S. A. ²Physics, University of Puerto Rico, Rio Piedras, San Juan, Puerto Rico, U. S. A. ³Chemistry, University of Puerto Rico, Rio Piedras, San Juan, Puerto Rico, U. S. A.</p>
P7	<p>Comparison of the magnetic properties of $Fe_{1-x}Mn_xSi$ semiconductor nanowires grown by CVD and by Mn-ion implantation of FeSi nanowires.</p> <p>José Hernandez-Pérez, Angel Ruiz, Angel Luis and Luis F Fonseca. <i>Department of Physics, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931.</i></p>
P8	<p>Synthesis and Characterization of Graphene Analogous of Transition Metal Dichalcogenides</p> <p>Satyaprakash Sahoo, Anand P.S. Gaur, and Ram S. Katiyar <i>Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00931 USA</i></p>
P9	<p>Functionalized 2D Wide Bandgap Semiconducting Sheets: Properties and Application</p> <p>Peter Feng¹, Xinpeng Wang,² Ali Aldalbahi³ and R.Y. Yang,¹ ¹Department of Physics, University of Puerto Rico, San Juan, PR/USA 00936-8377, ²Nanonex Corporation, Monmouth Junction, NJ 08852, and ³ King Abdullah institute for Nanotechnology and Department of Chemistry, KSU, Riyadh 11451, Saudi Arabia</p>
P10	<p>Lithium Adsorption and Diffusion in SnS_2 Bulk, Bilayer, Monolayer and Nanoribbon: A Computational Investigation</p> <p>Kaixiong Tu, Zhongfang Chen <i>Department of Chemistry, Institute for Functional Nanomaterials, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931.</i></p>
P11	<p>Graphitic-carbon nanospheres/TiO_2 composite based novel electron injection layer for enhanced photovoltaic performance in dye sensitized solar cell</p> <p>Radhe Agarwal, Satyaprakash Sahoo, Venkateswara Rao Chitturi, and Ram S. Katiyar <i>Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00931 USA</i></p>
P12	<p>Physical Properties of Graphene/BNNSs Heterostructures; Advance in 2D Functional Nanomaterials</p> <p>Muhammad Sajjad¹, Frank Mendoza¹, Tej Limbu^{1,2},</p>

WMN-15 Scientific Program

	<p>Xianping Feng^{1,2}, Brad R. Weiner^{1,3}, Gerardo Morell^{1,2} ¹ Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00931, USA ² Department of Physics, University of Puerto Rico, San Juan, PR 00936, USA ³ Department of Chemistry, University of Puerto Rico, San Juan, PR 00936, USA</p>
P13	<p>Magnetism and superconductivity in Eu doped Ba_{8-x}Eu_xAl₆Si₄₀ clathrates Yang Li, Jose Garcia, Giovanni Franco <i>Department of Engineering Science and Materials, University of Puerto Rico at Mayaguez, Mayaguez PR 00681-9044 USA</i></p>
P14	<p>Selective Gas Sensing with Graphene and MoS₂ Thin Film Transistors M. Shur¹, S. Rumyantsev¹, and A.A. Balandin² ¹Rensselaer Polytechnic Institute, Troy, New York 12180, USA ²University of California – Riverside, Riverside, California 92521 USA</p>
P15	<p>Spectrophotometric analysis of zirconium and calcium modified barium titanate relaxor ferroelectric thin films Álvaro Instan, Shojan P. Pavunny, Sudheendran Kooriyattil, and Ram S. Katiyar Department of Physics and Institute for Functional Nanomaterials, P.O. Box 70377, University of Puerto Rico, San Juan, PR 00936-8377, USA.</p>
P16	<p>Growth and characterization of tantalum oxynitride thin films for solar water splitting Bibek Thapa , R. Masso-Ferret, and R. Palai University of Puerto Rico, Rio Piedras Campus</p>
P17	<p>Structural, electrical and luminescence properties of tantalum oxynitride thin film Bibek Thapa¹, Kiran Dasari¹, H. Huhtinen², J. Wang³, W.M. Jadwisieniczak³ and R. Palai¹ ¹Department of Physics, University of Puerto Rico, San Juan, Puerto Rico, USA ²Department of Physics, University of Finland, Turku, Finland 20014 ³School of Electrical Engineering and Computer Science, Ohio University, Athens, OH, USA</p>
P18	<p>Theoretical Design of MoO₃-Based Nanodevices and High-Rate Lithium Ion Battery Electrodes Fengyu Li, Zhongfang Chen* Department of Chemistry, Institute for Functional Nanomaterials, University of Puerto Rico, Rio Piedras Campus, San Juan, PR 00931</p>
P19	<p>Novel γ-MnS Nanowires as Light Source and for Energy Storage Juan Beltran-Huarac¹, Oscar Resto¹, Jingzhou Wang², Wojciech M. Jadwisieniczak², Brad R. Weiner¹, Gerardo Morell¹ ¹Department of Physics and Chemistry, University of Puerto Rico, San Juan, PR 00936, USA ²School of Electrical Engineering and Computer Science, Ohio University, Athens, OH 45701, USA</p>
P20	<p>Photovoltaic Effect in Ferroelectric ZnO:Al/(Bi_{0.9}La_{0.1})(Fe_{0.97}Ta_{0.03})O₃/Pt hetrostructures</p>

WMN-15 Scientific Program

	<p>Rajesh K. Katiyar,^{1,2} Yogesh Sharma,^{1,2} Danilo Barrionuevo,^{1,2} Shojan P. Pavunny,^{1,2} Jamie Scott Young,^{1,2} Gerardo Morell,^{1,2} Brad R. Weiner,^{1,3} and Ram S. Katiyar,^{1,2} 1.Department of Physics, University of Puerto Rico, San Juan, Puerto Rico, PR 00936, USA 2.Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00931, USA 3.Department of Chemistry, University of Puerto Rico, San Juan, PR 00936, USA</p>
P21	<p>Electrooxidation of ammonia under the influence of microgravity in parabolic flights Acevedo, Raul^a; Morales, Camila^b; Ortiz, Edwin^b; Perez, Astrid^b; Morales, Roberto^c; Perez, Ivan^b; Nicolau, Eduardo^b; Flynn, Michael^e; Priest, Craig^f; Cabrera, Carlos^{b,d} a Department of Physics, University of Puerto Rico, Río Piedras Campus, PO Box 23346, San Juan, PR 00931-3346, USA b Department of Chemistry, University of Puerto Rico, Río Piedras Campus, PO Box 23346, San Juan, PR 00931-3346, USA c Department of Nutrition, University of Puerto Rico, Río Piedras Campus, PO Box 23346, San Juan, PR 00931-3346, USA d NASA-URC Center for Advanced Nanoscale Materials, PO Box 23346, San Juan, PR 00931-3346, USA e NASA Ames Research Center, Bioengineering Branch, Moffett Field, CA 94036, USA f University of South Australia, Ian Wark Research Institute, GPO Box 2471, Adelaide, South Australia 5001, Australia</p>
P22	<p>Silicon modified strontium titanate for logic and memory devices Sita Dugu, Shojan P. Pavunny, Yogesh Sharma, and Ram S. Katiyar Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00936-8377, USA.</p>
P23	<p>Ultra High Resolution Scanning Transmission Microscopy Oscar Resto Department of Physics, University of Puerto Rico, San Juan, Puerto Rico, PR, USA</p>
P24	<p>Nanoscale Ferroelectric and Tunneling Electroresistance in Multiferroic Heterostructures Danilo Barrionuevo¹, Le Zhang², N Ortega¹, A Sokolov^{2,3}, R S Katiyar¹ ¹Department of Physics and Institute of Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico 00931-3343 USA. ² Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, Nebraska 68588-0299 USA ³ Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, Nebraska 68588-0298 USA</p>
P25	<p>Nanoscale switchable polarization, leakage current behavior of (Ba_{0.955}Ca_{0.045})(Zr_{0.17}Ti_{0.83})O₃ epitaxial thin films Venkata Sreenivas Puli^{1,2,*}, Dhiren K. Pradhan², R. Martínez V², Shiva Adireddy¹, Douglas B. Chrisey¹, Ram. S. Katiyar²</p>

WMN-15 Scientific Program

	<p>1 Department of Physics and Engineering Physics, Tulane University, New Orleans- LA 70118, USA</p> <p>2Department of Physics, University of Puerto Rico, San Juan-00936, PR, USA</p>
P26	<p>Magnetoelectric coupling and Photovoltaic effect in transition metal modified polycrystalline BiFeO₃ thin films</p> <p>Venkata Sreenivas Puli^{1,2}, Dhiren Kumar Pradhan², Rajesh Katiyar², Gollapudi Srinivasulu³,Indrani Coondoo⁴, Neeraj Panwar⁵, Shiva Adireddy¹,Douglas B.Chrisey¹, Ram S.Katiyar²</p> <p>1Department of Physics and Engineering Physics, Tulane University, New Orleans- LA 70118, USA</p> <p>2Department of Physics and Institute of Functional Nanomaterials, University of Puerto Rico, San Juan-00936, PR, USA</p> <p>3Physics Department, Oakland University, Rochester, Michigan 48309-4401, USA</p> <p>4Department of Materials and Ceramic Engineering & CICECO, University of Aveiro, 3810-193 Aveiro, Portugal</p> <p>5Department of Physics, Central University of Rajasthan, Bandarsindri, Rajasthan-305801, India</p>
P27	<p>Humidity effects on tip-induced polarization switching in Pb(Fe_{0.5}Nb_{0.5})O₃</p> <p>Dhiren K. Pradhan¹, Evgheni Strelcov², Rama Vasudevan², Venkata S. Puli³, Sergei V. Kalinin², Ram S. Katiyar¹</p> <p>¹Department of Physics and Institute of Functional Nanomaterials, University of Puerto Rico, San Juan-00936, PR, USA</p> <p>²Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA</p>
P28	<p>Ferromagnetism in ZnO thin films grown by the reactive pulsed DC magnetron sputtering technique.</p> <p>Adrian Camacho-Berrios¹, Wilfredo Otaño², Victor Pantojas², Carlos Ortiz²</p> <p>¹University of Puerto Rico Rio Piedras campus, ²University of Puerto Rico Cayey campus</p>
P29	<p>Growth, and Characterization of Er doped In_{1-x}Ga_xN thin films</p> <p>Kiran Dasari¹, Bibek Thapa¹, Maxim Guinel¹, W.M. Jadwisienczak², H. Huhtinen³ and Ratnakar Palai¹</p> <p>1Department of physics, University of Puerto Rico, San Juan, Puerto Rico, 00931</p> <p>2School of Electrical Engineering and Computer Science, Ohio University, Athens, OH, US</p> <p>3Department of Physics, University of Turku, Turku, Turku, Finland</p>
P30	<p>Ferromagnetic/Ferroelectric/Ferromagnetic Spin Capacitors for Magnetoelectric Devices</p> <p>Fernando Aponte, L. Fonseca, and R. Palai</p> <p>Department of Physics, University of Puerto Rico, San Juan, PR 00936, USA</p>
P31	<p>Effect of Periodicity on Order Parameters of Multiferroic Nanostructures</p> <p>Shalini Kumari¹, Nora Ortega¹, Ashok Kumar², Ram S. Katiyar¹</p> <p>¹Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR 00931-3334,USA.</p>

WMN-15 Scientific Program

	² National Physical Laboratory(CSIR), Delhi, India.
P32	<p>Improved multiferroic properties of BiFeO₃ (BFO) ceramics through La and high valence Ta co-doping Yogesh Sharma¹, Rajesh K. Katiyar¹, Manoj K. Singh², and Ram S. Katiyar¹ ¹Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, PR-00936-8377, USA ²Centre of Material Sciences, University of Allahabad, Allahabad, India</p>
P33	<p>Electrical modulation of magnetization in a room temperature magnetoelectric PFNzT ceramic Dilsom A. Sanchez¹, Ashok Kumar², Nora Ortega¹, Ram S. Katiyar¹, Jim F. Scott^{1, 3} ¹Department of Physics, Institute Functional Nanomaterials, University of Puerto Rico, San Juan, PR,USA ² National Physical Laboratory (CSIR), India. ³Cavendish Laboratory, Department of Physics, University of Cambridge, Cambridge CB3 0HE,UK</p>
P34	<p>Tuning of Magnetic Properties in Cobalt-Doped Nanocrystalline Bismuth Ferrite Gina Montes Albino¹, Oscar Perales-Pérez², Boris Renteria², Marco Galvez³ and Maxime J-F Guinel⁴ ¹ Department of Mechanical Engineering, University of Puerto Rico at Mayagüez P.O. Box 9045, Mayagüez, Puerto Rico. 00681-9045 USA. ²Department of Engineering Science and Materials, University of Puerto Rico at Mayagüez, Mayagüez, Puerto Rico 00680- 9044, USA. ³Department of Physics, University of Puerto Rico at Mayagüez, Puerto Rico 00980, USA. ⁴Department of Physics, University of Puerto Rico at Rio Piedras, PO Box 70377, San Juan, Puerto Rico 00936-8377 USA.</p>
P35	<p>Ultrafast insulator-to-metal phase transition dynamics of VO₂ monitored by elastic light scattering Sergiy Lysenko Department of Physics, University of Puerto Rico, Mayaguez, PR 00681, USA</p>
7:00 pm-9:30pm	Dinner and Best Poster Award Presentation- Flamingo C & D

WMN-15 Scientific Program

Friday, January 16, 2015	
7:00 am-8:00 am	Registration and Breakfast-- Flamingo Foyer
Session III: Energy harvesting/High k- Materials-- Flamingo A & B Chair: Ram S. Katiyar and Brad Weiner	
8:00 am- 8:45 am (Invited Talk)	High-Throughput Manufacturing of Polymer-Ceramic Nanocomposite Dielectric Capacitors Designed for Energy Storage Brian Riggs, Ravi Elupula, Shiva Adireddy, Venkata Srinivas Puli, Scott Grayson, and Douglas B. Chrisey Tulane University, Physics and Engineering Physics Department New Orleans, LA 70188
8:55 am- 9:40 am (Invited Talk)	Hybrid Semiconductors Built on Inorganic Nanomodules: Designing Nanostructured Materials for Clean Energy Applications <u>Jing Li</u> , Department of Chemistry and Chemical Biology, Rutgers, The State University of New Jersey, Piscataway, NJ
9:40 am- 10:00 am	Preparation of Tungsten Oxide Nano-Ribbons, their Grafting with Platinum or Palladium Nanocrystals and the Evaluation of their Photocatalytic Activities <u>Maxime Guinel</u> Departments of Chemistry & Physics, University of Puerto Rico, San Juan, PR
10:00 am-10:15 am	Break-- Flamingo Foyer
10:15 am-11:00 am (Invited Talk)	A Theranostic Ceramic Nanovector for Malignant Neoplastic Diseases <u>Sandwip K. Dey</u> Ira A. Fulton College of Engineering; Arizona State University, Tempe, AZ
11:00 am-11:45 am (Invited Talk)	Interface-Tailored Oxide Thin Film-Based Nanolaminates Involving High-k and High-Piezoelectric Materials <u>Geunhee Lee</u> , ¹ Erika M. A. Fuentes-Fernandez, ¹ Guoda Lian, ¹ Ram S. Katiyar, ³ Orlando Auciello ^{1,2} ¹ Department of Materials Science and Engineering, University of Texas at Dallas, Richardson, TX, ² Department of Bioengineering, University of Texas at Dallas, Richardson, TX, ³ Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, PR
11:45 am-12:05 am	Nanoscale morphology of organic solar cell device characterization using AFM. <u>Josee Védrine-Pauléus</u> <i>Department of Physics and Electronics, University of Puerto Rico, Humacao, PR</i>
12:05 pm-1:30pm	Lunch -- Flamingo C & D

WMN-15 Scientific Program

Session IV: 2D Materials- Flamingo A & B Chair: Zhongfang Chen and Jing Li	
1:30 pm -2:15 pm (Invited Talk)	Two Dimensional Materials for Terahertz Electronics and Optoelectronics Applications <u>Michael Shur</u> ¹ , V. Ryzhii ² , and T. Otsuji ² ¹ Rensselaer Polytechnic Institute, Troy, USA, ² Research Institute for Electrical Communication, Tohoku University, Sendai, Japan
2:15 pm- 3:00pm (Invited Talk)	Enhancing application potential of graphene by its integration with 3D and 2D materials <u>Anirudha V. Sumant</u> Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL
3:00 pm-3:15 pm	Break- Flamingo Foyer
3:10 pm-3:30 pm	Electronic transmission of graphene monolayers controlled by graphene nanoribbons <u>Junqiang Lu</u> University of Puerto Rico at Mayaguez
3:30pm-3:50 pm	Design of Dye-Adsorbates for High-Potential Photo-Anodes by Optimization of Level Alignment and Electron Transfer Rates <u>Dalvin Méndez-Hernández</u> , Matthieu Koepf, Bradley J. Brennan, Charles A. Schmuttenmaer, Gary W. Brudvig, Robert H. Crabtree and Victor S. Batista <i>Department of Chemistry, Yale University, New Haven, CT</i>
3:50pm-4:10pm	Large-area bilayer graphene synthesis in the hot filament chemical vapor deposition reactor Frank Mendoza , Tej B. Limbu, Brad R.Weiner, Gerardo Morell , Institute for Functional Nanomaterials, University of Puerto Rico; Department of Physics, University of Puerto Rico at Rio Piedras; Department of Chemistry, University of Puerto Rico at Rio Piedras; San Juan, PR
4:10 pm-4:15 pm	Closing remarks and adjourn- R. Palai