

**22nd International Symposium on Integrated
Functionalities 2010**

ISIF 2010



Technical Program



**June 13-16, 2010
Conrad San Juan Condado Plaza
San Juan, Puerto Rico, USA.**

Vision and Topics

The International Symposium on Integrated Ferroelectrics (ISIF) has been held every year since its creation in 1987, initially at two main sites (Colorado Springs and Monterrey in the USA), and in recent years opened to sites in Europe and Asia. The ISIF has gathered researchers and engineers from academia, national laboratories, and industries, initially focused on fundamental and applied science of ferroelectric and high-dielectric constant thin films, materials integration, and design & fabrication of advanced devices, such as non-volatile ferroelectric random access memories (FeRAMs), ferroelectric thin film-based tunable microwave components and devices, sensors, photovoltaic ferroelectrics for solar cells, micro-electro-mechanical & nano-electro-mechanical systems (MEMS/NEMs). FeRAMs are now making strong inroads into the “smart cards” and RFID markets and companies like Hynix in Korea, and Matsushita-Panasonic, Fujitsu and Toshiba in Japan are making progress in the development of the next generation of FeRAMs.

Considering the significant progress made in recent years on other memory technologies, besides FeRAMs, and the emergence of novel materials with multifunctionalities and integration into multifunctional devices, the general chairs in consultation with the scientific community, have now expanded the focus of ISIF to include the science and technology of other multifunctional materials and their integration, such as multiferroics, magnetic, phase and resistive change, hard (e.g., diamond) and soft (e.g., biomaterials) materials, which integrated with other oxides traditionally addressed in prior ISIF’s, provide a new vision for science & technology of what can be defined as the field of integrated functionalities. Accordingly, the Symposium is now named “International Symposium on Integrated Functionalities” in order to broaden its scope to address the scientific and technological paradigm shift towards inclusion of the exciting scientific topics and technologies involving several multifunctional materials, in addition to oxides for Electronics as discussed above. The first symposium under this new title will be held in San Juan, PR, and we hope to attract large and small companies beyond the field of integrated ferroelectrics, to invigorate the ISIF, with a vision to the future of multifunctional materials and devices.

Prof. Ram S Katiyar
Program Chair

Dr. Félix Miranda
Program Co-Chair

Dr. Orlando Auciello
Program Co-Chair



ISIF 2010 International Symposium on Integrated Functionalities

Symposium Venue: *Hotel Conrad, San Juan, PR (USA) June 13-16, 2010*

Organized by: *The University of Puerto Rico, San Juan and The International Symposium on Integrated Functionalities.*

Program Chair

Prof. Ram Katiyar University of Puerto Rico, San Juan

Program Co-Chairs

Dr. Félix Miranda, NASA Glenn Research Center

Dr. Orlando Auciello, Argonne National Laboratory

ISIF General Chairs

Carlos Paz de Araujo, University of Colorado-Colorado Springs and Symetrix Corp

Orlando Auciello, Argonne National Laboratory

Sandwip Dey, Arizona State University

Rudy Panholzer, Naval Postgraduate School, Monterey, California

ISIF International Advisory Committee

U. Boettger, RWTH-Aachen, Germany
S. Hong, Argonne National Laboratory, USA
J. Celinska, Symetrix, USA
C.S. Hwang, Seoul National University, Korea
R. Ramesh, University of California-Berkeley, USA
T. Moise, Texas Instrument, USA
A.S. Bhalla, University of San Antonio, USA
J.F. Scott, Cambridge University, UK
A. Barthelemy, CNRS, France
K. Yao, IMRE, Singapore
H. Funakubo, Tokyo Institute of Technology, Japan
M. Cole, Army Research Laboratory, USA

Local Organizing Committee:

Manuel Gomez (UPR, San Juan)
Ram Katiyar (UPR, San Juan)
Gerardo Morell (UPR, San Juan)
Carlos Cabrera (UPR, San Juan)
Reji Thomas (UPR, San Juan)
Maxime Guinel (UPR, San Juan)
Julian Velez (UPR, San Juan)
Ashok Kumar (UPR, San Juan)
Felix Fernandez (UPR, Mayaguez)
Oscar Perales (UPR, Mayaguez)
Wilfredo Otano (UPR, Cayey)
Luis Rosa Rodriguez (UPR, Humacao)

Symposium Coordinators

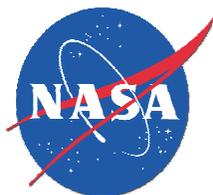
Maria Vargas, University of Puerto Rico at San Juan (m_vargas@rcse.upr.edu)

Irma Febo, University of Puerto Rico at San Juan (irma@epscor.upr.edu)

Publication

The Editor of the Journal, "Integrated Ferroelectrics", by Taylor & Francis, has agreed to publish ISIF2010 presentations as a special volume of the journal. Manuscripts should be prepared according to the instructions provided by the publisher and submitted via e-mail: isif2010-manuscript@rcse.upr.edu by **June 30, 2010**. The target date of publication is October 15, 2010.

ISIF 2010 SPONSORS



National Aeronautics and Space Administration



National Science Foundation



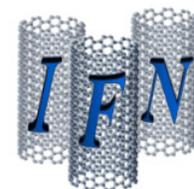
Department of Energy



Advance Materials Research Laboratory, UPR



University of Puerto Rico



Institute for Functional Nanomaterials, UPR



Institute for Complex Adaptive Matter



Taylor & Francis
Taylor & Francis Group

ISIF 2010 EXHIBITS



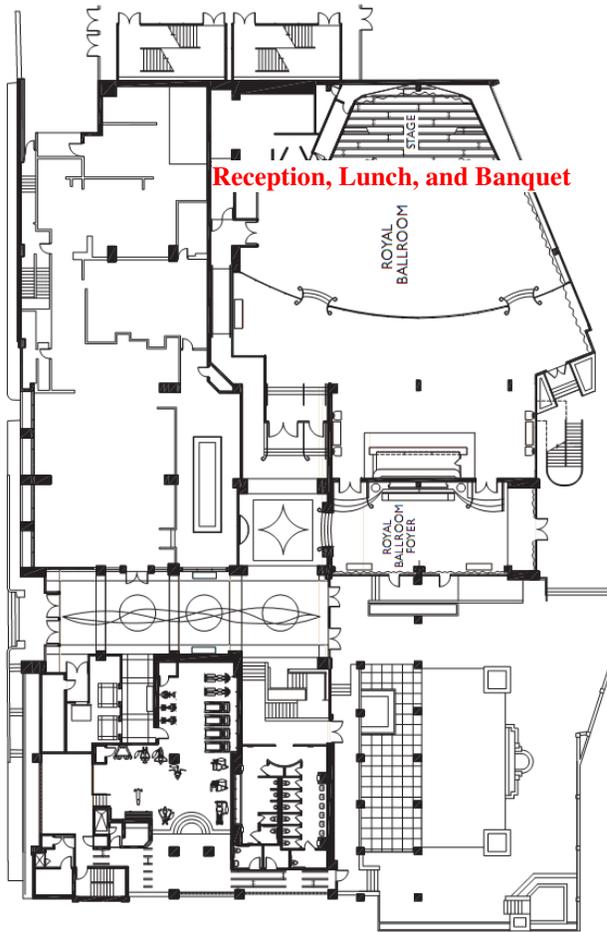
Quantum Design



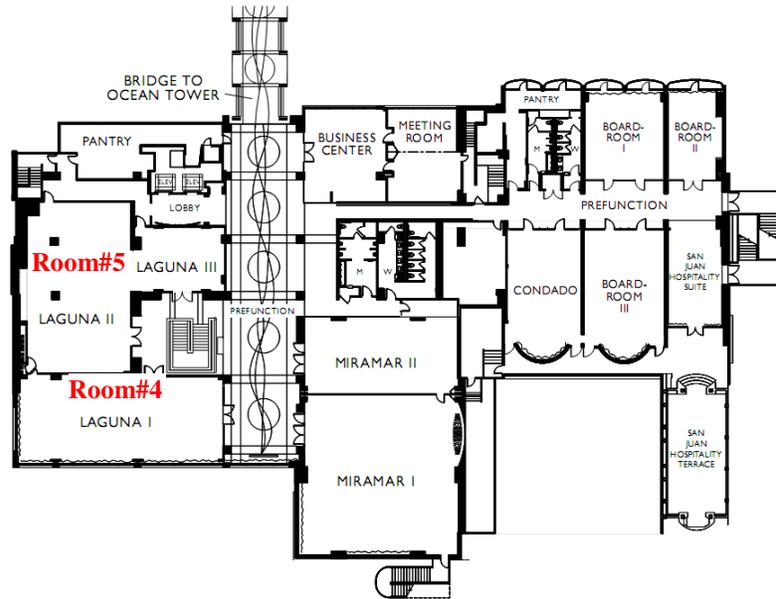
AJA International, Inc.

ISIF 2010 FLOOR MAP

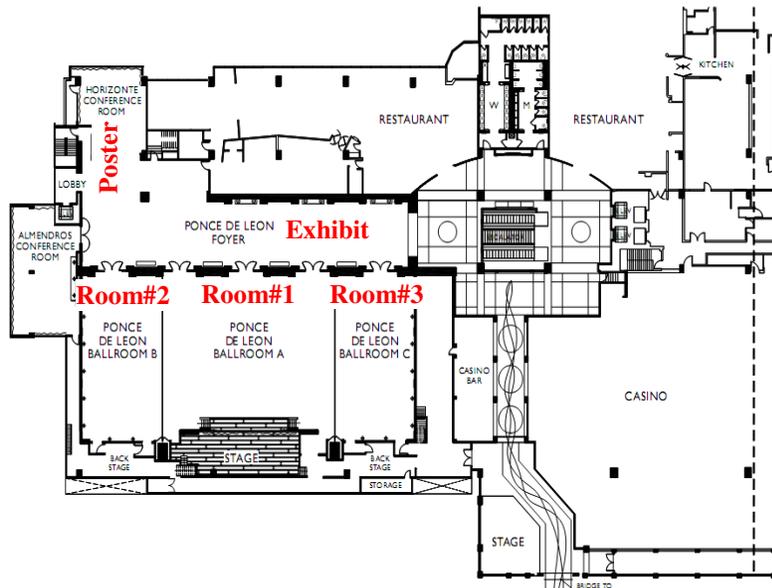
Laguna Lobby Level



Laguna Mezanine Level



Ocean Mezanine Level



SUNDAY, JUNE 13, 2010

Tutorial A: Theoretical (Room 4: Laguna 1)

Chairs: Y. Ishikawa and J. Velev, University of Puerto Rico

- 08:30 – 10:15** *First Principles Calculations of Ferroelectricity Part 1*, Marco Fornari, Central Michigan University.
- 10:30 – 12:15** *First Principles Calculations of Ferroelectricity Part 2*, Serge Nakhmanson, Argonne National Laboratory
- 12:15 - 13:30** **Lunch Break**
- 13:30-15:15** *Grid Computing* David Swanson, University of Nebraska
- 15:30-17:15** *Transport Properties*, Julian Velev, University of Puerto Rico

Tutorial B: Experimental (Room 5: Laguna 2)

Chairs: A. Kumar and R. Palai, University of Puerto Rico

- 08:30- 10:15** *Artificial superlattices: Production and Characterization* Matthew Dawber, Stonybrook University
- 10:30- 12:15** *PFM and AFM techniques* Seungbum Hong, Argonne national Laboratory
- 12:15 - 13:30** **Lunch Break**
- 13:30 - 15:15** *Optical spectroscopy techniques for ferroelectrics* Andreas Ruediger INRS, Canada
- 15:30 – 17:15** *Basics of Multifunctional and Metamaterials*, Amar Bhalla, UTSA, Texas

Registration: **15:00-18:00**

Welcome Reception: **18:00-19:00** **Royal Ballroom**

Government Funding Presentations ROYAL BALLROOM

Chair: Manuel Gomez, University Of Puerto Rico

- 19:00-19:30:** *Overview of NSF programs in Material Science & Engineering*, **Pradeep Fulay**, National Science Foundation.
- 19:30-20:00:** *Overview of NASA Research & Technology programs*, **Jih-Fen Lei**, NASA Glenn Research Center.

PLENARY & PARALLEL SESSIONS

Room	Session	Topic	Day	Time
1	Plenary	Non-volatile MRAM memories	Monday	08:00-08:45
1	Plenary	Towards an Electric Control of Spintronics Devices		13:30-14:15
1	S1	Ferroelectric Materials: Theory and Experiments.		09:00 - 17:45
2	S5	Tunable Dielectrics for RF Applications and Devices		09:00 – 16:00
2	S2	Multiferroics and Magnetolectrics: Theory & Expts.		16:15- 17:45
3	S4B	Non-Volatile Memories (MRAMs)		09:00 – 12:45
3	S4A	Non-Volatile Memories (RRAMs)		14:30- 17:45
4	S8	Ferroelectric Polymers, Composites and Liquid Crystals		09:00- 16:00
4	S7	Piezoelec. & Optoelec.for Sensors, Actuators, & Transducers		16:15- 17:45
5	S9	Energy Harvesting, Ferroelectric Photovoltaics		09:00- 12:15
5	S11	Ferroelectrics and Spintronics, Theory & Experiments		14:30- 17:45
6	S1-S12	Poster Presentations for all sessions		18:00 – 20:00
Day Break				
1	Plenary	Magnetolectric multiferroics- Controlling large polarization with magnetic fields	Tuesday	08:00-08:45
1	Plenary	Maturity and New Opportunities in Integrated Ferroelectrics and Functionalities		13:30-14:15
1	S1	Ferroelectric Materials:Theory & Expts.		09:00-10:30
1	S3	Nanoscale Ferroelectrics and 3-D Geometries for Memories		10:45-17:45
2	S2	Multiferroics and Magnetolectrics: Theory & Expts.		09:00-17:45
3	S4A	Non-Volatile Memories (RRAMs)		09:00-12:15
3	S4C	Non-Volatile Memories (FeRAMs)		14:40-17:45
4	S7	Piezoelec. & Optoelec.for Sensors, Actuators, & Transducers		09:00-16:00
4	S6	High-K Dielectrics for Nanoscale Logic and DRAM Devices		16:15-17:45
5	S11	Ferroelectrics and Spintronics, Theory & Experiments		09:00-16:00
5	S10	Ferroelectrics and Inorganics in Medicines and Health Care		16:15-17:45
Salon Royal		Symposium Banquet		19:00 – 21:00
Day Break				
1	Plenary	Design Approach to Non-lead Relaxor Perovskites for Multifunctional Applications	Wednesday	08:00-08:45
1	Plenary	Ferroelectrics and Multifunctional Materials In Space		01:30-02:15
1	S3	Nanoscale Ferroelectrics and 3-D Geometries for Memories		09:00- 15:30
2	S2	Multiferroics and Magnetolectrics: Theory & Expts.		09:00-16:00
3	S4C	Non-Volatile Memories (FeRAMs)		09:00-10:15
3	S4D	Non-Volatile Memories (PCRAMs)		10:45-15:45
4	S6	High-K Dielectrics for Nanoscale Logic and DRAM Devices		09:00-15:30
5	S10	Ferroelectrics and Inorganics in Medicines and Health Care		09:00-10:30
5	S12	Materials for Electrocaloric Coolers		10:45-16:00
Symposium End				

Room 1:Ponce de Leon A; **Room 2:**Ponce de Leon B; **Room 3:**Ponce de Leon C;
Room 4:Laguna 1; **Room 5:**Laguna2; **Room 6:** Horizonte

MONDAY, JUNE 14, 2010**8:00- 10:30****Plenary Talk 1: Room #1: Ponce de Leon A**

Chair: Mark Johnson (Naval Research Laboratory)

08:00-08:45Non-volatile MRAM memories, Stuart Parkin IBM San Jose.**Session 1: Ferroelectric Materials: Theory and Experiments****Room #1: Ponce de Leon A**

Chair : S. Pamir Alpay (UCONN)

Co-Chair: Husam Alshareef (KAUST)

- 09:00-09:30 I** Oxide Molecular Beam Epitaxy for High-quality Ferroelectric Thin Films, Sussane Stemmer, Bharat Jalan, Nicholas J. Wright, Junwoo Son & Roman Engel-Herbert University of California
- 09:30-10:00 I** Low processing temperature of ferroelectric thin films: the key for future integration, Paula Maria Vilarinho, University of Aveiro
- 10:00-10:15 C** Advances on the Reduction of the Processing Temperature of ferroelectric thin films: The Photochemical Solution Deposition Approach, Ricardo Jiménez Iñigo Bretos, & M. Lourdes Calzada, Instituto de Ciencia de Materiales de Madrid
- 10:15-10:30 C** MOCVD growth of Bi (Zn_{1/2}Ti_{1/2})O₃-based ferroelectric thin films and their electrical properties, Shintaro Yasui, Tokyo Institute of Technology

Session 5: Tunable Dielectrics for RF Applications and Devices**Room#2: Ponce de Leon B**

Chair: G. Subramaniam (Dayton Univ., Ohio)

Co-chair: F. Miranda (NASA-GRC, Ohio)

- 09:00-09:30 I** Tunable Microwave Devices using Ferroelectric Thin Films, Timothy Jackson, University of Birmingham.
- 09:30-10:00 I** Nanocrystalline ZnO Thin Film Transistors with High-K Gate Dielectrics for RF Applications; Kevin Leedy, Burhan Bayraktaroglu, Robert Neidhard, Airforce Research Laboratory.
- 10:00-10:15 C** Spread Spectrum Clock Generator using Tunable Ferroelectric Capacitor, T.S. Kalkur, Abu Kabir, University of Colorado at Colorado Springs
- 10:15-10:30 C** Novel Multi-capacitor Architecture for BST Thin Films Varactors; Guru Subramanyam, Mark Patterson, Kevin Leedy, Robert Neidhard, Chakrapani Varanasi, Gregg Steinhauer, University of Dayton.

Session 4B: Non-Volatile Memories (MRAMs)**Room#3: Ponce de Leon C**

Chair: Mark Johnson (NRL, USA)

- 09:00-09:30 I** High Stability STT MRAM, B. Dieny, I.L.Prejbeanu, K. Mackay, Y. Conraux, L. Lombard, E. Gapihan, C. Ducruet, C. Portemont, R.C. Sousa, J. Herault, M.T. Delaye, Y. Dahmane & B. Dieny, Crocus Technology, Spintec.
- 09:30-10:00 I** Crossbar MRAM Design of Low Power and Scalability, Jian-Gang (Jimmy) Zhu, Carnegie Mellon university
- 10:00-10:30 I** Non-Linear GMR and Spin-Transfer Torque For MRAM, Mark Blamire, A. Aziz, M. Ali, N. Banerjee, and B. J. Hickey, University of Cambridge; University of Leeds

Session 8: Ferroelectric Polymers, Composites and Liquid Crystals
Room#4: Laguna 1

Chair: Stephen Ducharme (UNL, Nebraska)
Co-chairs: Fouad Aliev (UPR, San Juan), Luis Rosa (UPR Humacao)

- 09:00-09:30 I** The Surface Science of Adsorption on Crystalline Ferroelectric Polymer Surfaces, Peter Dowben, University of Nebraska
- 09:30-10:00 I** Adsorption of Dipolar Molecules on Two Ferroelectric Polymers Carolina C. Ilie, State University of New York
- 10:00-10:30 I** Dynamic responses of dispersed ferroelectric liquid crystal composite systems, K. K. Raina, Neeraj, Thapar University

Session 9: Energy Harvesting, Ferroelectric Photovoltaics
Room#5: Laguna 2

Chair: O. Auciello, Argonne National Laboratory
Co chair: G. Morell, University of Puerto Rico

- 09:00-09:30 I** Polarized Semiconductor Solid Oxides based on Ferroelectrics: New Materials for Photovoltaic Devices, *Andrew M. Rappe*, University of Pennsylvania.
- 09:30-10:00 I** Multimodal Energy Harvesting Systems, *Shashank Priya*, Virginia Tech.
- 10:00-10:15 C** Integrated Energy Sensing, Generation, and Storage (SGS) system: Biosensor and Biofuel Cells Based on Vertically aligned Carbon Nanotube Arrays; *Archana Pandey*, Abhishek Prasad, Yoke Khin Yap, Michigan Technological University.
- 10:15-10:30 C** Parametric Study of an Energy Harvester Based on d33 Mode Piezoelectric Thin Films, *Mahmoud Al Ahmad*, University of Science & Technology Thuwal (Saudi Arabia)

10:30 - 10:45

Coffee Break

MONDAY, JUNE 14, 2010

10:45-13:30

Session 1: Ferroelectric Materials: Theory and Experiments

Room #1: Ponce de Leon A

Chair: S. Pamir Alpay (UCONN)
Co-Chair: Husam Alshareef (KAUST)

- 10:45-11:15 I** Ferroelectricity in strained Ruddlesden-Popper $Sr_{n+1}Ti_nO_{3n+1}$ Phases *Nathan D. Orloff*, Che-Hui Lee, Xiaoxing Xi, Craig J. Fennie, Ichiro Takeuchi, James C. Booth & Darell G. Schlom National Institute of Standards and Technology; University of Maryland; Cornell University; The Pennsylvania State University
- 11:15-11:45 I** Interface Engineered Nanostructures with Anomalous Dielectric Properties, *Chonglin Chen*, University of Texas at San Antonio
- 11:45-12:00 C** Ferroelectricity and Electroresistance in Nanoparticles, Nanowires and Cylindrical Nano-Shells, *Janathan E. Spainer*, Drexel University
- 12:00-12:15 C** Enhancement of Dielectric and Ferroelectric Properties in Donor Substituted Aurivillious SBT Ceramics, *Indrani Coondoo*, Neeraj Panwar, AM Biradar National Physical Laboratory.

Session 5: Tunable Dielectrics for RF Applications and Devices
Room#2: Ponce de Leon B

Chair: G. Subramaniam (Dayton Univ., Ohio)
Co-chair: F. Miranda (NASA-GRC, Ohio)

- 10:45-11:15 I Improvement in planar-type microwave tunable device considering strain relaxation effect of BST film, T. Yamada, Minoru Noda, T. Yamada, K. Seki, K. Yamashita & H. Funakubo, Kyoto Institute of Technology.
- 11:15-11:45 I Dielectric and Thermoelectric Behavior of $(\text{Ba}_x\text{Sr}_{1-x})\text{TiO}_3$ Thin Films, *John D. Baniecki*, M. Ishii, K. Kurihara, K. Yamanaka, Fujitsu Laboratories
- 11:45-12:00 C "Low Temperature Sinterable $\text{BaRE}_2(\text{MoO}_4)_4$ (RE=Pr,Sm,Gd and Dy) Ceramics and $\text{BaRE}_2(\text{MoO}_4)_4$ Filled PtFe laminates from Microwave Circuit Applications, *R. Ratheesh*, Nijesh K. James, Microwave Materials Division, Centre for Materials for Electronics Technology (C-MET)
- 12:00-12:15 C Tunable BST components for microwave applications, *Sandrine Pavan*, A. Rousseau, S. Pacchini, H.B. El-Shaarawy, B. Ouagague, J. Dhennink, M. Maglione, R. Plana, University Bordeaux.

Session 4B: Non-Volatile Memories (MRAMs)
Room#3: Ponce de Leon C
 Chair: Mark Johnson (NRL,USA)

- 10:45-11:15 I STT-MRAM: Recent Progress and Market Position, *Yiming Huai*, Roger Malmhall, Ioan Tudosa & Rajiv Ranjan, Avalanche Technology
- 11:15-11:45 I Spin-transfer torque RAM and technology of magnetic tunnel junctions, *J. Hayakawa*, S. Ikeda, H. Yamamoto, K. Miura, M.Y. Yamanouchi, K. Ito, T. Kawahara, R. Takemura, H. Takahashi, H. Matsuoka & H. Ohno, Advanced Research Laboratory; Tohoku University; Central Research Laboratory
- 11:45-12:15 I Quantum Theory of Spin Transfer Torques in a view of Memory Applications, *Mairbek Chshiev*, SPINTEC, Grenoble, France
- 12:15-12:45 I Spin filter barriers for spin generation and detection, *Guoxing Miao* MIT, Francis Bitter Magnet Lab.

Session 8: Ferroelectric Polymers, Composites and Liquid Crystals
Room#4: Laguna 1
 Chair: Stephen Ducharme (UNL, Nebraska)
 Co-chairs: Fouad Aliev (UPR, San Juan), Luis Rosa (UPR Humacao)

- 10:45-11:15 I Ferroelectric Polymer for Organic Electronics Applications, *PS Lee*, C. A. Nguyen, D. Y. Kusuma, Nanyang Technological University, Singapore
- 11:15-11:45 I Dipole layer in organic electronic devices-a unique application opportunity for ferroelectric polymer, *Jinsong Huang*, Yongbo Yuan, Timothy J. Reece & Stephen Ducharme, University of Nebraska
- 11:45-12:15 I Gate Controlled Non-volatile Graphene Ferroelectric Memory, *Barbaros Ozyilmaz*, National University of Singapore
- 12:15-12:45 I Organic Ferroelectric random Access Memories, *Seshu B. Desu*, Binghamton University.

Session 9: Energy Harvesting, Ferroelectric Photovoltaics
Room#5: Laguna 2
 Chair: O. Auciello, Argonne National Laboratory
 Co chair: G. Morell, University of Puerto Rico

- 10:45-11:15 I Domain Wall Driven Anomalous Photovoltaic Effect in BiFeO_3 , *Jan Seidel*, S.Y. Yang, S.J. Byrnes, P. Shafer, C-H Yang, M.D. Rosell, P. Yu, Y.-H. Chu, Jf. Scott, J.W. Ager, III, L.W. Martin & R. Ramesh, Lawrence Berkeley National Laboratory; University of California; National Chiao Tung University; University of Cambridge

- 11:15-11:45 I Polarization Dependant Bulk Photovoltaic Effect in Epitaxial Ferroelectric Thin Films, Kui Yao, Wei Ji, Meng Qin & Yung C. Liang, IMRE; ASTAR
- 11:45-12:00 C "Structural, Optical and Photovoltaic Properties of Bi₂FeCrO₆ epitaxial thin films, Riad Nechache, Centre Energie, Materiaux et Telecommunications (Quebec
- 12:00-12:15 C Piezoelectric MEMS based device as an energy source, Kuldeep Singh, Monika Chaudhary, S. K Singh, Amita Gupta, Department of Physics, H. P. University, Shimla

12:15 - 13:30

Lunch Break

MONDAY, JUNE 14, 2010

13:30-16:00

Plenary Talk 2: Room #1: Ponce de Leon A

Chair: Mark Johnson (Naval Research Laboratory)

- 13:30-14:15 Towards an Electric Control of Spintronics Devices, **Agnes Bathelemy**, University Paris –Sud.

Session 1: Ferroelectric Materials : Theory and Experiments

Room #1: Ponce de Leon A

Chair: S. Pamir Alpay (UCONN)

Co-Chair: Husam Alshareef (KAUST)

- 14:30-15:00 I Complex Polarization States in Ferroelectric Nanowires, R. Ramprasad, G. P. Pilonia University of Connecticut
- 15:00-15:30 I Asymmetric Displacement of hysteresis Loops and Smearing of the Transistor Point due to Space Charges in Ferroelectric Thin Films, I.B. Misirlioglu, M.B. Okatan & S.P. Alpay Sabanci University; University of Connecticut
- 15:30-15:45 C Putting the Groove back into Ferroelectric oxides: a prediction of Goldstone-like states in a layered perovskite with frustrated polarization, S.M. Nakhmanson, Ivan Naumov Argonne National Laboratory; Hewlett-Packard Information and Quantum Systems Laboratory
- 15:45-16:00 C Resistive Switching Properties of Epitaxial PZT Thin Films on (001) Si by RF Sputtering, Chun Wang, Carnegie Mellon University

Session 5: Tunable Dielectrics for RF Applications and Devices

Room#2: Ponce de Leon B

Chair: G. Subramaniam (Dayton Univ., Ohio)

Co-chair: F. Miranda (NASA-GRC, Ohio)

- 14:30-15:00 I Adaptive frequency Electronics based on tunable Ferroelectric capacitors, T.S. Kalkur, University of Colorado at Colorado Springs
- 15:00-15:30 I Voltage Tunable BST and BZN Thin Films on Fused Silica for Planar Microwave varactors, K.C. James Raju, K.Sudheendran, K.Venkata Saravanan and G.Lakshmi Narayana Rao, University of Hyderabad (India)
- 15:30-15:45 C 1/f Noise in Thin Ferroelectric Films and Implications for Loss Mechanisms Based on the Fluctuation-Dissipation Theorem, Robert Romanofsky, NASA Glenn Research Center
- 15:45-16:00 C Tunable Interdigital Capacitors with Ba_{0.5}Sr_{0.5}TiO₃ Thin Films on low-k Substrates for Frequency Agile Microwave Devices, K.C. James Raju, G. Narayana Rao, K. Venkata Saravanan, University of Hyderabad.

Session 4A:		Non-Volatile Memories (RRAMs)
		Room#3: Ponce de Leon C
		Chair: U. Boettger, RWTH-Aachen
		Co-chair: Isao Inoue, AIST, Japan
14:30-15:00	I	Resistance Switching in Oxides: Mechanisms and Materials Challenges for RRAM Application; <i>Alex Ignatiev</i> , University of Houston
15:00-15:30	I	Al/SrTiO _{3-x} N _y /Al Memristors, <i>Andrey Shkablo</i> , Myriam H. Aguirre & Anke Weidenkaff, EMPA- Swiss Federal Laboratories for Materials Science & Technology
15:30-16:00	I	Impacts of Oxygen Vacancy on Band Diagrams and Resistive Switching in Perovskite-Oxide Junctions, <i>Akihito Sawa</i> , A. Sawa, S. Asanuma, H. Yamada, and H. Akoh, AIST Tsukuba
Session 8:		Ferroelectric Polymers, Composites and Liquid Crystals
		Room#4: Laguna 1
		Chair: Stephen Ducharme (UNL, Nebraska)
		Co-chairs: Fouad Aliev (UPR, San Juan), Luis Rosa (UPR Humacao)
14:30: 15:00	I	Ferroelectric Polymer Gates for Semiconductor Heterostructures; <i>Igor Stolichnov</i> , Laboratory of Ceramics
15:00-15:30	I	Channel/ferroelectric interface modification in transparent ZnO non-volatile memory transistor with P(VDF-TrFE) polymer, <i>Seongil Im</i> , C.H. Park, Yonsei University
15:30-15:45	C	Nanoscale Studies of Ferroelectric PVDF-TrFE Copolymer using Piezoresponse Force Microscopy, <i>Pankaj Sharma</i> , Timothy J. Reece, Stephen Ducharme, Alexei Gruverman, University of Nebraska
15:45-16:00	C	The role of gauche bonds in the phase diagram and polarization dynamics of vinylidene fluoride copolymers, <i>Stephen Ducharme</i> , University of Nebraska
Session 11:		Ferroelectrics and Spintronics: Theory and Experiments
		Room#5: Laguna 2
		Chair: Agnes Barthelemy, THALES, France
		Co-chair: Val Novosad, Argonne National Laboratory
14:30-15:00	I	Spintronics, <i>S.D.Bader</i> , Argonne National Laboratory
15:00:15:30	I	Ferroelectric Barium Titanate Tunnel Barriers for (1) Giant Tunnel Electroresistance and (2) Control of Spin Polarization, <i>N.D. Mathur</i> , V. Garcia, M. Bibes, L. Bocher, S. Valencia, F. Kronast, A. Crassous, X. Moya, S. Enouz-Vedrenne, A. Gloter, D. Imhoff, C. Deranlot, S. Fusil, K. Bouzehouane & A. Barthélémy, University of Cambridge; Université Paris-Sud; Albert-Einstein-Str; Campus de l'École Polytechnique; Université d'Evry-Val d'Essonne
15:30-16:00	I	Controlling Spins with Light <i>Theo Rasing</i> Radboud University

16:00 - 16:15

Coffee Break

MONDAY, JUNE 14, 2010

16:15-17:45

Session 1: **Ferroelectric Materials : Theory and Experiments**

Room #1: Ponce de Leon A

Chair : S. Pamir Alpay (UCONN)

Co-Chair: Husam Alshareef (KAUST)

16:15-16:45 I Dissimilar Influence of Biaxial Strain on Phase Transition in Differently Oriented Epitaxial (Ba, Sr) TiO₃ Films, *Tomoaki Yamada*, T Kamo, T Iijima, D Su and Funakubo Tokyo Institute of Technology

- 16:45-17:15 I Size Induced Ferroelectricity in Binary Oxide Nanowires, Anna N. Morozovska, E.A.Eliseev, M.D. Glinchuk & R. Blinc NAS of Ukraine; Jozef Stefan Institute (Slovenia)
- 17:15-17:30 C Holographic integration for Photonics, Young-yuan Zhu, Yi-qiang Quin & Chao Zhang Nanjing University
- 17:30-17:45 C Dielectric Properties of Iron-Fluoride-Doped (Ba,Sr) TiO₃, Wolfgang Menesklo, F. Paul, J.R. Binder & E. Ivers-Tifée, Karlsruhe Institute of Technology; University of Freiburg.

Session 2: Multiferroics and Magnetoelectrics: Theory, Experiments

Room#1: Ponce de Leon A

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velev (UPR)

- 16:15-16:45 I Electrical Property of LCMO Thin Film in LCMO/PMN-PT/TERFENOL-D Heterostructure, H.L.W. Chan, Y. Jiang, R.K. Zheng, G.Y. Gao, Y. Wang, The Hong Kon Polytechnic University
- 16:45-17:00 C Depolarized Field in Rhombohedral BiFeO₃ Thin Films, CW Huang, CW Huang, YH Chu, J Wang, R. Ramesh, Lang Chen, Nayang Technological University
- 17:00-17:15 C Coexistence of Ferroelectric and Ferromagnetic properties at room temperature in Gd and Cr Co-substituted Bi₄Ti₃O₁₂ Thin Films, Ricardo Melgarejo, Reji Thomas & Ram S. Katiyar, Unviersidad de Puerto Rico
- 17:15-18:00 C Multiferroic properties in Sm-Doped BiFeO₃ Thin Films prepared by Chemical Solution Deposition, CV Tomy, SK Singh, T Era, M Itoh, Amita Gupta, Department of Physics, Indian Institute of Technology Bombay, Mumbai, India
- 17:30-17:45 C The thermooptic property of multiferroic BiFeO₃ films, Hiromi Shima, Koichi Tsutsumi, Michio Suzuki, Toshiyasu Tadokoro, Hiroshi Naganuma, Takashi Iljima, Takashi Nakajima & Soichiro Okamura, Tokio University of Science; J.A. Woollam Japan; Techno-Synergy Inc.; Tohoku University; National Institute of Advanced Industrial Science and Technology

Session 4A: Non-Volatile Memories (RRAMs)

Room#3: Ponce de Leon C

Chair: U. Boettger, RWTH-Aachen

Co-chair: Isao Inoue, AIST, Japan

- 16:15-16:45 I Engineering Control and Applications of oxide based Nano-switches, Jianhua Yang, J.P. Strachan, J. Borghetti, M.D. Pickett, Q. Xia, D.A.A. Ohlberg, D. R. Stewart, G.M.Ribeiro & R.S. Williams, Information and Quantum System Lab.
- 16:45-17:15 I A unified model to explain unipolar memory and threshold resistive switchings, Seo Hyoung Chang, S. B. Lee, S.C. Chae, J.S. Lee, B.S. kang, B. Kahng & T.W. Noh, Seoul Nat'l University, Hanyang University
- 17:15-17:30 I Resistance-dependent switching in NiO-based filamentary RRAM devices, Daniele Ielmini, C. Cagli, F. Nardi & A.L. Lacaita, Politecnico de Milano
- 17:30-17:45 I Re-Programmable Antifuse FPGA Utilizing Resistive Ceram Elements Chris Mcwilliams, Christopher Mc Williams, Carlos A. Paz de Araujo, Jolanta Celinska, Kan-Hao Xue, Symetrix Corporation

Session 7: Piezoelectrics and Opto-Electrics for Sensors, Actuators, Transducers

Room#4: Laguna 1

Chair: A. Bhalla (Univ. of Texas at SA)

Co-chair: Doug Chrisey (RPI, NY)

- 16:15-16:45 I Dielectric spectroscopy (RF and MW) in ferroelectrics and multiferroics, Jose Antonio Eiras, Universidade Federal de Sao Carlos
- 16:45-17:15 I Strain Relaxation and Dislocation Evolution in Epitaxial Perovskite Oxide Thin Films, Y Lin, CL Chen, University of Electronic Science & Technology of China, University of Texas.

- 17:15-17:45 I** From Nano to Bulk: Scaling the Structure-Properties relationships, Luis Fuentes-Cobas, A. Muñoz-Romero, L. Fuentes-Montero M. Loya-mancilla, G. Aquino de los Rios, M.E. Montero-Cabrera, H. Camacho-Montes, J. Camarillo -Cisneros & M:E. Fuentes-Montero, Centro de Investigación en Materiales Avanzados, Institute Laue-Langevin, Universidad Autónoma de Ciudad Juárez, Universidad Autónoma de Chihuahua.

Session 11: Ferroelectrics and Spintronics: Theory and Experiments

Room#5: Laguna 2

Chair: Agnes Barthelemy, THALES, France

Co-chair: Val Novosad, Argonne National Laboratory

- 16:15-16:45 I** Chiral Spin Textures at Surfaces; Stefan Blugel, Institut für Festkörperforschung, Institute for Advanced Simulation (IAS)
- 16:45-17:15 I** Spin Hall Effects in Metallic Nanostructures; Laurent Vila, Institute of nanoscience and Cryogenics
- 17:15-17:45 I** Magnetoelectric Coupling at Multiferroics Interfaces, Michael Fechner, I.V. Maznichenko, M. Holzer, S. Ostanin, A. Ernst, J. Henk & Ingrid Merting, Max Planck Institute of Microstructure Physics (Germany); Martin-Luther University Halle-Wittenberg
- 17:45-18:00 C** Closed-Space Flux Sublimation Growth and Properties of (Cu-Mn) Doped ZnO Films in Nanoneedle and Nanorods-like Morphologies, Alok Rastogi, Ratheesh R. Thankalekshmi, Samwad Dixit, Kousik Samanta, RS Katiyar Binghamton University.

MONDAY, JUNE 14, 2010

18:00-20:00

POSTER PRESENTATIONS

All Sessions

HORIZONTE

Chair: Luis Rosa, UPR-Humacao

Co-Chair: KK. Raina, Thapar University and K.C. James Raju, University of Hyberabad.

- P1M01 55 Years of Positive Temperature Coefficient of Resistance (PTCR): A Short Review, Venketa S. Puli, Ram S. Katiyar Universidad de Puerto Rico
- P1M02 Thickness Dependence of the Dielectric Properties of Tunable Barium Zirconate Titanate Epitaxial Thin Films, Jofre Ventura E. Langenberg, L.E. Coy, C. Ferrater, I. Fina, M.C. Polo, M. V. Garcia-Cuenca, L. Fabrega & M. Varela Iniversitata de Barcelona; Instituto de Ciencia de Materiales de Barcelona
- P1M03 Structural and Dielectric Properties of Manganese Modified Lead Zirconate Ceramics, Bal Govind Tiwari, R.N.P. Choudhary Department of Physics and Meteorology
- P1M04 Anisotropic ferro- and dielectric function in textured Bi₄Ti₃O₁₂ ceramics by te solid-state reaction based on multiple calcinations, Xiao-Bing Chen, Xiangyu Mao, Wei Wang & Jing Wu Yangzhou University
- P1M05 Crystallization and Dielectric Properties of Ferroelectric (PbSr)TiO₃ Borosilicate Glass Ceramics with Addition of La₂O₃, C.R. Gautam, D. Kumar & O. Parkash University of Lucknow; Banaras Hindu University (India)
- P1M06 Effect of Deposition Temperature of TiO₂ on the Piezoelectric Property of PbTiO₃ Film Grown by PbO Gas Phase Reaction Sputtering, Jiyoon Kim, Seungbum Hong, Simon Buhlmann, Yunseok Kim, Moonkyu Park, Yong Kwan Kim, Kwangsoo No Korea Advanced Institute of Science & Technology
- P1M07 Ferroelectric Properties of Nanoscale Barium Titanate Thin Films, H. Basantakumar Sharma, Manipur university.
- P1M08 Ferroelectric Studies on sol-gel derived Pb_{1-x}Ca_xTiO₃ Arun Singh Jamia Millia Islamia University
- P1M09 Hyperfine Characterization of Dielectric States in BaTi_{1-x}Hf_xO₃, Alberto López García, Roberto E. Alonso Instituto de Física La Plata
- P1M10 Irradiation Effect on Photoelastic Coefficients in Ferroelectric Li₂Ge₇O₁₅ Crystals, A.K. Bain, Prem Chand Indian Institute of Technology.

- P1M11 Low temperature structural and electrical properties of chemical solution deposited Pr-doped SrTiO₃ thin films on platinized silicon substrates, N.M. Murari, R. Thomas and R.S. Katiyar University of Puerto Rico.
- P1M13 Size Effects of Ferroelectric Materials: Phenomenological Theory, Anna N. Morozovska, E.A.Eliseev, V. Lashkarev Institute of Semiconductor of Physics; Institute of Problems of Materials Science.
- P1M14 Structure and Electrical Properties of Bi_{0.5}Na_{0.5}TiO₃ (Li, Ta, Sb) Modified (K_{0.5}Na_{0.5}NbO₃) Lead Free Ceramics, Amrita Singh, Ratnamala Chatterjee IIT Delhi.
- P1M15 Studies on dielectric properties of CaCu₃Ti₄O₁₂ thin films, Ajay Arora Vandana Arora and Vinay Gupta University of Delhi.
- P1M16 Study of Impedance in Ferroelectric Li₂Ge₇O₁₅ Crystals, Ashim Bain, Prem Chand Indian institute of Technology.
- P1M17 Study of Structural and electrical characterization of Ni/Nb modified Bi₂Ti₂O₇, M.P.K. Sahoo, Mukul Pastor & R.N.P.Choudhary Indian institute of technology Kharagpur.
- P1M18 Study on ferroelectric properties and residual stress of Bi_{3.15}Nd_{0.85}Zr_{0.05}O₁₂ thin films etched by inductively coupled plasma, Jianjun Li, Jia Li, Jun Yu University of Electronic Science and Technology of China/Huazhong University of Science and Technology.
- P1M19 Sub-Micron Gap Capacitors using Ferroelectric Thin-Films, T. Price, E.Benabe, T Weller, Y Emirov, A Kumar University of South Florida.
- P1M20 The thickness effect of BLT buffer layer in PZT/BLT thin film, Jianjun Li, Xinyi Wen, Yunyi Wu, Jun Yu University of Electronic Science and Technology of China/Huazhong University of Science and Technology.
- P2M01 Anomalous enhancement in magnetization in BiFeO₃ / CoFe₂O₄ heterostructured thin films, S. Dussan, Manoj Kumar Singh, RS Katiyar, University of Puerto Rico
- P2M02 Dielectric properties of multiferroic Co_{3-x}Mn_xO₄ ceramics, Monika Tomar, P.L. Meena, Monika Tomar, K. Sreenivas, Ravi Kumar, University of Delhi
- P2M03 Multiferroic Characteristics in Artificial BST/LSMO Superlattices Grown in Different Substrates by Pulsed Laser Deposition, Ricardo Martínez, A Kumar, R Palai, RS Katiyar University of Puerto Rico
- P2M04 Enhanced Magnetization and Magnetoelectric Coupling in Hydrogen Treated Hexagonal YMnO₃, Anurag Gaur, Nagesh Kumar, G. D. Varma National Institute of Technology Kurkshetra (India)
- P2M05 Ferroelectric properties and Conduction mechanisms of Multiferroic BiFeO₃ films grown by pulsed laser deposition, M.C. Chen, A.Q. Jiang, Z.H. Chen & X.B. Liu Fudan University
- P2M06 Improved Magnetic and dielectric Properties of Single Phase Nd Substituted BiFeO₃ Nano Crystalites, K. Singh M.Singh, Ashish Gautam, K. Sen. R.K. Kotnala, Himanchal Pradesh University Shimla, India.
- P2M07 Novel room temperature multiferroic PZT/PFT: A comparison with epitaxial thin films, Dilsom A. Sanchez , Ashok Kumar, RS. Katiyar, University of Puerto Rico.
- P2M08 Influence of the Magnetic Phase on Magnetoelectric Coupling in PMN-PT/ferrite Particulate Composites , Ducinei Garcia, F. L. Zabotto, A.J. Gualdi, A.J.A. Oliveira, J.A. Eiras, Ferroelectric Ceramics Group, Federal University of Sao Carlos, Brazil.
- P2M09 Raman Scattering at Phase Separation in Semiconductor Maganite-Multiferroic Eu_{0.8}Ce_{0.2}Mn₂O₅, Sergei Lushnikov, Ioffe Physical Technical Institute
- P2M10 Magnetoelectric contribution to magnetoelastic coupling in Pb(Fe_{1/2}Nb_{1/2})O₃ multiferroics ceramics, Barbara Fraygola, N. Frizon, M.H.Lente, D. Garcia and J.A. Eiras, Ferroelectric Ceramics Group, Federal University of Sao Carlos, Brazil.
- P2M11 Influence of the microstructural characteristics on ferroelectric, magnetic and magnetoelectric properties in PMN-PT/ferrite particulate composites, Fabio Zabotto, F. L. Zabotto, A.J. Gualdi, A.J.A. Oliveira, J.A. Eiras and D. Garcia, Ferroelectric Ceramics Group, Federal University of Sao Carlos, Brazil

- P3M01 Ferroelectric Domain Wall Pinning and Spatially-Resolved Switching Studies at a Bicrystal Grain Boundary in Bismuth Ferrite; Brian J Rodriguez, S. Choudhury, Y.H. Chu, A. Bhattacharyya, S. Jesse, K. Seal, A.P. Baddorf, R. Ramesh, L-Q Chen & S.V. Kalinin University College Dublin; Pennsylvania State University; National Chiao Tung University; Lehigh University, Oak Ridge National Laboratory; University of California.
- P3M02 Raman Spectra of Ferroelectric Thin Film Under Electric Field; Yu. I. Yuzuyuk, A.S. Anokhin, V.M. Mukhortov & M. El Marssi Southern Federal University; Southern Scientific Center RAS; Université de Picardie Jules Verne.
- P4AM01 Characteristics of resistive switching depending on located conducting filaments, Yeon Soo Kim, JS Kim, JS Choi, IR Hwang, Sahwan Hong, Gwangtaek Oh, Insong Yoon, Konkuk University
- P4AM02 Electrical Properties of both memory and threshold switching in Nb₂O₅ thin films, B.H. Park, Jieun Bae, S.O. Kang, J.S. Kim, J.S. Choi, I.R. Hwang, S.H. Hong, I.S. Byun, Y.S. Kim, G.T. Oh, J.A. Choi, I.S. Yoon, J.W. Son, Konkuk University
- P4AM03 The Investigation on Bipolar Switching in Pt/TiO₂/SRO thin films, Insong Yoon, J.S. Kim, J.S. Choi, I.R. Hwang, Sahwan Hong, Gwangtaek Oh, Yeonsoo Kim, S. O. Kang & B.H. park, Konkuk University
- P4AM04 Transparent resistance random access memory with HfO₂ resistance switching layer, Shima Hisashi, Nanodevice Innovation Research Center (NIRC)
- P4BM05 Ni/NiO Core Shell Nanostructures by Laser Induced Fragmentation: Characterizations and Application, M.K. Singh, A. Agarwal, R.K. Kotnala, and Ram Gopal, Department of Physics, MNNIT, Allahabad, India.
- P4CM06 Ferroelectric diode of ITO and BaTiO₃ Compound Films; X.B. Liu, A.Q. Jiang Fudan University
- P4CM07 Modeling of SONOS Memory Cell Erase Cycle; Thomas A. Phillips, Todd C. MacLeod & Fat D. Ho Marshall Space Flight Center; The University of Alabama in Huntsville
- P4CM08 New Methods for search and Sort with bit-serial and word-parallel type of functional memory, Hiroshi Nozawa, Graduate School of Energy Science Kyoto University (Japan)
- P4CM09 Static Characteristics of the Ferroelectric Transistor Inverter; Cody Mitchell, Crystal Laws, Todd C. MacLeod & Fat D. Ho The University of Alabama in Huntsville; Marshall Space Flight Center
- P4CM10 Switching characteristics of Ferroelectric Transistor Inverters; Crystal Laws, Cody Mitchell, Todd C. MacLeod & Fat G. Ho The University of Alabama in Huntsville; National Space Science and Technology Center
- P4CM11 Modeling a common-source amplifier using a ferroelectric Transistor; Rana Sayyah, Mitchell Hunt, Todd C. Macleod & Fat D. Ho University of Alabama, Marshall Space Flight Center
- P4CM12 Characterization of a Common-Source Amplifier using Ferroelectric Transistors; Mitchell Hunt Rana Sayyah, Todd C. MacLeod & Fat D. Ho University of Alabama; Marshall Space Flight Center
- P7M01 Design and Performances of Shaftless Motor for High Torque Generation, Jin-Heon Oh, Kee-Joe Lim, Dae-Hee Park, Boo-Hyung Ryu, Chungbuk National University; Doowon Institute of Technology; Wonkwang University & Dongguk University
- P7M02 Spin Coated ZnBeMgO Thin Films for Deep Ultraviolet Detection José Liriano, Neeraj Panwar, RS Katiyar, University of Puerto Rico
- P7M03 Terahertz wave generation using nonlinear optical approaches, Yalin Lu, US Air Force Academy
- P8M01 Dielectric and polarization properties of BaTiO₃ Nanoparticle/Ferroelectric Liquid Crystal Colloidal Suspension, Indrani Coondoo, Puja Goel, Anu Malik, A.M. Biradar National Physical Laboratory, India.
- P8M02 Ferroelectric properties and leakage behavior in poly (vinylidene fluoride-trifluoroethylene) ferroelectric thin films doped with diethyl phthalate, M.H. Tang, H.Y. Xu, Y.G. Xiao, J. He, Xiangtan University (China)

- P8M03 High mobility non-volatile memory thin film transistor with (VDF-TrFE) ferroelectric polymer, Kwang H. Lee, Gyubaek Lee, Min Suk Oh, Sung-Min Yoon & Seongil Im, Institute of Physics and Applied Physics; Korea Electronic Technology; Electronics and Telecommunications Research Institute.
- P9M01 Decorated Zinc Oxide Nanowires for Energy Harvesting Applications, Abhishek Prasad Archana Pandey, Yoke Khin Yap Michigan Technological University
- P9M02 Energy harvesting via frequency conversion using ferroelectric materials in silicon thin film solar cells, Yalin Lu, US Air Force Academy
- P9M03 Effect of RF deposition conditions on the metal-mixed SBT ferroelectric thin films for the photovoltaic applications, Rajesh Katiyar, Neeraj Panwar, J Liriano, G Morell, R Katiyar, UPR
- P9M04 Ferroelectric thin Film and Cantilever Development for Energy Harvesting Applications Husam Al Shareef, E Fuentes- Fernandez, W Debray, MA Quevedo-Lopez and BA Gnade, P Shah and A Hande, M Al Ahmad and HN Alshareef, University of Science & Technology Thuwal (Saudi Arabia)
- P10M01 Sol-gel derived nanostructured NiO films for urea biosensor; Netzahualcoyotl Palomera, Jose L. Vera, Enrique Melendez, Jaime E. Ramire*-Vick, Maharaj S. Tomar, S.P. Singh Universidad de Puerto Rico, Mayaguez Campus
- P11M01 Synthesis and characterization of magnetic diphas $ZnFe_2O_4/gFe_2O_3$ electrospun fibers, Melvin Arias, Boris Reiteria, O. Perales, V. Pantojas and W. Otano, University of Puerto Rico
- P11M02 Stabilization of ferromagnetism in Co-coped M:ZnO, Kajal Jindal Monika Tomar, Vinay Gupta, and K. Sreenivas, University of Delhi, India
- P11M03 Synthesis, magnetization and Raman scattering study of Ni-doped In_2O_3 nanoparticles, Sandra Dussan, Manoj Kumar Singh and Ram S. Katiyar, Universidad de Puerto Rico, University of Allahabad, India

Registration/Help Desk **Tuesday** **8:00-17:00**

TUESDAY, JUNE 15, 2010 **08:00-10:30**

Plenary Talk 3: Room #1: Ponce de Leon A
 Chair: Orlando Auciello (Argonne National Laboratory)
08:00-08:45 Magnetoelectric multiferroics - Controlling large polarization with magnetic fields; James F Scott, Univ. of Puerto Rico & Cambridge University.

Session 1: Ferroelectric Materials : Theory and Experiments
Room #1: Ponce de Leon A
 Chair: S. Pamir Alpay (UConn)
 Co-Chair: Husam Alshareef (KAUST)

- 09:00-09:30 I** Far-Infrared Soft-Mode Spectroscopy of $SrTiO_3$ Thin Films and Heterostructures J. Petzelt, D. Nuzhnyy, P. Kuzel, S. Kamba Institute of Physics (Czech Republic)
- 09:30-09:45 C** Ferroelectric and Piezoelectric Studies on Mo-Substituted $SrBi_2Ta_2O_9$ Ferroelectric Ceramics, Neeraj Panwar, Venkata S. Puli, Indrani Coondoo, RS Katiyar, University of Puerto Rico
- 09:45-10:00 C** Investigation on Divalent Metal Substituted Bismuth Titanate Ferroelectric Thin Films, Kan-Hao Xue, Carlos A. Paz de Araujo, Jolanta Celinska & Cristopher McWilliams University of Colorado at Colorado Springs
- 10:00-10:15 C** Structural, Dielectric and Magnetic Properties of $PbFe_{0.5}Nb_{0.5}O_3$, Margarita Correa, Ashok Kumar, RS. Katiyar Universtiy of Puerto Rico
- 10:15-10:30 C** Room Temperature Ferromagnetic Behavior in Yb-Doped GaN Semiconductor, J. Wu, University of Puerto Rico

Session 2:		Multiferroics and Magnetoelectrics: Theory, Experiments
		Room#2: Ponce de Leon B
		Chair: V. Nagarajan (UNSW)
		Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velev (UPR)
09:00-09:30	I	Creating a Strong Ferroelectric Ferromagnet via Spin-Phonon Coupling, <u>D.G. Schlom</u> , J.H. Lee, L. Fang, E. Vlahos, X. Ke, Y.W. Jung, L. Fitting Kourkoutis, J.W. Kim, P. Ryan, T. Heeg, M. Roeckerath, V. Goian, M. Bernhagen, R. Uecker, P.C. Hammel, K.M. Rabe, S. Kamba, J. Schubert, J.W. Freeland, D.A. Muller, C.J. Fennie, P. Schiffer, V. Gopalan, E. Johnston-Halperin, Cornell University, Penn State University; Ohio State University; Argonne National laboratory; research Center Julich Julich; Institute of Physics ASCR & Rutgers University
09:30-10:00	I	Controlling Magnetization with Electric Field using BiFeO ₃ , <u>Junling Wang</u> Lu You, Ngeah Theng Chua, Rui Guo, Lang Chen, Kui Yao, Nanyang Technological University
10:00-10:30	I	Novel Ferroicity by Design, <u>Craig j Fennie</u> , Cornell University
Session 4A:		Non-Volatile Memories (RRAMs)
		Room#3: Ponce de Leon C
		Chair: U. Boettger, RWTH-Aachen
		Co-chair: Isao Inoune, AIST, Japan
09:00-09:30	I	The Roles of Oxygen Vacancies and Hydrogen Ions in TiO ₂ -Based memory Devices, <u>John Ross Jameson</u> , Yoshio Nishi Adesto Technologies Corporation; Standford University
09:30-10:00	I	Dynamic Doping of TiO ₂ and Polypyrrole for Nonvolatile Memory, Richard McCreery Jing Wu, Sudip Barman, Andrew Bonifas, Lian Shoute University of Alberta
10:00-10:30	I	Nonvolatile Multilevel Storage Effect and Mechanism in Cu/BTMO:Cu/Pt RRAM, <u>Ming LiuWei</u> , Wang, Qi Liu, Shibing Long Chinese Academy of Sciences
Session 7:		Piezoelectrics and Opto-Electrics for Sensors, Actuators, Transducers
		Room#4: Laguna 1
		Chair: A. Bhalla (Univ. of Texas at SA)
		Co-chair: Doug Chrisey (RPI, NY)
09:00-09:30	I	Progress in flexure mode designed flexoelectric piezoelectric composites, <u>L.E. Cross</u> , B. Chu, W. Zhu & N. Li, Pennsylvania State University
09:30-09:45	C	Deposition and characterization of Pb((Zn _{1/3} Nb _{2/3}) _{0.6} (Fe _{2/3} W _{1/3}) _{0.4})O ₃ Ceramic-Glass Composites Thick Film Capacitors, <u>D.B. Chrisey</u> , M. Tomozawa, and R. Katiyar, Rensselaer Polytechnic Institute and UPR
09:45-10:00	C	Studies on interfacial defects and optical properties of c-axis oriented LiNbO ₃ thin films grown by pulsed laser deposition, <u>Monika Tomar</u> , Swati Shandilya, k. Sreenivas & Vinay Gupta, University of Delhi, India.
10:00-10:30	I	Piezoelectric Resonance Enhanced Acoustic Wave Detection and Electrooptic Modulation, Ruyan Guo, University of Texas
Session 11:		Ferroelectrics and Spintronics: Theory and Experiments
		Room#5: Laguna 2
		Chair: Agnes Barthelemy, THALES, France
		Co-chair: Val Novosad, Argonne National Laboratory
09:00-09:30	I	Tunnelling magneto resistance in complex oxide heterostructures with active ferroelectric barriers; Adrian Petraru, Michael Hambe, Nikolay A. Pertsev, Paul Monroe, Valanour Nagarajan, and <u>Hermann Kohlstedt</u> , University zu Kiel
09:30-10:00	I	Realization of Spin injected field effect Transistor, <u>Joonyeon Chang</u> Hyun Cheol Koo, Jonghwa Eom, Suk Hee Han, Mark Johnson, Korea Institute of Science and Technology
10:00-10:30	I	Spin Transfer Induced Microwave Oscillations <u>Jullie Grollier</u> , Unité Mixte de Physique

TUESDAY, JUNE 15, 2010**10:45-13:30****Session 3: Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories****Room #1: Ponce de Leon A**

Chair: Alex Gruverman, Nebraska

Co-Chairs: Gustau Catalan, Barcelona, Reji Thomas, University of Puerto Rico

- 10:45-11:15 I** Artificially Layered Ferroelectric Superlattices Based on PbTiO₃; *Matthew Dawber*, S. Callori, J. Sinsheimer, B. Ziegler, P. Zubko Stony Brook University
- 11:15-11:45 I** Variable-temperature scanning probe microscopy of individual ferroelectric nanostructures; *Jonathan Spanier*, Stephanie H. Johnson Drexel University
- 11:45-12:00 I** A Theoretical Study of a BiFeO₃-BiMnO₃ Nanocheckerboard; *Premala Chandra*, Lucia Palova, Karin M. Rabe Rutgers University (NJ - USA)
- 12:00-12:15 I** Effect of the modulation Period and Composition in the Fabrication of the BaTiO₃/SrTiO₃ Superlattices *Nora Patricia Ortega Achurry*, Ram S Katiyar, Ashok Kumar University of Puerto Rico

Session 2: Multiferroics and Magnetolectrics: Theory, Experiments**Room#2: Ponce de Leon B**

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velev (UPR)

- 10:45-11:15 I** Multifunctional Double Perovskite Thin Films and Heterostructures, *Arunava Gupta*, University of Alabama
- 11:15-11:45 I** Magnetolectric and Spin-Dependent Transport Effects in Ferromagnet/ Ferroelectric Oxide Heterostructures and Interfaces, *J.D. Burton*, University of Nebraska; University of Missouri; National Synchrotron Light Source
- 11:45-12:00 O** Ferroelectric Resistive Switching Mechanism in BiFeO₃ Investigated by Conductive Atomic Force Microscopy and Piezoresponse Force Microscopy, *Alessio Morelli* Florian Johann, Marin Alexe, Ionela Vrejoiu, Max Planck Institute of Microstructure Physics (Germany)
- 12:00-12:15 O** Impedance Spectroscopy and Ferroelectric Characterization of Ferromagnetic B-Site Ordered(Bi_{0.9}La_{0.1})₂NiMnO₆ Thin Film, *Eric Langenberg*, JM Rebled, S. Estrade, I Fina, CJM Daumont, J Ventura, L E Coy, C Ferrater, M C Polo, M V Garcia-Cuenca, L Fabrega, F Peiro, B Noheda, M Varela, J Fontcuberta, University of Barcelona

Session 4A: Non-Volatile Memories (RRAMs)**Room#3: Ponce de Leon C**

Chair: U. Boettger, RWTH-Aachen

Co-chair: Isao Inoue, AIST, Japan

- 10:45-11:15 I** Scalable Oxide Dual-Layer Memory Elements for Non-Volatile Cross-Point Memory Technology, *Rene Meyer*, Stanford University
- 11:15-11:45 I** Operating Current Reduction in Nickel Oxide Correlated Electron Random Access Memories (CeRAMs) Through Controlled Fabrication Process, *Jolanta Celinska-Cristopher* McWilliams, Carlos Paz de Araujo & Kan-Hao Xue Symetrix Corporation, University of Colorado at Colorado Springs
- 11:45-12:00 I** Resistive switching properties of sol-gel derived V-doped SrTiO₃ thin films grown on Si(100) substrates, *M.H. Tang* Z.P. Wang, Z.Z. Zeng Xiangtan University (China)
- 12:00-12:15 O** GaV₄S₈: a new candidate for RRAM memories? *M.P. Besland*, E. Souchier, . Guiot, B. Corraze, P. Moreau, V. Fernandez, P. Mazoyer, C. Estounes, E. Janod & L. Cario Universite de Nantes; STMICROELECTRONICS; CIRIMAT

Session 7: Piezoelectrics and Opto-Electrics for Sensors, Actuators, Transducers
Room#4: Laguna 1
 Chair: A. Bhalla (Univ. of Texas at SA)
 Co-chair: Doug Chrisey (RPI, NY)

- 10:45-11:15 I** Low Voltage Large Displacement Multi-Degree of Freedom Piezo MEMS Actuators, Brett Piekarski, Jeffery S. Pulskamp, Gabriel Smith, Ronald G. Polcawich, US Air Force Academy
- 11:15-11:45 I** Size-tuned design and piezoactivity in lead-free nanoceramics, Yosuke Shiratori Christian Pithan, University of Tokyo and Institute of Solid State Research (Germany)
- 11:45-12:00 C** Growth and field emission studies on CNT/diamond composite by HFCVD method Deepak Varshney Brad R. Weiner, Geraldo Morell University of Puerto Rico, Rio Piedras Campus
- 12:00-12:15 C** UV Photosensitivity of the Polycrystalline CVD Diamond Vladimir Makarov F Mendoza, A Hidalgo, B Weiner, G Morell University of Puerto Rico, Rio Piedras Campus

Session 11: Ferroelectrics and Spintronics: Theory and Experiments
Room#5: Laguna 2
 Chair: Agnes Barthelemy, THALES, France
 Co-chair: Val Novosad, Argonne National Laboratory

- 10:45-11:15 I** Giant Axial ratio Multiferroic BiFeO₃ phase, Helene Bea, CNRS/CEA/UJF
- 11:15-11:45 I** LaMnO₃/SrMnO₃ Superlattices: On the Verge of Ferromagnetism, Tiffany Santos, Argonne National Laboratory
- 11:45-12:00 C** Magneto-Electric Coupling and Ferroelectric Control of magnetization in Ferromagnetic Cobalt/Ferroelectric Copolymer Multi-Layer Films Abhijit Mardana, S Ducharme, S Adenwalla, University of Nebraska
- 12:00-12:15 C** Studies on ZnO tin-film transistors with PZT gate insulator, Z.H. Chen, X.B. Liu, M.C. Chen, H.H. Yu & A.Q. Jiang, Fudan University
- 12:15-12:30 C** Observation of Spin-Polarized State Transport from a Ferromagnetic to a Conductive Material, Vladimir I. Makarov, Igor Khmelinskii, S.A. Kochubei, Department of Physics, University of Puerto Rico, Rio Piedras

12:15 - 13:30 Lunch Break

TUESDAY, JUNE 15, 2010 13:30-16:15

Plenary Talk 4: Room #1: Ponce de Leon A
 Chair: Orlando Auciello (Argonne National Laboratory)
13:30-14:15 Maturity and New Opportunities in Integrated Ferroelectrics and Functionalities; Carlos Araujo, Symetrix Corp.USA.

Session 3: Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories
Room #1: Ponce de Leon A
 Chair: Alex Gruverman, Nebraska
 Co-Chairs: Gustau Catalan, Barcelona, Reji Thomas, University of Puerto Rico

- 14:30-15:00 I** Nanoscale Structure-Property Relations in Epitaxial Heterostructures Involving Ferroelectric PbZr_xTi_{1-x}O₃ Films; Ionela Vrejoiu, Max Planck Institute of Microstructure Physics (Germany)
- 15:00-15:30 I** The Topological Polarization in ferroelectric Nanowires: First Principle; Jiawang Hong, G. Catalan, D.N. Fang, Emilio Artacho and J. F. Scott Tsinghua University; ICREA y Centro de Investigacion en nanociencia y nanotecnología; Peking University; University of Cambridge; Universidad del País Vasco

- 15:30-16:00 I Domain wall motion in nanoscale ferroelectric/multiferroic capacitors Alessio Morelli, Yunseok Kim, Hee Han, Ionela Vrejoiu, Woo Lee, Sunggi Baik, Dietrich Hesse & Marin Alexe Max Planck Institute of Microstructures Physics; Pohang University of Science and Technology; Korea Research Institute of Standards and Science
- 15:45-16:00 I Ferroelectric Data Recording Using Servo-Controlled Tracking Technique Yasuo Cho Kenkou Tanka Tohoku University

Session 2: Multiferroics and Magnetoelectrics: Theory, Experiments

Room#2: Ponce de Leon B

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velev (UPR)

- 14:30-15:00 I Integration of single phase Magneto-electric Multiferroic with Si for FeRAM applications, Ashok Kumar, J.F. Scott & Ram S. Katiyar, University of Puerto Rico, Rio Piedras Campus; Cambridge University"
- 15:00-15:30 I Robust Isothermal Electric Control of Exchange Bias at Room Temperature, Christian Binek, Xi He, Yi Wang, N. Wu, A. Caruso, E. Vescovo, K.D. Belashchenki & P.A. Dowben, University of Nebraska; University of Missouri; National Synchrotron Light Source
- 15:30-15:45 C Local Dynamics of Domain Growth under applied Bias using in SITU STM-(s)TEM, Albina Borisevich, HJ Chang, SV Kalinin, P Wu, SY Yang, P Yu, R Ramesh, LQ Chen, SJ Pennycook, A Borisevich, Oak Ridge National Laboratory
- 15:45-16:00 C Local Enhancement of Magnetoelectric coupling observed using Magnetic Force Microscope, N.D. Mathur, M. Ghidini, University of Cambridge

Session 4C: Non-Volatile Memories (FeRAMs):

Room#3: Ponce de Leon C

Chair: H. Kohlstedt (Kiel University, Germany)

- 14:30-15:00 I Recent Advances in Ferroelectric-Gate Field-Effect-Transistor Technology; Shigeki Sakai, Mitsue Takahashi National Institute of Advanced Industrial Science and Technology
- 15:00-15:30 I Ferroelectric characterization of leaky thin films and current-voltage measuring technique of semicontinuous ultrathin high-k films; A.Q. Jiang, T.A. Tang Fudan University
- 15:30-16:00 I Driving Forces of Imprint Progress in PZT Thin-Film Capacitors for FeRAMS; Soichiro Okamura, Hiromi SHIMA, Takashi Nakajima Tokyo University of Science.

Session 7: Piezoelectrics and Opto-Electrics for Sensors, Actuators, Transducers

Room#4: Laguna 1

Chair: A. Bhalla (Univ. of Texas at SA)

Co-chair: Doug Chrisey (RPI, NY)

- 14:30-15:00 I ZnO Nanowire-Based Optoelectronic Device on Flexible Substrates Hongbin Yu, Tej Belagodu, Ebraheem Ali Azhar, and Sandwip Dey, Arizona State University
- 15:00-15:30 I Zinc-oxide Ultra-violet photodetector with enhanced response, Vinay Gupta, University of Delhi
- 15:30-15:45 C Simultaneous characterization of the electro-optic, inverse-piezoelectric, and electro-absorptive effects in (Sr,Ba) Nb₂O₆ (SBN) Thin Films, Mireille Cuniot-Ponsard J.M. Desvignes, A. Bellemain, F. Bridou, Univ. Paris-Sud, France
- 15:45-16:00 C BST thin films for optical and electro-optic applications, Sandrine Payan, A.Rousseau, F. Leroy, S. Payan, M. Maglione, E. Dogheche, ICMCB-CNRS University Bordeaux

Session 11:	Ferroelectrics and Spintronics: Theory and Experiments Room#5: Laguna 2 Chair: Agnes Barthelemy, THALES, France Co-chair: Val Novosad, Argonne National Laboratory
14:30-15:00	I First-principles modeling of spin transport in multiferroic tunnel junctions, <i>Nuala M. Caffrey</i> , Thomas Archer & Stefano Sanvito Trinity College Dublin.
15:00-15:30	I Sping Torque Oscillators and RF currents-modulation, locking, and ringing, <i>Johan Akerman</i> , University of Gothenburgh.
15:30-16:00	I Voltage Control of Magnetic Anisotropy in Au/Fe Co (001) Ultrathin Layer/ MgO Junctions, <i>Yoshishige Suzuki</i> , Osaka University (Japan).

TUESDAY, JUNE 15, 2010 **16:15-17:45**

Session 3:	Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories Room #1: Ponce de Leon A Chair: Alex Gruverman, Nebraska Co-Chairs: Gustau Catalan, Univ. de Barcelona, Reji Thomas, Univ. of Puerto Rico
16:15-16:45	I Domain Configuration in Single Crystal Ferroelectric Bars; <i>Alina Schilling</i> S. Prosandeev, L. Bellaiche, J.F. Scott & J.M. Gregg Queen's University; University of Arkansas & University of Cambridge
16:45-17:15	I Vortex-Mediated Polarization switching in nano-scale ferroelectrics: Ginzburg-Landau modeling approach; <i>Igor A. Luk'yanchuk</i> , Anaïs Sené & Laurent Baudry University of Picardie; Univeristy of Science and Technology of Lille (France)
17:15-17:30	I Ferroelectric PbTiO ₃ nanostructures for applications in ultra-high density non volatile ferroelectric random access memories; <i>María Torres</i> , M.L. Calzada, L.E. Fuentes Cobas, B. Rodriguez & L. Pardo Instituto de Ciencia de Materiales de Madrid, Centro de Investigación de Materiales Avanzados, University College Dublin & Max Planck Institute of Microstructure Physics
17:30-17:45	I Ferroelectric Thin Films on Multi-walled CNT Arrays for Three Dimensional FeRAMs <i>Sai G Shivareddy</i> , Ashok Kumar, Youngjin Choi, Gehan Amaratunga, J. F Scott, Ram S. Katiyar University of Cambridge
Session 2:	Multiferroics and Magnetolectrics: Theory, Experiments Room#2: Ponce de Leon B Chair: V. Nagarajan (UNSW) Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velez (UPR)
16:15-16:45	I Atomic View of Ferroelectricity by Aberration-Corrected STEM/EELS: Polarization, Tilts and Electronic Structure <i>Albina Borisevich</i> , HJ Chang, Pu Yu, R Ramesh, MP Oxley, S Okamoto, MK Niranjana, JD Burton, EY Tsymbal, Steve Pennycook, Sergei V Kalinin, Berkeley, California
16:45-17:15	I Labile ferroelastic nanodomains a medium tor for magneto-electric effect, <i>A.Varathrajan</i> , Nagarajan Valanoor, Ichiro Takeuchi, Univ. Of Maryland/UNSW
17:15-17:30	C Magnetic behavior of Bi _{0.75} Sr _{0.25} Fe _{1-x} Mn _x O ₃ (x=0.0, 0.1), <i>Jesús m. Siqueiros</i> , NS Almodovar, J Portelles, A Sosa, C Ostos, J Heiras, X Vendrell, L Mestres, Universidad Nacional Autónoma de México
17:30-17:45	C Mixed Tetragonal & Rhombohecral Domain Structure in BiFeO ₃ Thin Film with a strain-Driven Morphotropic Phase Boundary, <i>Huang Chuanwei</i> , CW Huang, YH Chu, J Wang, R. Ramesh, Lang Chen, Nanyang Technological University

Session 4C:	Non-Volatile Memories (FeRAMs) Room#3: Ponce de Leon C Chair: H. Kohlstedt (Kiel University, Germany)
16:15-16:45	I Characterization of Thin Film Ferroelectrics for Ferroelectrics for FRAMs; <u>Koichiro Honda</u> , Y.Kotaka, N. Kin, H. Yamaguchi Device & Materials Lab. Fujitsu Laboratories
16:45-17:15	I Dual Field Communication Scheme for UHF (860-960MHz) Gen2 RFID Chip, <u>Hee-Bok Kang</u> , Miseok Lee, Jeong-Ok, Youngwug Kim, Jinseog Choi Korea University
17:15-17:30	C Multiferroic BiFeO ₃ (BFO) thin-film on Silicon substrates, <u>NM Murari</u> , Reji Thomas, R Katiyar University of Puerto Rico, Rio Piedras Campus.
Session 6:	High-K Dielectrics for Nanoscale Logic and DRAM Devices Room #4: Laguna 1 Chair: D. Schlom (Cornell University, Ithaca, NY) Co-chair: Jürgen Schubert (IBN, Research Center Jülich, Germany)
16:15-16:30	C Point Defect Chemistry in Amorphous Hafnia; <u>R. Ramprasad</u> , C. Tang University of Connecticut; Fritz-Haber-Institut der Max-Planck-Gesellschaft
16:30-17:00	I MOCVD and ALD Routes for High-k Oxides: From Precursor Chemistry to Applications, <u>Anjana Devi</u> , Ruhr-University Bochum
17:00-17:30	I On the key role of nitrogen on reliability and performances of advanced High-K/Metal gate stacks, <u>Gilles Reimbold</u> , X. Garros, M. Cassé, C. Leroux, F. Martin, and F. Boulanger CEA-LETI, MINATEC, 17 rue des Martyrs, 38054 Grenoble cedex 9, France
17:30-17:45	C Tuning the Properties of Crystalline Lanthanide Oxides on Silicon; <u>Dominik Schwendt</u> , E. Bugiel & H.J. Osten Leibniz University.
Session 10:	Ferroelectrics and Inorganics in Medicines and Health Care Room #5: Laguna 2 Chair: S. Dey, Arizona State University Co-chair: Leo Ocola, Argonne National Laboratory
16:15-16:45	I Solid State Micro-and Nanopores For Biosensing Applications, <u>Mike Goryll</u> , N Chaplot, KC Lin, P Joshi, T Mathew, A Smolyanitsky, S Prasad, BL Ramakrishna, TJ Thornton School of Electrical, Computer and Energy Engineering, School of Mechanical Aerospace, Arizona State University
16:45-17:00	C Nanostructured ZnO for Biosensor Applications, <u>Vinay Gupta</u> , Shibu Saha, Monika Tomar, Sunil K. Arya, K. Sreenivas & S.P. Singh University of Delhi; National Physical Laboratory; Universidad de Puerto Rico
17:00-17:30	I Novel Material Systems for Thermal Ablation and Shock Wave Induced Injury in Idealized Cellular Constructs; <u>Dough Chrisey</u> Rensselaer Polytechnic Institute
17:30-17:45	C Osteoblast Cell Adhesion on Combinatorial Metal oxide Nanoscaffolds, Netzahualcoyotl Palomera, Jose L. Vera, Enrique Melendez, <u>Jaime E. Ramirez-Vick</u> , Maharaj S. Tomar Universidad de Puerto Rico, Mayaguez Campus.

19:00 - 21:00

Symposium Banquet

ROYAL SALON

Registration/Help Desk

Wednesday

8:00- 12:00

WEDNESDAY, JUNE 16, 2010

08:00-10:30

Plenary Talk 5: Room #1: Ponce de Leon A

Chair: Felix Miranda (NASA Glenn Research Center)

08:00-08:45 Design Approach to Non-lead Relaxor Perovskites for Multifunctional Applications, *Amar Bhalla*, UTSA, Texas.

Session 3: Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories

Room #1: Ponce de Leon A

Chair: Alex Gruverman, Nebraska

Co-Chairs: Gustau Catalan, Universidad de Barcelona, Reji Thomas, University of Puerto Rico

- 09:00-09:30 I** Non-contact mode AFM with static tip charges for ferroelectric domain detection; *Andreas Ruediger*, Institut National de la Recherche Scientifique (Canada).
- 09:30-10:00 I** 3D Piezoresponse Force Microscopy: Challenges and Innovations; *Seungbum Hong*, Ramesh Nath, Moonkyu Park, Bryan Huey, Ram S. Katiyar, Kwangsoo No, Orlando Auciello, & Amanda Petford-Long Argonne National Laboratory; University of Puerto Rico; Korea Advanced Institute of Science and Technology & University of Connecticut.
- 10:00-10:15 I** Nanoscale studies of Structural Properties and Domain Polarization in BiFeO₃ Thin Film-based nanostructures; *Orlando Auciello*, Ramesh Nath, Jeffrey A. Klug, Seungbum Hong, Alexandra Imre, Bernd Kabius, Michael J. Bedzyk & Ram S. Katiyar Argonne National Laboratory; Universidad de Puerto Rico; Northwestern University.
- 10:15-10:30 I** Probing ferroelectricity in ultrathin wedged epitaxial BaTiO₃ films; *Adrian Petraru*, Hermann Kohlstedt, Axel Solbach, Nikolay Pertsev, Markus Heidelmann, Uwe Klemradt, Willi Zander, Jugern Schubert, and Rainer Waser Christian-Albrechts-Universitat zu Kiel.

Session 2: Multiferroics and Magnetoelectrics: Theory, Experiments

Room#2: Ponce de Leon B

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velez (UPR)

- 09:00-09:30 I** Magnetism, Magnetoelectric Coupling and Ferroelectricity in Orthorhombic AMnO₃, Single Domain Epitaxial Thin Films, *J. Fontcuberta*, X. Martí, I. Fina, L. Fábrega & F. Sánchez Institut de Ciència de Materials de Barcelona; Universitat Autònoma de Barcelona; Universitat de Barcelona
- 09:30-09:45 C** Phonon and magnon anomalies near the magnetic phase transitions in BiFeO₃ thin films, Manoj Kumar Singh, *RS Katiyar*, and J.F. Scott, University of Puerto Rico
- 09:45-10:00 C** Dynamics of phase transitions and magnon-phonon coupling in BiFeO₃, *R. Palai*, R.S. Katiyar, H. Schmid, J.F. Scott, University of Puerto Rico, Rio Piedras Campus
- 10:00-10:15 C** Strain Induced Multiferrocity in EuTiO₃ Thin Films, *Stanislav Kamba*, V. Goian, M. Kempa, J.H. Lee & D.G. Schlom, Institute of Physics ASCR (Czech Republic); Cornell University
- 10:15-10:30 C** Dynamic magnetic and resistive effects on multiferroics PbZr_{0.52}Ti_{0.48}O₃/La_{0.67}Sr_{0.33}MnO₃ Superlattices, *Sandra Dussan*, Ashok Kumar, R.S. Katiyar, University of Puerto Rico

Session 4C: Non-Volatile Memories (FeRAMs)
Room#3: Ponce de Leon C
Chair: H. Kohlstedt (Kiel University, Germany)

- 09:00-09:30 I** Reliability of Ferroelectric Random Access Memory Embedded Within 130NM CMOS; John Rodriguez, K. Remack, J. Gertas, L. Wang, C. Zhou, K. Boku, J. Rodriguez-Latorre, K.R. Udayakumar, S. Summerfelt & T. Moise Senior Member of the Technical Staff, Texas Instruments.
- 09:30-09:45 C** Artificial Duplication of the fatigue state in PZT Thin Film Capacitors; Rachid Bouregba, S. Nossikpendou, C. Soyer, G. Poullain & D. Remiens Université de Caen (France)
- 09:45-19:00 C** SONOS Nonvolatile Memory Cell Programming Characteristics; Todd MacLeod, Thomas A. Phillips & Fat D. Ho Marshall Space Flight Center; The University of Alabama in Huntsville
- 10:00-10:15 C** Study of Interfacial Roughness of SrBi₂Ta₂O₉/ZrO₂/Si Heterostructures by x-ray scattering Asim Roy A. Dhar & S.K. Ray National Institute of Technology Silchar; IIT Kharagpur (India).

Session 6: High-K Dielectrics for Nanoscale Logic and DRAM Devices
Room #4: Laguna 1
Chair: D. Schlom (Cornell University, Ithaca, NY)
Co-chair: Jürgen Schubert (IBN, Research Center Jülich, Germany)

- 09:00-09:30 I** Ternary higher-k oxides for nanoscale logic devices J.M.J. Lopes¹, E. Durgun-Özben¹, R. Luptak¹, R.A. Minamisawa¹, S. Feste¹, D. Buca¹, J. Schubert¹, Q. T. Zhao¹, B. Holländer¹, A. Tiedemann¹, J.M. Hartmann², K. Bourdelle³, N. Kernevez³, P. Baumann⁴, M. Heuken⁴ and S. Mantl¹ ¹Institute of Bio- and Nanosystems (IBN-1) and JARA-Fundamentals of Future Information Technologies, Forschungszentrum Juelich, 52425, Germany, ²CEA-LETI, MINATEC, 17 Rue des Martyrs, 38054 Grenoble Cedex 9, France ³SOITEC, Parc Technologique des Fontaines, 38190 Bernin, France ⁴AIXTRON GmbH, Kaiserstr. 98, D-52134 Aachen, Germany.
- 09:30-10:00 I** Introducing Crystalline Rare-Earth Oxides into Si-Based Electronics; H. J. Osten, A. Laha, D. Schwendt, E. Bugiel & A. Fiseel Leibniz University
- 10:00-10:30 I** Band alignment at the interface of oxide insulators with semiconductors and metals, Valeri Afanas'ev, M. Houssa, and A. Stesmans University of Leuven.

Session 10: Ferroelectrics and Inorganics in Medicines and Health Care
Room #5: Laguna 2
Chair: S. Dey, Arizona State University
Co-chair: Leo Ocola, Argonne National Laboratory

- 09:00-09:30 I** Spin Vortex Microdisks as Multifunctional Carriers; Valentyn Novosad, D.-H. Kim, E. A. Rozhkova, I. Ulasov, M. S. Lesniak, T. Rajh, S. D. Bader Argonne National Laboratory; The University of Chicago
- 09:30-09:45 C** Potential of Fe₃O₄/ZnO Core-Shell nanoparticles in Photodynamic therapy for Cancer; S.P. Singh, J.C. Beltran, M.S. Tomar, O. Perales, L. Rivera & S. Peña University of Puerto Rico, Mayaguez Campus
- 09:45-10:00 C** Synthesis of Nanostructured Metal (Core) - Layered Double Hydroxide (Shell) as Inorganic Theranostics; Sandwip K. Dey, Arizona State University
- 10:00-10:30 I** Fabrication of High-Capacitance Capacitors Supplying Power to Implantable Artificial Retina Devices, Wei Li, Orlando Auciello, Argonne National Laboratory.

10:30 - 10:45 **Coffee Break**

WEDNESDAY, JUNE 16, 2010**10:45-13:30****Session 3: Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories****Room #1: Ponce de Leon A**

Chair: Alex Gruverman, Nebraska

Co-Chairs: Gustau Catalan, Universidad de Barcelona, Reji Thomas, University of Puerto Rico

- 10:45-11:15 I** Tunable properties and Domain Structures in Ferroelectric/Paraelectric Superlattices; *Pavlo Zubko*, M. Dawber, N. Stucki, C. Lichtensteiger, S. Gariglio, J.M. Triscone, E. Bousquet, P. Hermet & P. Ghosez Univeristy of Geneva; Stony Brook University; Universite de Liege
- 11:15-11:45 I** Vortex Polarization States in Ferroelectric Nanostructure Arrays; *Brian J Rodríguez*, X.S. Gao, L.F. Liu, W. Lee, I. I. Naumov, A.M. Bratkovsky, D. Hesse, and M. Alexe University College Dublin
- 11:45-12:15 I** Strain, charge, and Surface Effects on the Polarization Structure and Dynamics in ultrathin Ferroelectric Films, *Carol Thompson*, MJ Highland, D D Fong, J A Eastman, P H Fuoss, T T Fister, M. I Richard, S K Streiffer, G B Stephenson Northern Illinois University.

Session 2: Multiferroics and Magnetoelectrics: Theory, Experiments**Room#2: Ponce de Leon B**

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velez (UPR)

- 10:45-11:15 I** Strain Tuning Multiferroic BiFeO₃ Film Phases and Transitions, *Ingrid Cañero Infante*, B. Dupé, S. Lisenkov, I. Ponomareva, L. Bellaiche, G. Geneste, P.E. Janolin, S. Ravy, S. Petit, H. Béa, B. Warot-Fonrose, K. Bouzehouane, S. Fusil, E. Jacquet, M. Bibes, B. Dkhil, A. Barthélémy"CNRS, France
- 11:15-11:45 I** Multiferroics Under Epitaxial Strain: The Case Of TbMnO₃, *Christophe Daumont*, Beatriz Noheda, Unité mixte de physique ; University of Groningen
- 11:45-12:00 C** Polarization-dependant electron trasport through thin ferroelectric films and the influece of temperature, thickness and domains, *Arthur P. Baddorf*, Peter Maksymovych, Stephen Jesse, Pu Yu, Mark Huijben, Ramamoorthy Ramesh, Sergei V. Kalinin, Oak Ridge National Laboratory
- 12:00-12:15 C** Raman Study of Bi₃FeTi₃O₁₅ and Bi₅Fe_{0.5}Co_{0.5}Ti₃O₁₅, Xiao-Bing Chen, Xiangyu Mao, Wei Wang & Xi. Hu, Yangzhou University.

Session 4D: Non-Volatile Memories (PCMs)**Room #3: Ponce de Leon C**

Chair: Doo Seok Jeong, KIST, Korea

- 10:45-11:15 I** Electrical Conduction of GE-SB-TE Tuned by Addition of Bismuth; *Tae-Yon Lee*, Dong-Seok Suh, Jongseob Kim, Kijoon H.P. Kim, Cheolkyu Kim, Youn-Seon Kang, and Yoonho Khang Samsung Electronic (Korea)
- 11:15-11:45 I** Scaling effects of programming and reliability in phase change memories *Daniele Ielmini*, Politecnico de Milano and IUNET
- 11:45-12:15 I** Growth-dominant SuperLattice-like Phase change Medium and its application in lateral phase change memory, *HX Yang*, LP Shi, R Zhao, HK Lee, JM Li, KG Lim, TC Chong, National University of Singapore.

Session 6: High-K Dielectrics for Nanoscale Logic and DRAM Devices**Room #4: Laguna 1**

Chair: D. Schlom (Cornell University, Ithaca, NY)

Co-chair: Jürgen Schubert (IBN, Research Center Jülich, Germany)

- 10:45-11:15 I High -k Dielectrics on III-V Semiconductors, Ravi Droopad, W. Priyantha & G. Radhakrishnan Texas State University
- 11:15-11:45 I TiO₂ and Al-doped TiO₂ films grown by atomic layer deposition for next generation DRAM capacitor, Seong Keun Kim, Gyu-Jin Choi, Minha Seo, Sang Woon Lee, Jeong Hwan Han, and Cheol Seong Hwang Seoul National University
- 11:45-12:00 C Interlanthanied LaGdO₃ Ceramic and Thin Films for High-K Application SP Pavunny, R Thomas, TS Kalkur, J Shubert, RS Katiyar, University of Puerto Rico, Rio Piedras Campus
- 12:00-12:15 C TiTaO thin films deposited by magnetron sputtering for integrated capacitors in CMOS; M.P. Besland, F. Challali, S. Salimy, D. Averty, A. Rhallabi, J.C. Saubat, A. Charpentier, S. Toutain, M. Carette, J.P. Landesman & A. Gouillet University of Nantes

Session 12: Materials for Electrocaloric Coolers

Room #5: Laguna 2

Chair: J.F. Scott (Cambridge University, UK)

Co-chair: N.D. Mathur (Cambridge University, UK)

- 10:45-11:15 I Giant Electrocaloric Effect in Ferroelectric Polymers; Q. M. Zhang, Sheng-Guo Lu, Breet Neese, Xinyu Li, B. Rožič and Z. Kutnja, The Pennsylvania State University, University Park
- 11:15-11:45 I Giant Electrocaloric effect in solid ferroelectric materials: direct measurements; Zdravko Kutnjak, B. Rožič, H. Uršič, J. Holc & M. Kosec Jozef Stefan Institute (Slovenia)
- 11:45-12:15 I Electrothermal Properties of Perovskite Ferroelectric Films, S. Pamir Alpay, J. Zhang, G. Akcay, A.A. Heitmann, J.V. Mantese & G.A. Rossetti, Jr., University of Connecticut; United Technologies Research Center.
- 12:15-12:45 I Enhancement of Refrigeration Capacities in Ferroelectric Thin-Films; Rami N Chukka, Chen Lang Nanyang Technological University.

12:15 - 13:30

Lunch Break

WEDNESDAY, JUNE 16, 2010

13:30-16:15

Plenary Talk 6: Room #1: Ponce de Leon A

Chair: Felix Miranda (NASA Glenn Research Center)

- 13:30-14:15 Ferroelectrics and Multifunctional Materials In Space, Robert Romanofsky, NASA Glenn Research Center.

Session 3: Nanoscale Ferroelectrics and 3-D Geometries for High Density Memories

Room #1: Ponce de Leon A

Chair: Alex Gruverman, Nebraska

Co-Chairs: Gustau Catalan, Universidad de Barcelona, Reji Thomas, Univ. of Puerto Rico

- 14:30-15:00 I Quantitative Probes for the Functional Properties of Ferroelectric/ Dielectric Superlattices, Paul Evans, Ji-Young Jo, Rebecca Sichel, Pice Chen, Ryan Smith, Ho-Nyung Lee, Serge Nakhmanson, Eric Dufresne University of Wisconsin
- 15:00-15:15 I Strain Engineering in Superlattices of Complex Oxides; Mimoun El Marssi, J. Belhadi, Y. Gagou, F. de Guerville, Y. El Mendli, Yu. I. Yuzyuk & I. Raevski Université de Picardie Jules Verne; Southern Federal University
- 15:15-15:30 I Unipolar bipolar fatigue in antiferroelectric lead zirconate thin films; X.J. Lou, J. Wang National University of Singapore

Session 2: Multiferroics and Magnetoelectrics: Theory, Experiments

Room#2: Ponce de Leon B

Chair: V. Nagarajan (UNSW)

Co-chairs: Premi Chandra (Rutger Univ.) & Julian Velez (UPR)

- 14:30-14:45 C On the low temperature anomalies of BiFeO₃, Gustavo Catalan,, J. Herrero-Albillos, J. Alberto Rodriguez Velamazan, D. Colson, M. Viret, J.F. Scott, Universidad de Barcelona.
- 14:45-15:00 C Effective control of polarity in Bi_{0.9}La_{0.1}FeO₃ thin films by dopant-related internal bias, Yang Wang, Weigang Chen, Lang Chen, Junling Wang & John Wang, Nanyang Technological University; National University of Singapore
- 15:00-15:30 I Domain Wall Nanoelectronics, R. Ramesh, University of California.
- 15:30-15:45 C Multiferroic properties in Co-Doped BiFeO₃ Thin Films, M.S. Tomar, D. Barrionuevo, and S.P. Singh, University of Puerto Rico, Mayaguez Campus.
- 15:45-16:00 C Organic Multiferroic Tunnel Junctions with Ferroelectric Poly(vinylidene fluoride) Barriers, Juan M. Lopez-Encarnación, J.D. Burton, Yang Sung, Evgeny Y. Tsybmal & Julian P. Velez, University of Puerto Rico Rio Piedras Campus; University of Nebraska

Session 4D: Non-Volatile Memories (PCMs)

Room #3: Ponce de Leon C

Chair: Doo Seok Jeong, KIST, Korea

- 14:30-15:00 I Materials for Phase-Change Memory Operative at Elevated Temperatures, Tsung-Shune Chin, Kin-Fu Kao, Chih-Chung Chang, Yung-Ching Chu, Frederick T. Chen, Ming-Jinn Tsai Feng Chia University (Taiwan)
- 15:00-15:30 I Experimental Characterization of Phase Change Memory Arrays C. Zambelli, A. Chimenton & P. Olivo Università degli studi di Ferrara
- 15:30-15:45 I Growth and crystallization behaviors of Ge doped Sb-Te thin films deposited by a combined plasmaenhanced chemical vapor and atomic layer depositions; Seol Choi, Byung Joon Choi, Taeyong Eom, Jae Hyuck Jang, Woong Kyu Lee and Cheol Seong Hwang Seoul National University

Session 6: High-K Dielectrics for Nanoscale Logic and DRAM Devices

Room #4: Laguna 1

Chair: D. Schlom (Cornell University, Ithaca, NY)

Co-chair: Jürgen Schubert (IBN, Research Center Jülich, Germany)

- 14:30-15:00 I FEDRAM: A Dram Cell Based on Ferroelectric-Gated Transistor; T.P. Ma, Xiao Pan Yale University
- 15:00-15:30 I Rare-earth oxides as High-k gate-oxide materials for logic devices; Reji Thomas, P. Ehrhart, R. Waser, J. Shubert, R.S. Katiyar UPR, Institute fur Festkorperforschung, JARA-Fundamentals of Future Information Technology, Institute of Bio- and Nano-Systems.

Session 12: Materials for Electrocaloric Coolers

Room #5: Laguna 2

Chair: J.F. Scott (Cambridge University, UK)

Co-chair: N.D. Mathur (Cambridge University, UK)

- 14:30-15:00 I New Trends in Electrocalorics; S. Kar-Narayan, N.D. Mathur University of Cambridge.
- 15:00-15:30 I Electrocaloric Materials for Giant Pyroelectric Energy Harvesting, Gael Sebald, S. Pruvost, H. Zhu & D. Guyomar Université de Lyon.
- 15:30-16:00 I Electrocaloric Effect in Ferroelectric Relaxor Thin Films; Q. Zhang, T.M. Correia, J.S. Young, R.W. Whatmore, J. F. Scott, N.D. Mathur University of Cambridge, Cranfield University &University College Cork.

END

ISIF 2010 PROGRAM AND EVENT SCHEDULE

SUNDAY, June 13 Tutorials		MONDAY, June 14 Plenary & Sessions					TUESDAY, June 15 Plenary & Sessions					WEDNESDAY, June 16 Plenary & Sessions																												
8:30- 10:15		Plenary 1 08:00-8:50 Ponce de Leon A					Plenary 3 08:00-8:50 Ponce de Leon A					Plenary 5 08:00-8:50 Ponce de Leon A																												
TA1 Laguna 1	TB1 Laguna 2	S1	S5	S4B	S8	S9	S1	S2	S4A	S7	S11	S3	S2	S4C	S6	S10																								
		09:00-10:30					09:00-10:30					09:00-10:30																												
<i>Break 10:15-10:30</i>		<i>Coffee Break 10:30-10:45</i>																																						
10:30-12:15		S1	S5	S4B	S8	S9	S1	S2	S4A	S7	S11	S3	S2	S4D	S6	S12																								
TA2 Laguna1	TB2 Laguna2	10:45-12:15					10:45-12:15					10:45-12:15																												
<i>Break 12:15-13:30</i>		<i>Lunch Break 12:15-13:30 at ROYAL BALLROOM</i>																																						
13:30-15:15		Plenary 2 13:30-14:20 Ponce de Leon A					Plenary 4 13:30-14:20 Ponce de Leon A					Plenary 6 13:30-14:20 Ponce de Leon A																												
TA3 Laguna 1	TB3 Laguna2	S1	S5	S4A	S8	S11	S3	S2	S4C	S7	S11	S3	S2	S4D	S6	S12																								
		14:30-16:00					14:30-16:00					14:30-16:00																												
<i>Break 15:15-15:30</i>		<i>Coffee Break 16:00-16:15</i>																																						
15:30-17:15		S1	S2	S4A	S7	S11	S3	S2	S4C	S6	S10	<table border="0"> <tr><td>S1</td><td>Ponce de Leon A</td></tr> <tr><td>S3</td><td>Ponce de Leon A</td></tr> <tr><td>S5</td><td>Ponce de Leon B</td></tr> <tr><td>S2</td><td>Ponce de Leon B</td></tr> <tr><td>S4A-D</td><td>Ponce de Leon C</td></tr> <tr><td>S6</td><td>Laguna1</td></tr> <tr><td>S7</td><td>Laguna1</td></tr> <tr><td>S8</td><td>Laguna1</td></tr> <tr><td>S9</td><td>Laguna2</td></tr> <tr><td>S10</td><td>Laguna2</td></tr> <tr><td>S11</td><td>Laguna2</td></tr> <tr><td>S12</td><td>Laguna2</td></tr> </table>					S1	Ponce de Leon A	S3	Ponce de Leon A	S5	Ponce de Leon B	S2	Ponce de Leon B	S4A-D	Ponce de Leon C	S6	Laguna1	S7	Laguna1	S8	Laguna1	S9	Laguna2	S10	Laguna2	S11	Laguna2	S12	Laguna2
S1	Ponce de Leon A																																							
S3	Ponce de Leon A																																							
S5	Ponce de Leon B																																							
S2	Ponce de Leon B																																							
S4A-D	Ponce de Leon C																																							
S6	Laguna1																																							
S7	Laguna1																																							
S8	Laguna1																																							
S9	Laguna2																																							
S10	Laguna2																																							
S11	Laguna2																																							
S12	Laguna2																																							
TA4 Laguna 1	TB4 Laguna2	16:15-17:45					16:15-17:45																																	
<i>Welcome Reception</i> 18:00-19:00 ROYAL BALLROOM		Poster Sessions: S1-S12 16:00-18:00					<i>Symposium Banquet</i> 19:00-21:00																																	
<i>Govt. Funding Presentations</i> 19:00-20:00 ROYAL BALLROOM		HORIZONTE CONFERENCE ROOM					ROYAL BALLROOM																																	