

PENNSSTATE



## Technical Program



2014 Joint IEEE International Symposium on the Applications of Ferroelectrics  
International Workshop on Acoustic Transduction Materials and Devices  
Workshop on Piezoresponse Force Microscopy  
ISAF/IWATMD/PFM


Technical Groups	Group 1	ISAF/PFM Group 1: Fundamentals of Ferroelectrics and Related Materials
	Group 2	ISAF/PFM Group 2: Processing of Ferroelectric Crystals, Ceramics, Thick and Thin Films
	Group 3	ISAF/PFM Group 3: Characterization & Properties of Ferroelectrics
	Group 4	ISAF/PFM Group 4: Applications of Ferroelectrics, Piezoelectrics and Related Materials
	Group 5	IWATMD Group 5: Acoustic Transducers & Applications





# Sessions


<b>Session I</b>	Group 1 Stress and Strain Effects Group 2 Bulk Lead Free I Group 3 PFM 1 Group 4 Electrocaloric I Group 5 Acoustics	<b>Session VII</b>	Group 1 Piezoelectric Devices Group 2 Thin Films II Group 3 Lead Free Characterization I Group 4 MLC/Dielectrics II Group 5 Underwater Acoustics
<b>Session II</b>	Group 1 Fundamentals I Group 2 Novel Processing/Thin Films Group 3 PZT Characterization Group 4 Optical Properties & Devices Group 5 Underwater Transducers	<b>Session VIII</b>	Group 1 Relaxors Group 2 Novel Processing Group 3 BiFeO <sub>3</sub> Characterization Group 4 Adaptable Optics & MEMS Group 5 Relaxor-PT Single Crystals I
<b>Session III</b>	Group 1 Non-Classical FE I Group 2 BiFeO <sub>3</sub> Bulk/Films Group 3 PFM II Group 4 Biosensors and Biomedical Devices Group 5 Characterization I	<b>Session IX</b>	Group 1 Fundamentals of Domains Group 2 Single Crystal Characterization Group 3 Thin Film Characterization Group 4 Actuators Group 5 Magnetoelectrics
<b>Session IV</b>	Group 1 Multiferroics I Group 2 Bulk Lead Free II Group 3 Fundamentals & Properties Group 4 Integrated Ferroelectrics Group 5 Energy Harvesting I	<b>Session X</b>	Group 1 Non-Classical FE II Group 2 Thin Films III Group 3 Domains II Group 4 Polymers/Composites Group 5 Relaxor-PT Single Crystals II
<b>Session V</b>	Group 1 Fundamentals II Group 2 Thin Films I Group 3 Domains I Group 4 Pyroelectrics and Electrocalorics Group 5 Energy Harvesting II	<b>Session XI</b>	Group 1 Multiferroics II Group 2 Bulk Piezoelectrics Group 3 Lead Free Characterization II Group 4 Energy Storage/Dielectrics Group 5 Medical Transducers and Ultrasound
<b>Session VI</b>	Group 1 Conduction/Defect Mechanisms Group 2 Thick Film Group 3 PFM III Group 4 MLC/Dielectrics I Group 5 Ultrasonics and Modeling	<b>Special Session</b>	<b>Wakino Memorial Session</b>
		<b>Poster I</b>	Tuesday
		<b>Poster II</b>	Thursday

Tuesday, May 13, 2014

8:00 am - 8:15 am	<b>Welcome and Introductory Remarks</b> Presidents Hall 1 & 2				
8:15 am - 10:00 am	<b>Plenary Session</b> Session Chair: Susan Trolier-McKinstry				
8:15am	<b>Plenary 1</b>	PiezoMEMS Technology for RF Systems and mm-Scale Robotics	<u>Ronald G. Polcawich</u>	Presidents Hall 1 & 2	
9:15am	<b>Plenary 2</b>	Ceramic & Piezoelectric Applications for Venture Business	<u>Takaaki Tsurumi</u>	Presidents Hall 1 & 2	
10:00 am - 10:45 am	Refreshment Break				
10:45 am - 12:00 pm	<b>Session I</b>				
	<b>Group 1</b> Stress and Strain Effects	<b>Group 2</b> Bulk Lead Free I	<b>Group 3</b> PFM 1	<b>Group 4</b> Electrocaloric I	<b>Group 5</b> Acoustics
	Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
	Session Chair: Jon Ihlefeld	Session Chair: Jinrong Cheng	Session Chair: Sergei Kalinin	Session Chair: George Rossetti	Session Chair: Stephen Thompson
	<b>Exhibits Open</b>	<p>Application of PMN-PT Single Crystals as Templates for Strain Investigations on Superconducting Materials <i>S. Trommler, P. Pahlke, S. Molatta, J. Hänisch, K. Iida, L. Schultz, B. Holzapfel, and R. Hühne</i></p>	<p>Enhanced Temperature Stability and Fatigue Resistance in CaZrO<sub>3</sub>-modified (K, Na)NbO<sub>3</sub>-based Lead-Free Piezoceramics <i>K. Wang, F.-Z. Yao, and J.-F. Li</i></p>	<p>Nanoscale Characterization of Ferroelectric Materials by Scanning Probe Microscope under Ultrahigh Vacuum <i>K. Suzuki, T. Okamoto, H. Kondo, S. Suzuki, T. Hosokura, K. Murayama, N. Tanaka, and A. Ando</i></p>	<p>Anisotropy of the Electrocaloric Effect in Lead-Free Relaxors <i>F. Le Goupil, A.-K. Axelsson, L.J. Dunne, M. Valant, J. Dec, A. Berenov, and N. McN. Alford</i></p>
<p>(Li, Na, K)(Nb, Ta)O<sub>3</sub> Based Lead-free Piezoelectric Ceramics Modified by BiScO<sub>3</sub> and BaZrO<sub>3</sub> <i>F. Zhu, M.B. Ward, T.P. Comy, S.J. Milne, J.-F. Li, and A.J. Bell</i></p>		<p>Invited</p> 	<p>0.925 Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub> - 0.075 PbTiO<sub>3</sub> Relaxor Ferroelectrics Modified with Different Dopants for Electrocaloric Cooling Applications <i>C. Molin, S. Gebhardt, and A. Schönecker</i></p>	<p>Invited</p> 	
<p>Pressure-Induced Relaxor-To-Ferroelectric Crossover</p>		<p>Synthesis, Dielectric, Ferroelectric, and</p>	<p>Humidity Effects on Tip-induced Polarization</p>	<p>Correlation between Domain Structure and</p>	

<p>11:30am</p> <p>11:45am</p>	<b>Exhibits Open</b>	<p>in Vinylidene Fluoride Relaxor Terpolymer: Some Explanation to the High Performance of the Terpolymer/ Nanocomposites <u>F. Bauer</u> and L. Eyraud G.A. Samara (in memorium)</p> <p>Epitaxial Bi<sub>5</sub>Ti<sub>3</sub>FeO<sub>15</sub>-CoFe<sub>2</sub>O<sub>4</sub> Pillar-Matrix Multiferroic Nanostructures <u>X. Cheng</u>, A. Imai, H.L. Xin, E.A. Eliseev, A.N. Morozovska, S.V. Kalinin, R. Takahashi, M. Lippmaa, Y. Matsumoto, and V. Nagarajan</p> <p>Enhanced Inverse Flexoelectric Effect f44 in BST Bulk Materials <u>L. Shu</u>, W. Huang, X. Wei, and X. Jiang</p>	<p>Piezoelectric Characterization of Lead-Free Bi<sub>0.5</sub>Na<sub>0.5</sub>TiO<sub>3</sub>-BaZrO<sub>3</sub> Ceramics <u>A. Hussain</u>, J.U. Rahman, A. Maqbool, J.S. Kim, T.K. Song, W.J. Kim, and M.H. Kim</p> <p>Applications of (Bi<sub>0.5</sub>Na<sub>0.5</sub>)TiO<sub>3</sub>-(Bi<sub>0.5</sub>K<sub>0.5</sub>)TiO<sub>3</sub> Based Piezoceramics <u>T.Y. Ansell</u> and D.P. Cann</p> <p>Exploring the Piezoelectric and Electrostrictive Components of Potassium Sodium Bismuth Titanate <u>A.J. Goetzee-Barral</u>, A.J. Bell, T.P. Comyn, and T.J. Stevenson</p>	<p>Switching in Lithium Niobate <u>A.V. Ievlev</u>, A.N. Morozovska, V. Shur, and S.V. Kalinin</p> <p>Nanodomain Study of Lead-Free Relaxor Ca<sub>x</sub>Ba<sub>1-x</sub>Nb<sub>2</sub>O<sub>6</sub> using Piezoresponse Force Microscopy <u>C.S. Pandey</u>, D. Gobeljic, M. Burianek, V. Shvartsman, M. Muehlberg, D.C. Lupascu, and J. Schreuer</p> <p>Bioferroelectricity in Biomolecular Systems at the Nanoscale: Modeling and Analysis of AFM&amp;PFM Data <u>V.S. Bystrov</u></p>	<p>Electrocaloric Effect in Ferroelectrics <u>J.B. Wang</u>, B. Li, X.L. Zhong, and Y.C. Zhou</p> <p style="text-align: center;">Invited </p> <p>Electrocaloric Effect and the Ground State of the Relaxor Ferroelectrics N. Novak, R. Pirc, M. Wencka, and <u>Z. Kutnjak</u></p>	<p>Power Consideration <u>A. Aliev</u>, N. Mayo, and R. Baughman</p> <p>Phased Array Transducer for Health Monitoring of Composite Structures <u>B. Ren</u>, C.J. Lissenden, and J.L. Rose</p> <p>Using an Ultrasonic Transducer to Produce Tactile Rendering on a Touchscreen <u>F. Giraud</u>, C. Giraud-Audine, M. Amberg, and B. Lemaire-Semail</p>
<p>12:00 pm - 1:30 pm</p>	<p><b>Lunch</b> Presidents Hall 3 and 4 or the Gardens Restaurant (Lower Level)</p>					
<p>1:30 pm - 3:00 pm</p>	<p><b>Session II</b></p>					
	<p>Group 1 Fundamentals I</p>	<p>Group 2 Novel Processing/Thin Films</p>	<p>Group 3 PZT Characterization</p>	<p>Group 4 Optical Properties &amp; Devices</p>	<p>Group 5 Underwater Transducers</p>	
	<p>Room 207</p>	<p>Room 206</p>	<p>Room 208</p>	<p>Presidents Hall 2</p>	<p>Presidents Hall 1</p>	
	<p>Session Chair: Ahmad Safari</p>	<p>Session Chair: Geoff Brennecka</p>	<p>Session Chair: Kenji Uchino</p>	<p>Session Chair: Xiaoli Tan</p>	<p>Session Chair: Anne-Christine Hladky Hennon</p>	
<p>1:30pm</p>	<p>Domain Walls in Bismuth Ferrite: Ginzburg-Landau-Devonshire Theory <u>F. Xue</u>, Y. Gu, L. Liang, Y. Wang, and L.-Q. Chen</p>	<p>Epitaxial Growth of BaTiO<sub>3</sub> on Si and SOI by Molecular Beam Epitaxy For Ferroelectric Applications <u>L. Mazet</u>, R. Bachelet, L. Louahadj, S. Schamm-Chardon, M. Hytch, D.</p>	<p>High Temperature Stress-Dependent Piezoelectricity of Pb(Zr, Ti)O<sub>3</sub> <u>F.H. Schader</u>, D. Isaia, M. Weber, E. Aulbach, and K.G. Webber</p>	<p>Optimization of Electrooptic and Piezoelectric Coupling Effect in Relaxor-PT Single Domain Crystals <u>E.W. Sun</u>, R. Zhang, Z.G. Zhang, Y. Sun, F. Qin, Y.G.</p>	<p>Novel Acoustic Projector Technologies for Low Frequency AUV and UUV Platforms <u>J.F. Tressler</u> and B.H. Houston</p>	

1:45pm	<b>Exhibits Open</b>	<p><b>Electrostrictive Effect of PMN-PT Crystals</b>  <u>F. Li</u>, L. Jin, L. Wang, Z. Xu, and S. Zhang</p>	<p>Albertini, B. Gautier, G. Saint-Girons, and C. Dubourdieu</p> <p><b>Epitaxial Growth of Micron-Scale Platelet SrTiO<sub>3</sub> and Fabrication of &lt;001&gt; Textured Piezoelectric Ceramics</b>  <u>Y. Chang</u>, J. Wu, B. Yang, R. Zhang, Y. Sun, F. Qin, and Y. Zhang</p>	<p><b>In-situ Analysis of a Blocking Stress Experiment on a Tetragonal Ferroelectric Ceramic using Synchrotron X-ray Diffraction</b>  <u>L. Daniel</u>, D.A. Hall, K.G. Webber, A. King, and P.J. Withers</p>	<p>Zhang, and W.W. Cao</p> <p><b>Semiconducting Ferroelectric Oxides with Compositionally-Tunable Band Gap: Optical, Ferroelectric and Related Property Characterizations</b>  <u>J.E. Spanier</u></p>	<p>Invited</p> 
2:00pm		<p><b>Phase Field Study on PbTiO<sub>3</sub>/BaTiO<sub>3</sub> Ferroelectric Superlattice</b>  <u>L. Hong</u> and L.-Q. Chen</p>	<p><b>Atomic Layer Deposition for Single-Crystal Heteroepitaxial Ferroelectric Oxide Perovskite Thin Films</b>  <u>A. Akbashev</u>, G. Chen, and J.E. Spanier</p>	<p><b>Pressure-Induced Transitions in Ferroelectric PbZr<sub>0.54</sub>Ti<sub>0.46</sub>O<sub>3</sub> Single Crystal</b>  <u>M. Ahart</u>, Y. Xie, X. Long, Z.-G. Ye, R.W. Cohen, and R.J. Hemley</p>	<p><b>Photovoltaics in Ferroelectric Thin Films and Applications for UV Sensors</b>  <u>K. Yao</u>, S.C. Lai, and Y.F. Chen</p>	<p><b>Active Cloaking with Transducers</b>  <u>J.L. Butler</u>, A.L. Butler, and V. Curtis</p>
2:15pm		<p><b>Charge and Size Effects on the Piezoelectric Response in Ferroelectric Thin Films</b>  <u>X. Lu</u>, H. Yu, and W. Cao</p>	<p><b>Barium Titanate Thin Film Microstructure Control through Liquid Phase and Twinning</b>  <u>D.T. Harris</u>, M. J. Burch, J. Li, E.C. Dickey, and J.-P. Maria</p>	<p><b>Phase Transition Research of Micro Power Generator of Ferroelectric Ceramic</b>  <u>Z.H. Zhang</u>, K.J. Li, Z.G. Shi, D.H. Zhang, and X.D. Liu</p>	<p>Invited</p> 	<p><b>A PZT-based Injectable Acoustic Transmitter for Small Fish</b>  <u>H. Li</u>, Z.D. Deng, J. Xiao, M. Myjak, J. Lu, T.J. Carlson, and M.B. Eppard</p>
2:30pm		<p><b>The Electromechanical Coupling Coefficient: Engineering Figure of Merit or Fundamental Material Property?</b>  <u>A.J. Bell</u></p>	<p><b>Texture Analysis of Thick Bismuth Ferrite Lead Titanate Layers</b>  <u>M. Palizdar</u>, T.P. Comyn, T.J. Stevenson, C.M. Fancher, J.L. Jones, R. Walshaw, D. Mallick, T. Maity, S. Roy, S.F. Poterala, G.L. Messing, E. Suvaci, A.P. Kleppe, A.J. Jahcoat, and A.J. Bell</p>	<p><b>Electrical Properties of Tetragonal Thin-PZT-Film Capacitors from Room Temperature to 6.5 K</b>  <u>J.T. Evans</u>, S.P. Chapman, and D. Daughton</p>	<p><b>Thickness Dependent Stress Relaxation, Twinning and Thermal Expansion of Epitaxial LiNbO<sub>3</sub> and LiTaO<sub>3</sub> Thin Films on C-sapphire</b>  <u>A. Bartasyte</u>, V. Plausinaitiene, A. Abrutis, S. Stanionyte, S. Margueron, V. Kubilius, P. Boulet, S. Huband, and P.A. Thomas</p>	<p>Invited</p> 
2:45pm		<p style="text-align: center;">Invited</p> 	<p><b>Piezoelectric Properties of Zn<sub>1-x</sub>Mg<sub>x</sub>O Thin Films by Pulsed Laser Deposition</b>  <u>X. Kang</u>, L. Garten, J.P. Maria, and S. Trolier-McKinstry</p>	<p><b>Dynamic and Long-time Tests of the Transverse Piezoelectric Effect in PZT Thin Films</b>  A. Mazzalai, D. Balma, N. Chidambaram, S. Tiedke, and <u>P. Muralt</u></p>		

3:00 pm - 3:45 pm	<b>Refreshment Break</b>				
3:45 pm - 5:00 pm	<b>Session III</b>				
	<b>Group 1 Non-Classical FE I</b>	<b>Group 2 BiFeO<sub>3</sub> Bulk/Films</b>	<b>Group 3 PFM II</b>	<b>Group 4 Biosensors and Biomedical Devices</b>	<b>Group 5 Characterization I</b>
	<b>Room 207</b>	<b>Room 206</b>	<b>Room 208</b>	<b>Presidents Hall 2</b>	<b>Presidents Hall 1</b>
	Session Chair: David Cann	Session Chair: Andrew Bell	Session Chair: Nazanin Bassiri-Gharb	Session Chair: Sandy Cochran	Session Chair: Wenwu Cao
3:45pm	<b>Domain Structures and Polarization Reversal in B-glycine Crystals</b> <u>E. Seyedhosseini</u> , I. Bdkin, P. Zelenovskiy, S. Vasiliev, D. Petukhova, A. Turygin, V.Ya. Shur, D. Isakov, and A.L. Kholkin	<b>Development of High-temperature, Bismuth-ferrite based Piezoelectric Ceramics</b> <u>J. Bennett</u> , T.J. Stevenson, T.P. Comyn, and A.J. Bell	<b>High-Resolution Polarization Imaging by Pyroelectric Scanning Microscopy</b> <u>J. Song</u> and S. Ducharme	<b>High Frequency Piezoelectric Films Ultrasonic Transducer for Biomedical Applications</b> <u>Q.F. Zhou</u> , H.S. Hsu, X. Li, C.L. Fu, Z.Y. Chen, T. Ma and K.K. Shung	<b>Developing a New Approach to Multi-Field Characterization of Ferroelectric Single Crystals</b> <u>C.S. Lynch</u> , J.A. Gallagher, D. Baird, and J.M. Powers
4:00pm	<b>Epsilon Ferrite: A New Multiferroic Material?</b> <u>L. Corbellini</u> , J. Plathier, C. Lacroix, D. Menard, and A. Pignolet	<b>Piezoelectric and Multiferroic Properties of Barium Calcium Titanate-based Lead-Free Ferroelectric Ceramics</b> <u>B. Yang</u> , C. Li, S. Zhang, Y. Chang, R. Zhang, and Y. Sun	<b>Tuning of the Depolarization Field and Nanodomain Structure in Ferroelectric Thin Films</b> <u>C. Lichtensteiger</u> , S. Fernandez-Pena, C. Weymann, P. Zubko, and J.-M. Triscone	<p>Invited</p> 	<b>Characterization of Temperature Dependence of Full Matrix Material Properties Using Resonance Ultrasonic Spectroscopy</b> <u>L. Tang</u> , S. Li, and W. Cao
4:15pm	<b>High Temperature Lattice Dynamics Evolution of YMnO<sub>3</sub> and YbMnO<sub>3</sub> from Raman Spectroscopy</b> <u>H. Bouyanfif</u> , A.M. Salah, and M. Zaghrioui	<b>Structural, Ferroelectric and Piezoelectric Properties of Composition Spread Bi<sub>1-x</sub>Ga<sub>x</sub>FeO<sub>3</sub> Thin Films</b> <u>N. Jaber</u> , J. Wolfman, C. Daumont, B. Négulescu, A. Ruyter, G. Feuillard, J. Fortineau, T. Sauvage, B. Courtois, C. Autret-Lambert, and F. Gervais	<b>A Detailed Study of the Imaging Mechanisms Contributing to Charge Gradient Microscopy</b> <u>S. Tong</u> , W.I. Park, Y. Hiranaga, Y. Cho, S. Hong, and A. Roelofs	<b>Bacterial Cellulose/PVDF Composite Films for Touch Sensor: Study on the Effect of Bacterial Cellulose on Polarization Behaviors</b> <u>H. Manuspriya</u> , E. Phakdeeparaphan, and S. Ummartyotin	<b>Stability of Domain Engineered PIN-PMN-PT Single Crystals for Sound Projectors</b> <u>P. Finkel</u> , C. Murphy, A. Heitmann, J. Stace, and A. Amin
4:30pm	<b>Topochemical Synthesis and Characterization of a New Series of Non-centrosymmetric n=1 RP, LiRETiO<sub>4</sub> (RE = rare earth)</b>	<b>Ferroelectric, Piezoelectric and Structural Studies of Novel Bi-Based Perovskites</b> <u>M. Dolgos</u>	<b>Micro- and Nanodomain Imaging in Uniaxial Ferroelectrics by Optical, Scanning Electron, Piezoelectric Force</b>	<b>A Novel Acoustofluidic Device for Antigen Antibody Interaction Detection Using Electrochemical</b>	<b>Validation of the IEEE Standard Method for Calculating Length Extensional Coupling Factors</b>

Exhibits Open

4:45pm		<p>Layered Perovskites <u>A. Sen Gupta</u>, H. Akamatsu, M. Strayer, T. Mallouk, and V. Gopalan</p> <p>Ferroelectric Property in HfO<sub>2</sub>-ZrO<sub>2</sub> Film with Various Metal Electrodes <u>T. Shimizu</u>, T. Yokouchi, T. Oikawa, T. Shiraishi, T. Kiguchi, A. Akama, T.J. Konno, D.J. Kim, A. Gruverman, and H. Funakubo</p>	<p>Processing Optimization and Field-induced Strain Response in Laminated 0.6(Bi<sub>0.85</sub>La<sub>0.15</sub>)FeO<sub>3</sub>-0.4PbTiO<sub>3</sub> Ceramics <u>G.X. Jin</u>, J.G. Chen, D.L. Wang, R. Dai, J.J. Jiang, D.R. Jin, and J.R. Cheng</p>	<p>and Confocal Raman Microscopies <u>V.Ya. Shur</u> and <u>P.S. Zelenovskiy</u></p> <p>Finite Element Method Study of PFM Domain Contrast in BaTiO<sub>3</sub>, KNbO<sub>3</sub> and BiFeO<sub>3</sub> <u>S. Lei</u>, W. Cao, and V. Gopalan</p>	<p>Impedance Measurement <u>T.-H. Tsai</u>, P.-C. Lai, and C.-K. Lee</p> <p>Synthesis of 10nm Tetragonal Barium Titanate for use as a Biomarker <u>O. Matar</u>, S.J. Milne, A.P. Brown, and R.M.D. Brydson, and C. Walti</p>	<p><u>H.C. Robinson</u></p> <p>High Power Characterization of Lead-free Piezoelectric Ceramics <u>E.A. Gurdal</u>, S. Nahm, T. Tou, M. Hajezi, A. Safari, and K. Uchino</p>
5:00 pm - 6:30 pm	Exhibits Open	<p style="text-align: center;"><b>Poster Session I Dean's Hall</b> <b>Session Chair: Brady Gibbons</b></p> <p><b>*Denotes Student Poster Contest Finalist</b></p> <p><b>Group 1</b></p> <p>I.1 Effect of Polarization Change on the Emission Charge of PNZST Cathode Induced by Nanosecond Pulse <u>Y. Liu</u>, Y. Feng, H. He, and Z. Xu</p> <p>I.2 Effect of the Impurities on Conductivity of LiNaGe<sub>4</sub>O<sub>9</sub> Single Crystal <u>O.A. Bibikova</u>, M.D. Volnyanskii, and M.P. Trubitsyn</p> <p>I.3 Electric Field Control of Metallic Insulator Transition in Charge-ordered Fe<sub>2</sub>OBO<sub>3</sub> C. Liu, <u>X. Li</u>, H. Yang, X. Gao, and J. Li</p> <p>I.4 Modified Hydroxyapatite Structure and Properties <u>A.V. Bystrova</u>, Yu.D. Dekhtyar, A.I. Popov, I. Bdikin, A. Kholkin, and V.S. Bystrov</p> <p>I.5 Size Dependent Phonon Softening in Micro/Nanocrystals of Ferroelectric GeTe <u>G. Kamra</u> and S. Murugavel</p> <p>I.6 Atomic Displacements &amp; Phase Transitions in Ge-Sb-Te based Phase Change Memory Materials <u>M. Upadhyay</u> and S. Murugavel</p> <p>*I.7 Inhomogeneous Photochemical Deposition on Domain Engineered Ferroelectric Single Crystals <u>K. Lau</u>, Y. Liu, Q. Li, Z. Li, R.L. Withers, and Z. Xu</p> <p>I.8 Tuning the Ferroelectric Hysteresis Symmetry Utilizing the Interaction between Switchable and Non Switchable Polarization of a Piezoelectric and Ferroelectric <u>A Ghosh</u>, G. Koster, and G. Rijnders</p> <p>*I.9 First-principles Study of the Effect of Oxygen Vacancies Around the 180° Ferroelectric Domain Walls of Tetragonal PbTiO<sub>3</sub> <u>H.-C. Song</u>, H.J. Kim, and Y.-H. Shin</p> <p>I.10 Strong Non-volatile Voltage Control of Magnetism in Magnetic/Antiferroelectric Magnetoelectric Heterostructures <u>Z. Zhou</u>, X.Y. Zhang, T.F. Xie, T.X. Nan, Y. Gao, X. Yang, X.J. Wang, X.Y. He, P.S. Qiu, N.X. Sun, and D.Z. Sun</p> <p>*I.11 Second Harmonic Signatures of Ferroelectric Domain Grids in Ti:LiNbO<sub>3</sub> Waveguide Structures <u>T. Steinrücke</u>, C. Buchholz, A. Widhalm, G. Berth, and A. Zrenner</p> <p><b>Group 2</b></p> <p>I.12 Doping Effect on the Physical Properties of Bi-layered Aurivillius-type Structure SrBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub> Ferroelectric Ceramics</p>				

- I.C. Reis, A.C. Silva, R. Guo, A.S. Bhalla, and J.D.S. Guerra
- I.13 Effect of Glass Additive and Sintering Methods on the Microstructure and Electrical Properties of  $\text{Pb}_{0.87}\text{Ba}_{0.1}\text{La}_{0.02}(\text{Zr}_{0.7}\text{Sn}_{0.24}\text{Ti}_{0.06})\text{O}_3$  Anti-ferroelectric Ceramics  
S.S. Liu, G.Z. Zhang, Y.K. Zeng, S.L. Jiang, and Y.Q. Wang
- I.14 Synthesis and Photocatalytic Performance of  $\text{Bi}_2\text{Fe}_4\text{O}_9$ -reduced Graphene Oxide Composites by One-step Hydrothermal Method  
H. Sun, Y. Liu, Y. Zhang, S.S. Guo, L. Lv, W. Chen
- I.15 The Effects of  $\text{Sn}^{2+}$  Ion Doping on Perovskite Titanates  
Y. Cui and X. Wei
- I.16 Synthesis and Characterization of Lead-free Piezoelectric (K, Na) $\text{NbO}_3$  Nanorods  
J.-F. Li, L.-Q. Cheng, and K. Wang
- I.17 Synthesis and Photocatalytic Performance of  $\text{Bi}_2\text{Fe}_4\text{O}_9$  Microcrystals with Tunable Morphologies by Ultrasonic Cavitation-assisted Hydrothermal Method  
W. Cao, T. Tong, J. Chen, D. Jin, and J. Cheng
- I.18 Polyol-based Synthesis of Well Crystalline PZT Nanoparticles  
A. Nourmohammadi, M. Khosravi, E. Bahremani, and E. Rahmati
- I.19 Ferroelectric Properties of High Density  $0.5\text{Pb}(\text{Ni}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $0.35\text{PbTiO}_3$ - $0.15\text{PbZrO}_3$  Thick Films  
Y.S. Siva, A.R. Kulkarni, and N. Venkataramani
- \*I.20 Crystallographic Texture and Surface Morphology of Pt/ $\text{TiO}_2$  Templates for Enhanced PZT Thin Film Performance  
A. Fox, B. Drawl, G. Fox, B.J. Gibbons, and S. Trolter-McKinstry
- I.21 Study of Structural and Physical Properties of Tetragonal Tungsten Bronze  $\text{Ba}_2\text{LnFeNb}_4\text{O}_{15}$  Thin Films  
T. Hajlaoui, R. Bodeux, D. Michau, M. Josse, and A. Pignolet
- I.22 Investigation of the Microstructure in  $28\text{Pb}(\text{In}_{1/2}\text{Nb}_{1/2})\text{O}_3$ - $40\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $32\text{PbTiO}_3$   
L.A. Stoica and A.J. Bell
- I.23 Effects of Mn Doping on the Ferroelectric Properties of  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})_{0.7}\text{Ti}_{0.3}\text{O}_3$  Ceramics Near Morphotropic Phase Boundary  
J. Guo and Y. Feng
- I.24 Effect of Ball size and Ball Milling Time on Piezoelectric Properties of  $0.69\text{PZT}$ - $0.31\text{PZNN}$   
J.H. Ahn, M.S. Woo, D. Song, D.H. Cho, S. Nahm, and T.H. Sung
- I.25 Study on the Sintering Temperature and the Temperature Gradient Effect of  $0.69\text{PZT}$ - $0.31\text{PZNN}$  Ceramics by Controlling Grain Size  
D.H. Cho, J.H. Ahn, D. Song, M.S. Woo, S. Nahm, and T.H. Sung
- I.26 Piezoelectric and Dielectric Properties of Lead-free Sol-gel Made BHT Films and Powders  
T. Richardot, P. Boy, F. Levassort, and P. Belleville
- \*I.27 Coherence of Structural and Electrical Properties in Lead-free  $(\text{Bi}_{0.5}\text{Na}_{0.5})\text{TiO}_3$ - $\text{SrTiO}_3$  Ceramics  
S.W. Kim, M.H. Lee, H.I. Choi, T.J. Kim, D.J. Kim, J.S. Park, D. Do, M.H. Kim, T.K. Song, and W.J. Kim
- \*I.28 Investigating Local Order in Potassium Sodium Bismuth Titanate  
A.J. Goetzee-Barral, A.J. Bell, T.P. Comyn, and T.J. Stevenson
- \*I.29 Effect of  $\text{LiNbO}_3$  Doping on Dielectric, Ferroelectric and Field-Induced Strain Response of Lead-free  $0.97(\text{Bi}_{0.5}\text{Na}_{0.5}\text{Ti})\text{O}_3$ - $0.03\text{BaZrO}_3$  Ceramics  
J.U. Rahman, A. Hussain, A. Maqbool, J.S. Kim, T.K. Song, W.J. Kim, and M.H. Kim
- \*I.30 Piezoelectric and Dielectric Properties of CuO added  $(\text{Na},\text{K},\text{Li})(\text{Nb},\text{Sb},\text{Ta})\text{O}_3$  Ceramics Sintered at Low Temperature  
S.H. Shin, J. Yoo, K.S. Lee, L.H. Hwang, and S.-I. Lee
- I.31 Effect of  $\text{SrZrO}_3$ -Modified on Structural and Electrochemical Properties of  $(\text{Bi}_{0.5}\text{Na}_{0.5})\text{TiO}_3$ -Based Lead-Free Ceramics  
A. Maqbool, A. Hussain, J.U. Rahman, J.K. Park, T.G. Park, and M.H. Kim
- I.32 Characteristic of Ultrasonic Transducers Incorporating Undoped  $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$  Ceramics  
M. Bah, F. Giovannelli, F. Schoenstein, G. Feuillard, F. Levassort, E. Le Clezio, and I. Monot-Laffez
- I.33 Vibrometry Measurement and Analysis of Displacement Profile for Enhanced Electrooptic Effects near Piezoelectric Resonance  
R.A. McIntosh, A.S. Bhalla, and R. Guo



**Group 3**

- I.34 Domain Study in Samarium Doped BiFeO<sub>3</sub> Multiferroic Ceramics  
A.P. Turygin, D.O. Alikin, K.I. Protasov, J.B. Walker, C.C. Sorrell, T. Rojac, N. Valanoor, Y.Ya. Shur, and A.L. Kholkin
- \*I.35 Nanoscale Heterogeneity of the Polarization Reversal in Giant Strain Lead-free Relaxor-ferroelectric Composite Ceramics  
D.Gobeljic, V.V. Shvartsman, C. Groh, W. Jo, J. Rödel, S.Kalinin, and D.C. Lupascu
- I.36 Domain Faceting during 180 Degree Switching in PZT Thin Film  
Z.J. Hong, J. Britson, and L.-Q. Chen
- I.37 Impedance Analysis of Nb<sub>2</sub>O<sub>5</sub> Doped BaTiO<sub>3</sub>-Na<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub> Ceramics  
Y. Sun, H. Liu, H. Hao, and S. Zhang
- I.38 Correlation between Structural and Ferroelectric Properties of Epitaxial PMN-PT Films  
M. Mietschke, S. Engelhardt, S. Fähler, S. Gebhardt, L. Schultz, and R. Hühne
- \*I.39 Crystallization of Solution-derived PbTiO<sub>3</sub> Thin Films Monitored *in situ* using Synchrotron X-ray Diffraction  
T.M. Sanders, S. Mhin, C. Cozzan, and J.L. Jones
- I.40 Angular Dispersion of Phonon Modes in Potassium Titanyl Phosphate from Raman Scattering  
P. Mackwitz, M. Rüsing, G. Berth, and A. Zrenner
- I.41 Piezoresponse Force Microscopic Investigation of Ferroic Behavior in Biomaterials  
M. Pal, R. Guo, and A. Bhalla
- \*I.42 Study on the Grain Size, Valance State and Photoconductivity of Bismuth Ferrite Nanofibers  
R. Rivera and A. Safari

**Group 4**

- \*I.43 Integrated Electronics on Piezoelectrics  
M.L. Wallace, J.I. Ramirez, T.N. Jackson, and S. Trolier-McKinstry
- I.44 Fabrication of Flexible Two-dimensional Piezoelectric Micromachined Ultrasonic Transducer Array using Top-Crossover-to-Bottom Structure  
J. Jung, W. Lee, and H. Choi
- I.45 Organic Field Effect Transistors With Ferroelectric VDF-TrFE Copolymer Gate Dielectric  
D. von Nordheim, C. Möse, B. Peng, X.C. Ren, P.K.L. Chan, C.W. Leung, and B. Ploss
- I.46 Effect of Feature Size on Reliability and Aging in Patterned PZT Films for MEMS Applications  
J.I. Yang, S.Y. Lee, and S. Trolier-McKinstry
- I.47 The Study of Structure and Energy-storage Properties in Lead-free Anti-ferroelectric Na<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub>-K<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub>-K<sub>0.5</sub>Na<sub>0.5</sub>NbO<sub>3</sub> Ceramics  
J.F. Zhao, M.H. Cao, Z.H. Yao, H. Hao, Z.Y. Yu, and H.X. Liu
- I.48 Energy-storage Performance and Non-monotonic Trend of T<sub>c</sub> in xBi(Ni<sub>1/2</sub>Ti<sub>1/2</sub>)O<sub>3</sub>-(1-x)PbTiO<sub>3</sub> Piezoelectric Thin Films  
Z.K Xie, Z.X. Yue, B. Peng, and R. Griffin
- \*I.49 Microstructure and Mechanism for High-performance (Nb+In) Co-doped TiO<sub>2</sub> Rutile Material  
J. Li, F. Li, Z. Xu, and S. Zhang
- I.50 A New Biosensor Based on PVDF Film for Detection of Nucleic Acids  
B. Zhao, J. Hu, W. Ren, F. Xu, X. Wu, Z. Ye, and P. Shi
- I.51 Preparation and Applications of Piezoelectric Diaphragm Biosensors based on Silicon  
Q. Wang, G. Wang, X. Wu, W. Ren, P. Shi, and Z.-G. Ye
- I.52 Mn/Y Codoped Ba<sub>0.67</sub>Sr<sub>0.33</sub>TiO<sub>3</sub> Thin Films for Tunable Microwave Applications  
D. Yan, S. Yang, H. Liu, Y. Zhang, D. Xiao, X. Lai, and J. Zhu
- I.53 Residual Ferroelectricity in Ba<sub>1-x</sub>Sr<sub>x</sub>TiO<sub>3</sub> Thin Film Tunable Dielectrics  
L.M. Garten, P. Lam, D. Harris, J.-P. Maria, and S. Trolier-McKinstry
- \*I.54 Characterization of (1-x)Ba(Zr<sub>0.2</sub>Ti<sub>0.8</sub>)O<sub>3</sub>-x(Ba<sub>0.7</sub>Ca<sub>0.3</sub>)TiO<sub>3</sub> for Large Signal Actuator Applications  
M. Acosta, D. Brandt, M. Völger, H. Humburg, W. Jo, K. Webber, and J. Rödel

- I.55 Modelling of Electric Field and Stress in Piezoelectric Composite Plates under Bending Load: Application to a Curved Bender  
*G. Beckers and B. Debez*
- I.56 New Type of Ultrasonic Rotary Motor Which Has Four Line Contacts  
*S.K. Cheon, S.S. Jeong, M.H. Kim, and T.G. Park*
- \*I.57 Characterization of Piezoelectric and Elastic Properties of  $\text{ABGa}_3\text{O}_7$  Melilite Crystals  
*C. Shen, S. Zhang, H. Zhang, J. Wang, and T.R. Shrout*
- I.58 Optimal Design and Fabrication of a New 3D Anemovane using a Piezoelectric Unimorph Bender  
*H. Jang, J. Park, S. Jung, T. Park, and S. Choi*
- I.59 Giant Electrocaloric Response in Modified  $\text{BaTiO}_3$  Ceramics near Room Temperature for Next Generation of Refrigeration  
*X.-S. Qian, H.-J. Ye, Y.-T. Zhang, H. Gu, X. Li, C.A. Randall, and Q.M. Zhang*
- \*I.60 Synthesis and Properties of Tetragonal Tungsten Bronze  $\text{Ba}_6\text{Nb}_{10}\text{O}_{30}$  for Thermoelectric Applications  
*J. Chan, J. Bock, C.A. Randall, and S. Trolier-McKinstry*


### Group 5



- I.61 A Study on Vibration Modal Analysis of (011) cut 0.67PMN-0.33PT Single Crystal Disc for Ring-dot Transformers  
*M. Choi, E.A. Gurdal, H. Shekhani, and K. Uchino*
- I.62 Study on CuO Doping Effect on 0.69PZT-0.31PZNN for Multi-layer Piezoelectric Energy Harvesting System  
*D. Song, M.S. Woo, J.H. Ahn, D.H. Cho, S. Nahm, and T.H. Sung*
- I.63 Hybrid ( $d_{33}$  and  $d_{31}$  mode) Type Piezoelectric Energy Harvesting System Resulting 92 W Output Power  
*H.J. Jung, D. Song, J.Y. Cho, S.B. Kim, and T.H. Sung*
- I.64 Optimization Study of Impact Rod for Piezoelectric Energy Harvesting System  
*J.H. Kim, M.S. Woo, S.J. Hwang, J.H. Ahn, and T.H. Sung*
- I.65 Wide-Band Piezoelectric Resonance Frequency Energy Harvesting  
*H. Güleç, A.G. Akyürekli, M. Gül, M. Gürbüz, B. Koç, and A. Doğan*
- I.66 Energy Harvesting Potential of Lead Free NBT-BZT Piezoelectric Ceramics  
*A.G. Akyurekli, M. Gurbuz, M. Gul, H. Gulec, and A. Dogan*
- I.67 Energy Harvesting with Multilayer Piezoelectric Ceramics  
*M. Gul, A.G. Akyurekli, H. Gulec, M. Gurbuz, N. Kurosaki, and A. Dogan*
- \*I.68 Stress Dependence of Losses in Piezoelectric Ceramics  
*T. Liu, E.A. Gurdal, H.N. Shekhani, A.V. Carazo, and K. Uchino*
- \*I.69 Voltage Tuning of Ferromagnetic Resonance with Bistable Magnetization Switching in Energy-efficient Magnetoelectric Composites  
*Z. Zhou, M. Liu, T. Nan, B.M. Howe, G.J. Brown, and N.X. Sun*
- \*I.70 Enhancing the Magnetoelectric Response of Terfenol-D/polyvinylidene Fluoride Laminates by Exploiting the Shear-mode Effect  
*M.-C. Lu, L. Mei, and Q.M. Zhang*
- I.71 Measurement of Weak Magnetic Fields using Magnetoelectric Response  
*M.K. Myrzakhmet, R. Iskakov, and G. Kumisbek*
- I.72 Simulation and Experimental Studies on Tri-Phasic PZT Piezoelectric Transducer  
*J.P. Tamez, M.C. Bhardwaj, A. Bhalla, and R. Guo*
- I.73 A PZT-based Injectable Acoustic Transmitter for Small Fish  
*H. Li, Z.D. Deng, J. Xiao, M. Myjak, J. Lu, T.J. Carlson, and M.B. Eppard*
- I.74 Methods for Increasing a Generating Power of the Cross-type Piezoelectric Generator  
*S.S. Jeong, J.K. Park, and T.G. Park*
- I.75 Dynamic Energy Harvesting Performance of Two Polyvinylidene Fluoride Piezoelectric Flags in Parallel Pattern in an Axial Flow  
*X.B. Shan, R.J. Song, Z.L. Xu, and T. Xie*



6:30 pm - 8:30 pm




## Reception President's Hall 3 and 4




Wednesday, May 14, 2014

8:00 am - 9:45 am		Session IV				
		Group 1 Multiferroics I	Group 2 Bulk Lead Free II	Group 3 Fundamentals & Properties	Group 4 Integrated Ferroelectrics	Group 5 Energy Harvesting I
		Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
		Session Chair: Tim Stevenson	Session Chair: Hajime Nagata	Session Chair: Philippe Papet	Session Chair: Glen Fox	Session Chair: Peter Finkel
8:00am	Exhibits Open	<b>Electronic Structure of Multiferroic Bi<sub>2</sub>FeCrO<sub>6</sub>: Interplay between Electron Correlation, Spin-orbit Coupling, and the Lattice Distortions, Tilting and Rotations</b> <u>L. Braescu, F. Vidal, and A. Pignolet</u>	<b>BNBT based Lead-free Piezoelectric Ceramics for Transducer Applications</b> <u>E. Hennig, P. Ditas, A. Kynast, M. Toepfer, and M. Hofmann</u>	<b>Thermal Conductivity and Phonon Scattering Mechanisms in Ferroelectric Thin Films</b> <u>J.F. Ihlefeld, B.M. Foley, B. Donovan, M. Wallace, D. Medlin, D. Scrymgeour, L. Ye, B.D. Huey, B.B. McKenzie, B.J. Gibbons, D.G. Schlom, S. Trolier-McKinstry, and P.E. Hopkins</u>	<b>The Piezoelectronic Transistor: A Fast Low Power Transduction Device</b> <u>G.J. Martyna, P.M. Solomon, B. Bryce, L.-W. Hung, M. Copel, A. Schrott, W. Haensch, S.M. Rossnagel, T.M. Shaw, T.N. Theis, H. Miyazoe, J. Chang, R. Keech, S. Shetty, S. Trolier-McKinstry, B.G. Elmegreen, X.-H. Liu, M.A. Kuroda, and D.M. News</u>	<b>Cymbal Transducer for Sensor, Actuator, Energy Harvesting Application</b> <u>A. Dogan</u>
8:15am		<b>Purely Voltage-driven 180° Magnetization Reversal in BiFeO<sub>3</sub>-based Heterostructure</b> <u>J.-M. Hu, J.J. Wang, T.N. Yang, C.-W. Nan, and L.-Q. Chen</u>	<b>Effects of A-site Stoichiometry in 1-x(Bi<sub>0.5</sub>Na<sub>0.5</sub>TiO<sub>3</sub>)-xBaTiO<sub>3</sub> Ceramics Near the Morphotropic Phase Boundary (MPB)</b> <u>S. Prasertpalichat and D.P. Cann</u>	<b>Effect of Sn<sup>2+</sup> Ion for the Ferroelectric Phase Transition of Sn Doped SrTiO<sub>3</sub></b> <u>S. Suzuki, H. Kasatani, T. Nakano, K. Abe, K. Deguchi, and A. Ando</u>	<b>Dielectric and Piezoelectric Properties upon Lateral Scaling of PMN-PT Films for Logic</b> <u>R. Keech, S. Shetty, D. News, G. Martyna, M. Kuroda, M. Copel, B. Bryce, T. Shaw, T. Theis, P. Solomon, W. Haensch, B. Huey, J. Bosse, L. Ye, and S. Trolier-McKinstry</u>	Invited 
8:30am		<b>Mapping the Phase Diagram of BiFeO<sub>3</sub>-LaFeO<sub>3</sub> Superlattices</b>	<b>Piezoelectric Properties of BiNT based Ceramics Doped with Sn</b>	<b>Fractal Analysis in Piezoelectrics</b> <u>K. Uchino</u>	<b>Ferroelectric Random Access Memory Embedded in Analog Friendly CMOS</b>	





	<b>Exhibits Open</b>	<p><u>G. Rispens</u>, <u>B. Ziegler</u>, Z. Zanolli, P. Ghosez, J. Iñiguez, and P. Paruch</p>	<p><u>G. Yesner</u>, P. Urbankowski, and A. Safari</p>		<p><u>S.R Summerfelt</u>, K.R. Udayakumar, H.-C. Wen, T. San, J. Rodriguez, S. Chevacharoenkul, D. Frystak, R. Bailey, J. Rodriguez-Latorre, C. Zhou, M. Ball, P. Ndai, S. Madan, Z.J. Yu, J.P. Campbell, H. McAdams, S. Khanna, S.C. Bartling, T. Moise</p>	<p>Energy Harvesting <u>T. Yoshimura</u>, K. Kariya, S. Murakami, and N. Fujimura</p>
8:45am		<p>Combinatorial Studies of Multilayer Periodicity Modulation on Ferroelectric Behaviour of Sm-BiFeO<sub>3</sub> Multilayers <u>R. Maran</u>, S. Yasui, H. Funakubo, I. Takeuchi, and N. Valanoor</p>	<p>Synthesis of Sodium Niobate Based Lead-free Piezoelectric Ceramics using Submicron Powder <u>R. Aoyagi</u>, S. Banno, and M. Maeda</p>	<p>Measurement of Nonlinear Dielectric Constants of PZT Thin Films used in Ferroelectric Probe Data Storage Technology <u>Y. Hiranaga</u> and Y. Cho</p>	<p>Invited</p> 	<p>Energy Harvesting with (K,Na)NbO<sub>3</sub> Films Deposited on Flexible Metal Foil by Hydrothermal Method <u>T. Shiraishi</u>, N. Kaneko, M. Kurosawa, H. Uchida, Y. Suzuki, T. Kobayashi, and H. Funakubo</p>
9:00am		<p>Strain Driven Structural Phase Transitions in Dysprosium Doped BiFeO<sub>3</sub> Ceramics <u>D.C. Arnold</u> and R.C. Lennox</p>	<p>Phase Field Modeling of Lead-Free Relaxor/Ferroelectric Composites <u>K.G. Webber</u> and D.J. Franzbach</p>	<p>Quantum 1/f Noise and Phase Noise in Ferroelectrics, Piezoelectrics, MEMS Resonators, Sensors, and Piezoresponse Force Microscopes <u>P.H. Handel</u>, H. Hora, P. Fraundorf, and T.F. George</p>	<p>Development of Ferroelectric RAM (FRAM) for Mass Production <u>T. Eshita</u>, W. Wang, K. Nakamura, S. Mihara, H. Saito, Y. Hikosaka, K. Inoue, S. Kawashima, H. Yamaguchi, and K. Nomura</p>	<p>Energy Harvesters Utilizing {001} Oriented PZT Films on Ni Foils <u>H.G. Yeo</u>, C.B. Yeager, T.N. Jackson, C. Rahn, X. Ma, and S. Trolier-McKinstry</p>
9:15am		<p>EuTiO<sub>3</sub>: An Almost Multiferroic Material with Novel Strong Spin-lattice Coupling <u>A. Bussmann-Holder</u></p>	<p>Domain Structure of KNN-based Ceramics <u>Y. Qin</u>, J. Zhang, and S. Zhang</p>	<p>Temperature Dependent Dielectric and Raman Characteristics of Substituted Bismuth Pyrochlores <u>K. Sudheendran</u>, S.P. Pavunny, and R.S. Katiyar</p>	<p>Invited</p> 	<p>Kilometer Long PVDF Nanoribbon Arrays For Energy Harvesting and Sensing Applications <u>M. Kanik</u>, O. Aktas, H.S. Sen, E. Durgun, and M. Bayindir</p>
9:30am	<p>Two Phonons Anomalies at Low Temperature in Multiferroics BiFeO<sub>3</sub> <u>M.K. Singh</u>, G. Singh, and R.S. Katiyar</p>	<p>The Influence of MnO<sub>2</sub>-addition on the Dielectric, Ferroelectric and Piezoelectric Properties of Sr<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub> Ceramics <u>S. Kundu</u> and K.B.R. Varma</p>	<p>Dielectric Relaxation in Ca<sub>5</sub>Nb<sub>4</sub>TiO<sub>17</sub> Ceramics <u>C. Li</u>, X. Wei, H. Yan, and M.J. Reece</p>	<p>The Tunneling Effect in the Solid State Capacitors Based on Ultrathin Ferroelectric Polymer Films <u>X.J. Meng</u>, Y. Hou, J.L. Wang, X.L. Zhao, B.B. Tian, C.G. Duan, B.L. Liu, Y.H. Zou, J.L. Sun, and J.H. Chu</p>	<p>Energy Harvesting Simulation of Two Piezoelectric Flags in Serial Pattern in the Uniform Fluid <u>R.J. Song</u>, X.B. Shan, F.B. Tian, and T. Xie</p>	

9:45 am - 10:30 am		Refreshment Break				
10:30 am - 12:00 pm		Session V				
		Group 1 Fundamentals II	Group 2 Thin Films I	Group 3 Domains I	Group 4 Pyroelectrics and Electrocalorics	Group 5 Energy Harvesting II
		Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
		Session Chair: Zuo-Guang Ye	Session Chair: Ronald Polcawich	Session Chair: Amar Bhalla	Session Chair: Wei Ren	Session Chair: Aydin Dogan
10:30am	Exhibits Open	Structure-Properties of the Intermediate Phase of Antiferroelectric PbZrO <sub>3</sub> <i>R. Faye, H. Lui, N. Guilblin, X. Bril, D. Kajewski, K. Roleder, J.-M. Kiat, B. Dkhil and P.-E. Janolin</i>	ALD Pt Applications for PZT Sidewall Growth <i>D.M. Potrepka, L.M. Sanchez, and R.G. Polcawich</i>	Extrinsic Permittivity due to Reversible Domain Wall Motion in Perovskites <i>P. Mokrý, K. Steiger, T. Sluka, and A.K. Tagantsev</i>	Application of Relaxor-PT Single Crystals in Pyroelectric Detectors <i>N. Neumann, A. Movchikova, S-G. Lee, H.S. Luo, M. Dietze, and M. Es-Souni</i>	Influence of Feedback on Modal Shapes and its Consequences on Broadband Energy Harvesting <i>C. Giraud-Audine, F. Giraud, and M. Amberg</i>
10:45am		Ferroelectric Phase Transitions and Large Energy Conversion in Domain Engineered Ferroic Crystals <i>P. Finkel, A. Amin, and S. Lofland</i>	Seed Layer TiO <sub>2</sub> Structure Impact on {111}-Textured Pt Electrodes for Integrated Piezoelectric MEMS Devices <i>G.R. Fox, D.M. Potrepka, R.G. Polcawich, and D.A. Cullen</i>	Self-ordered 1D Arrays of Ferroelectric Domains in Epitaxial PZT Thin Films <i>L. Feigl, P. Yudin, I. Stolichnov, T. Sluka, K. Shapovalov, L.J. McGilly, X.-K. Wei, A.K. Tagantsev, and N. Setter</i>	Invited 	A Low Frequency Piezoelectric MEMS Energy Harvester <i>C. Yeager, S. Trolier-McKinstry, I. Ramirez, and T.N. Jackson</i>
11:00am		TBD	Effects of Pb-excess in Pb(Zr <sub>0.52</sub> , Ti <sub>0.48</sub> )O <sub>3</sub> , PZT(52/48), Thin Films <i>L.M. Sanchez, G.R. Fox, I. Takeuchi, and R.G. Polcawich</i>	Laser Scanning Microscopy Observation of Domains in (Li,Na)NbO <sub>3</sub> and (K,Na)NbO <sub>3</sub> Films <i>I. Fujii, T. Nakao, A. Kohori, S. Yamazoe, and T. Wada</i>	Investigation of Relaxor-based Single Crystals and their Applications in Infrared Detectors <i>H. Luo, L. Li, X. Li, and X. Zhao</i>	Wide Frequency Range Noise Shield using Curved Glass Plates with Piezoelectric Macro Fiber Composite Actuators <i>K. Steiger, P. Mokrý, J. Václavík, P. Psota, R. Doleček, V. Lédl</i>
11:15am		Tricritical Behavior in Lead Zirconate-Titanate (PZT) Ceramics: A Heat Capacity Investigation <i>G.A. Rossetti, Jr., C.-C. Chung, and R. Pérez-Moyet</i>	Integrating Piezoelectric Materials into Bio-Sensing Applications by Printing Ceramic Solutions <i>A.J. Welsh, D. Dezest, L. Nicu, M.A. Hickner, and S. Trolier-McKinstry</i>	Invited 	Reactively Sputtered PMN-PT Thin Films for Electrocaloric Applications <i>A. Kleiner, G. Suchanek, L. Liu, A. Eydam, and G. Gerlach</i>	Analysis of Energy Harvesting Performance for d <sub>15</sub> Mode Piezoelectric Bimorph in Series Connection Based on Timoshenko Beam Model <i>X. Zheng, Y. Zhu, L. Li, and Y. Yu</i>
11:30am		Phase Transitions at High-Pressure and Structural Description of the Macroscopic Piezo-Ferroelectric Properties of				

11:45am	<b>Exhibits Open</b>	<p>the Pb(Zr<sub>1-x</sub>Ti<sub>x</sub>)O<sub>3</sub> Solid Solution  <i>J. Rouquette, G. Fraysse, M. Hinterstein, J. Haines, and P. Papet</i></p> <p style="text-align: center;">Invited  </p>	<p>Direct Deposition of Ferroelectric PZT Films on Glass and Polymer Substrates  <i>S.J. Brewer, T.C. Field, P.C. Joshi, and N. Bassiri-Gharb</i></p> <p>Structural and Electrical Properties of 0.1BiYbO<sub>3</sub>-0.9PbTiO<sub>3</sub> Piezoelectric Thin Films Grown by Pulsed Laser Deposition  <i>Y. Li, P. Shi, X. Wu, T. Zou, and W. Ren</i></p>	<p>Domain Dynamics Studies by PZT Materials  <i>M. Omori, T. Mishima, and M. Nishimura</i></p> <p>Investing 180° Domain Switching Behavior in Ferroelectric Ceramic by <i>in-situ</i> X-ray Absorption Technique  <i>S. Pojprapai and W. Kempet</i></p>	<p>Modeling of High Performance Chip-Scale Cooling Device based on Giant Electrocaloric Effect Dielectrics  <i>H. Gu, X.-S. Qian, H. Ye and Q.M. Zhang</i></p> <p>Electrocaloric Effect in Ultrathin Ferroelectric Films  <i>Y. Liu, I.C. Infante, X.J. Lou, D.C. Lupascu, and B. Dkhil</i></p>	<p>Broadband Vibration Energy Harvesting using Piezoelectric Array  <i>Z. Xiao, T. Yang, and X. Yao</i></p> <p>Electromechanical Modeling and Experimental Verification of Nonlinear Hybrid Vibration Energy Harvester  <i>Z.L. Xu, X.B. Shan, R.J. Song, and T. Xie</i></p>
12:00 pm - 1:30 pm		<b>Lunch</b> <b>Presidents Hall 3 and 4 or the Gardens Restaurant (Lower Level)</b>				
1:30 pm - 3:00 pm		<b>Session VI</b>				
		<b>Group 1</b> <b>Conduction/Defect Mechanisms</b>	<b>Group 2</b> <b>Thick Film</b>	<b>Group 3</b> <b>PFM III</b>	<b>Group 4</b> <b>MLC/Dielectrics I</b>	<b>Group 5</b> <b>Ultrasonics and Modeling</b>
		Room 207	Room 206	Room 208	Room 205	Presidents Hall 1
		Session Chair: Ruyan Guo	Session Chair: Jon-Paul Maria	Session Chair: Anton levlev	Session Chair: Elizabeth Dickey	Session Chair: Qifa Zhou
1:30pm	<p>Influence of the Charges and of the Vacancies on the Behavior of Lead Zirconate Titanate (PZT) Ceramics  <i>L. Lebrun, L. Eyraud, and D. Audigier</i></p>	<p>Potassium Sodium Niobate Thick Films and their Small Reduction of the Piezoelectric d<sub>33</sub> Coefficient  <i>J. Pavlič, B. Malič, and T. Rojac</i></p>	<p>Influence of Single Grain Boundaries on Domain Wall Mobility in Ferroelectrics  <i>S. Trolier-McKinstry, D. Marincel, S. Jesse, S. Kalinin, H. Zhang, and I.M. Reaney</i></p>	<p>Reliability Design for Multi-Layer Ceramic Capacitors with Thin Dielectric Layers  <i>K. Morita, N. Chigira, and Y. Mizuno</i></p>	<p>Analog Transmission Line Modeling of Composite Piezoelectric Transducers using Modelica® or Simscape™  <i>S.C. Thompson</i></p>	
1:45pm	<p style="text-align: center;">Invited  </p>	<p>Dynamic Strain Measurement using Piezoelectric Paint  <i>J.M. Hale and I. Payo</i></p>	<p>Background-free Piezoresponse Force Microscopy for Quantitative Measurements  <i>W. Wang, Y. Geng, and W. Wu</i></p>	<p style="text-align: center;">Invited  </p>	<p>Optimization of Piezoelectric Transducer Design by Modeling and Simulation  <i>R. Sahul, E. Nesvijski, and W. Hackenberger</i></p>	
2:00pm	Towards Reversible	Spray-on Ferroelectrics for	Direct Observation of	Influence of Excess Ba	"Smart Sonic Sound"	

2:15pm	2:30pm	2:45pm	<b>Exhibits Open</b>	<p>Control of Domain Wall Conduction in Pb(Zr<sub>0.2</sub>Ti<sub>0.8</sub>)O<sub>3</sub> Thin Films <i>I. Gaponenko, P. Tückmantel, J. Karthik, L.W. Martin, and P. Paruch</i></p>	<p>Fabrication of Custom Tailored Composite Transducers for NDE and SHM <i>K. Sinding, A. Orr, L. Tien, N. Malarich, and B. Tittmann</i></p>	<p>Ferroelectric Domain-switching through Magnetic Fields using Piezoresponse-Force Microscopy (PFM) <i>L.F. Henrichs, J. Bennett, and A.J. Bell</i></p>	<p>Concentration on the Dielectric Nonlinearity in Mn and V-doped BaTiO<sub>3</sub> Multi Layer Ceramic Capacitor <i>S.-H. Yoon, J.-S. Park, J.-B. Lim, S.-H. Kim, and D.-Y. Kim</i></p>	<p>Piezoelectric Film Speaker <i>S. Iwasaki, S. Nakamura, and S. Fukuoka</i></p>
				<p>Lessons Learnt and Surprises in Controlling Oxygen Vacancy in Ferroelectric and Related Materials <i>C.A. Randall, H. Shimizu, X. Chen, R. Maier, Y. Tsur, N. Shomrat, S. Trolier-McKinstry, D. Shay, and J. Bock</i></p>	<p>The Study on Improving the Piezoelectric Properties of Textured Lead-Free Piezoelectric Thick Films <i>J. Zhai, F. Fu, and W. Bai</i></p>	<p>Size Effects in Lead-Free Bi-containing Materials Studied by Piezoresponse Force Microscopy <i>N. Salazar, A. Gil, D. Pérez-Mezcua, I. Bretos, M.L. Calzada, and J. Ricote</i></p>	<p>Invited</p> 	<p>Invited</p> 
				<p>Investigation of Polarization's Role on the Conduction Mechanism of Heavily Oxygen Deficient Ferroelectric (Sr,Ba)Nb<sub>2</sub>O<sub>6</sub> <i>J.A. Bock, S. Lee, S. Trolier-McKinstry, and C.A. Randall</i></p>	<p>Structures, Properties and Applications of Lead-Free (1-x)(Bi<sub>0.5</sub>Na<sub>0.5</sub>)TiO<sub>3</sub>-xBaTiO<sub>3</sub>/Bi<sub>0.5</sub>Na<sub>0.5</sub>TiO<sub>3</sub> 0-3 Composite Thick Films <i>W. Ren, J. Zhao, H. Ji, L. Wang, X. Wu, and P. Shi</i></p>	<p>Subcritical Switching Dynamics and Humidity Effects in Nanoscale Studies of Ferroelectric Domain Growth <i>C. Blaser and P. Paruch</i></p>	<p>Titanate Glass-Ceramic Materials for Mobile Applications in the GHz Frequency Range <i>H. Braun, M. Letz, M. Hovhannisyan, and H.J. Elmers</i></p>	<p>High Power Longitudinal/Torsional Mode Transducers for Surgical and Dental Applications <i>G. Bromfield, M. Flitcroft, O. Jovic, and L. Clayton</i></p>
2:45pm				<p>Electron Transport Properties of Composite Ferroelectrics <i>O.G. Udalov, N.M. Chchelkatchev, A. Glatz, and I.S. Beloborodov</i></p>	<p>Invited</p> 	<p>Characterization of the PTCR Effect in Doped Barium Titanate <i>A.M. Douglas, A. Kumar, R.W. Whatmore, and J.M. Gregg</i></p>	<p>Self-healing MnO<sub>2</sub> Electrodes for Enhanced Reliability of Dielectric Films <i>B. Akkopru Akgun, M. Lanagan, and S. Trolier-McKinistry</i></p>	<p>Coupled Method for Electromechanical Characterization of Piezoelectric Multimodal Structures <i>R. Rouffaud, A.-C. Hladky, M. Pham-Thi, C. Bantignies, and F. Levassort</i></p>
3:00 pm - 3:45 pm			<b>Refreshment Break</b>					
3:45 pm - 5:00 pm			<b>Session VII</b>					
			<b>Group 1 Piezoelectric Devices</b>	<b>Group 2 Thin Films II</b>	<b>Group 3 Lead Free Characterization I</b>	<b>Group 4 MLC/Dielectrics II</b>	<b>Group 5 Underwater Acoustics</b>	
			Room 207	Room 206	Room 208	Room 205	Presidents Hall 1	
			Session Chair: Derek Wilke	Session Chair: Kazumi Kato	Session Chair: Christopher Lynch	Session Chair: Akira Ando	Session Chair: Lynn Ewart	




3:45pm	<b>Exhibits Open</b>	<p><b>Long Term Stability of Encapsulated High Power Actuators</b>  <u>H.-J. Schreiner</u>, R. Bindig, T. Uhl, and K. Beck</p>	<p><b>High <math>T_c</math> / High Coupling Perovskite Thin Films</b>  <u>K. Wasa</u>, T. Matsushima, H. Adachi, T. Matsunaga, T. Yanagitani, T. Yamamoto, S. Yoshina, and S. Tanaka</p>	<p><b>Phase Transitions, Elastic Softening, and Piezoelectricity in BaTiO<sub>3</sub>-based Ceramics</b>  <u>X. Tan</u>, H.Z. Guo, B.K. Voas, S.P. Beckman, S.J. Zhang, C. Zhou, and X.B. Ren</p>	<p><b>High Temperature Stability in Dielectric and Insulating Properties of Silicate with Low Dimensional Octahedron</b>  <u>J. Kimura</u>, H. Taniguchi, T. Iijima, T. Shimizu, S. Yasui, M. Itoh, and H. Funakubo</p>	<p><b>Single Crystal Transducers for Underwater Acoustic Communication Applications</b>  <u>E. Kuntsal</u>, M. Staska, and R. Meyer</p>
4:00pm		<p><b>PZN-PT Single Crystal Accelerometers</b>  <u>D.H. Lin</u>, Y. Xia, S. Zhang, and L.C. Lim</p>	<p><b>The Effect of Varying A-Site Stoichiometry on Dielectric and Piezoelectric Properties in Thin Film Pb(Zr,Ti)O<sub>3</sub></b>  <u>D.M. Marincel</u>, A. Belianinov, M.B. Okatan, S. Jesse, S. Kalinin, D.A. Randall, and S. Trolier-McKinstry</p>	<p>Invited</p> 	<p><b>Dielectric Ceramic Films on Base Metal Substrates for High Energy Density Capacitors</b>  <u>D.-K. Kwon</u>, D.S. Son, and M.H. Lee</p>	<p>Invited</p> 
4:15pm		<p><b>Mechanical and Electric Energy Flows in Piezoelectric Shunt Damping Systems</b>  <u>J. Václavík</u>, M. Kodejška, and P. Mokrý</p>	<p><b>Flexible Piezoelectric Thin Film Pressure Sensors using Scanning Laser Lift-Off Method</b>  <u>C.Y. Kang</u>, M.S. Noh, S.D. Han, M.G. Kang, W.S. Jung, H.G. Moon, and S.J. Yoon</p>	<p><b>Microstructure, Dielectric, and Electromechanical Properties of the Bi<sub>1/2</sub>Na<sub>1/2</sub>TiO<sub>3</sub>-25SrTiO<sub>3</sub> Lead-free Incipient Piezoceramic</b>  <u>M. Acosta</u>, W. Jo, M. Scherrer, L.A. Schmitt, M. Deluca, W. Donner, H.J. Kleebe, and J. Rödel</p>	<p>Invited</p> 	<p><b>Design and Test of Miniaturized Broadband Tonpilz Projectors for Evaluation of Solid State Converted Single Crystals</b>  <u>M.R. Zarnetske</u>, A. Amin, C. Murphy, and J. Stace</p>
4:30pm		<p><b>A Novel Traveling Wave Ultrasonic Motor using Sandwich-type Ring Stator</b>  <u>X.Y. Zhou</u></p>	<p><b>High Temperature Nano-grained PbTiO<sub>3</sub> Thick Film by Aerosol-Deposition</b>  <u>J. Ryu</u>, S.-Y. Choi, A. Welsh, S. Trolier-McKinstry, H. Choi, S. Priya, and D.-Y. Jeong</p>	<p><b>Electric Field Induced Phase Transition Revisited: a <sup>23</sup>Na NMR Investigation of (Bi<sub>1/2</sub>Na<sub>1/2</sub>)TiO<sub>3</sub>-BaTiO<sub>3</sub></b>  <u>P.B. Groszewicz</u>, H. Breitzke, E. Sapper, R. Dittmer, W. Jo, G. Buntkowsky, and J. Rödel</p>	<p><b>Barium Titanate-based Nanoceramics Prepared by Chemical Coating Method for Application to Next Generation MLCC</b>  <u>X. Wang</u>, Y. Zhang, J. Kim, and L. Li</p>	<p><b>PZN-PT Single Crystal Tonpilz Projectors</b>  <u>L.C. Lim</u>, S. Zhang, D.H. Lin, and Y. Xia</p>
4:45pm		<p><b>Energy Harvesting based on Piezoelectric Ericsson Cycles in a Piezoceramic Material</b>  <u>B. Zhang</u>, B. Ducharne, G. Sebald, and D. Guyomar</p>	<p><b>Thickness-dependent Breakdown Strength of PZT Thin Films</b>  <u>B. Peng</u>, Z.K. Xie, and Z.X. Yue</p>	<p><b>Local Scale Atomic Displacements in High Permittivity BaTiO<sub>3</sub>-Bi(Zn<sub>0.5</sub>Ti<sub>0.5</sub>)O<sub>3</sub>: Refinements of X-ray Diffraction Patterns and Neutron Pair Distribution Functions</b></p>	<p>Invited</p> 	<p>TBD</p>





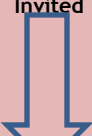






				<i>T.-M. Usher, J.S. Forrester, T. Iamsasri, N. Triamnak, D.P. Cann, and J.L. Jones</i>	
6:30 pm - 9:00 pm	<b>Banquet</b> President's Hall				


**Thursday, May 15, 2014**

8:00 am - 9:45 am	<b>Session VIII</b>				
	<b>Group 1</b> Relaxors	<b>Group 2</b> Novel Processing	<b>Group 3</b> BiFeO <sub>3</sub> Characterization	<b>Group 4</b> Adaptable Optics & MEMS	<b>Group 5</b> Relaxor-PT Single Crystals I
	Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
	Session Chair: Laurent Lebrun	Session Chair: Xiaohui Wang	Session Chair: Alp Sehirlioglu	Session Chair: Kui Yao	Session Chair: Shujun Zhang
8:00am	<p>Nanoscale Investigations of the Crossover from Non-Ergodic to Ergodic Behavior of BNT-Based Relaxors <i>D. Gobeljic, V.V. Shvartsman, R. Dittmer, W. Jo, J. Rödel, and D.C. Lupascu</i></p>	<p>New Strategies for Designing Ferroelectric Materials at the Nano- and Micro-scales <i>C. Elissalde, M. Albino, R. Berthelot, J. Lesseur, A. Kassas, D. Sallagoity, U.-C. Chung, J. Majimel, S. Mornet, D. Bernard, C. Estournès, L. Piraux, and M. Maglione</i></p>	<p>Ferroelectric, Ferromagnetic and Piezoresponse Force Microscopic Studies of Room-Temperature Multiferroic (1-x)Bi<sub>0.9</sub>Dy<sub>0.1</sub>FeO<sub>3</sub>-xPbTiO<sub>3</sub> <i>J. Zhuang, W. Ren, and Z.-G. Ye</i></p>	<p>Piezoceramic Components in Thick Film Technology for Adaptive Optics <i>S. Gebhardt, D. Ernst, B. Bramlage, and A. Schönecker</i></p>	<p>Continuous Feeding Growth of Ternary PIN-PMN-PT Single Crystals <i>M. Matsushita and K. Echizenya</i></p>
8:15am	<p>Electric-field-induced Local Structural Phenomena in Pb-based Perovskite-type Relaxor Ferroelectrics Near T* <i>B. Mihailova, T. Steilmann, B.J. Maier, and E. Dul'kin</i></p>	<p>Invited</p> 	<p>Study on the Grain Size, Valance State and Photoconductivity of Bismuth Ferrite Nanofibers <i>R. Rivera and A. Safari</i></p>	<p>The Method of Ferroelectric Film Bulk Acoustic Resonators Switching <i>A.K. Mikhailov, S.V. Ptasnik, P. K. Petrov, N. McN Alford, and A.B. Kozyrev</i></p>	<p>Crystal Growth and Thermal Stability Study of PIN-PMN-PT Crystals <i>J. Luo, S. Taylor, S.J. Zhang, and W. Hackenberger</i></p>
8:30am	<p>Relaxor Behavior and Multiferroic Properties of Modified BiFeO<sub>3</sub>-PbTiO<sub>3</sub> Solid Solutions with Morphotropic Phase Boundary <i>J. Cheng, J. Chen, S. Bu, and D. Jin</i></p>	<p>Control of Architecture and Dielectric Properties of Ferroelectric Ceramic Composites <i>M. Albino, A. Kassas, J. Lesseur, U.-C. Chung, M. Maglione, D. Bernard, C. Estournès, and C. Elissalde</i></p>	<p>Strain Effects in BiFeO<sub>3</sub>/LaFeO<sub>3</sub> Superlattices from X-ray Diffraction and Raman Spectroscopy Investigations <i>B. Carcan, H. Bouyanfif, M. El Marssi, F. Le Marrec, J. Wolfman, C. Autret, and D. Arnold</i></p>	<p>Adjustable Optics Systems Based on PZT Thin Films with Integrated ZnO Electronics <i>R.H.T. Wilke, R.L. Johnson-Wilke, M.L. Wallace, J.I. Ramirez, T.N. Jackson, and S. Trolrier-McKinstry</i></p>	<p>Target Values for Generation II PiezoCrystal Material Properties <i>L.M. Ewart, M.-J. Pan, and T.R. Shrout</i></p>

Exhibits Open

8:45am	<b>Exhibits Open</b>	Invited 	Fabrication of Piezoelectric Ceramic Hollow Fibers with Low Sintering Temperature and their Characterization <u>E. Mensur-Alkoy</u> , M.Y. Kaya, D. Avdan, M.U. Unver, and S. Alkoy	Strain Accommodated in $x\text{BiFeO}_3 - (1-x)\text{PbTiO}_3$ Epitaxial Films at the MPB <u>F. Esat</u> , T.P. Comyn, and A.J. Bell	Invited 	Invited 
9:00am		Correlation between Short and Long Range Order with the Dielectric Responses of Relaxors and “Normal” Ferroelectrics <u>J.A. Eiras</u> , V.R. Mastelaro, and A. Michalowicz	Textured Lead-free Strontium Barium Niobate (SBN61) Bulk Ceramics <u>S. Alkoy</u> and S. Dursun	Perovskite-like $\text{Fe}_2\text{O}_3$ Parasitic Phase in Nd Doped $\text{BiFeO}_3$ Films <u>H. Zhang</u> , D.M. Marincel, S. Trolier-McKinstry, and I.M. Reaney	Piezoelectric MEMS Gyroscope with Sputtered PZT Film <u>T. Takemoto</u> and H. Minami	Synthesis and Characterization of $\text{Pb}(\text{Zr}_{1-x}\text{Ti}_x)\text{O}_3$ [PZT] Single Crystals Y. Xie, A.A. Bokov, B. Wang, X. Long, and <u>Z.-G. Ye</u>
9:15am		Invited 	Piezoelectric Enhancement of 111-oriented Fine-grained Barium Titanate Ceramics Prepared by Electrophoresis Deposition Method under High Magnetic Field <u>S. Wada</u> , E. Kobayashi, S. Ueno, K. Nakashima, T. Takei, N. Kumada, T. Suzuki, T. Uchikoshi, Y. Sakka, Y. Miwa, S. Kawada, S. Omiya, and N. Kuboder	Origin of the Peculiar Piezoelectric Response of $\text{BiFeO}_3$ Ceramics <u>T. Rojac</u> , H. Ursic, A. Bencan, B. Malic, and D. Damjanovic	Invited 	Growth and Piezo-/Ferroelectric Properties of $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3\text{-Bi}(\text{Zn}_{1/2}\text{Ti}_{1/2})\text{O}_3$ Ternary Single Crystals <u>R.A. Belan</u> , H.N. Taylor, and Z.-G. Ye
9:30am		Phonon Localization as a Driver for Polar Nanoregions in Relaxor Ferroelectrics <u>M.E. Manley</u> , J.W. Lynn, D.L. Abernathy, E.D. Specht, O. Delaire, A.R. Bishop, R. Sahul, J.D. Budai	Application of Lower Temperature for Crystallization of $\text{PbTiO}_3$ Nanopowders Synthesized by the Sol-gel Method <u>E.R. Adarmanabadi</u> , A. Nourmohammadi, M.H. Feiz, M. Lanki, and E. Bahremandi	Invited 	ITO on $\text{LiNbO}_3$ for Ultrasound Applications Y. Qiu, G. Brodie, G.C. Spalding, M.P. MacDonald, and <u>S. Cochran</u>	The Growth and Properties of Novel Piezoelectric Crystals $\text{Pb}(\text{In}_{1/2}\text{Nb}_{1/2})\text{O}_3\text{-Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$ and $\text{Bi}(\text{Mg}_{1/2}\text{Ti}_{1/2})\text{O}_3\text{-PbTiO}_3$ with High Curie Temperature <u>X. Chen</u> , G. Xu, J. Liu, D. Yang, and Y. Liu
9:45 am - 10:30 am	Refreshment Break					
10:30 am - 12:00 pm	Session IX					
	Group 1 Fundamentals of Domains	Group 2 Single Crystal	Group 3 Thin Film Characterization	Group 4 Actuators	Group 5 Magnetolectrics	

		Characterization				
		Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
		Session Chair: Jacob Jones	Session Chair: Satoshi Wada	Session Chair: Raegan Johnson	Session Chair: Takaaki Tsurumi	Session Chair: Harold Robinson
10:30am	<b>Exhibits Open</b>	<b>Charged Domain Walls Formation and Study in BaTiO<sub>3</sub> Domain Engineered Crystals</b> <u>P.S. Bednyakov</u> , T. Sluka, A.K. Tagantsev, and N. Setter	<b>Grain Size and Texture Effects on Polarization Reversal Dynamics in BaTiO<sub>3</sub> under High Power Drive Conditions</b> <u>G.L. Brennecka</u> , W. Meier, K.E. Meyer, D.F. Sava Gallis, G.J. Denison, F.J. Zutavern, M.A. Blea-Kirby, D. Felman, J. Roth, T. Breuer, H.J. Brown-Shaklee, and W. Huebner	<b>Concurrent Measurement of Longitudinal and Transverse Effective Piezoelectric Coefficients (<math>d_{33,f}</math> and <math>e_{31,f}</math>) by Double Beam Laser Interferometry</b> <u>T. Schmitz-Kempen</u> , S. Sivaramakrishnan, P. Mardilovich, and S. Tiedke	<b>Electrical Properties of Dense (Bi<sub>1/2</sub>K<sub>1/2</sub>)TiO<sub>3</sub> Ceramics and Demonstration of Their Multilayer Actuator</b> <u>H. Nagata</u> and T. Takenaka	<b>Strong Magnetoelectric Coupling in Multiferroic Heterostructures and Low-Power Devices</b> <u>N.X. Sun</u>
10:45am		<b>Crystal and Microstructure Effects on Switching Dynamics of Ferroelectric Ceramics</b> S. Zhukov, <u>Y.A. Genenko</u> , H. Kungl, and H. von Seggern	<b>The Effect of Lattice Protons on Raman Activity of BaTiO<sub>3</sub> Utilizing High-temperature Micro Raman Spectroscopy</b> <u>G.L. Wynick</u> , S.M. Pilgrim, and W.A. Schulze	<b>The Role of the Cantilever in Qualitative and Quantitative Electromechanical Microscopies</b> <u>R. Proksch</u>	Invited 	Invited 
11:00am		<b>Controlled Ultrafine Domain and Domain-wall Patterns and their Properties</b> T. Sluka, P.X.-K. Wei, L. Feigl, P. Yudin, Bednyakov, L. McGilly, A. Crassous, Z. Huang, K. Vaideeswaran, M. Mtebwa, I. Stolichnov, A. K. Tagantsev, and <u>N. Setter</u>	<b>Point Defect Migration Under Electrical Bias: Model Experimental Studies on Single-Crystal TiO<sub>2</sub></b> <u>E.C. Dickey</u> and A. Moballeggh	<b>Aspect Ratio, Electric Field and Temperature Dependence on Piezoelectric Resonance Characterization</b> <u>T. Stevenson</u> , W. Vickers, P.M. Weaver, P. Woolliams, M. Stewart, C. Baldauf, A.J. Bell, and T.P. Comyn	TBD	<b>Recent Progress in Magnetoelectric Devices</b> <u>S. Dong</u>
11:15am		Invited 	<b>Temperature Dependence of Electrical Properties and Domain Structure Evolution of (K, Na)(Nb, Ta)O<sub>3</sub> Single Crystal</b> <u>L. Zheng</u> , W. Cao, B. Yang, Z. Zhang, and F. Qin	<b>A Geometry Independent Approach to the Measurement of the Piezoelectric Coefficient of Thin Films</b> <u>M. Stewart</u> , S. Lepadatu, and M.G. Cain	<b>The Influence of Phase Transitions and Ferroelectricity on the True Operational Range of Lead-containing and Lead-free Piezoelectric Actuators</b> <u>J. Koruza</u> , D. Franzbach, V. Rojas, D. Brandt, A. Ayrikyan, and K.G. Webber	<b>Development of Low Cost and Highly Sensitive Magnetoelectric Susceptometer for Liver Iron Detection</b> <u>L. Mei</u> , M.-C. Lu, and Q.M. Zhang

11:30am	<b>Exhibits Open</b> 	<b>Exerting Control over Domain Wall Density, Position and Conductivity: Towards Domain-wall Based Devices</b> <u>R.G.P. McQuaid</u> , J.R. Whyte, A. Kumar, P. Sharma, A. Gruverman, C. Canalias, J.F. Scott, R.W. Whatmore, and J.M. Gregg	<b>KNbO<sub>3</sub> Single Crystal and (K/Na/Li)(Nb/Sb/Ta)O<sub>3</sub> Textured Ceramics: Stress- and Temperature-induced Phase Transitions</b> Ph. Colombar, A. Slodczyk, <u>G. Gouadec</u> , and M. Pham Thi	<b>TEM Imaging of Thick, Multi-Layer AlN Film Deposited on Oxide</b> <u>K. Knisely</u> , A. Peczkalski, K. Mnaymneh, K. Sun, and K. Grosh	<b>Surface Mapping of High Field Piezoelectric Strain at Temperature</b> <u>T. Stevenson</u> , T. Quast, G. Bartl, and T. Schmitz-Kempen	<b>Quantifying Thickness-dependent Charge Mediated Magnetoelectric Coupling in Magnetic/dielectric Thin Film Heterostructures</b> <u>Z. Zhou</u> , T.X. Nan, Y. Gao, X. Yang, S. Beguhn, M. Li, Y. Lu, J. L. Wang, M. Liu, K. Mahalingam, B.M. Howe, G.J. Brown, and N.X. Sun
11:45am		<b>Flux Growth and Electric Field Induced Phase Transition of PLZST Antiferroelectric Single Crystal</b> <u>Q. Li</u> , J.H. Gao, Y.L. Zhang, Y.Y. Li, Q.F. Yan, F.P. Zhuo, X.Q. Xi, and X.C. Chu	<b>Epitaxial Integration of Rock-salt Oxides with GaN</b> <u>C.T. Shelton</u> , I. Bryan, E.A. Paisley, E. Sachet, M. Bügler, M. Biegalski, J. LeBeau, B. Gaddy, R. Collazo, Z. Sitar, D. Irving, A. Hoffman, and J.-P. Maria	<b>Actuation Performance of Piezoelectric Fiber Composites</b> <u>D. Zhang</u> , X. Lin, and K. Zhou	<b>Synthesis and Magnetic Properties of Coaxial Ni-BaTiO<sub>3</sub> Nanocable Arrays</b> <u>D. Sallagoity</u> , R. Berthelot, J. Majimel, N. Penin, C. Elissalde, M. Maglione, V. Antohe, and L. Piraux	
12:00 pm - 1:30 pm		<b>Lunch</b> <b>Presidents Hall 3 and 4 or the Gardens Restaurant (Lower Level)</b>				
1:30 pm - 3:15 pm	<b>Session X</b>					
	<b>Group 1</b> <b>Non-Classical FE II</b>	<b>Group 2</b> <b>Thin Films III</b>	<b>Group 3</b> <b>Domains II</b>	<b>Group 4</b> <b>Polymers/Composites</b>	<b>Group 5</b> <b>Relaxor-PT Single Crystals II</b>	
	Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1	
	Session Chair: Nagarajan Valanoor	Session Chair: Paul Clem	Session Chair: Nava Setter	Session Chair: Sidney Lang	Session Chair: Jian Tian	
1:30pm	<b>Identification of Conductivity Mechanisms in Nanostructured Ceria through Lateral Electrochemical Measurements</b> <u>J. Ding</u> , E. Strelcov, S. Kalinin, and N. Bassiri-Gharb	<b>Nano-second Time Resolved Piezoresponse at the MPB in Rare-earth Substituted BiFeO<sub>3</sub> Thin Films Determined by Time-dependent In-situ Synchrotron Diffraction</b> <u>I. Takeuchi</u> , S. Yasui, A. Varatharajan, H. Funakubo, Y. Ehara, T. Shiraishi, T. Shimizu, M. Itoh, Y. Imai, H. Tajiri, O. Sakata, P. Maksymovych, S. Kalinin, F. Xue, L.-Q. Chen	<b>Ferroelectric Domain Structure and Properties of Epitaxial PZT Bilayer Thin Film Heterostructures</b> <u>N. Valanoor</u>	<b>A Light Sensitive Smart Polymer Actuator-based Loudspeaker Array</b> P.-C. Lai and <u>C.-K. Lee</u>	<b>Electric Field and Temperature Induced Phase Transitions in [001]-, [011]-, and [111]-oriented PIN-PMN-PT Single Crystals</b> <u>Z. Li</u> , Y. Wan, Z. Yu, S. Xia, F. Li, L. Wang, Z. Xu, S. Fan, and X. Yao	
1:45pm	<b>Strain Dependent Reducibility of Cerium</b>		<b>Polarization Coupling in Ferroelectric Bilayers</b>	<b>Piezo- and Ferroelectric P(VDF-TrFE) Films with</b>	<b>X-ray Diffraction Investigations on High-T<sub>c</sub></b>	

Exhibits Open

2:00pm

Oxide: Predictions from Multiscale Simulations  
*D. Er, J. Li, M. Cargnello, R.J. Gorte, and V.B. Shenoy*



*A. Grigoriev, C. Yang, P. Salev, O. Causey, D. Tinberg, S. Trolrier-McKinstry*

Inkjet-printed PEDOT:PSS Electrodes: Preparation Parameters and Property Evaluation  
*M. Sborikas, B. Fischer, and M. Wegener*

Ternary PIN-PMN-PT Crystals: Bifurcated Polarization Rotation and Phase Diagrams  
*Y.J. Wang, H.S. Luo, J.F. Li, and D. Viehland*

Ferroelectricity in Doped Hafnium Oxide  
*U. Schroeder, E. Yurchuk, J. Müller, D. Martin, T. Schenk, C. Adelman, S. Kalinin, U. Boettger, A. Kersch, and T. Mikolajick*

Impact of Compressional and Tensile Biaxially-Anisotropic Strain on the Ferroelectric Properties of Epitaxial  $\text{NaNbO}_3$  and  $\text{SrTiO}_3$  Films  
*R. Wördenweber, J. Schwarzkopf, B. Cai, Y. Dai, D. Braun, J. Schubert, and E. Hollmann*

Time-Resolved X-Ray Diffraction Study of Lattice Strain and Domain Dynamics in Uniaxial Ferroelectric Single Crystals  
*S. Gorfman, H. Choe, J. Dec, M. Ziolkowski, U. Pietsch, T. Łukasiewicz*

Novel Organic-Inorganic Composites with High Thermal Conductivity for Electronic Packaging Applications  
*H. Wang and Y. Zhou*

Temperature and Frequency Dependence of Electric Field Induced Phase Transitions in PMN-xPT  
*J. Wooldridge, M. Stewart, C. Vecchini, M.G. Cain, M. Gutmann, and M. Reece*



2:15pm

Giant Electrostriction in Gd-doped Ceria: Mechanism and Practical Applications  
*R. Korobko, A Frenkel, and I. Lubomirsky*

Phase Transitions Induced by Two Order Parameters in In-plane Compressed  $\text{SrTiO}_3$  Thin Films  
*T. Yamada, B. Wylie-van Eerd, O. Sakata, A.K. Tagantsev, H. Morioka, Y. Ehara, S. Yasui, H. Funakubo, T. Nagasaki, and J. Trodahl*

Phase-field Modeling on the Elastically Coupled Magnetic and Ferroelectric Domains  
*T.N. Yang, J.M. Hu, C.W. Nan, and L.Q. Chen*

Pressure Sensitivity Response of Polymeric Ferroelectret Foam Films  
*T.E.G. Alvarez-Arenas*

High Voltage Drive Characteristics of PZN-PT Single Crystals  
*S. Zhang, D.H. Lin, Y. Xia, and L.C. Lim*

2:30pm



2:45pm

Effect of Bombardment and Annealing Duration on Residual Stresses in *In Situ* Laser Crystallized PZT Thin Films  
*A. Rajashekhara, A. Fox, H. Zhang, S.S.N. Bharadwaja, I.M. Reaney, and S. Trolrier-McKinstry*

Ferroelastic Domain Wall Motion in PZT Thin Films  
*R.L. Johnson-Wilke, M. Wallace, R.H.T. Wilke, G. Esteves, J. Jones, and S. Trolrier-McKinstry*

Characterization of Transducer Backing Materials with Variable Large Acoustic Impedance and High Attenuation  
*R. Zhang, J. Liu, Z. Zhang, Y. Sun, and W. Cao*

Influence of Temperature Modulation during Poling on the Performance of Hard Piezoelectric Materials  
*S. Eßlinger, P. Neumeister, and A. Schönecker*

Sol-gel Processing and Property Characterization of Lead-free Piezoelectric (K, Na)NbO<sub>3</sub> Films on Nb:SrTiO<sub>3</sub> Substrates  
*J.-F. Li and Q. Yu*

Vibrational Fingerprints of Potassium Titanyl Phosphate: Analysis and Visualization of Ferroelectric Domain Structures  
*M. Rüsing, P. Mackwitz, G. Berth, and A. Zrenner*

Performance of Thin Film Polyvinylidene fluoride (PVDF) for Pyroelectric Energy Harvesting  
*D.A. Zabek, J. Taylor, E. LeBoulbar, and C.R. Bowen*

Characterization of Full Set Material Constants of PIN-PMN-PT Single Crystal based on Inverse Impedance Spectroscopy using Only One Sample  
*S. Li and W. Cao*

3:00pm	<b>Exhibits Open</b>	<p>Cationic Ordering and Electrical Transport Phenomena in Three New Double Perovskite Oxides BaNdCoXO<sub>6</sub> (X = Nb<sup>5+</sup>, Ta<sup>5+</sup>, Sb<sup>5+</sup>)  <u>C. Bharti</u>, N. Bhadra, A. Sen, S. Chanda, and T.P. Sinha</p>	<p>Invited</p> 	<p><i>In-situ</i> TEM Observations on the Electrical Fatigue of a PMN-PT Ceramic  <u>H.Z. Guo</u>, S.J. Zhang, and X. Tan</p>	<p>High Electromechanical Responses of Ultra-High Density Aligned Nano-Porous Microwave Exfoliated Graphite Oxide/Polymer Nanocomposites Ionic Actuators  <u>M. Ghaffari</u>, Y. Zhou, M. Lin, C.M. Koo, and Q.M. Zhang</p>	<p>Review on Development of Shear Mode of PMN-PT based Piezoelectric Crystals  <u>P. Han</u></p>
3:15pm		<p>Spatially Resolved Mapping of Second Order Susceptibility Tensor Elements in Periodically Poled Lithium Niobate  <u>A. Widhalm</u>, M. Grothe, G. Berth, and A. Zrenner</p>	<p>Molecular Ferroelectrics for Organic Electronics  <u>S. Ducharme</u></p>			
3:15 pm - 4:00 pm	<b>Refreshment Break</b>					
3:30 pm - 5:00 pm	<p><b>Wakino Memorial Session</b>          Presidents Hall 2          Session Chair: Yukio Sakabe</p>					
3:30pm	<p>Development on Highly Transparent Ceramics  <u>N. Tanaka</u>, <u>Y. Kintaka</u>, S. Kuretake, and A. Ando</p>					
4:00pm	<p>Dielectric Resonators for Enhanced Magnetic Resonance Imaging  <u>M.T. Lanagan</u>, M. Pyrz, S.E. Perini, T.U. Neuberger, F. Chen, and E. Semouchkina</p>					
4:15pm	<p>Wide-Band Dielectric Spectroscopy of Perovskite Dielectrics --- Technique and Interpretation ---  <u>T. Tsurumi</u>, H. Hoshina, and H. Takeda</p>					
4:30pm	<p>Microwave Dielectric Ceramics: An Historical Perspective  <u>I.M. Reaney</u></p>					
4:45pm	<p>Utilizing Electrical Impedance Spectroscopy to Understand Dielectric and Piezoelectric Processing and Properties Relations: A Tribute to the Inspiration of Dr. Kikuo Wakino  <u>C. Randall</u></p>					
4:00 pm - 6:30 pm	<p><b>Poster Session II</b> Deans Hall          Session Chair: Tadej Rojac</p> <p><b>Group 1</b></p> <p>II.1 Intrinsic LiNbO<sub>3</sub> Point Defects from Total-Energy Differences and Slater-Janak Transition State Calculations  <u>Y. Li</u>, S. Sanna, A. Rieffer, and W.G. Schmidt</p>					

- II.2 The Influence of Different Defects on Ferroelectric and Piezoelectric Properties of  $\text{Pb}(\text{Ni}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-Pb}(\text{Zr,Ti})\text{O}_3$  Ceramics  
*J. Zeng, G. Li, L. Zheng, and Q. Yin*
- II.3 Variable Range Hopping Conduction in Ultrathin Ferroelectric Tunneling Junction  
*J.L. Sun, X.L. Zhao, B.B. Tian, B.L. Liu, X.J. Meng, and J.H. Chu*
- II.4 Chemical Bonds Properties and Ferroelectricity of Bismuth Layer Structure Ferroelectric Materials  
*X. Xiao and S. Li*
- II.5 The Peculiarities of Incommensurate Phase in C and 2C Polytypes of  $\text{TlInS}_2$  Ferroelectric  
*A. Salnik, Y.P. Gololobov, and N.A. Borovoy*
- II.6 Soft Phonon Modes of Successive Phase Transitions in  $\text{SrHfO}_3$  Studied by Raman Spectroscopy  
*M.K. Singh, G. Singh, S. Kojima, and R.S. Katiyar*
- II.7 Piezoelectric Ruddlesden-Popper Phase  $\text{NaRETiO}_4$   
*H. Akamatsu, K. Fujita, T. Kuge, A. Sen Gupta, A. Togo, S. Lei, F. Xue, G. Stone, J.M. Rondinelli, L.Q. Chen, I. Tanaka, V. Gopalan, and K. Tanaka*
- II.8 Domain Wall Evolution Laws of Piezoceramic Materials under Mechanical Loading  
*M. Domenjoud, J. Bustillo, M. Lethiecq, and F. Levassort*
- II.9 Optical Properties of Ti Indiffused  $\text{LiNbO}_3$  from First Principles  
*A. Riefer, S. Sanna, A. Schindlmayr, and W.G. Schmidt*
- II.10 Time-dependent Conductivity in Lithium Niobate Crystals with Charged Domain Walls  
*V. Ya. Shur, I.S. Baturin, A.R. Akhmatkhanov, D.S. Chezganov, and A.A. Esin*
- II.11 Nanodomain Structuring of Uniaxial Ferroelectrics: Achievements in Domain Nanotechnology  
*V. Ya. Shur*
- II.12 Acoustical Activity of Lithium Niobate Crystals  
*F.R. Akhmedzhanov*
- II.13 Relaxor Ferroelectrics and Intrinsic Inhomogeneity  
*A. Bussmann-Holder*
- II.14 From Normal Ferroelectric Transition to Relaxor Behavior in Aurivillius Ferroelectric Ceramics - Spin-Glass Model  
*Y. González-Abreu, A. Peláiz-Barranco, J.D.S. Guerra, Y. Gagou, and P. Saint-Grégoire*
- II.15 Investigation of the Ferroic Properties and Magnetoelectric Response in  $[\text{PbZr}_{0.65}\text{Ti}_{0.35}\text{O}_3]_{1-x}\text{-}[\text{BaFe}_{12}\text{O}_{19}]_x$  Multiferroic Composites  
*J.D.S. Guerra, S. Betal, M. Pal, A.J.A. Oliveira, R. Guo, and A.S. Bhalla*
- II.16 Microwave Dielectric Properties in PZT-xBaM Multiferroic Composites  
*J.D.S. Guerra, R. McIntosh, R. Guo, and A.S. Bhalla*
- II.17 Multiferroic Properties of  $\text{BiFeO}_3\text{-PVDF}$  Composite Films  
*N. Dabra, B. Kaur, L. Singh, V.A. Reddy, R. Nath, D.-Y. Jeong, and J.S. Hundal*
- II.18 Magnetoelectric Properties of Lead-free  $\text{AlFeO}_3$  and Mn, Nb Doped Compositions  
*L.F. Cotica, G.M. Santos, V.F. Freitas, I.A. Santos, S. Betal, M. Pal, R. Guo, and A.S. Bhalla*
- II.19  $\text{BiFeO}_3/\text{LaFeO}_3$  Superlattices and  $\text{BiFeO}_3$  Thin Films Investigations: Growth and Strain Effects  
*B. Carcan, H. Bouyanfif, M. El Marssi, F. Le Marrec, J. Wolfman, C. Autret, and D. Arnold*
- II.20 Observation of Room Temperature Magnetoelectric Coupling in  $\text{NiFe}_2\text{O}_4/(\text{Ba,Ca})(\text{Ti,Zr})\text{O}_3$  Composite Thin Films Grown By Chemical Solution Deposition  
*E. Venkata Ramana, D.Sharma, M.P.F.Graça, and M.A.Valente*

### Group 2

- II.21 Dielectric and Ferroelectric Properties of  $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$  Ceramics Prepared by Multiple Stepped Microwave Sintering  
*X. Wang, Y. Yu, and X. Yao*
- II.22 Effects of  $\text{InNbO}_4$  Fabrication on Perovskite PIN-PMN-PT  
*L. Wang, S. Zhao, L. Jin, F. Li, and Z. Xu*
- II.23 Continuous Fabrication Piezoceramic Fibers and Ribbons by a Novel Alginate Gelation Method and Their Electrical Properties



- S. Alkoy, E. Mensur-Alkoy, R. Olukcent, S. Dursun, A. Berksoy-Yavuz, M.Y. Kaya, and I. Dursun
- II.24 Synthesis and Characterization of 0.7BiFeO<sub>3</sub>-0.3BaTiO<sub>3</sub> Crystallites by the Hydrothermal Method  
T. Tong, J.G. Chen, J. Jian, D.R. Jin, and J.R. Cheng
- II.25 Synthesis, Development, and Electromechanical Characterization of Novel Barium Titanate and Lead Zirconate Titanate Nanoparticle Materials  
C.B. DiAntonio, T. Monson, A. Cook, T. Chavez, and L. Evans
- II.26 Piezoresponse in Ferroelectric Nanotubes as a Function of Composition  
T. Field, R. Vasudevan, and N. Bassiri-Gharb
- II.27 Ferroelectric Properties of the Poly(vinylidene fluoride-trifluoroethylene (P(VDF-TrFE)) thin Films Blended with Inorganic Pb(Zr, Ti)O<sub>3</sub>  
B.E. Park and W.-G. Lee
- II.28 Structural and Electrical Characterization of Electro Spray Deposited PZT Sol-PZT Nanopowder Composite Thick Films  
M. Gürbüz, H. Sakurai, Y. Kuromitsu, A. Oral, A. Doğan
- II.29 Fabrication and Characterization of Compositionally Graded Pb<sub>x</sub>Sr<sub>1-x</sub>TiO<sub>3</sub> Thin Films on Stainless Steel by the Sol-gel Method  
S. Huang, D. Chen, J. Chen, and J.Cheng
- II.30 Study on Sintering Temperature Effect for Enlarging Area of 0.69PZT-0.31PZNN Thick Film  
M.S. Woo, D. Song, J.H. Ahn, D.H. Cho, S. Nahm, and T.H. Sung
- II.31 High Curie Temperature BiInO<sub>3</sub>-PbTiO<sub>3</sub> Films  
S.Y. Lee and S. Trolrier-McKinstry
- II.32 Electrothermal Properties of Sol-Gel PZT Prepared with Varying Lead-Excess  
B. Hanrahan, L. Sanchez, C.M. Waits, and R. Polcawich
- II.33 Effect of Sn<sup>4+</sup> Substitution on Structure and Properties in the PbSnO<sub>3</sub>-PbZrO<sub>3</sub>-PbTiO<sub>3</sub> Ternary System  
Z. Xing, X. Wei, and L. Jin
- II.34 Enhanced Piezoelectric Properties of (0.95-x) BiFeO<sub>3-x</sub> PbTiO<sub>3</sub>-0.05 Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub> Ceramics for High Temperature Applications  
J. Jiang, J. Chen, and J. Cheng
- II.35 Fabrication and Optical Properties of Relaxor Ferroelectric PMN-PZT Transparent Ceramics  
W. Ruan, G. Li, J. Zeng, W. Zhao, K. Zhao, L. Zheng, and H. Zeng
- II.36 Effect of Pressure on Electromechanical Behavior of High Temperature Piezoelectrics  
B. Kowalski and Alp Sehirlioglu
- II.37 Strong Ferroelectric Domain-wall Pinning in 0.6BiFeO<sub>3</sub>-0.4(Bi<sub>0.5</sub>K<sub>0.5</sub>)TiO<sub>3</sub> Lead-free Piezoelectric Ceramics  
M. Hagiwara and S. Fujihara
- II.38 Structures and Electrical Properties of Manganese Doped K<sub>0.5</sub>Na<sub>0.5</sub>NbO<sub>3</sub> Piezoelectric Ceramics  
L. Wang, W. Ren, P. Shi, and X. Wu
- II.39 Dielectric Relaxation and Enhanced Piezoelectric Properties of lead-free (Na<sub>0.5</sub>K<sub>0.5</sub>)(Nb,Ta)O<sub>3</sub> Based Ceramics  
J.S. Kim, A. Hussain, T.K. Song, M.H. Kim, and W J. Kim

### Group 3

- II.40 Effect of Grain Boundary on Electrostatic Signal in Polycrystalline LiNbO<sub>3</sub> Thin Films via Electrostatic Force Microscopy  
D.A. Kiselev, R.N. Zhukov, A.S. Bykov, M.D. Malinkovich, and Y. Parkhomenko
- II.41 Unraveling the LiNbO<sub>3</sub> X-Cut Surface by Atomic Force Microscopy and Density Functional Theory  
S. Sanna, S. Rode, S. Klassen, A. Riefer, W.G. Schmidt, and A. Kühnle
- II.42 Study of Ferroelectric Domain Dynamics via Piezoresponse Force Microscopy  
K.Y. Zhao, H.R. Zeng, W. Ruan, J.T. Zeng, G.R. Li, and Q.R. Yin
- II.43 Long-range Domain-domain Interaction during Tip-induced Ferroelectric Domain Switching  
A.V. Ievlev, E. Strelcov, S. Jesse, A.N. Morozovska, E.A. Eliseev, Y.V. Pershin, A. Kumar, I.I. Kravchenko, V.Ya. Shur, and S.V. Kalinin
- II.44 Domain Wall Motion and Electric-field-induced Phase Transitions in Li-modified K<sub>0.5</sub>Na<sub>0.5</sub>NbO<sub>3</sub>  
T. Iamsasri, G. Tutuncu, C. Uthaisar, S. Pojprapai, and J.L. Jones
- II.45 Low Frequency Dielectric Relaxation in Na<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub> Single Crystal



- T.V. Kruzina, V.M. Sidak, M.P. Trubitsyn, S.A. Popov, and J. Suchanicz
- II.46 Ferroelectric and Raman Spectroscopic Studies of Acceptor Doped Lead-free  $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3\text{-BaTiO}_3$  Single Crystals  
E. Venkata Ramana, A.Durairajan, M.P.F.Graça, and M.A.Valente
- II.47 Resonant Raman Scattering in  $\text{LiNbO}_3$  and  $\text{LiTaO}_3$   
A. Bartasyte and S. Margueron
- II.48 Multiphase-coexisting Structure and Refinement of  $(1-x)(\text{Li}_{0.05}\text{Na}_{0.475}\text{K}_{0.475})(\text{Nb}_{0.95}\text{Sb}_{0.05}\text{O}_3)\text{-xBiFeO}_3$  Ceramics  
M.H. Jiang, Y.X. Li, Z.F. Gu, G. Cheng, and C.A. Randall
- II.49 Evaluation on Residual Stress in  $\text{Bi}_{3.15}(\text{Eu}_{0.7}\text{Nd}_{0.15})\text{Ti}_3\text{O}_{12}$  and BNT based Polycrystalline Ferroelectric Thin Films by using the Orientation Average Method  
K. Zhan, X.J. Zheng, and H.B. Cheng
- II.50 Variation of Piezoelectric Properties across Thin PZT Film Capacitors  
J.T. Evans, S.P. Chapman, and Naomi Montross
- II.51 Enhanced Nonlinear Optical Properties in Ultra-strained  $\text{BiFeO}_3$  Thin Films  
R.C. Haislmaier, A. Melville, J.C. Yang, N.J. Podraza, S.A. Denev, Y.H. Chu, D.G. Schlom, and V. Gopalan
- II.52 Terahertz Time-domain Spectroscopic Study on Relaxer Ferroelectric  $(1-x)\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-xPbTiO}_3$   
T. Mori, T. Yamada, and S. Kojima
- II.53 Band-excitation Electrochemical Strain Microscopy of the Commercial  $\text{LiMn}_2\text{O}_4$  Battery Material  
D.O. Alikin, S. Luchkin, A.V. Ievlev, A.P. Turigin, D.V. Pelegov, V.Ya. Shur, S. Kalinin, and A.L. Kholkin

#### Group 4




- II.54 High Energy-Storage Performance in Tetragonal- quadrature Two-Phase Composite Anti-Ferroelectric Ceramics  
L. Zhang, G.Z. Zhang, Y.K. Zeng, and S.L. Jiang
- II.55 Fractional Operator for Hysteresis and Complex Dielectric Permittivity  
B. Ducharne, B. Zhang, G. Sebald, and D. Guyomar
- II.56 High-frequency Bandwidth Model for Dielectric Ferroelectrics  
B. Ducharne, B. Zhang, G. Sebald, and D. Guyomar
- II.57 Effect of the Grain Boundary on the Energy Storage Properties of  $(\text{Ba}_{0.4}\text{Sr}_{0.6})\text{TiO}_3$  Paraelectric Ceramics with Various Grain Sizes  
Z. Song, H. Liu, H. Hao, M. Cao, Q. Xu, Z. Wang, Z. Yao, and Z. Yu
- II.58 Dielectric Properties of Barium Strontium Calcium Titanate Ceramics with Compositional Inhomogeneity  
H. Dong, D. Jin, C. Xie, J. Cheng, J. Chen, and J. Chen
- II.59 Dielectric Behavior of Lead Magnesium Niobate-lead Titanate Ceramics under AC Electric Fields (O)  
G. Li, W. Zhao, L. Huang, W. Ruan, K. Zhao, J. Zeng, and H. Zeng
- II.60 Energy-storage Density of the  $\text{Bi}_{0.5}(\text{Na}_{0.82}\text{K}_{0.18})_{0.5}\text{TiO}_3$  - based Ferroelectric Thin Films  
S.A Chae, W.S. Woo, S.-S. Won, C.W. Ahn, and I.W. Kim
- II.61 Ferroelectric Glass Ceramics as Energy Storage Materials-Perspectives for Processing and Characterization  
Y. Zhang, X. Song, and J. Zhu
- II.62 Ultrasonic Polymer-based Actuators for CTC Detection and Retention on Flowing Blood Samples  
I. González, A. Castillejo, J. Berganzo, A. Martin, V. Acosta, J.L. Soto, M. Tijero, M. Bouali
- II.63 Growth of  $\text{Ca}_3\text{Ta}(\text{Ga}_{0.5}\text{Al}_{0.5})_3\text{Si}_2\text{O}_{14}$  Piezoelectric Single Crystals and their Piezoelectric Properties  
T. Kudo, Y. Yokota, Y. Shoji, K. Kamada, S. Kurosawa, and A. Yoshikawa
- II.64 Boracite Ferroelectric Synthesis and Characterization for Energy Conversion  
K. Lu and J. Scheinbeim
- II.65 Ferroelectric and Electrocaloric Properties of  $(\text{Ba}_{0.85}\text{Ca}_{0.15})(\text{Ti}_{0.9}\text{Zr}_{0.1})\text{O}_3$  Ceramics  
Y.S. Kim, J. Yoo, and Y.H. Jeong


#### Group 5

- II.66 High Transition Temperature - High Coupling Lead Magnesium Niobate-Lead Zirconium Titanate Single Crystals for Sound Projectors  
A.A. Heitmann, J.J. Stace, H.-Y. Lee, and A.H. Amin
- II.67 Fabrication and Characterization of  $d_{36}$  Shear Mode Crystal Stacks  
J. Tian, B. Stone, S. Dynan, P. Han, S. Brumbaugh, and R.J. Meyer
- II.68 Effect of Acceptors and Donors on Growth and Piezoelectric Properties of SSCG PMN-PZT Single Crystals  
S.-M. Lee, D.-H. Kim, and H.-Y. Lee
- II.69 Monitoring of the Piezoelectric Properties and Structural Changes of the PMN-32%PT Crystals during Poling Process  
J. Sestoke, Prof. Habil, R.J. Kazys, and R. Sliteris
- II.70 Comparison of Generation II and III Piezoelectric Single Crystals for Applications in High Power Ultrasound Actuators  
M.R. Sadiq, A. Bolhovitins, T. Jiang, Z.Huang, and S. Cochran
- II.71 Hydrostatic Piezoelectric Properties of [011] poled PMN-PT Single Crystals and 2-2 Lamellar Composites  
S. Zhang, L. Li, Z. Xu, X. Geng, J. Luo, and T.R. Shrout
- II.72 Electric Field Dependent Dielectric Behavior for [111]-oriented PMN-PT Single Crystal with Different Compositions  
N. Luo, S. Zhang, Q. Li, Y. Zhang, and T.R. Shrout
- II.73 The Study of 1-1-3 Piezoelectric Composite Base on Relaxor Ferroelectric Single Crystal  
L. Qin, L.-K. Wang, D. Long, J.-J. Liu, and B. Zhang
- II.74 Robust Determination of Complete Set of Constants for [011]<sub>c</sub> Poled PMN-PT Single Crystal  
R. Sahul, S. Zhang, W. Jiang, W. Cao, E. Nesvijski, and W. Hackenberger
- II.75 1-3 PiezoCrystal Composite Langevin Transducer Performance Comparison  
T. Mudarri, J. Aghia, C. Ursch, A. Pacheco, T. Tiano, and B. Pazol
- II.76 Reduced Development Costs for PiezoCrystal Transducers  
J. Aghia, T. Mudarri, C. Ursch, A. Pacheco, T. Tiano, and B. Pazol
- II.77 Energy Harvesting using the FER-FEO Phase Transformation in [011] cut PIN-PMN-PT Single Crystals  
W. Dong, P. Finkel, A. Amin, and C. Lynch
- II.78 Wideband Tonpilz Transducer with a Voided Head Mass  
H. Kim and Y. Roh
- II.79 Tonpilz Type Underwater Vector Sensor  
Y. Roh and Y. Lim
- II.80 An Investigation on Noise Reduction Performance and Mechanical Damping of PZT Composite Structure  
M. Yao, Y. Zheng, and X. Yao
- II.81 Transducer Construction and Control for Simultaneous Acoustic Energy Transmission and Backward data Reception  
S. Ozeri and D. Shmilovitz
- II.82 Annular Piezoelectric Ceramic Transformer in Radial Vibration  
L. Shuyu, H. Jing, Z. Xiaoli, and W. Yong
- II.83 Identification of Impact Source Utilizing Array Piezoelectric Sensors  
J. Kim and S.K. Lee
- II.84 New Piezo1D 1-Dimensional Modeling Software  
R. Tasker
- II.85 Determination of Microscopic Parameters of Piezoceramic Materials under Electrical Loading using Genetic Algorithm  
J. Bustillo, M. Domenjoud, J. Fortineau, G. Gautier, and M. Lethiecq
- II.86 Finite Element Simulation of 1-3 Piezocomposite Sonar Arrays Under Thermal and Hydrostatic Duress  
A. Tweedie, G. Harvey, and R. Banks
- II.87 Finite Element Modeling of Transducers Incorporating Single Crystal Materials using the ATILA++ Code  
P. Mosbah, R.J. Meyer, D.C. Markley, and B. Dubus
- II.88 Using Heat Generation to Characterize Mechanical Losses in Piezoelectric Ceramics in Resonance  
H.N. Shekhani and K. Uchino

- II.89 Planar Microphone based on Piezoelectric Electrospun poly( $\gamma$ -benzyl- $\alpha$ ,L-glutamate) Nanofibers  
K. Ren, J.E. West, and S.M. Yu
- II.90 Magnetostrictive Stress Reconfigurable Thin Film Resonators For Near DC Magnetoelectric Sensors  
J. Kiser, R. Lacomb, K. Bussmann, S. Lofland, C.J. Hawley, J.E. Spanier, X. Zhuang, C. Dolabdjian, and P. Finkel

Friday, May 16, 2014

8:00 am - 10:00 am		Session XI				
		Group 1 Multiferroics II	Group 2 Bulk Piezoelectrics	Group 3 Lead Free Characterization II	Group 4 Energy Storage/Dielectrics	Group 5 Medical Transducers and Ultrasound
		Room 207	Room 206	Room 208	Presidents Hall 2	Presidents Hall 1
		Session Chair: Jing-Feng Li	Session Chair: Ichiro Fujii	Session Chair: Joe Evans	Session Chair: Hong Wang	Session Chair: Ming-Jen Pan
8:00am	Exhibits Open	Electric Field-Induced Oxidation of Ferromagnetic/Ferroelectric Interfaces <u>M. Bisht</u> , S. Couet, M. Trekels, M. Menghini, C. Petermann, M.J. Van Bael, J.P. Locquet, R. Ruffer, A. Vantomme, and K. Temst	Pb(Yb <sub>1/2</sub> Nb <sub>1/2</sub> )O <sub>3</sub> -PbTiO <sub>3</sub> : A Rainbow of Ferroelectric Properties <u>C. Cochard</u> , C. Bogicievic, X. Bril, N. Guiblin, F. Porcher, O. Guedes, and P.-E. Janolin	Insight into the Electric Field Induced Ferroelectric to Relaxor Transition <u>W. Jo</u> , J.E. Daniels, D. Damjanovic, W. Kleemann, and J. Rödel	Cubic Pyrochlore Bismuth Zinc Niobate Thin Films for Dielectric Energy Storage <u>E.K. Michael</u> and S. Trolier-McKinstry	Transducer Design and Piezoelectric Materials for Ultrasonic Particle Manipulation <u>C.E.M. Demore</u> , Y. Qiu, C. Courtney, P. Glynne-Jones, S. Gebhardt, A. Schönecker, M. Hill, B. Drinkwater, and S. Cochran
8:15am		Invited 	Piezoelectric Glass-Ceramics for High-Temperature Applications <u>M.J. Davis</u> , P. Vullo, and R.H.T. Wilke, S.J. Zhang, and C.A. Randall	New Topological Features and Temperature Dependence of the Diffuse X-ray Scattering in Na <sub>0.5</sub> Bi <sub>0.5</sub> TiO <sub>3</sub> <u>S. Gorfman</u> , D.S. Keeble, and P.A. Thomas	Ferroelectric PLZT Films Deposited on Base-Metal Foils for Power Inverters in Electric Drive Vehicles <u>U. Balachandran</u> , B. Ma, T.H. Lee, and S.E. Dorris	Invited 
8:30am		Magnetoelectric Coupling and Interfacial Effects in BiFeO <sub>3</sub> /BaTiO <sub>3</sub> Thin Film Heterostructures <u>V.V. Lazenka</u> , M. Lorenz, H. Modarresi, P. Schwinkendorf, F. Bern, M. Grundmann, M.J. Van Bael, A. Vantomme, and K. Temst	Structure, Dielectric, and Piezoelectric Properties of (0.97-x)BiScO <sub>3</sub> -xPbTiO <sub>3</sub> -0.03Pb(Mn <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> High Temperature and High Power Piezoelectric Ceramics <u>J. Chen</u> and J.R. Cheng	Effect of the Powder Process Type on Dielectric and Leakage Current Characteristics of Flux Grown 94NBT-6BT Single Crystals <u>M. Gürbüz</u> and A. Doğan	Ferroelectric BaTiO <sub>3</sub> Colloidal Nanocrystals for the Design of Fluoro-Polymer-Ceramic Nanocomposites with High Dielectric Constant for Energy Storage Applications <u>G. Caruntu</u> , S.S. Parizi, R. Sully, and D. Caruntu	Invited 
8:45am		Studies of the Structural,	Modification of PZT with	Structure Modification in	Advanced Dielectric	

	<b>Exhibits Open</b>	<p>Transports and Electrical Properties in Multiferroic Tunnel Junction <u>D. Barrionuevo</u>, N. Ortega, A. Sokolov, and R.S. Katiyar</p>	<p>Bismuth: A Structural and Electrical Study <u>T. Kainz</u>, F.A. Mautner, and K. Reichmann</p>	<p>Na<sub>1/2</sub>Bi<sub>1/2</sub>TiO<sub>3</sub>-BaTiO<sub>3</sub> Based Lead-Free Single Crystals C. Chen, <u>X. Zhao</u>, X. Li, H. Zhang, H. Deng, and H. Luo</p>	<p>Energy Storage and Electronics <u>S. Wu</u>, Q.C. Burlingame, M. Lin, Y. Zhou, Q. Chen, M. Shao, A. Payzant, K. Xiao, and Q.M. Zhang</p>	
9:00am		<p>Direct and Converse Magnetolectric Coupling in Cobalt Ferrite-barium Titanate (0-3) Particulate Composite <u>M.F. Etier</u>, V.V. Shvartsman, H. Trivedi, S. Salamon, H. Wende, and D.C. Lupascu</p>	<p>Enhancement of Piezoelectric Properties of PbFe<sub>0.5</sub>Nb<sub>0.5</sub>O<sub>3</sub>-PbTiO<sub>3</sub> Solid Solution Ceramics at Cryogenic Temperatures <u>E.I. Sitalo</u>, A.V. Blazhevich, I.P. Raevski, S.P. Kubrin, S. I. Raevskaya, V.V. Titov, Haydn Chen, C.-C. Chou, T.A. Minasian, M.A. Malitskaya, S.I. Shevtsova, and I.N. Zakharchenko</p>	<p>Anisotropy of Ferroelectric Behavior of (1-x) Bi<sub>1/2</sub>Na<sub>1/2</sub>TiO<sub>3</sub> - xBaTiO<sub>3</sub> Single Crystals across the Morphotropic Phase Boundary <u>D. Schneider</u>, W. Jo, J. Rödel, D. Rytz, and T. Granzow</p>	<p>Dielectric Properties in BaTiO<sub>3</sub>-Bi(Mg<sub>2/3</sub>Nb<sub>1/3</sub>)O<sub>3</sub> Ceramic and Potential For Energy Storage <u>T. Wang</u>, X. Wei, and L. Jin</p>	<p>Inverse Biasing Capability of a Dual Deflectable Membrane MEMS Ultrasonic Transducer for Medical Applications <u>T.A. Emadi</u> and D.A. Buchanan</p>
9:15am		<p>A Novel Multifunctional Magneto-Dielectric Solid Solution Ceramic Material of 0.25LiFe<sub>5</sub>O<sub>8</sub>-0.75Li<sub>2</sub>ZnTi<sub>3</sub>O<sub>8</sub> with Relatively High Permeability and Ultra Low Dielectric Loss <u>L. He</u>, D. Zhou, F. Xiang, and H. Wang</p>	<p>Phase Transition and Dielectric Properties of AgNbO<sub>3</sub>-LiTaO<sub>3</sub> Lead-free Ceramics <u>Y. Tian</u>, L. Jin, and X. Wei</p>	<p>Influence of Lattice Defects on Ferroelectric and Piezoelectric Properties in Lead-free (Na<sub>0.53</sub>K<sub>0.47</sub>)NbO<sub>3</sub> Ceramic <u>G.H. Ryu</u> and M.H. Kim</p>	<p>Thin Film Deposition and Characterization of High Energy Density Glass <u>M.J. Pyrz</u>, B. Akkopru-Akgun, S. Trolter-McKinstry, and M. Lanagan</p>	<p>A Two-Port Piezoelectric Micromachined Ultrasonic Transducer <u>F. Sammoura</u>, S. Shelton, S. Akhbari, D. Horsley, and L. Lin</p>
9:30am		<p>Studies of Ferroelectric and Magnetic Phase Transitions in Multiferroic PbFe<sub>0.5</sub>Nb<sub>0.5</sub>O<sub>3</sub>-PbTiO<sub>3</sub> and PbFe<sub>0.5</sub>Ta<sub>0.5</sub>O<sub>3</sub>-PbTiO<sub>3</sub> Solid Solution Ceramics <u>A.V. Blazhevich</u>, I.P. Raevski, S.P. Kubrin, M.S. Molokeev, S.V. Misjul, E.V. Eremin, E.I. Sitalo, S. I. Raevskaya, V.V. Titov, D.A. Sarychev, M.A. Malitskaya, and I.N. Zakharchenko</p>	<p>Effect of Grain Size on Domain Structures, Dielectric and Thermal Depoling of Nd-substituted Bismuth Titanate Ceramics G. Viola, K. Chong, M. Eriksson, Z. Shen, J. Zeng, Q. Yin, Y. Kan, P. Wang, H. Ning, H. Zhang, M.E. Fitzpatrick, M.J. Reece, and <u>H. Yan</u></p>	<p>High Piezoelectric Properties of KNN-based Piezoelectric Ceramics J. Wu, X. Chen, X. Chen, Q. Chen, W. Zhang, D. Xiao, and <u>J. Zhu</u></p>	<p>Fabrication and Dielectric Properties of Multilayer Core-shell BaTiO<sub>3</sub>-based Ceramics <u>H. Hao</u>, T. Wang, C. Zhang, H. Liu, and M. Cao</p>	<p>High Power Torsional Mode Transducers For Dental Applications <u>G. Bromfield</u>, M. Flitcroft, and O. Jovic</p>
9:45am		<p>New Spin Amplitude Modulation Driven Solid and Soft Composite Multiferroics</p>	<p>Growth and Physical Properties of Al doped Ca<sub>3</sub>NbGa<sub>3</sub>Si<sub>2</sub>O<sub>14</sub> Crystals <u>Y. Yokota</u>, T. Kudo, S.</p>	<p>Electrical and Mechanical Properties of 0.5Ba(Zr<sub>0.2</sub>Ti<sub>0.8</sub>)O<sub>3</sub>-0.5(Ba<sub>0.7</sub>Ca<sub>0.3</sub>)TiO<sub>3</sub> (BZT-</p>	<p>Invited</p> 	<p>Invited</p> 

	<b>Exhibits Open</b>	B. Rozic, M. Jagodic, S. Gyergyek, M. Drofenik, D. Arcon, and <u>Z. Kutnjak</u>	Kurosawa, K. Kamada, and A. Yoshikawa	BCT) Lead Free Ferroelectric Ceramics Reinforced with Nanosized Al <sub>2</sub> O <sub>3</sub> <u>P. Adhikari, R. Mazumder, and G.K. Sahoo</u>		
10:00 am - 10:45 am		Refreshment Break				
10:45 am - 11:45 pm  10:45am		<b>Plenary Session</b> Presidents Hall 1 & 2 Session Chair: Richard J. Meyer, Jr.				
11:45 am - 1:00 pm		<b>Plenary 3</b> Sonar Transducer History and Future Needs		<u>Jan Lindberg</u>		Presidents Hall 1 & 2
	<b>Lunch</b> Presidents Hall 3 & 4					