



**Symposium 21  
FERROELECTRICITY AND PIEZOELECTRICITY:  
MATERIALS, DEVICES, AND APPLICATIONS**

**CHAIRS**

**M. W. Cole**

US Army Research Laboratory, APG, MD

**Luis Fuentes Cobas**

Centro de Investigación en Materiales Avanzados

**S. P. Alpay**

University of Connecticut, Storrs, CT

**M. Ivill**

US Army Research Laboratory APG, MD

**MONDAY, AUGUST 17  
ROOM MEXICO**

**MORNING SESSION**

**S21-01 9:00-9:15**

**SYNTHESIS, ACTIVATION AND MONOLITHIC INTEGRATION OF NANOSTRUCTURED PEROVSKITE OXIDE THIN-FILMS FOR UN-COOLED IR SENSORS**

M.W. Cole<sup>1</sup>, M. Ivill<sup>1</sup>, F.E. Livingston<sup>2</sup>, W. Sarney<sup>3</sup>

<sup>1</sup> Weapons and Materials Directorate, U.S. Army Research Laboratory, APG, MD 21005 <sup>2</sup> Micro/Nano Technology Department, Space Materials Laboratory, The Aerospace Corporation, El Segundo, CA 90245 <sup>3</sup> Sensors & Electron Devices Directorate, U.S. Army Research Laboratory, ALC, MD 20783

**S21-02 9:15-9:30**

**TUNABLE MICROWAVE DIELECTRIC PROPERTIES OF BST THIN FILMS**

P.A. Salvador<sup>1</sup>, H. Du<sup>1</sup>, S. Wang<sup>1</sup>, M. Skowronski<sup>1</sup>, L. Alldredge<sup>2</sup>, W. Chang<sup>2</sup>, S. W. Kirchoefer<sup>2</sup>, S. Perini<sup>3</sup>, M. Lanagan<sup>3</sup>

<sup>1</sup>Department of Materials Science and Engineering, 5000 Forbes Ave., Carnegie Mellon University, Pittsburgh, PA 15206, USA. <sup>2</sup>Naval Research Laboratory, Washington, DC 20375, USA. <sup>3</sup>Materials Research Institute, Pennsylvania State University, University Park, PA 16802, USA. E-mail: paul7@andrew.cmu.edu.

**S21-03 9:30-9:45**

**METAL ORGANIC CHEMICAL VAPOR DEPOSITION OF MONOLITHIC AND FUNCTIONALLY GRADED BST FILMS**

N.M. Sbrockey, S. Sun, G.S. Tompa

Structured Materials Industries, Inc., 201 Circle Drive North, Unit #102, Piscataway, NJ 08854 sbrockey@structuredmaterials.com

**S21-04 9:45-10:00**

**BST FILMS GROWN BY METAL ORGANIC CHEMICAL VAPOR DEPOSITION INCORPORATING REAL-TIME CONTROL OF STOICHIOMETRY**

D. A. Boyd

California Institute of Technology, Division of Engineering and Applied Science, MC 104-44, Pasadena, CA 91125, daboyd@caltech.edu

**S21-05 10:00-10:15**

**FERROELECTRIC THIN FILM BASED INTRINSICALLY SWITCHABLE RESONATORS AND FILTERS**

V. Lee and A. Mortazawi

Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI 48109, USA

**S21-06 10:15-10:30**

**NOVEL APPROACHES TO COMPLEX OXIDE THIN FILM GROWTH AND DEFECT CHARACTERIZATION**

Susanne Stemmer, Bharat Jalan and Junwoo Son

Materials Department, University of California, Santa Barbara, California, U.S.A. E-mail: stemmer@mrl.ucsb.edu

**S21-07 10:30-10:45**

**LOW-LOSS AND HIGHLY TUNABLE BST THIN FILMS AT MICROWAVE FREQUENCIES**

Andrew T. Hunt<sup>1</sup>, Zhiyong Zhao<sup>1</sup>, Yongdong Jiang<sup>1</sup>, Kwang Choi<sup>1</sup>

<sup>1</sup>Ngimat Co, 5315 Peachtree Blvd, Atlanta, GA 30341, USA.

E-mail: ahunt@ngimat.com

**S21-08 10:45-11:00**

**INTERFACE ENGINEERED HIGHLY EPITAXIAL FERROELECTRIC THIN FILMS AND MULTILAYERED STRUCTURES WITH OPTIMIZED DIELECTRIC PROPERTIES**

Chonglin Chen

Department of Physics and Astronomy, University of Texas at San Antonio, Texas And The Texas Center for Superconductivity and Department of Physics, University of Houston, Texas

**11:00-11:30**

**COFFEE BREAK**

**11:30-12:30**

**PLENARY SESION 2**

**S21-09 12:30-12:45**

**POLAR OXIDE MATERIALS: SYNTHETIC STRATEGIES AND FERRO-PIEZOELECTRIC PROPERTIES**

S.-H. Kim,<sup>1</sup> K. M. Ok,<sup>2</sup> H. Y. Chang,<sup>1</sup> J. Yeon,<sup>1</sup> and P. S. Halasyamani<sup>1</sup>

<sup>1</sup>Department of Chemistry, University of Houston, 136 Fleming Building, Houston, TX 77204-5003.

<sup>2</sup>Department of Chemistry, Chung-Ang University, 221 Heukseok-dong, Dongjak-gu, Seoul 155-756, Republic of Korea.

**S21-10 12:45-13:00**

**STRUCTURAL CHARACTERIZATION OF Cu<sup>2+</sup> FUNCTIONAL CENTERS IN 'LEAD-FREE' (K<sub>0.5</sub>Na<sub>0.5</sub>)NbO<sub>3</sub> PIEZOELECTRICS**

E. Erüna<sup>1</sup>, R.-A. Eichel<sup>1</sup>, J. Acker<sup>2</sup>, H. Kungl<sup>2</sup>, M.-J. Hoffmann<sup>2</sup>

<sup>1</sup>Universitaet Freiburg, Institut für Physikalische Chemie I, Albertstr. 21, D-79104 Freiburg, Germany <sup>2</sup>Institut für Keramik im Maschinenbau, Universitaet Karlsruhe, D-76131 Karlsruhe, Germany

bru.eruenal@physchem.uni-freiburg.de



**S21-11 13:00-13:15**

**HIGH-ELECTRIC-FIELD PROPERTIES OF FERROELECTRIC THIN FILMS AND FERROELECTRIC/DIELECTRIC MULTILAYERS**

Ji-Young Jo,<sup>1</sup> R. Sichel,<sup>1</sup> Alexei Grigoriev,<sup>1,a</sup> and Paul G. Evans<sup>1</sup>

<sup>1</sup> Materials Science and Engineering and Materials Science Program, University of Wisconsin, Madison, WI 53706 <sup>a</sup> Present address: University of Tulsa, Tulsa, OK 74104

Email: evans@engr.wisc.edu

**S21-12 13:15-13:30**

**INTERFACIAL STRUCTURES OF PEROVSKITE EPITAXIAL FILMS**

J.C. Jiang<sup>1</sup>, J. He<sup>1</sup>, C.L. Chen<sup>2</sup>, E.I. Meletis<sup>1</sup>

<sup>1</sup>Department of Materials Science and Engineering, The University of Texas at Arlington, Arlington, Texas 76019, USA. <sup>2</sup>Department of Physics and Astronomy, The University of Texas at San Antonio, San Antonio, Texas 78249, USA. E-mail: Jiang@uta.edu

**S21-13 13:30-13:45**

**HOW MUCH OF THE CONVERSE PIEZOELECTRIC COEFFICIENT IS DUE TO THE INTRINSIC PIEZOELECTRIC EFFECT?: TIME-RESOLVED X-RAY DIFFRACTION MEASUREMENTS REVEAL MAGNITUDE OF OTHER CONTRIBUTIONS**

A. Pramanick<sup>1,2</sup>, J. L. Jones<sup>1</sup>

<sup>1</sup>Department of Materials Science and Engineering, University of Florida, Gainesville, FL, USA. <sup>2</sup>now at Department of Materials Science and Engineering, New York State College of Ceramics at Alfred University, Alfred, NY, USA. E-mail: jjones@mse.ufl.edu

**S21-14 13:45-14:00**

**POINT DEFECT CHARACTERISATION IN PEROVSKITE TITANATE OXIDE MATERIALS**

D.J. Keeble

Carnegie Laboratory of Physics, School of Engineering, Physics, and Mathematics, University of Dundee, Dundee DD1 4HN, Scotland.

**14:00-16:00 LUNCH**

**16:00-18:30 AFTERNOON SESSION**

**S21-15 16:00-16:15**

**PHASE TRANSITIONS IN NANOSCALE FERROELECTRIC HETEROSTRUCTURES: ULTRAVIOLET RAMAN SPECTROSCOPY STUDIES**

D. A. Tenne<sup>1</sup>, J. D. Schmidt,<sup>1</sup> P. Turner,<sup>1</sup> A. Soukiassian,<sup>2,3</sup> M. Biegalski,<sup>2,4</sup> D. G. Schlom,<sup>2,5</sup> S. Nakhmanson,<sup>6</sup> X. X. Xi,<sup>2</sup> S. Trolrier-McKinstry,<sup>2</sup> Y. L. Li,<sup>2</sup> L. Q. Chen,<sup>2</sup> R. S. Katiyar,<sup>7</sup> M. Bernhagen,<sup>8</sup> P. Reiche<sup>8</sup>, and R. Uecker<sup>8</sup>

<sup>1</sup>Department of Physics, Boise State University, 1910 University Dr., Boise, ID, 83725-1570, USA. <sup>2</sup>Department of Materials Science and Engineering and Materials Research Institute, the Pennsylvania State University, University Park, PA, USA. <sup>3</sup>Swiss Federal Institute of Technology, Lausanne, Switzerland. <sup>4</sup>Oak Ridge National Laboratory, Oak Ridge, TN, USA. <sup>5</sup>Department of Materials Science and Engineering, Cornell University, USA. <sup>6</sup>Argonne National Laboratory, Argonne, IL, USA. <sup>7</sup>Department of Physics, University of Puerto Rico, San Juan, Puerto Rico. <sup>8</sup>Institute for Crystal Growth, Berlin, Germany, dmitritenne@boisestate.edu

**S21-16 16:15-16:30**

**STUDIES OF CHEMICAL ORDER ON VARYING LENGTH SCALES IN AA'BB'O<sub>6</sub> AND ABO<sub>2</sub>N PEROVSKITES**

P. M. Woodward,<sup>1</sup> G. M. King<sup>1</sup> and S. Garcia-Martin<sup>2</sup>

<sup>1</sup>Department of Chemistry, Ohio State University, 100 W. 18<sup>th</sup> Ave., Columbus, OH 43210 USA; <sup>2</sup>Departamento de Química Inorgánica, Facultad de Ciencias Químicas, Universidad Complutense, Madrid-28040, Spain.

E-mail: woodward@chemistry.ohio-state.edu

**S21-17 16:30-16:45**

**NANOSCALE TWIST OF A FERROELECTRIC POLYMER MATERIAL**

Jiandi Zhang

Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA 70803, USA; Email: jzandiz@lsu.edu

**S21-18 16:45-17:00**

**HIGH-QUALITY LANGATATE CRYSTALS FOR HIGH-Q AND SENSOR APPLICATIONS**

Christine Klemenz Rivenbark<sup>1</sup>,

<sup>1</sup>Krystal Engineering LLC, 1429 Chaffee Drive, Titusville, FL 32780, U.S.A.

E-mail: cklemenz@ieee.org

**S21-19 17:00-17:15**

**FROM MEMS TO NEMS: OPPORTUNITIES AND CHALLENGES FOR ALN PIEZOELECTRIC NANO-ELECTROMECHANICAL RESONATORS AND SWITCHES**

G. Piazza

University of Pennsylvania, Department of Electrical and Systems Engineering, 200 S. 33rd street, Philadelphia, PA, 19104, USA.

E-mail: piazza@seas.upenn.edu

**S21-20 17:15-17:30**

**STRESS RELAXATION EFFECT ON THE ELECTRICAL RESPONSE OF CB/SEBS AND GP/SEBS COMPOSITES**

Iván A. Estrada-Moreno<sup>1</sup>, Alberto Díaz-Díaz<sup>2</sup>, Monica E. Mendoza-Duarte<sup>1</sup>, Rigoberto Ibarra-Gómez<sup>1</sup>

<sup>1</sup>Química de Materiales, Centro de Investigación en Materiales Avanzados, S.C. Chihuahua, Chihuahua 31109, México; <sup>2</sup>Física de Materiales, Centro de Investigación en Materiales Avanzados, S.C. Chihuahua, Chihuahua 31109, México E-mail: ivan.estrada@cimav.edu.mx

**S21-21 17:30-17:45**

**DIELECTRIC TRANSFORMATIONS OF 2D QUANTUM DOTS ARRAYS**

R.E. Moctezuma<sup>1</sup> and J.L. Carrillo<sup>2</sup>

<sup>1</sup>Facultad de Ciencias Físico-Matemáticas, Universidad Autónoma de Puebla, Apartado Postal J-48, C.P. 72570, Puebla, Puebla, México.

<sup>2</sup>Instituto de Física, Universidad Autónoma de Puebla, Apartado Postal J-48, C.P. 72570, Puebla, Puebla, México. carrillo@sirio.ifuap.buap.mx

**S21-22 17:45-18:00**

**STRAIN RELAXATION IN EPITAXIAL PEROVSKITE FERROELECTRIC THIN FILMS**

Y. Lin

State Key Laboratory of Electronic Thin films and Integrated Devices, University of Electronic Science & Technology of China, Chengdu, Sichuan 610054, P. R. China, Email: linyuan@uestc.edu.cn



**S21-23 18:00-18:15**

**NEW HIGH-TEMPERATURE PIEZOELECTRIC CERAMICS**

I. Sterianou\*, T. Sebastian, I.M. Reaney

University of Sheffield, Department of Engineering Materials, Mappin Street, S1 3JD, Sheffield, United Kingdom email: I.Sterianou@shef.ac.uk

**S21-24 18:15-18:30**

**PIEZOELECTRIC ENERGY HARVESTING: A MATERIALS PERSPECTIVE**

Prof. Donald R. Uhlmann<sup>1</sup>, Dr. Gimtong "GT" Teowee<sup>2</sup>

<sup>1</sup>Arizona Materials Laboratory, Department of Materials Science & Engineering, 4715 East Fort Lowell, AZ 85712. <sup>2</sup>Special Devices Inc., 14370 White Sage Road, Moorpark, CA 93021. Email: uhlmann@aml.arizona.edu

**TUESDAY, AUGUST 18  
ROOM MEXICO**

**MORNING SESSION**

**S21-25 9:00-9:15**

**WEDGE DOMAINS IN COMPOSITIONALLY GRADED FERROELECTRICS: DIELECTRIC RESPONSE AND TUNABILITY**

M. B. Okatan<sup>1</sup> A. L. Roytburd<sup>2</sup> J. V. Mantese<sup>3</sup> and S. P. Alpay<sup>1</sup>

<sup>1</sup>Materials Science and Engineering Program, Department of Chemical, Materials, and Biomolecular Engineering, University of Connecticut, CT, 06269, USA. Email: p.alpay@ims.uconn.edu <sup>2</sup>Department of Materials Science and Engineering, University of Maryland, College Park, MD, 20742, USA. <sup>3</sup>United Technologies Research Center, East Hartford, CT, 06108, USA.

**S21-26 9:15-9:30**

**PHASE FIELD MODELS OF DOMAIN STRUCTURES AND DIELECTRIC PROPERTIES OF FERROELECTRIC THIN LAYERS, MULTILAYERS, GRADED LAYERS AND FERROELECTRIC-DIELECTRIC COMPOSITES.**

A. Artemev, B. Geddes

Carleton University, Mechanical & Aerospace Engineering, 1125 Colonel By Dr., Ottawa, ON, K1S 5B6, Canada

**S21-27 9:30-9:45**

**MORPHOTROPISM, MICROSTRUCTURE AND ELECTROMECHANICAL PROPERTIES IN FERROELECTRIC SOLID SOLUTIONS**

G. A. Rossetti, Jr.

Materials Science & Engineering Program and Institute of Materials Science, University of Connecticut, 97 North Eagleville Road, Storrs, CT USA 06269. E-Mail: rossetti@ims.uconn.edu

**S21-28 9:45-10:00**

**DESIGN OF DOMAIN STRUCTURES IN CONTINUOUSLY GRADED**

Roytburd, Alexander.

University of Maryland, United States. E-mail: roytdur@gmail.com

**S21-29 10:00-10:15**

**SEMICONDUCTING FERROELECTRICS FOR SOLAR ENERGY CAPTURE AND CONVERSION**

A. M. Rappe, J. W. Bennett, I. Grinberg

<sup>1</sup>The Makenini Theoretical Laboratories, Department of Chemistry, University of Pennsylvania, 231 S. 34th St., Philadelphia, PA 19104-6323 USA.

E-mail: rappe@sas.upenn.edu

**S21-30 10:15-10:30**

**ATOMISTIC INSIGHT INTO COMPLEX PHENOMENA IN FERROELECTRIC ALLOYS**

L. Bellaiche<sup>1</sup>, S. Lisenkov<sup>2</sup>, I. Ponomareva<sup>2</sup> and R. Resta<sup>3</sup>

<sup>1</sup> Department of Physics, University of Arkansas, Fayetteville, AR 72701, USA <sup>2</sup> Department of Physics, University of South Florida, Tampa, FL 33620, USA. <sup>3</sup> INFN DEMOCRITOS National Simulation Center, via Beirut 2, 34014 Trieste, Italy E-mail: iponomar@cas.usf.edu

**S21-31 10:30-10:45**

**LARGE FIELD BEHAVIOR AND MODELING OF FERROELECTRIC MATERIALS**

C.S. Lynch

University of California, Los Angeles. Mechanical and Aerospace Engineering, 46-147G Engineering IV, 420 Westwood Plaza, Los Angeles CA 90095-1597. E-mail: cslynch@seas.ucla.edu

**S21-32 10:45-11:00**

**DOMAIN WALL DYNAMICS AND MEMORY IN COBALT BROMINE BORACITES**

R.E. Moctezuma<sup>1</sup>, J.L. Carrillo<sup>2</sup> and M.E. Mendoza<sup>2</sup>

<sup>1</sup>Facultad de Ciencias Físico-Matemáticas, Universidad Autónoma de Puebla, Apartado Postal J-48, C.P. 72570, Puebla, Puebla, México.

<sup>2</sup>Instituto de Física, Universidad Autónoma de Puebla, Apartado Postal J-48, C.P. 72570, Puebla, Puebla, México. rosario@sirio.ifuap.buap.mx

**11:00-11:30**

**COFFEE BREAK**

**11:30-12:30**

**PLENARY SESION 3**

**S21-33 12:30-12:45**

**TEXTURED MULTIFERROICS: 2-D DIFFRACTION ANALYSIS AND PROPERTIES PREDICTION**

L. Fuentes-Cobas<sup>1</sup>, L. Fuentes-Montero<sup>1</sup>, M. Loya-Mancilla<sup>1</sup>, M- E. Montero-Cabrera<sup>1</sup>

<sup>1</sup>Centro de Investigación en Materiales Avanzados, M. Cervantes 120, 31109 Chihuahua, México. Email: luis.fuentes@cimav.edu.mx

**S21-34 12:45-13:00**

**MAGNETOELECTRIC COUPLING IN COMPOSITE MULTIFERROIC HETEROSTRUCTURES**

J. Hoffman<sup>1</sup>, C. A. F. Vaz<sup>1</sup>, H. J. A. Molegraaf<sup>2</sup>, S. Gariglio<sup>2</sup>, D. van der Marel<sup>2</sup>, J.-M. Triscone<sup>2</sup>, C.H. Ahn<sup>1</sup>

<sup>1</sup>Department of Applied Physics and CRISP, Yale University, New Haven, Connecticut 06520 <sup>2</sup>DPMC, University of Geneva, 24 Quai Ernest Ansermet, 1211 Geneva 4, Switzerland

**S21-35 13:00-13:15**

**INVESTIGATIONS ON SINGLE PHASE MAGNETOELECTRIC MULTIFERROICS**

Ram S. Katiyar, A. Kumar, G.L. Sharma, J.F. Scott

Department of Physics and Institute for Functional Nanomaterials, University of Puerto Rico, San Juan, Puerto Rico 00931-3343, USA



**S21-36 13:15-13:30**

**LANTHANUM AND STRONTIUM DOPED BFO SAMPLES OBTAINED BY A WET CHEMICAL ROUTE**

C. Ostos<sup>1</sup>, J. Siqueiros<sup>1</sup>, N. S. Almodovar<sup>2</sup>, N. Fernandez<sup>3</sup>, X. Vendrell<sup>4</sup>, M.L. Martínez-Sarrión<sup>4</sup>, L. Mestres<sup>4</sup>.

<sup>1</sup> Centro de Nanociencia y Nanotecnología, UNAM, Ensenada, BC, Mexico.  
<sup>2</sup> Facultad de Física-IMRE, Universidad de La Habana, San Lázaro y L, 10400, La Habana, Cuba. <sup>3</sup> Facultad de Química, Universidad de La Habana, Zapata s/n, 10400, La Habana, Cuba. <sup>4</sup> Facultad de Química, Universidad de Barcelona, C/ Martí i Franqués, 1-11, 08028, Barcelona, Spain.  
E-mail: ceostoso@cnyun.unam.mx

**S21-37 13:30-13:45**

**CRYSTAL CHEMISTRY AND DOMAIN STRUCTURE OF RARE-EARTH DOPED BIFEO<sub>3</sub> CERAMICS**

S. Karimi, I.M. Reaney, Y.Han, J. Pokorny and I. Sterianou,  
Department of Engineering Materials, University of Sheffield, Sheffield, S1 3JD, UK. E-mail: I.M.Reaney@sheffield.ac.uk

**S21-38 13:45-14:00**

**MORPHOTROPIC PHASE BOUNDARY IN RARE-EARTH DOPED BiFeO<sub>3</sub> THIN FILMS**

I. Takeuchi  
Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742; takeuchi@umd.edu

**14:00-16:00 LUNCH**

**16:00-18:30 AFTERNOON SESSION**

**S21-39 16:00-16:15**

**WEAK FERROMAGNETISM IN THE Bi<sub>0.75</sub>Sr<sub>0.25</sub>FeO<sub>3</sub> MULTIFERROIC AT ROOM TEMPERATURE**

J. M. Siqueiros<sup>1</sup>, C. Ostos<sup>1</sup>, A. Sosa<sup>2</sup>, N. Suarez<sup>2</sup>, M.L. Martínez-Sarrión<sup>3</sup>, L. Mestres<sup>3</sup>.

<sup>1</sup> Centro de Nanociencias y Nanotecnología, UNAM, Ensenada, BC, México.  
<sup>2</sup> Facultad de Física-IMRE, Universidad de La Habana, San Lázaro y L, 10400, La Habana, Cuba. <sup>3</sup> Facultad de Química, Universidad de Barcelona, C/ Martí i Franqués, 1-11, 08028, Barcelona, Spain.  
E-mail: jesus@cnyun.unam.mx

**S21-40 16:15-16:30**

**CHANGING DIELECTRICS INTO MULTIFERROICS—ALCHEMY ENABLED BY STRAIN**

Darrell G. Schlom  
Department of Materials Science and Engineering, Cornell University

**S21-41 16:30-16:45**

**EFFECTS OF IRON VALENCE AND OXYGEN STOICHIOMETRY ON THE PROPERTIES OF MULTIFERROIC BiFe<sub>1-x</sub>Cr<sub>x</sub>O<sub>3</sub> THIN FILMS**

R. Naik<sup>1</sup>, A. Dixit<sup>1</sup>, S. Talebi<sup>1,2</sup>, C. Sudakar<sup>1</sup>, G. Lawes<sup>1</sup>, V.M. Naik<sup>2</sup>  
<sup>1</sup>Department of Physics and Astronomy, Wayne State University, Detroit, MI 48201, USA. <sup>2</sup>Department of Natural Sciences, University of Michigan-Dearborn, Dearborn, MI 48128, USA. E-mail: rnaik@wayne.edu

**S21-42 16:45-17:00**

**ELECTRIC-FIELD CONTROL OF SINGLE-MAGNETIC DOMAINS IN A MAGNETOELECTRIC THIN FILM**

T.K. Chung and G.P. Carman

MAE Department, UCLA, 38-137 M Engineering IV, Los Angeles, CA 90095, carman@seas.ucla.edu

**S21-43 17:00-17:15**

**FUNCTIONALLY STEPPED MAGNETOSTRICTIVE-PIZOELECTRIC THICK FILM MULTILAYERS: STUDIES ON MAGNETO-ELECTRIC INTERACTIONS**

S. Mandal and G. Srinivasan  
Physics Department, Oakland University, Rochester, Michigan 48309. srinivas@oakland.edu

**S21-44 17:15-17:30**

**FINITE CURVATURE-DRIVEN GIANT FERROELECTRIC RESPONSE IN COAXIAL CYLINDRICAL NANOSTRUCTURES**

S. S. Nonnenmann, O. D. Leaffer, E. M. Gallo, M. T. Coster, G. R. Soja, and J. E. Spanier<sup>†</sup>  
Dept. of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA 19104, E-mail: spanier@drexel.edu,

**S21-45 17:30-17:45**

**ARTIFICIALLY LAYERED FERROELECTRIC SUPERLATTICES: TAILORED PROPERTIES AND UNUSUAL COUPLING**

M. Dawber<sup>1,2</sup>, C. Lichtensteiger<sup>1</sup>, P. Zubko<sup>1</sup>, N. Stucki<sup>1</sup>, E. Bousquet<sup>3</sup>, P. Ghosez<sup>3</sup> and J.-M. Triscone<sup>1</sup>  
<sup>1</sup> DPMC, University of Geneva, Switzerland <sup>2</sup> Now at Stony Brook University, NY, USA <sup>3</sup> Université de Liège, Institut de Physique, Belgium  
E-mail: Celine.Lichtensteiger@unige.ch

**18:30-20:30 POSTER SESSION & COFFEE BREAK**

**S21-P01**

**PHASE TRANSITIONS ON (K<sub>0.48</sub>NA<sub>0.52</sub>)<sub>0.96</sub>LI<sub>0.04</sub>NB<sub>0.85</sub>TA<sub>0.15</sub> BY PHOTOACOUSTIC OF PULSED LASER**

R. López<sup>1</sup>, R. Castañeda-Guzmán<sup>2</sup>, S. J. Pérez-Ruiz<sup>2</sup>, F. González<sup>3</sup>, M.E. Villafuerte-Castrejón<sup>1</sup>

<sup>1</sup>Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Circuito Exterior S/N, A.P. 70-360, México D.F., México.  
<sup>2</sup>Centro Ciencias Aplicadas y Desarrollo Tecnológico, Universidad Nacional Autónoma de México, Circuito Exterior S/N, A.P. 70-186, México D.F., México. <sup>3</sup>Departamento de Ingeniería de Procesos e Hidráulica, Universidad Autónoma Metropolitana-Iztapalapa, A.P. 55-534, 09340 México D.F. México.

**S21-P02**

**Nd DOPED BiFeO<sub>3</sub>: A NEW PBO FREE ANTIFERROELECTRIC**

Sarah Karimi, Ian M. Reaney, Yisong Han, Jan Pokorny and Iasmi Sterianou  
Department of Engineering Materials, University of Sheffield, Mappin Street, Sheffield S1 3JD, United Kingdom.  
E-mail: mtp07sk@shef.ac.uk

**S21-P03**

**PZT-CoFe<sub>2</sub>O<sub>4</sub> MAGNETOELECTRIC MULTIFERROIC COMPOSITE**

M. E. Botello-Zubiate, A. Hurtado-Macias\*, C. R. Santillán-Rodríguez, J. A. Matutes-Aquino, J. González-Hernández.  
Centro de Investigación en Materiales Avanzados, S.C. Miguel de Cervantes 120 Complejo Industrial, C.P. 31109, Chihuahua, Chih. México  
E-mail: jose.matutes@cimav.edu.mx



**S21-P04**

**EPITAXIAL GROWTH AND DIELECTRIC STUDY OF PYROCHLORE  
 $\text{Pb}_2\text{FeNbO}_{6.5}$  THIN FILMS DEPOSITED BY RF SPUTTERING**

P. Góngora<sup>1</sup>, M. A. E. Martínez<sup>2</sup>, M. Abúndiz<sup>1</sup>, R. Font<sup>2</sup>, O. Raymond<sup>2</sup>, R. Machorro<sup>2</sup>, and J. M. Siqueiros<sup>2</sup>

<sup>1</sup>Posgrado de Física de Materiales, CICESE-CNyN-UNAM, Ensenada 22860 Baja California, México.

<sup>2</sup>Centro de Nanociencias y Nanotecnología, Universidad Nacional Autónoma de México, Ensenada 22860, Baja California, México.

<sup>3</sup>Facultad de Física, Universidad de la Habana, San Lázaro y L, Ciudad Habana 10400, Cuba

**S21-P05**

**CHARACTERIZATION OF MONOLITHIC AND COMPOSITIONALLY  
GRADED MULTILAYER  $\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$  THIN FILMS**

D. Bruzzese<sup>1</sup>, C. Weiss<sup>2</sup>, E. Gallo<sup>1</sup>, K. Fahnestock<sup>1</sup>, C. L. Schauer<sup>1</sup>, T. S. Kal-  
kur<sup>3</sup>, N. Sbrockey<sup>4</sup>, G. S. Tompa<sup>4</sup>, S. P. Alpay<sup>2</sup>, and J. E. Spanier<sup>1</sup>

<sup>1</sup>Department of Materials Science & Engineering, Drexel University, Philadelphia PA, USA;

<sup>2</sup>Institute of Materials Science, University of Connecticut, Storrs, CT, USA;

<sup>3</sup>Department of Electrical and Computer Engineering, University of Colorado at Colorado Springs, CO, USA; <sup>4</sup>Structured Materials Industries, Inc., Piscataway, NJ USA;

<sup>†</sup>spanier@drexel.edu,

**S21-P06**

**PREPARATION OF FERROELECTRIC CERAMIC WITH LAYER AS  
MEMBRANE**

A. Flores-Cuautle, M. Acuatla-Meneses, E. Suaste-Gómez

Centro de Investigación y Estudios Avanzados del instituto Politécnico Nacional, Electrical Engineering Department, Av. IPN No. 2508 San Pedro Zacatenco, D.F. México

e-mail: esuaste@cinvestav.mx jfflores@cinvestav.mx

**S21-P07**

**SYNTHESIS OF LEAD-FREE  $(\text{K}_{0.5}\text{Na}_{0.5})(\text{Nb}_{1-x}\text{Ta}_x)\text{O}_3$  PIEZOELECTRIC  
CERAMICS**

A. Valenzuela<sup>1,2</sup>, J. Portelles<sup>3</sup>, J. Heiras<sup>2</sup>, J. Siqueiros<sup>2</sup>

<sup>1</sup>Posgrado en Ciencia e Ingeniería de Materiales UNAM,

<sup>2</sup>Centro de Nanociencias y Nanotecnología, UNAM, Km. 107 Carretera Tijuana-Ensenada, Ensenada, B.C. 22860.

<sup>3</sup>Facultad de Física, Universidad de La Habana, San Lázaro y L 10400, La Habana, Cuba.

E-mail: avalenzu@cnyunam.mx



**NOTES**