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# Ferroelectricity Newsletter

A quarterly update on what's happening in the field of ferroelectricity

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Volume 9, Number 4

Fall 2001

## ZEROING IN ON NEW PUBLICATIONS

In this issue we want to expand our scope by featuring *Sensors and Materials*, an international journal on sensor technology. A good way to familiarize you with this publication is to provide a list of articles published in the first four issues of 2001, two of which contain papers delivered at the **First Symposium on "Kansei" Biosensing**, held in August 2000 in Nagano, Japan. You will find this information on pages 14 and 15.

Staying in the field of publications, we highlight new volumes in the Materials Research Society Symposium Proceedings Series, five volumes from the 2000 MRS Spring Meeting in San Francisco, California, and three from the 2000 MRS Fall Meeting in Boston, Massachusetts.

They explore materials, technology, and reliability for advanced interconnects and low-k dielectrics; polycrystalline metal and magnetic thin films; morphology and dynamics of crystal surfaces in complex molecular systems; interfaces, adhesion, and processing in polymer systems; amorphous and heterogeneous silicon thin films; structure and mechanical properties of nanophase materials; nonlithographic and lithographic methods of nanofabrication; and silicon carbide. Please turn to pages 10 to 13 for more details.

As usual, presentations of conferences are listed in this newsletter. One is the **Sixth International Symposium of Ferroic Domains and Mesoscopic Structures (ISFD-6)**, held in spring 2000 in China, and the other is the **NATO Advanced Research Workshop on Modern Aspects of Ferroelectricity**, held in conjunction with the **Open Ukrainian-French Meeting on Ferroelectricity (UFMF-1)** in May 2000 in the Ukraine.

On pages 16 to 18 we bring you information about three additional conferences in 2002: the **2002 MRS Spring Meeting** in San Francisco; the **Electroceramics VIII Conference** in Rome; and the **7th International Symposium on Ferroic Domains and Mesoscopic Structures (ISFD-7)** at the French Riviera.

True to tradition, we summarize the contents of the quarterly newsletters at the end of the year. You will find the Index of Volume 9, arranged by sections, on page 19 of this issue.

Rudolf Panholzer  
Editor-in-Chief

## IN THIS ISSUE

<b>From the Editor</b>	<b>1</b>
<b>Papers</b>	
UFMF-1	<b>2</b>
ISFD-6	<b>4</b>
<b>Publications</b>	
MRS Publications	<b>10</b>
<b>Upcoming Meetings</b>	
2002 MRS Spring Meeting	<b>16</b>
Electroceramics VIII	<b>17</b>
ISFD-7	<b>18</b>
<b>Index of Volume 9</b>	<b>19</b>
<b>Calendar of Events</b>	<b>20</b>

## Ferroelectricity Newsletter

Volume 9, Number 4  
Fall 2001

The *Ferroelectricity Newsletter* is published quarterly by the Naval Postgraduate School, Space Systems Academic Group, Monterey, California, with the support of the Office of Naval Research (ONR).

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<b>UFMF-1 PAPERS</b>
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**NATO ADVANCED RESEARCH WORKSHOP ON MODERN ASPECTS OF FERROELECTRICITY**  
and  
**OPEN UKRAINIAN-FRENCH MEETING ON FERROELECTRICITY (UFMF-1)**

The NATO Advanced Research Workshop on Modern Aspects of Ferroelectricity and the Open Ukrainian-French Meeting on Ferroelectricity was held from 6 -11 May 2000 in Kiev, Ukraine. The meeting was the first in the series of such meetings that will take place every two years.

The proceedings of this meeting were published in *Ferroelectrics*, Volume 254, Numbers 1-4 (2001). In their editorial, guest editors **Maya Glinchuk** and **Robert Farhi** noted that a total of 38 manuscripts were submitted from 82 presentations. Significant numbers of manuscripts were devoted to ferroelectric thin films and multilayers, relaxor ferroelectrics, defects and impurities in ferroelectric materials. In addition to above mentioned areas, both theoretical and experimental study of ferroelectric domains, phase transitions and phase diagrams of complex ferroelectrics were presented.

The NATO Workshop on Ferroelectricity (UFMF-1) was supported by the NATO Scientific Affairs Division, the Gordon and Breach Science Publishing, the Institute for Problems of Materials Science, the Ukrainian Council on Ferroelectricity and Related Phenomena, the National Academy of Sciences of Ukraine, and the Ministry of Science and Education of Ukraine.

The following is a list of the authors and titles of the presentations published in the proceedings.

Structure and vibrational properties of some  $\text{PbTiO}_3$ -based ferroelectric superlattices

*F. Le Marrec, R. Farhi, M. El Marssi, J.-L. Dellis, D. Ariosa, and M.G. Karkut*

Mixed systems of ferroelectric relaxors

*Maya D. Glinchuk, E.A. Eliseev, V.A. Stephanovich, and B. Hilczer*

Phase diagram of mixed ferroelectrics

*Maya D. Glinchuk, Eugeny A. Eliseev, and Vladimir A. Stephanovich*

Nonisothermal sintering of barium titanate nanopowders of different origination

*Andrey V. Ragulya and Anton V. Polotay*

Substrate effect on the PLD growth of ferroelectric materials thin films

*Jean-Rene Duclere, L'Habib Hamedi, Maryline Guilloux-Viry, and Andre Perrin*

Thermowave studies of porous silicon as substrate material for pyroelectric detectors

*Svetlana L. Bravina, Ivan V. Blonsky, Nicholas V. Morozovsky, and Vadim O. Salnikov*

EPR investigations of copper centers in  $\text{KTaO}_3$  single crystals

*D.V. Azamat, C.B. Azzoni, A.G. Badalyan, P.G. Baranov, P. Galinetto, M.C. Mozzati, V.A. Trepakov, L. Jastrabik, J. Rosa, and S. Kapphan*

The octahedral cluster compounds of early transition metals: An original class of dielectric materials

*Christiane Perrin, Stephane*

*Cordier, Fakhili Gulo, and Andre Perrin*

(Ba,Y)(Ti,Zr,Sn) $\text{O}_3$ -based PTCR materials

*Anatoli Bilous, Oleg V'Yunov, and Leonid Kovalenko*

Theoretical study of electrical oscillation effect in  $\text{Sn}_2\text{P}_2\text{Se}_4$  single crystals with incommensurate phase

*Anna N. Morozovska*

THZ transmission spectroscopy applied to dielectrics and microwave ceramics

*Alexej Pashkin, Elena Buixaderas, Petr Kuzel, Mei-Hui Liang, Chen-Ti Hu, and I-Nan Lin*

Domain structure in (La,Pr) $\text{GaO}_3$  solid solutions

*D.I. Savytskil, L.O. Vasylechko, M. Berkowski, J. Fink-Finowicki, R. Aleksiyko, P. Byszewski, and*

<b>UFMF-1 PAPERS</b>
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*A.O. Matkovskii*

Soft-mode Raman spectra in  $K_{1-x}Li_xTa_{1-y}Nb_yO_3$

*P. Galinetto, E. Guilotto, P. Camagni, G. Samoggia, V.A. Trepakov, and P.P. Syrnikov*

Thermoluminescence on polar and nonpolar phases of  $BaB_2O_4$  crystals

*V.T. Adamiv, Ya.V. Burak, O.T. Antonyak, and M.S. Pidzyrailo*

Dielectric relaxation of space charges and polarons in ferroelectric perovskites

*M. Maglione*

ESR investigation of photoinduced centers in optically transparent PLZT ceramics

*A.M. Slipenyuk, V.V. Laguta, M.D. Glinchuk, I.P. Bykov, Yuan Wan-Zong, Du Jinmei, J. Rosa, and L. Jastrabik*

Polarization relaxation in piezoelectric  $0.7Pb(Mg_{1/3}Nb_{2/3})O_3-0.3PbTiO_3$

*Dwight Viehland*

Piezoelectric properties of PZT: Influence of (Zr/Ti) ratio and niobium substitution

*T. Haccart, C. Soyer, E. Cattan, and D. Remiens*

A new ferroelectric compound:  $PbK_2LiNb_5O_{15}$

*Y. Gagou, D. Mezzane, N. Aliouane, T. Bادهche, M. Elaamani, M.-H. Pischedda, and P. Saint-Grégoire*

Ellipsometry and limm investigations of the interaction between PZT thin films and platinum electrodes and air

*A. Deineka, M.D. Glinchuk, L.*

*Jastrabik, G. Suchaneck, T. Sandner, and G. Gerlach*

Longitudinal field influence on phase transition and physical properties of the  $KH_2PO_4$  family ferroelectrics

*I.V. Stasyuk, R.R. Levitskii, A.P. Moina, and B.M. Lisnii*

Photoinduced phenomena and shallow levels in  $K_{1-x}Li_xTaO_3$

*E. Giulotto, P. Galinetto, P. Camagni, G. Samoggia, V.A. Trepakov, and L. Jastrabik*

The influence of uniform pressure and electric field on phase transitions of the  $Sn_2P_2S_6$  ferroelectric

*V.M. Kedyulich, A.G. Slivka, E.I. Gerzanich, V.S. Shusta, and P.P. Guranich*

On the problem of the functional representation for cluster ferroelectric systems

*N.A. Korynevskii*

Two-phase nucleation in ferro- and antiferroelectrics

*V.M. Ishchuk and V.L. Sobolev*

Relaxation dynamics of interphase FE-AFE boundaries

*V.M. Ishchuk*

Reflection of light by charged domain walls in  $Sn_2P_2S_6$  uniaxial ferroelectrics

*A.A. Grabar, I.V. Kedyk, I.M. Stoika, and Yu.M. Vysochanskii*

Temperature variation of optical absorption edge in  $Sn_2P_2S_6$  and  $SnP_2S_6$  crystals

*I.P. Studenyak, V.V. Mitrovciij, Gy.Sh. Kovacs, O.A. Mykajlo,*

*M.I. Gurzan, and Yu.M. Vysochanskii*

Influence of anionic substitution on phase transitions in  $Cu_6P(S_{1-x}Se_x)_5I$  superionic ferroelastics

*I.P. Studenyak*

Electronic structure of some oxide ferroelectrics and materials similar to them: Ultrasoft X-ray spectroscopy study

*T. Bondarenko*

Effects of lateral rarefaction wave on phase transition of PZT-95/5 ceramics under shock wave

*Du Jinmei, Yuan Wanzong, Dong Qingdong, and B.O. Sokol*

Fluctuon type carrier localization near charged defect

*M.D. Glinchuk, R.O. Kuzian, V.V. Laguta, S.N. Nokhrin, and I.P. Bykov*

ESR study of  $BaTiO_3$  ceramics doped by Y and Ca

*A.M. Slipenyuk, M.D. Glinchuk, I.P. Bykov, V.V. Laguta, S.N. Nokhrin, A.G. Belous, O.I. Vyunov, L.L. Kovalenko, and J. Jastrabik*

Low temperature dielectric behavior in iron doped incipient ferroelectric  $KTaO_3$

*Zbigniew Trybula, Szymon Los Lagorzata Trybula, Maya D. Glinchuk, Igor P. Bykov, and Valentin V. Laguta*

The manifestation of dipoles clustering in paraelectric phase of disordered ferroelectrics

*V.A. Stephanovich*

**ISFD-6 PAPERS**

**THE SIXTH INTERNATIONAL SYMPOSIUM OF FERROIC DOMAINS AND MESOSCOPIC STRUCTURES (ISFD-6)**

Organized by the Laboratory of Solid State Microstructures at Nanjing University, the **Sixth International Symposium on Ferroic Domains and Mesoscopic Structures** was held at Nanjing University, China, from 29 May - 2 June 2000. The ISFD-6 received 180 abstracts and scheduled 58 oral presentations (35 invited) and 79 poster presentations with 131 registered participants. The participants and papers came from 17 countries and regions distributed in four continents: Australia, Belgium, Canada, China, Czech Republic, France, Germany, Hong Kong, Japan, Korea, Latvia, Malaysia, Mexico, Poland, Russia, Singapore, Switzerland, United States. This symposium was truly international in character, the first in a series to be held in a country outside Europe and America.

**General Co-Chairs**

D. Feng (Member of CAS, Nanjing University, China) and S.S. Jiang (President of Nanjing University)

**International Advisory Committee**

C. Boulesteix (France), J.F. Scott (Australia), V. Janovec (Czech Republic), D. Feng (China), L.A. Shuvalov (Russia), R. Le Bihan (France), T. Hahn (Germany), G. Van Tendeloo (Belgium), E. Salje (United Kingdom), B. Hilczer (Poland), W.G. Zhu (Singapore), S.T. Lee (China, Hong Kong), H. Ito (Japan), L.E. Cross (USA), A.V. Shil'nikov (Russia), A. Krumins (Latvia), J. Fousek (Czech Republic), I. Stasyuk (Ukraine), G. Rosenman (Israel), J. Hatano (Japan), V.K. Wadhawan (India), N.B. Ming (China), A. Sawada (Japan)

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The symposium was structured into six sessions:

- Structure and characterization
- Statics, dynamics, and switching of ferroic systems
- Theory of domains and phase transitions
- Thin films, multilayers, and domain engineering
- Relaxor ferroelectrics
- Devices and applications

The ISFD-6 proceedings, guest edited by **Duang Feng and J.-M. Liu** of Nanjing University, include 98 papers submitted to the meeting, with 21 invited papers. The following is a list of the titles and authors of the proceedings published in *Ferroelectrics* Volumes 251, 252, 253, Numbers 104 (2001).

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**UFMF-1 PAPERS**, continued from page 3

ESR of Y and Pb-doped BaTiO<sub>3</sub> ceramics with positive temperature coefficient of resistivity

*A.M. Slipenyuk, M.D. Glinchuk, V.V. Laguta, I.P. Bykov, S.N. Nokhrin, A.G. Belous, O.I. Vyunov, L.L. Kovalenko, and L. Jastrabik*

Photoinduced Ti<sup>3+</sup> center in SrTiO<sub>3</sub>

*V.V. Laguta, M.D. Glinchuk, R.O. Kuzian, S.N. Nokhrin, I.P. Bykov, J. Rosa, L. Jastrabik, and M.G. Karkut*

Structural characterization of PZT thin films and related properties

*T. Badeche, Y. Gagou, N. Aliouane, O.A. Aktsipetrov, M.H. Pischedda, and P. Saint-Grégoire*

## ISFD-6 PAPERS

**STRUCTURE AND CHARACTERIZATION**

X-ray study of sublattice structures in ferroelastics

*Akikatsu Sawada, Isao Hashiguchi, Yasuhide Watanabe, and Yoshihiro Kuroiwa*

Status and future aspects in nanoscale surface inspection of ferroics by scanning probe microscopy

*L.M. Eng, F. Schlaphof, S. Trogisch, A. Roelofs, and R. Waser*

Nonstoichiometry, composition domain, and hysteresis in rare earth higher oxides

*Z.C. Kang*

Simultaneous observations of nanometer size ferroelectric domains and surface morphology using scanning nonlinear dielectric microscopy

*Hiroyuki Odagawa and Yasuo Cho*

Effect of ultraviolet irradiation on SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub> thin film capacitors

*Zhigang Zhang, Jinsong Zhu, Chunhua Song, Feng Yan, and Yening Wang*

Study of phase conversion in PMN-PT ceramics near the morphotropic phase boundary

*Wei-Min Zhu, Cheng-En Li, Chun-Ji Guo, Hai-Xue Yan, and Liang-Xing He*

Anelastic relaxation in PbNb<sub>2</sub>O<sub>6</sub> ceramics

*Lian-Xing He, Cheng-En Li, Ting-Guo Chen, Hai-Xue Yan, and Wei-Min Zhu*

Calorimetric, optical, and electron microscopy studies of Co<sub>3</sub>B<sub>7</sub>O<sub>13</sub>Cl ferroic boracite

*A.G. Castellanos-Guzman, M. Czank, Arun Kumar, Gurvinderjit Singh, V.S. Tiwari, and V.K. Wadhawan*

*In situ* TEM observation of the 90° domain wall mobility in Pb(ZrTi)O<sub>3</sub> ceramics

*Xiaobing Chen, Yong Ding, Jianshe Liu, Chaojing Lu, Jinsong Zhu, and Yening Wang*

Shape memory effect of antiferroelectrics

*Yurong Dai, Ying Chen, Huimin Shen, Zhifang Zhang, and Yening Wang*

Superstructure in PbWO<sub>4</sub>:La crystals

*Qisheng Lin and Xiqi Feng*

Observation and analysis of domain configurations in domain engineered PZN-PT single crystals

*Jianhua Yin and Wenwu Cao*

Temperature dependent surface images of several ferroic crystals observed by scanning probe microscopy

*S.I. Hamazaki, Y. Takahashi, F. Shimizu, and M. Takashige*

Photorefractive property of Ce:KLN crystals

*Chun Hui Yang, Ye Quan Zhao, and Rui Wang*

The nature of some nonlinear optic coefficients in ferroelectrics

*J.F. Webb, K.H. Chew, J. Osman, and D.R. Tilley*

Ferroelectric domain structures in

tetragonal bismuth- and zinc-modified Pb(Ni<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>-PbZrO<sub>3</sub>-PbTiO<sub>3</sub> ceramics conserved by TEM

*Xinhua Zhu, Jianmin Hong, Tao Zhu, Jianmin Zhu, Shunhua Zhou, Qi li, Zhiguo Li, and Naiben Ming*

Structural change and some associated anomalies in the ferroelectric PbK<sub>2</sub>LiNb<sub>5</sub>O<sub>15</sub>

*Y. Gagou, D. Mezzane, N. Aliouane, J. Fabry, T. Badeche, A. Zegzouti, M. Lopez, and P. Saint-Grégoire*

High-resolution electron microscopy investigation on stacking faults in SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub> ferroelectric thin films prepared by metallorganic deposition

*Xinhua Zhu, Aidong Li, Di Wu, Tao Zhu, Zhiguo Liu, and Naiben Ming*

Synchrotron radiation topographic characterization of L-arginine phosphate monohydrate crystals

*Y. Ding, S. Nie, X.S. Wu, S.S. Jiang, X.B. Hu, S.Y. Guo, D. Xu, S.Y. Sun, J.H. Jiang, and Y.L. Tian*

**STATICS, DYNAMICS, AND SWITCHING OF FERROIC SYSTEMS**

Low-frequency dispersion of purified Rb<sub>2</sub>ZnCl<sub>4</sub>

*Volkmar Mueller, Yaroslav Shchur, Egbert Fuchs, and Horst Beige*

Ferroelectric domain structure, domain wall mobility and related fatigue-free behavior in SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub>

*Yong Ding, Jianshe Liu,*

<b>ISFD-6 PAPERS</b>
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*Yening Wang, and Kehsin Kuo*

Domain walls and phase transition initiated ultrasonic attenuation of TiNi single crystals

*Xuelei Liang, Huimin Shen, Xiaobing Ren, Yening Wang, and Kazuhiro Otsuka*

Ferroelectric-ferroelastic phase transition in  $\beta$ -LiNH<sub>4</sub>SO<sub>4</sub>: Nir Raman and domain structure studies

*Maria Polomska*

Effect of defect induced nucleation and growth on switching behavior in ferroelectrics

*Rajeev Ahluwalia and Wenwu Cao*

Real-time observation of twin boundary motion in organic crystal (TMTSF)<sub>2</sub>X

*Kazushige Kawabata, Yasuyoshi Hosokawa, Takashi Kawauchi, and Takashi Sambogi*

Effect of domain structure realignment on the pyroelectric current temperature dependence in gadolinium molybdate crystals

*R.M. Grechishkin, O.V. Malyshkina, N.B. Prokofieva, and S.S. Soshin*

## THEORY OF DOMAINS AND PHASE TRANSITIONS

On the evolution of texture between  $\alpha$  and  $\beta$  phases in quartz: Aspects relevant with the problem of the anomalous light scattering

*P. Saint-Grégoire, E. Snoeck, and N. Aliouane*

Domain structure in ferroelectric

particles

*W.L. Zhong, Y.X. Wang, C.L. Wang, B. Jiang, and L.A. Bursill*

Tensor properties of ferroic domains

*Vojtech Kopsky*

Dynamic hysteresis in multi-domain Potts polar systems: Monte-Carlo simulation and some experiments

*J.-M. Liu and Z.G. Liu*

On ferrotoroidics and electrotoroidic, magnetotoroidic, and piezotoroidic effects

*Hans Schmid*

Conversion equations and domain states in ferroic phase transitions

*Vojtech Kopsky and Daniel B. Litvin*

A Monte-Carlo study of magneto-electric coupling system

*X.S. Gao, J.-M. Liu, Q.C. Li, and Z.G. Liu*

Domain pair symmetry reduction due to disorientations

*D.B. Litvin, V. Janovec, and J. Privratská*

Phase transition properties of compositionally graded ferroelectric structure

*C.L. Wang, X.S. Wang, Y. Xin, Z. Wang, X.H. Xu, W.L. Zhong, and P.L. Zhang*

Size effects of ferroelectric particles described by the transverse Ising model

*Y. Xin, C.L. Wang, X.S. Wang, and W.L. Zhong*

Switching in ferroelectric thin film: Simulation with heterogeneous nucleation

*Chunhua Li, Xiaobing Chen, Jinsong Zhu, and Yening Wang*

Coupling interaction induced a single new artificial ferroelectric superlattice

*J. Shen and Y.Q. Ma*

Size effects of ferroelectric sandwich structure in the presence of the long-range coupling interaction

*J. Shen and Y.Q. Ma*

Microscopic origin of the two-sublattice model for antiferroelectric state

*R.A. Hatt and W. Cao*

The structure of S-walls in  $m3m \rightarrow mmm$  ferroelastics

*Jiri Erhart, Wenwu Cao, and Jan Fousek*

A Monte-Carlo approach of remanence enhancement effect in ferroelectric Potts lattice

*J.-M. Liu, Z.C. Wu, G.H. Cao, X.H. Liu, and Z.G. Liu*

Quantum behavior in one-dimensional mesoscopic Thue-Morse rings

*Yu Li, R.W. Peng, G.J. Jin, Mu Wang, A. Hu, and S.S. Jiang*

Monte-Carlo simulation of domains and mesoscopic structures in complex perovskite relaxor ferroelectric  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$

*J.S. Liu, Z.R. Liu, H. Zheng, J. Ni, B.L. Gu, and X.W. Zhang*

## THIN FILMS, MULTILAYERS, AND DOMAIN ENGINEERING

Engineering multidomain ferroic samples

## ISFD-6 PAPERS

*J. Fousek and L.E. Cross*

Epitaxial growth of ferroelectric  $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$  thin films for room temperature tunable microwave devices

*C.L. Chen, J. Shen, S.Y. Chen, Z. Zhang, G.P. Luo, W.K. Chu, and C.W. Chu*

Mesoscopic structures in two-dimensional ferroelectric polymers

*Stephen Ducharme, M. Bai, Matt Poulsen, S. Adenwalla, S.P. Palto, L.M. Blinov, and V.M. Fridkin*

SPM studies on surface charge and local piezo-response of ferroelectric thin films

*X.F. Chen, W.G. Zhu, W.G. Liu, O.K. Tan, and X. Yao*

Effect of grain size on the fatigue properties of  $\text{Pb}(\text{Zr}_{0.3}\text{Ti}_{0.7})\text{O}_3$  thin films prepared by metallorganic decomposition

*Feng Yan, Peng Bao, Helen L.W. Chan, Chung-Loong Choy, Xiaobing Chen, Jingsong Zhu, and Yening Wang*

New high  $T_c$  piezoelectric ceramics with bismuth layer structure

*Haixue Yan, Chengen Li, Jianguang Zhou, Weimin Zhu, and Lianxing He*

$\text{Pb}(\text{Zr,Ti})\text{O}_3$  thin films prepared on  $\text{PbTiO}_3/\text{Si}(100)$  by chemical solution decomposition technique

*S.W. Wang, H. Wang, X.H. Xu, Y. Hou, S.X. Shang, C.L. Wang, J.F. Hu, and M. Wang*

Dielectric and ferroelectric properties of  $\text{Bi}_2\text{Ti}_2\text{O}_7$  thin films with (111) orientation

*Zhuo Wang, Ji Huang, Shaowei Wang, Xiaohong Xu, Yun Hou, Min Wang, Hong Wang, Chunlei Wang, Jifan Hu, and Yuguo Wang*

Study on the characterization and formation mechanism of microdomains in  $\text{Ba}_{0.7}\text{Sr}_{0.3}\text{TiO}_3$  thin films by HREM

*Yongping Ding, Jiansheng Wu, and Zhongyan Meng*

Thick PZT films deposited on stainless steel substrates coated with barrier layers

*Kun Li, Kwan-Wah Lee, Helen Lai-Wa Chan, and Chung-Loong Choy*

Characterization of ferroelectric  $(1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$  films prepared by pulsed laser deposition

*J. Wang, K.H. Wong, H.L.W. Chan, and C.L. Choy*

Study on ferroelectric and dielectric properties of Li-doped ZnO ceramics and thin films prepared by PLD method

*Z.C. Wu, X.M. Zhang, J.-M. Liu, Q.C. Li, X.Y. Chen, J. Yin, N. Xu, and Z.G. Liu*

Growth of  $\text{LiNbO}_3$  crystal with periodic ferroelectric domain structure by current induction and its acoustic application

*Zhiliang Wan, Yuanxin Xi, Quan Wang, Yanqing Lu, Yongyuan Zhu, and Naiben Ming*

Bismuth-layered ferroelectric  $\text{Bi}_3\text{TiNbO}_9$  thin films grown by pulsed laser deposition

*B. Yang, X.J. Zhang, S.T. Zhang, X.Y. Chen, Y.F. Chen, Y.Y. Zhu,*

*Z.G. Liu, and N.B. Ming*

Fabrication of the ionic-type phononic crystal and its long-wavelength optical properties

*Yan-Qing Lu, Quan Wang, Yuan-Xin Xi, Zhi-Liang Wan, Xue-Jing Zhang, and Nai-Ben Ming*

Domain reversal in  $\text{Er:LN}$  by external field poling

*Y.B. Chen, Y. Du, S.N. Zhu, Y.Q. Lu, Y.Y. Zhu, N.B. Ming, and Y.H. Xu*

Domain behavior and polarization changes in ferroelectric films under stress

*Xiaomei Lü, Xuesong Zhang, Jinsong Zhu, Zhiguo Liu, and Yening Wang*

Sol-gel derived pyroelectric barium strontium titanate thin films for infrared detector applications

*Jiang-Gong Cheng, Jun Tang, Shao-Ling Guo, and Jun-Hao Chu*

Effect of the charge distribution at the interface on the properties of  $\text{PZT}/\text{SiO}_2/\text{Si}$  heterostructure

*Yuan Lin, Weizhi Gong, Chun Cai, Zhao Hao, Bo Xu, and Bairu Zhao*

Fabrication and characteristics of  $\text{Ag}/\text{Pb}(\text{Zr}_{0.53}\text{Ti}_{0.47})\text{O}_3/\text{ultrathin-SiO}_2/\text{Si}$  and  $\text{Ag}/\text{Pb}(\text{Zr}_{0.53}\text{Ti}_{0.47})\text{O}_3/\text{YBa}_2\text{Cu}_3\text{O}_{7-d}$  systems

*Yuan Lin, Baoting Liu, Zhao Hao, Weizhi Gong, Chun Cai, Bo Xu, and Bairu Zhao*

PZT thin films with preferred-orientation induced by external stress

## ISFD-6 PAPERS

Hongxia Qin, Jinsong Zhu,  
Zhiqiang Jin, and Yening Wang

## RELAXOR FERROELECTRICS

Anomalous X-ray scattering study of chemical and polar nanodomains in  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$  single crystals  
Andrei Tkachuk and Haydn Chen

Ferroelectric domains in the uniaxial relaxor system  $\text{SBN}:\text{Ce}$ ,  $\text{Cr}$  and  $\text{Co}$   
P. Lehnen, E. Beckers, W. Kleemann, Th. Loike, and R. Pankrath

Perovskite nanocrystallite of PMN-based ferroelectrics by mechanical activation  
J.M. Xue, J. Wang, D.M. Wan, and B.K. Gan

Domain structures and related piezoelectric properties of 67Pmn-33Pt relaxor-based ferroelectric single crystals  
Dong-Lin Li, Gui-Sheng Xu, Ping-Chu Wang, Xiao-Ming Pan, Hao-Su Luo, and Zhi-Wen Yin

Ferroelectric domains and their dynamics under electric field in PMNT single crystals  
Gui-Sheng Xu, Dong-Lin Li, Hao-Su Luo, Hai-Qing Xu, Ping-Chu Wang, and Zhi-Wen Yin

PLZT ceramics Fabry-Perot interferometers for visible and mid-infrared lasers  
Maris Ozolinsh, Hans J. Eichler, Dag Hanstorp, Y.G. Sun, Y.E. Wang, X.Y. Kang, and H.E. Zhao

Transmission electron microscopy

study of the domain structures of the relaxor ferroelectric PMN-PT 67/33 single crystals

K.. Baba-Kishi, G.K.H. Pang, C.L. Choy, H.L.W. Chan, Haosu Luo, Qingrui Yin, and Zhiwen Yin

Ordering and electric-field effects on the ferroelectric phase transition of some relaxors  
L.S. Kamzina

Elastic matching of morphotropic phases in polydomain  $(1-x)\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3 - x\text{PbTiO}_3$  single crystals  
V. Yu. Topolov and Z.-G. Ye

Complex domain and heterophase structures in  $(1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3 - x\text{PbTiO}_3$  single crystals  
Z.-G. Ye and V. Yu. Topolov

The dielectric behavior of relaxor ferroelectrics  
H.K. Guo, Y.N. Wang, J.S. Zhu, and H.M. Shen

## DEVICES AND APPLICATIONS

Periodically poled  $\text{LiNbO}_3$  OPO for generating mid IR to terahertz waves  
Hiromasa Ito, Takaaki Hatanaka, Sajad Haidar, Koichiro Nakamura, Kodo Kawase, and Tetsuo Taniuchi

Formation of self-organized nanodomain patterns during spontaneous backswitching in lithium niobate  
V.Ya. Shur, E.L. Rumyantsev, E.V. Nikolaeva, E.I. Shishkin, D.V. Fursov, R.G. Batchko, L.A. Eyres, M.M. Fejer, R.L. Byer,

and J. Sindel

SHG interference microscope as a tool of nondestructive observation of ferroelectric  $180^\circ$  domain structures  
Yoshiaki Uesu, Haruyuki Mohri, Yamato Shindo, and Sunao Kurimura

Electron emission from ferroelectrics  
R. Le Bihan

Scanning nonlinear dielectric microscopy for investigation of nanosized ferroelectric domains and local crystal anisotropy  
Yasuo Cho

Optical properties and applications of double-doped  $\text{In}:\text{Fe}:\text{LiNbO}_3$  crystal  
Wang Rui, Xu Wusheng, Liu Xinrong, and Xu Xinguang

Photodamage resistance properties and application of  $\text{In}:\text{LiNbO}_3$   
Xu Wusheng, Wang Rui, Zhen Xihe, Zhang Wanlin, Chen Xiaojun, Wang Zhengping, and Zhouguangyong

Quasiperiodic optical superlattice in  $\text{KTiOPO}_4$  by electric poling technique  
Z.L. Wang, J. Wu, X.J. Liu, D.Z. Sheng, and N.B. Ming

Growth and phase conjugate effect of Co-doped  $\text{SBN}:\text{Ce}:\text{Cu}$   
Ye Quan Zhao, Chun Hui Yang, Shao Jun Shi, and Jun Wang

Investigation of the holographic storage property and application of  $\text{Zn}:\text{Fe}:\text{LiNbO}_3$   
Ye Quan Zhao, Jun Wang, Yu

<b>ISIF 2001 PAPERS</b>
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*Heng Xu, Chao Zhong Zhao, and  
Guang Yong Zhou*

Photorefractive effect of double  
doped Ce:Co:KNSBN crystals  
*Xu Yuheng, Wang Jun, Sun  
Chengjun, and Zhao Chaozhong*

Growth and property of Er:KLN  
crystals  
*Chun Hui Yang, Jun Wang, Xin  
Hong Yang, and Xiao Jun Chen*

TE-TM mode converter based on  
PPLN waveguide  
*Yuanxin Xi, Quan Wang,  
Zhiliang Wan, Xuejin Zhang,  
Yanqing Lu, and Naiben Ming*

Acoustic superlattice with linear  
taper of period and applications  
*Quan Wang, Yuanxin Xi,  
Zhiliang Wan, Yanqing Lu,  
Yongyuan Zhu, Yanfeng Chen,*

*and Naiben Ming*

Electrooptical spectral filter based  
on optical superlattice LiNbO<sub>3</sub>  
*Yan-Qing Lu, Quan Wang, Yuan-  
Xin Xi, Zhi-Liang Wan, Xue-Jing  
Zhang, and Nai-Ben Ming*

Realization of fast photorefractive  
response speed in near-stoichiomet-  
ric LiNbO<sub>3</sub> crystals  
*Xiaojun Chen, Bing Li, Tao Ling,  
Dengsong Zhu, Shaolin Chen,  
Zhiheng Huang, and Zhongkang  
Wu*

Quasi-phase matching and recipro-  
cal space  
*Chao zhang, Yongyuan Zhu,  
Shining Zhu, and Naiben Ming*

Memory properties of metal ferro-  
electric semiconductor structure  
*Zhixun Ma, Xiangjian Meng, and*

*Junghao Chu*

Three-component quasiperiodic  
superlattice and its Fourier spectrum  
*Hong Wei, Chao Zhang, Yong-  
Yuan Zhu, Shi-Ning Zhu, and  
Nai-Ben Ming*

Efficient continuous wave green  
light generation in a periodically  
poled LiTaO<sub>3</sub> crystal by single-pass  
frequency doubling  
*Hui Liu, Xiaoyan Liang, Wei  
Hou, Shining Zhu, Yongyuan  
Zhu, Zuyan Xu, and Neiben Ming*

Ultraviolet generation in a dual-  
periodic domain inverted structure  
in LiTaO<sub>3</sub> crystal by frequency  
tripling a 1.064 $\mu$ m laser  
*Zhaowei Liu, Yiqiang Qin,  
Yongyuan Zhu, Huitian Wang,  
Chao Zhang, Shining Zhu, and  
Naiben Ming*

### *Ferroelectricity Newsletter*

including all back issues is available on Internet

**<http://www.sp.nps.navy.mil/projects/ferro/ferro.html>**

in Adobe Acrobat PDF file format

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<b>PUBLICATIONS</b>
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***NEW VOLUMES FROM THE MATERIALS RESEARCH SOCIETY******Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics***

This new volume from the Materials Research Society (MRS) highlights important achievements and challenges in advanced interconnects and low-k dielectrics as employed in the microelectronics industry. The replacement of Al alloys with Cu along with the introduction of new barrier materials to protect Cu from chemical attack, and the utilization of new dielectric materials with a lower relative dielectric constant  $k$  than  $\text{SiO}_2$  in multilevel metallization structures of increasing complexity are the major themes of evolution in this field. Invited reviews illustrate the significant progress that has been achieved as well as the challenges that remain. Contributed papers presented by researchers from different countries demonstrate progress on current topics using a truly multidisciplinary approach.

Edited by G.S. Oehrlein (University of Maryland), K. Maex (IMEC), Y.-C. Joo (Seoul National University), S. Ogawa (Matsushita Electronics Corporation), and J.T. Wetzel (International SEMATECH), *Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics* [ISBN: 1-55899-520-X] is Volume 612 in the MRS Symposium Proceedings Series. This volume documents proceedings from the 2000 MRS Spring Meeting in San Francisco, California, and contains 83 papers, 591 pages. It is available in hardcover for \$71.00 (MRS member), \$82.00 (U.S. list), and \$94.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

***Polycrystalline Metal and Magnetic Thin Films — 2000***

The newest volume in a continuing series focuses on the direction taken to understand and control the properties of polycrystalline materials.

The unprecedented growth in the semiconductor, electronics, and storage industries is the result of continued miniaturization of circuit devices, increases in chip functionality, and increased storage capacity and performance, along with a decrease in per-function cost. Hardware shrinkage has taken place both laterally and vertically, leading to similar decreases in the dimensions of interconnection wires, contact metallization, and magnetic storage footprints. The increasingly important role of surfaces, interfaces, defects, and impurities has raised serious materials questions about how to control the properties of polycrystalline thin films used in applications requiring tight performance tolerances. This is especially true as the dimensions of these films shrink to levels where 100 or fewer atomic layers are routinely being used to achieve critical materials properties (contact resistance, diffusion barriers, magnetic moments, etc.). The understanding of polycrystalline film structures during growth and the evolution of various film properties with time and temperature is critical to the successful design and development of smaller devices. Topics include magnetic thin films and structures; polycrystalline metal films — microstructure and grain evolution; and stress and mechanical properties of thin films.

Edited by Bruce M. Clemens (Stanford University), Lynne Gignac (IBM T.J. Watson Research Center), James M. MacLaren (Tulane University), and Oliver Thomas (Université d' Aix-Marseille), *Polycrystalline Metal and Magnetic Thin Films — 2000* [ISBN: 1-55899-523-4] is Volume 615 in the MRS Symposium Proceedings Series. This volume documents proceedings from the 2000 MRS Spring Meeting in San Francisco, California, and contains 26 papers, 189 pages. It is available in hardcover for \$38.00 (MRS members), \$48.00 (U.S. list), and \$59.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

***Morphology and Dynamics of Crystal Surfaces in Complex Molecular Systems***

Just published by the MRS, this volume highlights molecular assembly and dynamics at crystal surfaces in complex

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<b>PUBLICATIONS</b>
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molecular systems, which are of central importance in fields as diverse as geochemistry, crystal growth, structural biology, corrosion science, pharmaceutical production, and food science. In all of these areas, understanding surface morphology and dynamics requires consideration of multiple chemical species, molecular anisotropy, impurities, and the interface between fluid and solid phases.

This volume brings together researchers from each of these fields to explore common themes in the growth and dissolution of inorganic, organic, and macromolecular crystals and films produced both through natural and synthetic processes. The focus of the research is on the physical and structural studies of these processes. Many of the contributions to the volume include the results of atomic-force microscopy investigations of surface dynamics. A second, more recent experimental method for determining the atomic structure of crystal surfaces, surface X-ray diffraction, is also featured here. Topics include inorganic systems — surface morphology and step kinetics; fluid-mineral interfaces; growth of organic films and supramolecular solids; biogenic and biomimetic systems; growth and morphology at the oxide solution interface; macromolecules; and inorganic systems — impurities and defects.

Edited by Jim De Yoreo (Lawrence Livermore National Laboratory), William Casey (University of California — Davis), Alexander Malkin (University of California — Irvine), Elias Vlieg (University of Nijmegen), and Michael Ward (University of Minnesota), *Morphology and Dynamics of Crystal Surfaces in Complex Molecular Systems* [ISBN: 1-55899-528-5] is Volume 620 in the MRS Symposium Proceedings Series. This volume documents proceedings from the 2000 MRS Spring Meeting in San Francisco, California, and contains 22 papers, 203 pages. It is available in hardcover for \$42.00 (MRS members), \$52.00 (U.S. list), and \$63.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

### ***Interfaces, Adhesion and Processing in Polymer Systems***

Just published by MRS, this volume documents symposium reports from the 2000 MRS Spring Meeting in San Francisco, California, and contains 29 papers, 203 pages.

The demands placed upon polymer performance have paralleled the growth in application and have driven the development of multicomponent polymer formulation with superior physical, mechanical, and interfacial properties. Many applications also require that a polymeric material be attached or placed in contact with another material. In certain cases, like the classic nonstick pan, lubrication, and release paper, it is desirable to create surfaces that do not interact with the material in contact. In applications such as toughening of blends, filled or fiber-reinforced polymers, and coatings, however, dissimilar materials must adhere to each other for enhanced performance. Likewise, the structure and properties of polymer/metal interfaces play a crucial role in the shear field affecting the stick-slip behavior during polymer processing, and biomaterial/biological interfaces play a key role in promising areas of biotechnology. This volume focuses on addressing both the fundamental scientific aspects and the advances in applications of polymers at surfaces/interfaces/thin films and the effects of the interfaces on processing and adhesion. Topics include thin films; polymer-polymer and polymer-wall interfaces; polymer interface and its effect on processing; polyelectrolytes and proteins at surfaces; nanostructures — from thin films to bulk; mechanical aspects of soft biomaterial interfaces; polymer adhesion; polymer surfaces and surface modification.

Edited by Spiros H. Anastasiadis (Foundation for Research and Technology, Hellas Institute of Electronic Structure and Laser), Alamgir Karim (National Institute of Standards and Technology), and Gregory S. Ferguson (Lehigh University), *Interfaces, Adhesion and Processing in Polymer Systems* [ISBN: 1-55899-537-4] is Volume 629 in the MRS Symposium Proceedings Series. It is available in hardcover for \$67.00 (MRS members), \$77.00 (U.S. list), and \$88.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

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<b>PUBLICATIONS</b>
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***Amorphous and Heterogeneous Silicon Thin Films — 2000***

This new volume provides a continuing international forum for scientists and engineers to exchange their latest research results on topics ranging from silicon thin-film physics and chemistry, to novel device design and engineering. The volume, the eighteenth in a popular series from MRS, covers all aspects of hydrogenated amorphous silicon (a-Si:H) science and technology, and is the fourth consecutive volume in the series to cover heterogeneous silicon film materials, including nanocrystalline, microcrystalline, and polycrystalline films. A special “Millennium Session,” celebrating the most important achievements of the last three decades in the field of amorphous and microcrystalline silicon thin films, is featured. Additional topics include amorphous film growth and properties; nanocrystalline/microcrystalline film growth and properties; ordering, ordering transitions and photocrystalline films: polycrystalline films, epitaxial growth and properties; catalytic/hot-wire CVD — amorphous to polycrystalline films; implantation, annealing and crystallization; structure and hydrogen; band, band tails and defect states; metastability and equilibration; thin-film transistors, displays and imagers; thin-film solar cells and solar-cell structures; amorphous silicon detectors and other devices; and heterogeneous silicon transport and device applications.

Edited by Robert W. Collins (The Pennsylvania State University), Howard M. Branz (National Renewable Energy Laboratory), Martin Stutzmann (Technische Universität München), Subhendu Guha (United Solar Systems Corporation), and Hiroaki Okamoto (Osaka University), *Amorphous and Heterogeneous Silicon Thin Films — 2000* [ISBN: 1-5899-517-X] is Volume 609 in the MRS Symposium Proceedings Series. This volume documents proceedings from the 2000 MRS Spring Meeting in San Francisco, California, and contains 156 papers, 1091 pages. It is available in hardcover for \$71.00 (MRS members), \$82.00 (U.S. list), and \$94.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

***Structure and Mechanical Properties of Nanophase Materials — Theory and Computer Simulation vs Experiment***

Just published by MRS, this volume documents symposium reports from the 2000 MRS Fall Meeting in Boston, Massachusetts, and contains 44 papers, 314 pages.

Nanocrystalline materials exhibit a broad range of fascinating mechanical properties. The mechanical behavior of nanostructured material may best be optimized through a comprehensive understanding of the relations between materials processes, internal structure, length scale, and deformation mechanisms. Recent advances in computer modeling are bringing new insight into the deformation processes in nanocrystalline materials. This volume brings together experimentalists, computer modelers and theorists to advance the present state of understanding on strength- and ductility-limiting factors in nanostructural materials; clarify issues pertinent to the production and engineering of superior nanostructures materials; and stimulate discussion of potential applications. Emphasis is placed on, first, the guidance that computer modeling can give in designing experiments as well as to their interpretation, and, second, the guidance suggested by experiments and characterization of actual nanocrystalline samples in setting up the initial structure of a computer model and the development of new potentials. Nanostructured materials of interest include metals, ceramics, and composites in bulk form, thin films, and layered structures. Topics include mechanical properties and deformation behavior; mechanical properties and deformation behavior — bulk materials; mechanical properties and deformation behavior — multilayers; mechanical properties and deformation behaviors — softening at very small grain sizes; ceramic materials; and clusters and other nanostructures.

Edited by Diana Farkas (Virginia Polytechnic Institute and State University), Harriet Kung (Los Alamos National Laboratory), Merrilea Mayo (The Pennsylvania State University), Helena Van Swygenhoven (Paul Scherrer Institute), and Julia Weertman (Northwestern University), *Structure and Mechanical Properties of Nanophase Materi-*

**PUBLICATIONS**

*als — Theory and Computer Simulation vs Experiment* [ISBN: 1-55899-544-7] is Volume 634 in the MRS Symposium Proceedings Series. It is available in hardcover for \$74.00 (MRS members), \$85.00 (U.S. list), and \$97.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

***Nonlithographic and Lithographic Methods of Nanofabrication: From Ultralarge-Scale Integration to Photonics to Molecular Electronics***

This new volume highlights future advances in information technology that will have major socio-economic significance, and will rely heavily on technical and scientific progress in the field of nanotechnology. For example, nanofabrication should lead the semiconductor industry to mass produce ULSI circuits having 100nm (0.1 $\mu$ m) resolution by 2006 as predicted by the Semiconductor Industry Association. The challenge of building systems for fabrication at this level imposes formidable pressure on the lithographic processes in terms of dimension tolerances (10nm or less) and positioning accuracy (1nm or less), to quote only a few specifications. Due to the enormous costs of next generation lithographic machines, it is now felt that economically reasonable improvements will focus mainly on the materials science aspect of the lithographic process — the development of advanced resists, and more generally, of smart materials. This volume brings together, in a single forum, researchers with a wide range of expertise in microelectronics, optics, magnetism, polymer synthesis and materials science. The reader should find it to be a useful overview of the state of the art, both theoretical and experimental, as well as an indication of future trends and remaining challenges in this technologically important field. Topics include advanced techniques and novel materials for nanolithography; unconventional approaches to nanofabrication and nanopatterning; self-assembled systems and chemical routes to nanostructures; photonic, electronic and magnetic properties of nanostructures; and molecular devices.

Edited by Lhadi Merhari (CERAMEC), John A. Rogers (Lucent Technologies), Alamgir Karim (National Institute of Standards and Technology), David J. Norris (NEC Research Institute), and Younan Xia (University of Washington), *Nonlithographic and Lithographic Methods of Nanofabrication — From Ultralarge-Scale Integration to Photonics to Molecular Electronics* [ISBN: 1-55899-546-3] is Volume 636 in the MRS Symposium Proceedings Series. The volume documents proceedings from the 2000 MRS Fall Meeting in Boston, Massachusetts, and contains 51 papers, 370 pages. It is available in hardcover for \$79.00 (MRS members), \$91.00 (U.S. list), and \$105.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

***Silicon Carbide — Materials, Processing and Devices***

Just published by MRS, this volume documents symposium reports from the 2000 MRS Fall Meeting in Boston, Massachusetts, and contains 78 papers, 546 pages.

Advances in silicon carbide materials, processing and device design have recently resulted in implementation of SiC-based electronic systems and offer great promise in high-voltage, high-temperature, and high-frequency applications. This volume focuses on new developments in basic science of SiC materials as well as rapidly maturing device technologies. The challenges in this field include understanding and decreasing defect densities in bulk SiC crystals, controlling morphology and residual impurities in epilayers, optimization of implant activation and oxide-SiO interfaces, and developing novel device structures. This volume brings together the crystal growers, physicists, and device experts needed to continue the rapid pace of silicon-carbide-based technology. Topics include SiC bulk growth; SiC epitaxy; SiO<sub>2</sub>/SiC interfaces; SiC devices; SiC materials, characterization, and devices; implantation/radiation damage; and metallization/characterization.

Edited by Anant Agarwal (Cree, Inc.), Marek Skowronski (Carnegie Mellon University), James A. Cooper, Jr. (Purdue University), and Erik Janzén (Linköping University), Volume 640 in the MRS Symposium Proceedings Series is available in hardcover for \$79.00 (MRS members), \$91.00 (U.S. list), and \$105.00 (non-U.S. list). The volume is also available electronically on the MRS website with free access for all current MRS members.

<b>PUBLICATIONS</b>
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**AN INTERNATIONAL JOURNAL ON SENSOR TECHNOLOGY*****Sensors and Materials*****Scope**

This journal is designed to provide a forum for people working in multidisciplinary fields of sensing technology. *Sensors and Materials* publishes contributions describing original work in the experimental and theoretical fields, aimed at the understanding of sensing technology, related materials, associated phenomena, and applied systems. Expository or review papers and short notes are also acceptable.

**Topics**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Optical sensing</li> <li>• Humidity sensing</li> <li>• Pressure sensing</li> <li>• Mechanical sensing</li> <li>• Biological sensing</li> <li>• Nuclear sensing</li> </ul> | <ul style="list-style-type: none"> <li>• Temperature sensing</li> <li>• Electromagnetic sensing</li> <li>• Acoustic sensing</li> <li>• Gas sensing</li> <li>• Remote sensing</li> <li>• Materials for sensing technology</li> </ul> |
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**Sample of Articles Published in *Sensors and Materials***

We are bringing you the titles and authors of articles published so far this year in *Sensors and Materials*.

**VOLUME 13 NUMBER 1****Review**

The diode Hall effect and its sensor applications: An overview

*Chavdar Roumenin, Konstantin Dimitrov, Dimitar Nikolov, and Avgust Ivanov*

**Research Reports**

Characteristics of chromium nitride thin-film strain gauges

*Gwi-Y-Sang Chung, Won-Jae Lee, and Jae-Sung Song*

Miniaturized magnetic field sensors utilizing giant magneto-impedance

(GMI) effect and surface acoustic wave (SAW) technology

*H. Hauser, R. Steindl, Ch. Hausleitner, J. Nicolis, and A. Pohl*

Etching microwave silicon (EMSi)-microwave enhanced fast deep anisotropic etching of silicon for micro-electromechanical systems (MEMS)

*Jan A. Dziuban and Rafal Walczak*

A new process technique for

complementary metal-oxide-semiconductor (CMOS) compatible sensors

*Chin-Shown and Sien Chi*

**Book Review**

*Biomimetic Sensor Technology*  
Cambridge University Press, 2000  
by Kiyoshi Toko  
ISBN: 0 521 59342 5  
(hardback)

*Christiane Ziegler, University of Kaiserslautern*

<b>PUBLICATIONS</b>
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**VOLUME 13 NUMBERS 2 & 3**

These two issues of *Sensors and Materials* contain papers delivered at the **First Symposium on "Kansei" Biosensing**, organized by the Institute of Electrical Engineering of Japan in collaboration with the Institute of Electronics, Information and Communication Engineers (Japan) and was held at Nagano from 21-22 August 2000 with about 250 participants.

During the conference, 13 oral talks and 30 posters were presented. The oral sessions were highlighted by the excellent contributions of three invited speakers. The topics of the symposium included the (bio-) electronic tongue, (bio-) electronic nose, taste sensor systems, odor sensor systems, bio-sensors, sensor data processing, chemical sensor applications, chemical sensors for environmental monitoring and highly sensitive measurement of chemical substances.

Guest editors Teruaki Katsube (Saitama University) and Hidehito Nanto (Kanazawa Institute of Technology) state in the preface: "We believe that these special issues will aid the development of novel smart sensor systems, such as the electronic nose and tongue, and sensor systems beneficial to human life in the new century."

**Research Reports**

A smart ammonia gas sensor using QCM with plasma-polymerized membrane

*H. Nanto, Y. Hamaguchi, Y. Yokoi, S. Kurosawa, T. Oyabu, E. Kusano, and A. Kinbara*

Removal of indoor formaldehyde by hybrid chemical filters

*Seimei Shiratori, Taketo Suzuki, Shinja Kushida, and Yuji Inami*

Diffusion characteristics of chemicals causing sick-building syndrome

*Takashi Oyabu, Ayako Sawada, and Hidehito Nanto*

Discrimination of D-amino acids from L-amino acids using electric potential changes of a membrane

*H. Chibvongodze, K. Hayashi, and K. Toko*

Development of high-speed pressure distribution measurement systems and its application to food texture characterization

*Teruaki Azuma*

Detection of interactions between lipid/polymer membranes and taste substances by quartz resonator

*Shu Ezaki and Satoru Iiyama*

Enzyme reactor system for the determination of the quality of chicken

*Yuji Suzuki, Ron Usami, Koki Horikoshi, and Hirokazu Okuma*

Analysis of saltiness and bitterness of inorganic salts using taste sensors

*Satoru Iiyama, Shu Ezaki, and Kiyoshi Toko*

Fundamental study of various taste solutions by ultrasonics

*Yohichiro Kojima and Hatsuyoshi Kato*

Gingival crevicular fluid (GCF)-collecting device for analyzing microvolume sample solutions

*Masaki Yamaguchi, Yukiko Fukushi, Katsuya Yamazaki, and Masashi Kobayashi*

Analysis of tastes of amino acids using surface-polarity controlled sensors

*M.J. Ju, K. Hayashi, and K. Toko*

Development of technology for separating and identifying bitter substances

*Ryuji Takamatsu, Kiyoshi Toko, Hiroshi Takeguchi, and Akira Kawabata*

**VOLUME 13 NUMBER 4****Research Reports**

Integrated high-speed, high-sensitivity photodiodes and optoelectronic integrated circuits

*Horst Zimmermann*

Penicillin detection by means of silicon-based field-effect structures

*Arshak Pohossian, Marion Thust, Peter Schroth, Alfred Steffen, Hans Lüth, and Michael J. Schöning*

Fabrication of porous platinum thin films for hydrocarbon sensor applications

*K.D. Harris, J.R. McBride, K.E. Nietering, and M.J. Brett*

Platinum patterning by a modified lift-off technique and its application in a silicon load cell

*H.D. Tong, R.A.F. Zwijze, J.W. Berenschot, R.J. Wiegerink, G.J.M. Krijnen, and M.C. Elwenspoek*

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<b>UPCOMING MEETINGS</b>
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**2002 MRS Spring Meeting**

**1 - 5 April 2002**

**San Francisco Marriott and Argent Hotels**

**San Francisco, California, USA**

**Symposium H: Materials Issues for Tunable RF and Microwave Devices III**

### **Scope**

The development of low-cost tunable microwave devices is expected to have a significant impact on both commercial and military systems. These devices include tunable band-pass filters for wireless communications, phase shifters and true time delay devices for electronic scanning antennas, tunable radiating structures for frequency hopping, and tunable transformers to reduce RF impedance mismatch. In recent years, it has been recognized that nonlinear-dielectric, ferrite, CMR ferromagnetic, and superconducting perovskite oxide materials can be used to fabricate high performance RF devices and circuitry while reducing device size, weight, and cost over conventional technologies.

The purpose of this symposium is to bring together researchers from a broad range of both materials development, materials characterization and device design disciplines to discuss the challenges of developing new tunable RF and microwave device technologies, as well as examining the latest advances in the more conventional approaches. The critical issues to be addressed are defined by current device requirements that are materials related or limited. The RF devices require low loss materials that can provide tuning over broad-bandwidths using moderate drive voltages with reasonable temperature stability. In some cases, devices must handle significant power without breakdown.

Extensive efforts are in progress to understand the tuning and loss mechanisms at high frequencies in the materials, to identify and characterize new materials for bulk- and thin-film based device applications, to improve thin film processing and characterization, and to demonstrate expected performance benefits of the new tunable microwave technology.

### **Topics**

- New tunable materials
- Materials characterization
- Surface and interface characterization
- Dielectric loss mechanisms at microwave frequencies
- Tunability issues
- Effects of microstructure on dielectric properties
- Temperature stability
- Power handling capability
- Preparation and optimization of bulk and thin film properties
- Defining material figure of merit in the context of device requirements
- Devices, components, and prototypes
- Other related material and device issues

### **Symposium Organizers**

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**UPCOMING MEETINGS**

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[www.mrs.org/meetings/spring2002/](http://www.mrs.org/meetings/spring2002/)

**Electroceramics VIII Conference**  
**25 - 28 August 2002**  
**Rome, Italy**

**Scope**

This conference is interdisciplinary in nature, including all aspects of chemistry, physics, materials science and technology, as well as applications of electroceramics.

**Topics**

## Synthesis, Processing, and Characterization

- Synthesis and processing of electroceramics
- Sintering and microstructure development
- Grain boundary engineering of electroceramics
- Advances in characterization techniques
- Multilayer structures

## Electroceramics for the Information Society

- Dielectric materials, devices, and applications
- Ferroelectrics
- Ferroelectric thin films
- Piezoelectrics
- Pyroelectrics
- Microwave dielectrics and applications
- Electronic packaging
- Optical ceramics, photonics
- Superconducting ceramics
- Magnetic ceramics

**UPCOMING MEETINGS**

## Electroceramics for Environment and Energy

- Ionic, mixed, and electronic conductors
- Transport phenomena, defects, diffusion
- Batteries
- Fuel cells
- Membrane gas separation technologies
- Sensors
- Electrochromic displays
- Varistors, PTCR, NTCR

## New Trends for Electroceramics

- Nanocrystalline materials
- Nanotechnologies
- Ceramic MEMS
- Functional nanocomposites
- Hybrid organic and inorganic materials
- Functional mesoporous oxides

**International Advisory Board**

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[www.uniroma2.it/eventi/electroceramics/](http://www.uniroma2.it/eventi/electroceramics/)

**7th International Symposium on Ferroic Domains and Mesoscopic Structures (ISFD-7)**  
**15 - 19 September 2002**  
**Peninsula of Giens (French Riviera)**

**Scope**

After the first symposium on ferroic domains that was held in Volgograd (Russia) in 1989, the scope of ISFD has been progressively enlarged to all types of mesoscopic structures and, more recently, to problems related with structural organisation at nanometric scales. Such questions as static domain structures in crystals and ceramics, dynamics of domain walls and switching phenomena, change of domain structures at phase transitions, domains in thin films and size effects, nano- and mesoscopic structures, including relaxors, glasses, and incommensurate phases, will be discussed at the symposium.

During the last years, research in the field of applications has become so important that aspects related to FeRAMs and integrated ferroelectric films, high-k materials for microelectronics, domain engineering and photonics, domains in piezoelectric materials, transducers, sensors, actuators, and shape memory alloys, together with development of techniques, will give rise to special sessions.

**Contact**

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<http://isfd7.cjb.net>

<b>INDEX OF VOLUME 9, NUMBERS 1 - 4</b>
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**Upcoming Meetings**

13th American Conference on Crystal Growth and Epitaxy (ACCGE-13), Burlington, Vermont, USA	12-16 Aug 01	No.1, p.26
“Advanced Materials for Novel Microwave Devices,” Special Focused Session at the 2001 Asia Pacific Microwave Conference (APMC 2001), Taipei, Taiwan	3-6 Dec 01	No.1, p.27
2nd Ferroelectric Workshop in Puerto Rico (FWPR'01), San Juan, Puerto Rico	1-2 Jun 01	No.2, p.14
2001 MRS Fall Meeting, Boston, Massachusetts, USA	26-30 Nov 01	No.2, p.15
1st International Meeting on Ferroelectric Random Access Memories (FeRAM 2001)	19-21 Nov 01	No.3, p.23
2002 MRS Spring Meeting, San Francisco, California, USA	1-5 Apr 02	No.4, p.16
Electroceramics VIII, Rome, Italy	25-28 Aug 02	No.4, p.17
7th International Symposium on Ferroic Domains and Mesoscopic Structures (ISFD-7) Peninsula of Giens, French Riviera	15-19 Sep 02	No.4, p.18

**Conference Reports**

3rd Asian Meeting on Ferroelectrics (AMF-3)	12-15 Dec 00	No.1, p.2
Ferroelectrics 2000 UK		No.1, p.24

**Index of Conference Papers**

3rd Asian Meeting on Ferroelectrics (AMF-3)	12-15 Dec 00	No.1, p.4
Ferroelectrics 2000 UK		No.1, p.24
2nd International Seminar on Relaxor Ferroelectrics (ISRF-II)	23-28 Jun 98	No.2, p.2
8th International Symposium on Ferroelectric Semiconductors (ISFS-8)	30 Aug-5 Sep 98	No.2, p.4
Ferroelectric and Related Models in Biological Systems	26 Jun-1 Jul 95; 25 Feb 98	No.2, p.7
Ferroelectrics Workshop in Puerto Rico (FWPR-99)	12-14 May 99	No.2, p.9
13th International Symposium on Integrated Ferroelectrics (ISIF 2001)	11-14 Mar 01	No.3, p.2
2nd Workshop on Ferroelectrics and FRAM Technology	11 Nov 00	No.3, p.17
NATO Advanced Research Workshop on Modern Aspects of Ferroelectricity and Open Ukrainian-French Meeting on Ferroelectricity (UFMF-1)	6-11 May 00	No.4, p.2
6th International Symposium of Ferroic Domains and Mesoscopic Structures (ISFD-6)	29 May-2 Jun 00	No.4, p.4

**Publications**

New MRS Publications	No.2, p.10
<i>Handbook of Thin Film Materials</i>	No.2, p.11
<i>Handbook of Surfaces and Interfaces of Materials</i>	No.2, p.12
<i>Crystal Growth and Design</i>	No.2, p.13
New MRS Publications	No.3, p.21
New MRS Publications:	
<i>Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics; Polycrystalline Metal and Magnetic Thin Films—2000; Morphology and Dynamics of Crystal Surfaces in Complex Molecular Systems; Interfaces, Adhesion and Processing in Polymer Systems; Amorphous and Heterogeneous Silicon Thin Films—2000; Structure and Mechanical Properties of Nanophase Materials—Theory and Computer Simulation vs Experiment; Nonlithographic and Lithographic Methods of Nanofabrication: From Ultralarge-Scale Integration to Photonics to Molecular Electronics; Silicon Carbide—Materials, Processing and Devices</i>	No.4, p.10
<i>Sensors and Materials</i>	No.4, p.14

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**CALENDAR OF EVENTS 2001**

Nov.19-21	• 1st International Meeting on Ferroelectric Random Access Memories (FeRAM 2001), Gotemba, Japan (see <i>Ferroelectricity Newsletter</i> , Vol. 9, No. 3, p. 23)
Nov 26-30	• 2001 MRS Fall Meeting, Boston, Massachusetts, USA (see <i>Ferroelectricity Newsletter</i> , Vol. 9, No. 2, p.15)
Dec 3-6	• “Advanced Materials for Novel Microwave Devices” at the 2001 Asia-Pacific Microwave Conference (APMC 2001), Taipei, Taiwan (see <i>Ferroelectricity Newsletter</i> , Vol. 9, No. 1, p. 27)
<b>2002</b>	
Apr 1-5	• 2002 MRS Spring Meeting, San Francisco, California, USA (see p.16)
May 28- Jun 1	• International Joint Conference on the Applications of Ferroelectrics 2002 (IFFF 2002), Nara, Japan International Symposium on the Applications of Ferroelectrics (ISAF XIII 2002) International Symposium on Integrated Ferroelectrics (ISIF XIV 2002) The meeting on Ferroelectric Materials and their Applications (FMA XIX 2002) Contact: Prof. Tadashi Shiosaki: fma@ms.aist-nara.ac.jp; website: fma.aist-nara.ac.jp
Jun 10-14	• 8th IUMRS International Conference on Electronic Materials (IUMRS-ICEM2002), Xi'an, China Contact: Prof. Cheng Jianhua: icem2002@btamail.net.cn; http://www.c-mrs.org.cn/icem2002
Aug 25-28	• Electroceramics VIII Conference, Rome, Italy (see p. 17)
Sep 15-19	• 7th International Symposium on Ferroic Domains and Mesoscopic Structures (ISFD-7), Peninsula of Giens, French Riviera (see p. 18)