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## Ferroelectricity Newsletter / v.7:no.3 Summer 1999

Monterey, California, Naval Postgraduate School

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# Ferroelectricity Newsletter

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

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Volume 7, Number 3

Summer 1999

## **GETTING READY FOR THE Y2K MEETINGS FROM HONG KONG TO JURMALA**

The first listing of papers in this issue deals with the Sixth Japan-CIS/Baltic Symposium on Ferroelectricity held in March 1998 at the University of Tokyo in Noda, Japan. The attendants came from Russia, Ukraine, Lithuania, Latvia, and the majority from Japan, including scientists from various countries who were working in Japan at that time. The makeup of participants at this conference in terms of geography mirrors the global spread of the ferroelectric community.

The same is true of the meetings scheduled for the year 2000. It seems appropriate for this particular field of investigation that the first gathering in 2000 we got notice of is the workshop on “**Fundamental Physics of Ferroelectrics**” in Aspen, Colorado, dealing with fundamental experiments and first-principle calculations. (See page 12.)

This is followed by **ISIF 2000**, held for the first time outside the United States, in Aachen, Germany. Turn to page 13 for details of the technical program. The social program includes an organ recital in the famous Aachen Cathedral, Charlemagne's palatinate chapel, followed by the conference dinner in the Coronation Hall.

At almost the same time researcher in the field of **optical wave manipulation** meet in Davos, Switzerland (see page 14), followed in April by the traditional **MRS Spring Meeting** in San Francisco (see page 15).

The site for the **5th European Conference on the Application of Polar Dielectrics** is Jurmala in Latvia. (See page 17.) Jurmala, which means “seaside,” is a cluster of former fishing villages along the southern shore of the Gulf of Riga, some 15 miles from Riga, the capital of Latvia, a country bordering on the Baltic. According to the first announcement, pine trees, fresh air, the calm flow of the river, and the golden sandy beaches provide the finest conditions for enjoyment of nature, relaxation, and (maybe therefore?) creative work.

The next conference of **Electroceramics** takes place in Portoroz, Slovenia's biggest tourist center, again located on a seashore, this time of the Mediterranean (see page 18). The **3rd Asian Meeting on Ferroelectrics**, held in December 2000 in Hong Kong, described on page 19, winds up our world tour on behalf of ferroelectricity.

Rudolf Panholzer  
Editor-in-Chief

## **IN THIS ISSUE**

<b>From the Editor</b>	<b>1</b>
<b>Papers</b>	
JCBSF-6	2
IMFS-7	8
<b>Publications</b>	
May <i>MRS Bulletin</i>	10
<b>Upcoming Meetings</b>	
SPIE's 1999 Symposium	11
“Fundamental Physics of FE”	12
ISIF 2000	13
ICONO'5	14
MRS 2000 Spring Meeting	15
ECAPD-5	17
Electroceramics VII	18
AMF-3	19
<b>Calendar of Events</b>	<b>20</b>

## **Ferroelectricity Newsletter**

Volume 7, Number 3  
Summer 1999

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<b>JCBSF-6 PAPERS</b>
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**THE SIXTH JAPAN-CIS/BALTIC SYMPOSIUM ON FERROELECTRICITY (JCBSF-6)**

The Sixth Japan-CIS/Baltic Symposium on Ferroelectricity was held from 22-25 March 1998 at the Science University of Tokyo in Noda, Japan. This symposium followed five previous meetings which were held approximately every four years since 1976. The Organizing Committee was supported in its task by the Physical Society of Japan in cooperation with the Japan Society of Applied Physics and the Crystallographic Society of Japan and was sponsored by the Science University of Tokyo, Murata Science Foundation, Gordon and Breach Science Publishers, Shoeni Chemicals Co., and Tokyo Instruments Co.

The attendants of the symposium came from the following countries: 17 from Russia, 2 from Ukraine, 1 from Lithuania, 1 from Latvia, and 126 from Japan, including 12 from various countries who are working as researchers in Japan. Oral presentations consisted of 56 papers at 11 sessions and there were 78 presentations at 3 poster sessions.

The main topics covered fundamentals and applications of ferroelectrics and related materials. Some of the sessions were:

- Phase transitions
- Relaxors and new materials
- Nonlinear optics
- New phenomena and new materials
- Ferroelasticity, thin films, and applications
- Origin of ferroelectricity and applications
- Domains

In addition to session discussions, effective exchange of useful information was made in the lobby and at an ad hoc round table. JCBSF-6 provided not only an important contribution to the progress of science and technology but also promoted friendly relations between scientists.

The Seventh Japan-CIS/Baltic Symposium on Ferroelectricity will be held in 2002 in St. Petersburg.

The proceedings of JCBSF-6 are published in the journal *Ferroelectrics*, Volumes 217, 218, 219 (1998), guest edited by T. Shigenari, Y. Ishibashi, Y. Uesu, B.A. Strukov, and A.S. Sigov.

The following is a list of the titles and authors of the presentations given at JCBSF-6.

**SECTION 1: PHASE TRANSITIONS**

Neutron and synchrotron radiation studies of the phase transition of  $h$ -BaTiO<sub>3</sub>

*Y. Noda, K. Akiyama, T. Shobu, Y. Kuroiwa, H. Nakao, Y. Morii, and H. Yamaguchi*

X-ray study of ferroelectric phase transition by Li-substitution in semiconducting ZnO

*A. Onodera, N. Tamaki, H.*

*Sato, and H. Yamashita*

Crystal structure of perovskite PbZrO<sub>3</sub> re-investigated by high resolution powder neutron diffraction

*H. Fujishita and S. Katano*

Ferroelastic phase transitions in Rb<sub>2</sub>KM<sup>3+</sup>F<sub>6</sub> elpasolites

*I.N. Flerov, M.V. Gorev, A. Tressaud, and J. Grannec*

Impulsive stimulated raman scattering study of kdp: observation of B<sub>2</sub>

soft polariton mode

*S. Yoshioka, Y. Tsujimi, and T. Yagi*

Some peculiarities in the incommensurate phase transition in quartz

*T. Shigenari, T.A. Aslanyan, N. Ukigaya, Y. Makita, and K. Abe*

Self-field effect,  $\nabla P$ , and thermodynamic stability of spontaneous polarization in thin ferroelectric platelets

*Y. Watanabe and A. Masuda*

<b>JCBSF-6 PAPERS</b>
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Dielectric properties and pressure effects in layer-type bismuth solid solution of  $\text{Sr}_{2-x}\text{Pb}_x\text{Bi}_4\text{Ti}_5\text{O}_{18}$  ( $0 \leq x \leq 2$ )

*N. Yasuda, H. Ohwa, Y. Nakaoka, M. Iwata, and Y. Ishibashi*

Structural phase transitions of betaine phosphite studied by X-ray scattering

*K. Hasebe, K. Masuno, S. Nanitani, and T. Asahi*

Softening of low-frequency modes in ferroelectric  $\text{Bi}_3\text{TiNbO}_9$  and  $\text{Bi}_3\text{TiTaO}_9$

*I. Saitoh and S. Kojima*

Powder X-ray diffraction study of  $\text{Cs}_2\text{CoI}_4$  from room temperature down to 40 K

*T. Kurihama, F. Shimizu, and T. Izumi*

Micro-Raman scattering study of the phase transition of  $\text{K}_2\text{Mn}_2(\text{SO}_4)_3$

*A. Sakai, M. Kitoh, M. Negishi, and K. Itoh*

NMR and X-ray investigations of phase transition in  $\text{in}(\text{C}_2\text{H}_5)_{4/2}\text{ZnCl}_4$

*M. Machida T. Ishino, Y. Shimoikeda, S. Gondo, N. Koyano, and Y. Iwata*

Elastic properties of tetragonal  $\text{KH}_2\text{P}_2\text{O}_7$  by high-pressure Brillouin spectroscopy

*S. Sasaki, F. Nakashima, and H. Shimizu*

Modulated phases of  $\text{LiTiSO}_4$

*H. Kasano, S. Tsuchiyama, Y. Kawamura, and H. Mashiyama*

The secondary ferroelectricity along the *c*-direction of  $\text{Rb}_2\text{CoCl}_4$

*T. Yamaguchi and F. Shimizu*

The study on the dielectric property and structure of perovskite titanate  $\text{CdTiO}_3$

*P.-h. Sun, T. Nakamura, Y.J. Shan, Y. Inaguma, and M. Itoh*

A model of phase transition with breaking supersymmetry

*H. Mashiyama and K.T. Mashiyama*

Forty crystal structure analyses of  $\text{KH}_2\text{PO}_4$  in the paraelectric phase

*K. Itoh and M. Uchimoto*

The linear and nonlinear dielectric susceptibilities in the incommensurate phase

*M. Iwata, M.H. Kuok, H. Orihara, and Y. Ishibashi*

The effect of oxygen deficiency on soft modes in reduced hexagonal  $\text{BaTiO}_3$  studied by Raman scattering

*Y. Yamazaki, M. Kasahara, T. Yagi, and Y. Akishige*

Mechanism of transition between  $1q$  and  $3q$  incommensurate phases in two-dimensional crystal models

*S.V. Dmitriev, T. Shigenari, and K. Abe*

Ti-isotope effect on ferroelectric phase transition of  $\text{PbTiO}_3$

*H. Shigematsu, T. Futatsugi, and T. Matsui*

Comment on abnormality of structural phase transition in the  $\text{KNO}_3$  crystal

*Y. Takagi and A. Minoh*

Dielectric property in  $\text{K}_2\text{Fe}(\text{SO}_4)_2$

*H. Ishigami and M. Sumita*

Dielectric anomaly in hexagonal  $\text{ABX}_3$ -type antiferromagnets with successive structural phase transitions

*K. Morishita, N. Nakano, T. Kato, K. Itoh, and T. Mitsui*

Dielectric dispersion in  $\text{BaTiO}_3$  single crystal at low temperatures

*Y. Akishige, T. Nakanishi, and N. Mori*

Femtosecond time resolved impulsive stimulated raman scattering in KDP-type ferroelectrics

*T. Hikita, Y. Jiang, A. Satoh, and K. Itoh*

Specific heat and ESR study of langbeinite-type crystals

*T. Hikita, A. Onodera, and M. Tanimoto*

Mössbauer spectroscopy of some iron compound ferroelectrics

*T. Hikita, K. Itoh, K. Gesi, H. Ishigami, and H. Niida*

## SECTION II: RELAXORS AND DIPOLE GLASSES

Nonlinear dielectric response of relaxor ferroelectrics

*M.D. Glinchuk and V.A. Stephanovich*

Phase stability, dielectric and piezoelectric properties of relaxor based ferroelectrics

*N. Ichinose and Y. Yamashita*

Effect of MnO additive on  $\text{Pb}[(\text{Zn}_{1/3}\text{Nb}_{2/3})_{1-x}\text{Ti}_x]\text{O}_3$  Single Crystals

*K. Harada and Y. Yamashita*

Thermal relaxation dynamics in

<b>JCBSF-6 PAPERS</b>
-----------------------

TGS studied by time-resolved spectroscopy

*Y. Tsujimi, T. Matsui, H. Furuta, and T. Yagi*

Influence of  $\text{NH}_4$ -Rb substitution on the phase transitions with different kinds of proton disorder in mixed  $[(\text{NH}_4)_{1-x}\text{Rb}_x]_3\text{H}(\text{SO}_4)_2$  crystals

*A.I. Baranov, V.V. Dolabinina, E.D. Yakushkin, V.Yu. Vinnichenko, V.H. Schmidt, and S. Lancers-Mendez*

Nonlinear dielectric constant in relaxor ferroelectrics

*H. Orihara, R. Kamei, M. Iwata, Y. Ishibashi, H. Ohwa and N. Yasuda*

Effects of structure ordering, structure defects and external conditions on properties of complex ferroelectric perovskites

*A. Sternberg, L. Shebanovs, E. Birks, Y. Yamashita, M. Tyunina, and V. Zauls*

Structural and optical studies of development of the long-range order in ferroelectric relaxor

$\text{Pb}[(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3/9\%\text{PbTiO}_3]$

*Y. Uesu, Y. Yamada, K. Fujishiro, H. Tazawa, S. Enokido, J.M. Kiat, and B. Dkhil*

Tem observation of polar domains in relaxor ferroelectric  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$

*M. Yoshida, S. Mori, N. Yamamoto, Y. Uesu, and J.M. Kiat*

Application of seam and sam to ferroelectric and ferroelastic crystals

*F.M. Jiang, S. Kojima, B.Y. Zhang, and Q.R. Yin*

On the origin of the incommensurate phase in quartz

*T.A. Aslanyan, T. Shigenari, and K. Abe*

### SECTION III: NONLINEAR OPTICS

Second harmonic generation interferometer for structural studies of thin ferroelectric ceramic films

*O.A. Aktsipetrov, A.A. Fedyanin, A.A. Nikulin E.D. Mishina, A.S. Sigov., and N.E. Sherstyuk*

Growth of  $\text{K}_3\text{Li}_2\text{Nb}_5\text{O}_{15}$  and  $\text{KNbO}_3$  ferroelectric fiber crystals by pulling-down technique

*V.I. Chani, K. Nagata, and T. Fukuda*

Nonlinear optical spectroscopy of electronic transitions and domains in ferroelectric antiferromagnet  $\text{YMnO}_3$

*V.V. Pavlov, R.V. Pisarev, D. Fröhlich, and St. Leute*

Photorefractive effects in ferroelectrics as manifestation of structural violations on mesoscales

*I.F. Kanaev and V.K. Malinovsky*

Theory of optical property in  $\text{LiNbO}_3$ : elasto-optic and electro-optic effects

*W. Kinase, K. Ohi, K. Harada, H. Yagi, M. Inoue, M. Tashiro, S. Kashiwakura, H. Takei, and K. Nakamura*

A frustrated rotation of trimethylammonium molecule in

$(\text{CH}_3)_3\text{NHCl}$  studied by inelastic neutron scattering

*T. Oya, S. Gondo, H. Takakura, M. Machida, and N. Achiwa*

Temperature dependence of the Raman spectra in  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$

*H. Ohwa, M. Iwata, N. Yasuda, and Y. Ishibashi*

Average and local structures of  $\text{KBr}_{1-x}(\text{NO}_2)_x$  mixed crystals

*K. Yagi, T. Chibana, V.A. Shuvaeva, K. Sakaue, and H. Terauchi*

Phase transition in the relaxor  $\text{Pb}(\text{In}_{1/2}\text{Nb}_{1/2})\text{O}_3$

*K. Nomura, T. Shingai, N. Yasuda, H. Ohwa, and H. Terauchi*

Dielectric dispersion in  $\text{KTaO}_3$  by Li and Nb defects

*K. Ohi, K. Yoshida, and M. Oguro*

The origin of polar ordering in incipient ferroelectrics with weak off-center impurities

*V.S. Vikhnin, P.A. Markovin, and W. Kleemann*

Ferroelectric behavior and phase diagrams of  $\text{SrTiO}_3$ -based solid solutions

*M.E. Guzhva, V.V. Lemanov, P.A. Markovin, and T.A. Shuplygina*

Optical behavior of ferroelectric "single crystalline" films of vinylidene fluoride/trifluoroethylene copolymers

*Y. Tajitsu, M. Aoki, Y. Kamei, R. Nishina, H. Suzuki, and H. Ohigashi*

<b>JCBSF-6 PAPERS</b>
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Light deflection by antiferroelectric liquid crystals under electric bias field

*S. Tatemori, H. Uehara, J. Hatano, H. Saito, S. Saito, and E. Okabe*

Successive phase transition in an antiferroelectric liquid crystal having three isolated phenyl rings in the core

*H. Sato, J. Hatano, H. Uehara, H. Saito, S. Saito, and E. Okabe*

Dielectric relaxation study of ferroelectric liquid crystalline polymer (LCP1) in the smectic C\* and isotropic phases

*H. Miyata, M. Maeda, and I. Suzuki*

Dielectric relaxation study of a liquid crystalline side-chain siloxane polymer in the smectic a and isotropic phases

*H. Miyata, M. Maeda, and I. Suzuki*

The behavior of high temperature quantum paraelectricity in some perovskite titanates

*Y.J. Shan, T. Nakamura, P.H. Sun, Y. Inaguma, and M. Itoh*

Electric field dependence of a doublet in quantum-paraelectric SrTiO<sub>3</sub> studied by Brillouin scattering

*M. Watanabe, M. Yamaguchi, and T. Yagi*

Preparation of c-axis oriented (Nd, Ce)<sub>2</sub>cCuO<sub>y</sub> thin films by tripolar-type dc magnetron sputtering

*K. Takahashi, K. Tanaka, H. Ikeda, H. Suzuki, S. Tsutsumi, K. Fujikawa, J. Hatano, and A.L. Gruverman*

Epitaxy of K<sub>3</sub>Li<sub>2</sub>Nb<sub>5</sub>O<sub>15</sub> (KLN) films on KLN fiber crystal substrates

*V.I. Chani, K. Nagata, M. Imaeda, and T. Fukuda*

Growth and optical properties of SbNbO<sub>4</sub> films

*G. A. Mohamed, T. Yamazaki, N. Nakatani, J. Yuhara, and K. Morita*

Nonlinear optical properties of Ba<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub> thin films prepared by Nd<sup>3+</sup>:YAG (λ= 266 nm) laser ablation

*Y. Masuda, Y. Kidachi, S. Fujita, H. Masumoto, and T. Hirai*

Laser energy density and O<sub>2</sub> gas pressure effects on the fabrication of Ba<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub> thin films by pulsed laser ablation method

*S. Ando, K. Konakahara, and T. Tsukamoto*

Ferroelectric properties of bismuth layer-structured oxides

*K. Komura, H. Nagata, and T. Takenaka*

Ferroelectric properties of Rb<sub>2</sub>CdI<sub>4</sub>

*F. Shimizu, M. Takashige, T. Kurihama, and T. Yamaguchi*

#### SECTION IV: NEW PHENOMENA AND NEW MATERIALS

Effect of Nd<sup>3+</sup> doping upon ferroelectric properties of LaBGeO<sub>5</sub> crystals

*B.A. Strukov, Y. Uesu, A. Onodera, N. Gorshkov, and I.V. Shnaidshstein*

Self-ordering of polar merocyanine

dye molecules in Langmuir-Blodgett films

*N. Kato, H. Aida, K. Saito, and Y. Uesu*

Effect of firing atmosphere on Pb(Co<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>-PZT ceramics

*T. Ogawa, M. Ogawa, T. Koide, T. Fujii, and H. Matsumoto*

Ferroelectricity in complex chalcogenides M'M''P<sub>2</sub>X<sub>6</sub> (M', M'' - Sn, Pb, Cu, In, Cr; X - S, Se)

*Yu. Vysochanskii*

#### SECTION V: FERROELASTICITY, THIN FILMS AND APPLICATIONS

Peculiarities of domain wall dynamics in ferroelastic phase of

Ba<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub>  
*S.A. Gridnev, A.V. Biryukov, and O.N. Ivanov*

Preparation of LiNbO<sub>3</sub> thin films by bias sputtering

*T. Nishida, T. Shiosaki, T. Horiuchi, and K. Matsusige*

Oriented Sr<sub>0.48</sub>Ba<sub>0.51</sub>La<sub>0.01</sub>Nb<sub>2</sub>O<sub>6</sub> thin films prepared on Pt/Ti/SiO<sub>2</sub>/Si(100) substrate by pulsed laser deposition

*H. Xu, R. Kubo, Y. Yoshino, M. Noda, and M. Okuyama*

Electron emission in ferroelectrics with different value of coercive field

*A.S. Sidorkin, S.D. Milovidova, N.Yu. Ponomareva, and O.V. Rogazinskaya*

Recent applications of relaxor materials

*Y. Yamashita, K. Harada, and S. Saitoh*

<b>JCBSF-6 PAPERS</b>
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## SECTION VI: ORIGIN OF FERROELECTRICITY AND HYDROGEN BOND SYSTEMS

Origin of ferroelectricity in SbSI  
*A. Audzijonis, J. Grigas, A. Kajokas, S. Kvedaravicius, and V. Paulikas*

The shear-stress-induced ferrodistortive phase transition in  $\text{KHCO}_3$  studied by Brillouin scattering  
*S. Takasaka, Y. Tsujimi, and T. Yagi*

Magnetoelectric effect of  $\text{TmMn}_2\text{O}_5$   
*M. Uga, N. Iwata, and K. Kohn*

Polar direction of  $\text{NaNO}_2$  crystal induced by an AC electric field  
*Y. Tokugawa and Y. Yamada*

Discrimination of ferroelectrics from quantum paraelectrics among perovskite titanates  $\text{ATiO}_3$  and  $(A'_{1/2}A''_{1/2})\text{TiO}_3$   
*T. Nakamura, Y.J. Shan, P.-h. Sun, Y. Inaguma, and M. Itoh*

An isotropic polarization fluctuation due to the ice rule in ICE Ih  
*T. Yoshida and M. Tokunaga*

Neutron diffraction study on the crystal structures of deuterated and nondeuterated  $\text{LiTiC}_4\text{H}_4\text{O}_6 \cdot \text{H}_2\text{O}$  (LTT)  
*Y. Iwata, N. Koyano, M. Machida, and K. Deguchi*

Raman and Brillouin studies on solid HCl under high pressure and low temperature  
*T. Kume, T. Tsuji, K.*

*Kamabuchi, S. Sasaki, and H. Shimizu*

Dielectric relaxation in ferroelectric  $(\text{CH}_3)_2\text{NH}_2\text{H}_2\text{PO}_4$  and its isotope effect  
*M. Komukae, T. Irieda, J. Hatori, and T. Osaka*

Dielectric and thermal studies of phase transition in  $(\text{CH}_3)_2\text{NH}_2\text{H}_2\text{AsO}_4$   
*J. Hatori, K. Tsuri, K. Deguchi, M. Komukae, and T. Osaka*

Raman scattering study of  $\text{Rb}_3\text{D}_x\text{H}_{1-x}(\text{SeO}_4)_2$   
*M. Kasahara and T. Yagi*

Raman scattering study of  $\text{Rb}_3\text{D}_x\text{H}_{1-x}(\text{SO}_4)_2$   
*J. Watanabe, M. Kasahara, and T. Yagi*

Hydrogen ordering pattern of  $\text{K}_3\text{D}(\text{SO}_4)_2$  in low temperature phase  
*I. Tamura and Y. Noda*

Effect of hydrostatic pressure on the structural phase transitions in ferroelectric  $(\text{CH}_3\text{NH}_3)\text{AlX}_5 \cdot 6\text{H}_2\text{O}$  (X: Cl, Br)  
*K. Gesi*

X-ray study of ferroelastic phase transition in  $\text{CsLiCrO}_4$  crystals  
*I. Hashiguchi, Y. Watanabe, and A. Sawada*

Ferroelectricity of  $\text{SmMn}_2\text{O}_5$   
*T. Fujita and K. Kohn*

Magnetoelectric effect and rare earth magnetic ordering of  $\text{ErMnO}_3$   
*N. Iwata and K. Kohn*

Ferroelectric transitions of  $\text{LuMn}_2\text{O}_5$   
*I. Kagomiya and K. Kohn*

Ferrotoic phase transition in boracites  
*D.G. Sannikov*

The surface images of monoclinic domains in  $\text{NdP}_5\text{O}_{14}$  and  $\text{WO}_3$  by atomic force microscope  
*S.I. Hamazaki, N. Tashiro, Y. Fukurai, F. Shimizu, M. Takashige, and S. Kojima*

Growth and domain structure of LATGSP single crystals  
*T. Yamazaki, G.A. Mohamed, M. Shish, and N. Nakatani*

Translational vibrations of domain bin ferroelectrics with defects  
*A.S. Sidorkin and A.S. Sigov*

## SECTION VII: DOMAINS

Nucleation and growth of incommensurate phase in the C-to-IC transition of sodium nitrite  
*K. Hamano, K. Abe, and T. Mitsui*

Simulation study of zigzag domain boundary formation in ferroelectric-ferroelastics using the TDGL equation  
*A. Kuroda, K. Ozawa, Y. Uesu, and Y. Yamada*

Grain size-dependent switching in barium titanate ferroelectric ceramics analyzed by means of their Landau coefficients  
*D. Ricinchi C. Harnagea, and M. Okuyama*

X-ray study of proper ferroelastic phase transition in lithium ammonium tartrate crystal  
*A. Sawada, M. Ishida, and Y. Watanabe*

<b>JCBSF-6 PAPERS</b>
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Phase diagram and heterophase structure of the  $K_2Cd_{2X}Mn_{2(1-X)}(SO_4)_3$  solid solutions

*R. Vlokh, Z. Czaplá, B. Kosturek, I. Skab, O.V. Vlokh, and I. Girnyk*

Polarization reversal and domain wall mobility in polar commensurate phases

*J. Hlinka, H. Orihara, T. Nagaya, and Y. Ishibashi*

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### ***OPTICAL DISK DRIVE OF THE FUTURE***

*Michael Thomas from Colossal Storage  
announces a new technology with patents pending on future optical holograph storage.*

Colossal Storage technology provides a new way of reading and writing to a ferroelectric disk storage media utilizing the theory of quantum electronics to control molecular properties by atom electron movement/displacement.

The colossal drive employs ultraviolet laser diodes with voltage transducer to write and UV laser diodes and nanooptical transistors or nanofloating gate MOSFETs to read.

Ferroelectric molecules in different orientations can affect the UV photon parameters, such as diffraction, reflectivity, transmittivity, surface topography/morphology, electrostatic field strength and +/- vector voltage polarity.

Colossal Storage technology allows for infinite nondestructive reads of data on the ferroelectric disk.

Colossal Storage has focused on NAS (Network ñ Attached Storage) as core user of this technology.

The cost of the colossal drive will equal today's hard drive cost, ~ \$.02/megabyte, with much higher disk spindle speeds (over 10,000 RPM) and higher bandwidth data transfer rate parameters (over 500 MBPS).

The colossal optical drive density is 40 gigabits/sq in up to 500 gigabits/sq in, compared with around 4 gigabits/sq in maxing at ~16 gigabits of today's hard drives and optically assisted drives maxing out at ~40 gigabits/sq in, and contact recording atomic force microscopes, maxing out at ~300 gigabits/sq in.

Other Colossal Storage patents cover the ability to do holographic and 3D storage, increasing densities even further.

The Colossal Storage optical drive will offer infinite double-sided read and writes for the retention of data storage for ten years or more.

Colossal Storage hopes to find a business partner with assets and capabilities to move forward on production development of this unique storage device of tomorrow.

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<b>IMFS-7 PAPERS</b>
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**THE SEVENTH SYMPOSIUM ON FERROELECTRIC SEMICONDUCTORS (IMFS-7)**

The Seventh Symposium on Ferroelectric Semiconductors took place on 25-27 September 1996 at Rostov-on-Don, Russia. A. A. Grekov and S. Kramarov, guest editors of the proceedings, wrote that "the semiconducting properties of ferroelectric crystals and ceramic materials have been the major interest of the physics community of Rostov State Pedagogical University during the last 20 years. This is why the International Symposium on Ferroelectric Semiconductors (IMFS) traditionally has taken place at Rostov-on-Don."

The symposium featured 27 invited lectures and 94 oral and poster presentations. The reports by young scientists, whose number increased noticeable over IMFS-6, showed a remarkable degree of competence. Two new directions of activity surfaced in the course of the discussions:

The first relates to the creation of a new family of "active" materials, such as high temperature superconductors with layered perovskite-like structures. The composition and structure of most known ferroelectrics are almost the same as HTS materials. The fundamental question concerns the nature of the tremendous differences in the electrodynamic properties of the materials extracted from the neighboring domains of the  $T_c$  phase diagram. The second direction is defined by the creation of a new mathematical approach to the theory of the ceramic's sintering. It helps to define a rather new technology and creates rigid, durable ceramic materials with stable dielectric properties.

The meeting was sponsored by the Russian Fund for Basic Research, the Russian Academy of Education, the Science Council on Ferroelectrics and Dielectrics of the Russian Academy of Sciences, the Rostov State University, and the Rostov-on-Don Pedagogical Institute.

The proceedings are published in the journal *Ferroelectrics*, Volume 214 Numbers 3-4 (1998).

The following lists the topics and authors of presentations delivered at IMFS-7.

Polarization distribution in Ferroelectric-semiconductor $\text{Sn}_2\text{P}_2\text{S}_6$ in the phase transition region <i>A.A. Bogomolov, A.V. Solnyshkin, O.N. Sergeeva, S.V. Ershov and M.M. Major</i>	<i>Babanskikh, and V.A. Titov</i> A study of the electrophysical parameters of some solid solutions of the $\text{Pb}_{0.88}\text{Ba}_{0.88}\text{Sr}_{0.44}\text{Ti}_x\text{Zr}_{1-x}\text{O}_3$ system <i>L.E. Pustovaja, Yu.N. Zakharov, A.A. Nesterov, I.N. Zakharchenko and T.G. Lupeiko</i>	<i>Myasnikov</i> Study of spectra of $\text{CdSnO}_3$ monocrystal <i>E.N. Myasnikov, R.I. Spinko, E.A. Shalaeva, and T.P. Myasnikova</i>
Characteristic behavior of non-stationary shorted photocurrent in $\text{Sn}_2\text{P}_2\text{S}_6$ films in the phase transition region <i>A.A. Bogomolov, O.V. Malyshkina, A.V. Solnyshkin, I.P. Raevsky, N.P. Protzenko, and D.N. Sandjiev</i>	Dynamic born charges and the problem of phase transitions in ferroelectric semiconductors <i>A.V. Turik and A.G. Khasabov</i> Nonlinear charge transport phenomena in polycrystalline ferroelectric semiconductors <i>A.N. Pavlov and I.P. Raevski</i>	Low-frequency dielectric dispersion and electrical properties of monoclinic tellurium acid ammonium phosphate crystals <i>N.D. Gavrilova, I.A. Malyshkina, and N.N. Bolshakova</i>
Bending vibrations of ferroelectric monomorphs <i>V.Z. Borodin, A.V. Prihod'Kov, Yu.N. Zakharov, V.A.</i>	The mass of the large radius polaron <i>A.E. Myasnikova and E.N.</i>	Doping influence on the physical properties of $\text{Bi}_2\text{TeO}_5$ single crystals <i>K.V. Domoratsky, A.Yu. Kudzin, L.Ya. Sadovskaya, and G.Ch. Sokolyanskii</i> Anomalous behavior of dielectric

<b>IMFS-7 PAPERS</b>
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permittivity of lithium sulfate monohydrate after thermal shock  
*N.D. Gavrilova, A.M. Lotonov, and T.B. Frolova*

Magnetically stimulated current oscillations in modified antimony sulfoiodide  
*E.V. Stitsenko*

Prediction of technological stability of polycrystalline ferroelectric semiconductors using as an example lead ferroniobate  
*A.A. Grekov, Yu.V. Dashko, L.M. Katsnelson, and S.O. Kramarov*

Thermal stresses in ferroelectric ceramics  
*S.O. Kramarov and Yu.V. Dashko*

Analysis of physical mechanism of field electron emission from ferroelectrics  
*V.Sakhnenko, V. Rudkovskii, and V. Borodin*

New binary systems of solid solutions based on Na  
*L.A. Reznitchenko, N.V. Dergunova, G.A. Geguzina, O.N. Razumovskaya, L.A. Shilkina, and L.S. Ivanova*

Correlation between the microstructure of ferroelectric ceramics and their chemical and phase composition, the degree of perfection of the crystal structure and the preparation conditions  
*A.Ya. Dantsiger, L.A. Reznitchenko, S.I. Dudkina, O.N. Razumovskaya, and L.A. Shilkina*

Atomic substitution effects in binary solid solution systems based upon  $\text{NaNbO}_3$   
*G.A. Geguzina, L.A. Reznitchenko, and N.V. Dergunova*

The stabilization of the properties of ferro-piezoelectric ceramics for filters  
*S. Gavrilyatchenko, V. Gavrilyatchenko, and L. Reznitchenko*

Viscosity effects and switching processes in  $\text{BaTiO}_3$  crystals  
*M.V. Kolysheva*

Thermoelectret state in mn, Cr-doped  $\text{Bi}_{12}\text{SiO}_{20}$  crystals  
*T.V. Panchenko, Yu. Potapovich, and L.M. Karpova*

Injection process kinetics for ferroelectric semiconductor struc-

tures  
*S.V. Tolstousov and E.N. Myasnikov*

The influence of macroscopic inhomogeneities on charge transport in ferroelectric crystal  $\text{LiNbO}_3$   
*I.F. Kanaev, V.K. Malinovsky, A.V. Novomlntsev, and A.M. Pugachev*

Elastic and anelastic properties of  $\text{CsH}_2\text{AsO}_4$  crystal in the paraelectric phase  
*S.A. Gridnev and S.A. Kravchenko*

Dielectric hysteresis loops dispersion in TGS crystals  
*B.N. Prasolov, M.Y. Palagin, and V.V. Gorbatenko*

The influence of a constant electric field on relaxation processes due to the interaction of domain boundaries and mobile point defects in TGS  
*B. Prasolov, N. Postnikova, and I. Safonova*

Conductivity of single crystal  $\text{LiNbO}_3$  annealed in  $\text{H}_2$  atmosphere  
*L.D. Kaverin and L.N. Korotkov*

Volumes 221 Numbers 1-4 (1999) and 222 Numbers 1-4 (1999) of *Ferroelectrics* contain the proceedings of

**The Fifth International Symposium on  
Ferroic Domains and Mesoscopic Structures (ISFD-5)**

held at Pennsylvania State University, Pennsylvania, USA  
6-10 April 1998

## PUBLICATIONS

### **MAY MRS BULLETIN HIGHLIGHTS 1998 MRS FALL MEETING PRESENTATIONS**

The May issue of *MRS Bulletin* features articles based on presentations from the recipients of the Society's Von Hippel Award and Turnbull Lectureship.

#### **Medical Materials for the Next Millenium**

*based on the 1998 Von Hippel Award presentation by Larry L. Hench (Imperial College of Science, Technology, and Medicine).*

Due to longer life expectancies during the next century, there is a growing need for artificial prosthetic implants. Developed in the late 1960s by Hench, Bioglass™ was found to bond with bone very well. Moreover, in 1980 it was discovered that Bioglass™ is the only synthetic material to bond well with soft tissue. The future looks very promising. The major goal is regeneration of tissue and bone, and Bioglass™ has been shown to stimulate growth of new bone material.

#### **Unsolved Mysteries of Water in Its Liquid and Glass States**

*based on the 1998 MRS David Turnbull Lecture by H. Eugene Stanley (Boston University).*

Stanley's presentation examined how the low-temperature glassy phase of water provides clues to understanding water in its liquid phase. Linus Pauling recognized that the distinguishing feature of H<sub>2</sub>O compared to other seemingly similar materials was the preponderance of hydrogen bonds. "It's a hydrogen-bonded gel with a very, very short bond life," Stanley recounted, "and therefore water doesn't behave like jello, but flows just like any other liquid."

#### **Partially Disordered Inorganic Materials**

by Anthony K. Cheetham (University of California at Santa Barbara).

"Crystals are like people; it is the defects in them that tend to make them interesting." While not all scientists will concur with this statement by John Meurig Thomas, there is no doubt that the presence of defects in crystals and other solid materials can have a profound effect upon their chemical and physical properties and, consequently, that defect can have a major impact on the practical utility of many technological materials. The focus of the proposed thematic issue is on systems that are partially disordered, spanning the range between, but not including, sodium chloride and an amorphous material. Even within this range the aim is not to be comprehensive, and for practical reasons coverage will be restricted to inorganic materials and hybrid inorganic-organic systems.

Published monthly, *MRS Bulletin* delivers news, breakthroughs, and reviews. Spanning a wide range of leading-edge materials developments, plans include

- gas sensing materials
- corrosion science
- nanoscale wire formation
- applications of rare-earth doped materials
- materials science of the cell
- advanced materials for energy storage
- neutron scattering.

Single copies of *MRS Bulletin* are \$16. The 1999 subscription rate is \$155 in the US and \$215 elsewhere.

#### **Contact**

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email: info@mrs.org

Volume 220, Numbers 3-4 (1999) of *Ferroelectrics*  
is a special issue on  
**Ferroelectric and Related Models in Biological Systems**

A collection of papers from the  
**Second Workshop on Nonlinear Models of Biomembrane Molecular Structures**  
held in Pushchino, Russia, 26 June - 1 July 1995  
&  
**The Workshop on Condensed-state Models of Voltage-dependent Ion Channels**  
Kansas City, Missouri, USA, 25 February 1998

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**UPCOMING MEETINGS**

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**SPIE's 1999 Symposium and Education Program on Microelectronic Manufacturing  
19 - 23 September 1999  
Santa Clara Marriott, Santa Clara, California, USA**

Sponsored by the International Society for Optical Engineering (SPIE), this year's symposium provides a large number of papers and posters covering cutting-edge manufacturing technologies that impact the current and future production of microelectronics.

**Symposium:** 22-23 September 1999

**Continuing Education Program:** 19-23 September 1999

**Exhibit:** 21-22 September 1999

**Technical Conferences**

- Plenary Session:
  - Scaling the gate dielectric  
*David J. Eaglesham, Lucent Technologies/Bell Labs*
  - Integration challenges at 0.15 $\mu$ m technology node  
*Dr. Farhad Moghadam, Applied Materials*
  - Mainstreaming SOI CMOS technology  
*Ghavam G. Shahidi, Advanced Silicon Technology Center (ASTC), IBM Microelectronics Division*
- Microelectronic device technology
- Process, equipment, and materials control in IC manufacturing
- Multilevel interconnect technology
- In-line methods and monitors for process and yield improvement

**Continuing Education Program**

- Diagnostics, yield, and reliability
  - Semiconductor characterization, reliability, and failure analysis
  - MOS gat dielectrics: Process, technology, and reliability
  - Chip reliability
  - Submicron device physics and technology
  - Use of focused ion beams in microelectronics
- Device and process technology
  - Vertical scaling for deep submicron devices: Dielectrics, dopants, and contacts
  - Dry etching in microelectronic manufacturing
  - Advanced silicon wafer cleaning
  - Process integration and device characterization in microelectronic manufacturing
  - Multilevel interconnect technology
  - Copper interconnect technology
- Microlithography and patterning
  - Practical process design for microlithography
  - Extending semiconductor lithography resolution using image process integration
- Micromachining and microfabrication
  - Polysilicon surface micromachine technology and devices
  - Process integration for high aspect ratio microstructures

**UPCOMING MEETINGS**

**Workshop on "Fundamental Physics of Ferroelectrics"  
13 - 20 February 2000  
Aspen, Colorado, USA**

There will be a workshop on "Fundamental Physics of Ferroelectrics" at the Aspen Center for Physics, 13-20 February 2000. As the Y2K sequel to the Williamsburg workshops on fundamental experiments and first-principles calculations for ferroelectrics, this should be a memorable event, summarizing the previous decade of fundamental research on ferroelectrics and leading into the future.

Further information on the Aspen Center for Physics is available at

<http://andy.bu.edu/aspen/>

Information on the workshop is available under

<http://www.gl.ciw.edu/GL-Conferences.html>

Participation is limited to about 100 people, and the deadline for registration is 1 November 1999.

**Organizers**

Ronald Cohen, Carnegie Institution of Washington

Karin Rabe, Yale University

**Contact**

Ronald Cohen, Geophysical Laboratory, Carnegie Institution of Washington

5251 Broad Branch Rd., NW, Washington, DC 20015

phone and fax: 202-537-3951

**Website**

<http://www.gl.ciw.edu/GL-Conferences.html>

**email**

[cohen@gl.ciw.edu](mailto:cohen@gl.ciw.edu)

***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**

The PDF file format maintains the graphics and organization of the printed newsletter. Adobe Acrobat Reader is a helper application distributed free for Web browsers. Acrobat is available for Macintosh, Windows, DOS, SGI, and Sun SPARC operating systems.

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**fax: +831-655-3734 e-mail: [liebmann@redshift.com](mailto:liebmann@redshift.com) or [rpanholzer@nps.navy.mil](mailto:rpanholzer@nps.navy.mil)**

**mail: Hannah Liebmann, 500 Glenwood Circle, Suite 238, Monterey, CA 93940-4724 USA**

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<b>UPCOMING MEETINGS</b>
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**12th International Symposium on Integrated Ferroelectrics (ISIF 2000)****12 -15 March 2000****Aachen, Germany**

This is the first time that ISIF is held outside the United States of America, which clearly shows the interest in integrated ferroelectric technology on an international scale.

Substantial progress has been made in the science and technological applications of ferroelectric thin films, which promises a bright future for potential new technologies. Applications of ferroelectrics have achieved enough maturity to define the industry as a highly active field of research and commercialization.

The work on high permittivity thin films suggests that these materials may play a fundamental role in a new generation of DRAMs. The field of ferroelectric/piezoelectric materials is experiencing considerable growth due to the potential applications in MEMS technologies. Other important fields attracting attention are pyroelectric sensors, integrated high-frequency devices and electrooptical components. In addition, hot topics, such as nanotechnology and the exploitation of nanosize effects, will be addressed.

**Topics**

- Device integration issues
- Materials processing and integration
- Testing and characterization
- DRAMs and materials
- FeRAMs and materials
- Modeling and theory
- High-frequency devices
- Pyroelectric and optical applications
- Piezoelectric and MEMS applications
- Nonvolatile memory applications
- Nanotechnology and nanosize effects

**Call for Papers**

Authors are invited to submit a 300-word abstract by 31 October 1999. Abstracts are requested on state-of-the-art topics that reflect the maturity of the field and research problems that continue to challenge workers in this areas. Submitted papers should deal with the topics listed, but other topics of relevance to the field are solicited.

ISIF 2000 abstracts will only be accepted in electronic format using either Web submission (preferred) or email. Please use only one method of sending your abstract.

**Hard copies will not be accepted!**

Web submission (preferred):

**<http://www.isif.rwth-aachen.de>**

Instructions for abstract submittal are given at this site.

Email submission:

**[isif2000@iwe.rwth-aachen.de](mailto:isif2000@iwe.rwth-aachen.de)**

Please format the abstracts on an 8.5" x 11" area with the title centered in UPPER CASE, leaving a two-line spacing, followed by the name(s) of the author(s) and affiliation CENTERED. Do not include pictures or graphs.

**UPCOMING MEETINGS**

Abstracts will also be accepted as Word 6.0 (or higher) documents sent as email attachments.

**Please submit all abstracts by 31 October 1999**

Abstracts will be reviewed and authors will be informed of acceptance and the allotted time for presentation as soon as possible.

**Poster Session**

ISIF 2000 will again feature a poster session. Please indicate on your abstract if you prefer the poster session.

**Tutorial Sessions**

Four tutorial sessions, which will run consecutively, are planned for Sunday, 12 March 2000. The topics will be announced later.

**Organization/Company Exhibits**

If your organization or company wishes to have an exhibit or display during the symposium, please indicate that on your preregistration.

**Preregistration**

Send your name, institution, complete address, phone, fax, and email to:

Forschungszentrum Jülich GmbH, Conference Service, D-52425 Jülich, Germany

phone: +49-24-61-61-30-08; fax: +49-24-61-61-38-30; email: a.deussen@fz-juelich.de

**For further requests, please contact**

Kerry Baugh, Symposium Coordinator, University of Colorado at Colorado Springs

1867 Austin Bluffs Parkway, Suite 201, PO Box 7150, Colorado Springs, CO 80933-7150, USA

phone: +719-262-3488; email: isif@mail.uccs.edu

**(Do not use this email address for abstract submission.)**

**5th International Conference on Organic Nonlinear Optics (ICONO'5)  
12 - 16 March 2000  
Davos, Switzerland**

Optical wave manipulation is one of the future technologies for optical processing and communication. Organic nonlinear optical materials are thought to have a key role in those technologies, and a lot of effort to develop new molecules/materials as well as fundamental understanding is under way throughout the world.

The first International Conference on Organic Nonlinear Optics (ICONO'1), with Dr. F. Kajzar as chairman, was held in Val Thorens, France, in January 1994, with more than 140 participants from 12 countries around the world. It was strongly recognized among participants during the conference that the direct exchange of newest experimental results and relevant ideas on nonlinear optics is an excellent way to promote this research field.

The following ICONO'2 (chairman Professor Seizo Miyata, 1995, Kusatsu, Japan), ICONO'3 (chairman Professor M. Kuzyk, 1996, Marco Island, USA), and ICONO'4 (chairman Professor H. Sasabe, 1998, Chitose, Japan), were also very successful.

ICONO'5 intends to achieve international exchange of information and cooperation among researchers in academia,

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**UPCOMING MEETINGS**

government laboratories, and industries and to stimulate growth in the field of organic nonlinear optics.

**Topics**

- Fundamental studies
- Novel molecular design and synthesis
- Crystal growth of organics
- Poled polymers for second harmonic generation and electrooptic devices
- Optical amplification, switching, memories
- Wave mixing and phase conjugation
- Fibers and waveguides
- Ultrafast nonlinear optics in organic materials
- Photorefractive effects
- Nonlinear optical information storage
- Novel nonlinear optical phenomena and applications
- Optical parallel processing
- Display applications (organic light-emitting diodes, spatial light modulators)

**Abstracts**

Authors are requested to submit an abstract (100 words) by **30 September 1999**.

**Preregistration**

To receive the second circular, visit the ICONO'5 home page at

**<http://www.icono5.ethz.ch>**

and fill in the on-line mailing list subscription form. Or you can also send your name, full address, and email address to the contact address.

**Contact**

Conference Secretariat, Christian Bosshard, Nonlinear Optics Laboratory, Institute of Quantum Electronics, ETH Hönggerberg, HPF E14, CH-8093 Zürich, Switzerland  
phone: +41-1-633-2329; fax: +41-1-633-1056; email: [icono5@wntweb.ethz.ch](mailto:icono5@wntweb.ethz.ch)  
home page: **<http://www.icono5.ethz.ch>**

**Materials Research Society 2000 Spring Meeting**  
**24 - 28 April 2000**  
**San Francisco, California, USA**

The first MRS Spring Meeting of the new millenium will feature 34 symposia that highlight new advances in the synthesis and application of materials in fields ranging from advanced integrated circuits to biomaterials.

The scientific sessions will include many new and developing areas of materials science in addition to some well-established and popular topics. Several silicon processing symposia will cover areas from dopant-defect interactions, silicides, and dielectrics to interconnects. Thin-film materials and processes will be well presented, featuring magnetoelectronics, polycrystalline films, corrosion and epitaxy of oxides and semiconductors. Symposia on materials processing and devices will bring us the state of the art in flat panel display, wide-bandgap devices, and novel oxide-based devices. Interesting materials, such as optoelectronic polymers and thermoelectrics will also be discussed. MRS will host two new symposia on millimeter-wave technology for materials characterization and on direct



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**UPCOMING MEETINGS**

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write technologies. The strong interest of MRS in soft materials will be continued with topics covering polymer nanostructures, organic/inorganic hybrids, and the granular state. There will also be two symposia dedicated to materials modeling and, for the first time on the West Coast, a symposium on materials education. A symposium on analyzing, predicting, and preventing disasters will include many good examples of when materials really matter.

Symposium X will feature topics on the forefront of materials science. To complement the scientific sessions, tutorial sessions associated with several symposia will provide a detailed introduction into particularly exciting areas of research. Also, the exhibit will showcase products of interest to the materials community.

**Abstracts**

For abstracts submitted by email, fax, or mail, the deadline is **18 October 1999**.

Send your email request for a template to [spring2000@abstracts.mrs.org](mailto:spring2000@abstracts.mrs.org) beginning 1 October 1999.

The most effective way to submit an abstract is via the MRS Website—the choice of more than 90 percent of submitting authors. The deadline for abstracts submitted via the MRS Website is **1 November 1999**.

**Proceedings**

A number of symposia from this meeting will publish proceedings in the MRS Symposium Proceedings series.

**2000 MRS Spring Meeting Chairs**

For specific technical program information, contact any of the following persons:

**Anna C. Balazs**, University of Pittsburgh, Department of Chemical Engineering  
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**Website**

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

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**UPCOMING MEETINGS**

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**The 5th European Conference on the Application of Polar Dielectrics (ECAPD-5)  
27 - 30 August 2000  
Jurmala, Latvia**

The rapid development of materials research, device research, and understanding of basic properties of polar dielectrics and the quality of work done in Europe in this field justify the decision that after Zürich (1988), London (1992), Bled (1996), and Montreux (1998) the conference series should be continued regularly.

**Topics**

- Materials research of inorganic and organic single crystals, thin films, ceramics, polymers, composites, and liquid crystals
- Basic research of device oriented physical properties of dielectrics: Ferro-, piezo-, and pyroelectric properties, electrooptical and nonlinear optical effects, photorefractivity, and photoconductivity
- Device research: Piezoelectric transducers, smart sensors and actuators, pyroelectric detectors, electrooptical (spatial) light modulators and displays, 2D and 3D storage devices, optical signal processors, ferroelectric thin film memories. integrated optical devices, and microelectromechanical systems
- Processing technologies and transfer from research to the industry

**International Organizing Committee**

F. Agullo-Lopez (Madrid, Spain); D. Bauerle (Linz, Austria); R. Blinc (Ljubljana, Slovenia); J. Fousek (Prague, Czech Republic); P. Gunter (Zürich, Switzerland); B. Hilczer (Poznan, Poland); A. Krumins (Riga, Latvia); V. Lemanov (St. Petersburg, Russia); F. Micheron (Guyancourt, France); N. Setter (Lausanne, Switzerland); H. Thomann (Munich, Germany); R. Whatmore (Cranfield, UK); M. Zgonik (Ljubljana, Slovenia)

**Local Organizing Committee**

A. Krumins (chairman); A. Jozepa, J. Kotomin, D. Millers, M. Ozolinsh, E. Serdiene, and A. Sternberg

**Preregistration**

In order to receive the second circular, send your name, address, phone and fax numbers, email address to the contact person listed below. Please indicate if you want to present a paper.

**Contact**

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phone: +371-718-7816; fax: +371-711-2583; email: [eva@cfi.lu.lv](mailto:eva@cfi.lu.lv)

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**CONGRESSIONAL SCIENCE AND ENGINEERING FELLOWSHIP**

The Optical Society of America (OSA) and the Materials Research Society (MRS) seek applicants for the 2000-2001 Congressional Science and Engineering Fellowship. The Fellowship provides one scientist each year with valuable public-policy learning experience. In addition, it has contributed to the more effective use of optical and materials science knowledge in government and has broadened awareness about the value of scientist and engineer-government interaction among OSA and MRS members and within the federal government.

Good communication skills are extremely important. Applicants are expected to be OSA or MRS members and have earned a PhD degree. The one-year appointment will begin on 1 September 2000. Application deadline: 14 January 2000.

For further details please contact MRS at [oare@mrs.org](mailto:oare@mrs.org) or OSA at [ebaldw@osa.org](mailto:ebaldw@osa.org), or access the MRS website at [www.mrs.org](http://www.mrs.org)

**UPCOMING MEETINGS**

**Electroceramics VII  
3 - 6 September 2000  
Portoroz, Slovenia**

**Topics**

- Dielectric materials, devices, and applications
- Ferroelectric, piezoelectric, and pyroelectric materials, devices, and applications
- Grain boundary controlled processes and devices
- Ionic and electronic conductors
- Superconductors
- Magnetic materials, processing, and applications
- Microwave materials and applications
- Optical ceramics, photonics
- Processing, sintering, and microstructure development of electroceramics
- Transport phenomena, defects, diffusion, electric conductivity
- Microanalysis of electroceramics
- Nanomaterials, nanostructures, nanotechnologies
- Ferroelectric thin films
- Multilayer structures
- Composite materials
- Electronic packaging

**Important Dates**

- 15 September 1999: Preregistration
- October 1999: 2nd announcement and call for papers
- 28 February 2000: Abstract deadline
- 30 April 2000: Notification of acceptance
- 1 June 2000: Registration
- 3 September 2000: Receipt of manuscripts

**Preregistration**

Send your name, address, phone and fax numbers, and email address to the contact person listed below. Please also indicate if you plan to submit an abstract and if so, give the title.

**Organization**

Professor Marija Kosec (Jozef Stefan Institute, Ljubljana, Slovenia), chairperson

**Contact**

Sanja Fidler and Dr. Barbara Malic, Electroceramics VII-2000 Secretariat, Ceramics Department, Jozef Stefan Institute  
Jamova 39, 1000 Ljubljana, Slovenia  
phone: +386-61-177-3353; fax: +386-61-126-3126; email:ele-ceram@ijs.si

**Website**

<http://www2ijs.si/ele-ceram/welcome.html>

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<b>UPCOMING MEETINGS</b>
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**3rd Asian Meeting on Ferroelectrics (AMF-3)  
12 - 15 December 2000  
Hong Kong, China**

This meeting aims to provide a forum for reviewing the recent developments in the field of ferroelectrics, covering the full range of physical phenomena and applications.

**Topics**

- Theories and fundamental phenomena of ferroelectrics
- Novel materials and experimental techniques
- Crystals and ceramics
- Ferroelectric polymers and composites
- Glass and amorphous systems, nanostructures
- Dielectric, piezoelectric, and pyroelectric properties
- Optical properties and nonlinear phenomena
- Domains and boundaries
- Surfaces, interfaces, and defects
- Relaxor ferroelectrics
- Processing of ferroelectric materials
- Ferroelectric thin films and memory devices
- Applications: Sensors, actuators, transducers, and microwave devices
- Ferroelectrics and microelectromechanical systems (MEMS)
- Electrooptics, displays, and infrared imaging
- Energy storage, wireless communications, and optical data storage

**Important Dates**

- 1 March 2000: Abstract deadline
- 1 July 2000: Notification of acceptance
- 1 September 2000: Early registration deadline

**Proceedings**

The proceedings of AMF-3 will be published by Gordon and Breach Science Publishers as a special issue of the journal *Ferroelectrics*.

**Executive Committee**

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## CALENDAR OF EVENTS 1999

Aug 29-  
Sep 3 • 7th International Conference on Ferroelectric Liquid Crystals (FLC 99), Darmstadt, Germany  
(see *Ferroelectricity Newsletter*, Vol. 7, No. 1, p. 23)

Sep 14-18 • 15th Russian Conference on Physics of Ferroelectrics, Rostov-on-Don, Russia (see *Ferroelectricity Newsletter*, Vol. 7, No. 2, p. 17)

Sep 14-18 • Piezotechnique 99, Rostov-on-Don, Russia (see *Ferroelectricity Newsletter*, Vol. 7, No. 2, p. 18)

Sep 19-23 • SPIE's 1999 Symposium and Education Program on Microelectronic Manufacturing, Santa Clara, California, USA (see p. 11)

Sep 30-  
Oct 2 • European Conference on Macromolecular Physics (EPS'99), Potsdam, Germany (see *Ferroelectricity Newsletter*, Vol. 7, No. 1, p. 23)

Nov. 29-  
Dec. 3 • MRS 1999 Fall Meeting, Boston, Massachusetts, USA (see *Ferroelectricity Newsletter*, Vol. 7, No. 2, p. 19)

## EVENTS IN 2000

Feb 13-20 • Workshop on Fundamental Physics of Ferroelectrics, Aspen, Colorado, USA, (see p. 12)

Mar 12-15 • 12th International Symposium on Integrated Ferroelectrics (ISIF 2000), Aachen, Germany (see p. 13)

Mar 12-16 • 5th International Conference on Organic Nonlinear Optics (ICONO'5), Davos, Switzerland (see p. 14)

Apr 24-28 • MRS 2000 Spring Meeting, San Francisco, California, USA (see p. 15)

Aug 27-30 • 5th European Conference on the Application of Polar Dielectrics (ECAPD-5), Jurmala, Latvia  
(see p. 17)

Sep 3-6 • Electroceramics VII, Portoroz, Slovenia (see p. 18)

Dec 12-15 • 3rd Asian Meeting on Ferroelectrics (AMF-3), Hong Kong, China (see p. 19)