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2003

## Ferroelectricity Newsletter / v.11:no.2 Spring 2003

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 11, Number 2

Spring 2003

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## **CELEBRATING 55 YEARS OF SERVICE AS RESEARCHER AND EDUCATOR**

In the winter 1994 issue of the *Ferroelectricity Newsletter* we published the first of four installments on the history of ferroelectricity, written by L. Eric Cross, Evan Pugh Professor of Electrical Engineering at The Pennsylvania State University.

The editorial introducing Professor Cross's historical overview said in part: "Professor Eric Cross, whom some of you have had the pleasure to hear speak at conferences, has graciously set time aside from his busy schedule to delight us with one of his extraordinarily vivid accounts of the early years of ferroelectricity. In general, his articles, as his talks, have only one flaw: they end too soon. Professor Cross, however, mentioned that he may write more short articles telling the rest of the story of ferroelectricity as he experienced it during his 45 years of involvement in the field,"

In the fall issue of the same year appeared the second part, called "The Middle Years," followed in summer 1995 by "The Golden Years." The winter 1997 issue brought the conclusion of the series, called "The Final Chapter."

Born and educated in Leeds, England, Professor Cross came to the New World in 1961, where he devoted the majority of his professional life to helping create one of the most enduring and influential research groups in ferroelectric materials at The Pennsylvania State University.

At the occasion of Professor Eric Cross's 80th birthday, the University of Leeds and The Pennsylvania State University are hosting a symposium in Leeds this September. Please go to page 9 to learn more about this unique and memorable event.

On behalf of the global community connected with the *Ferroelectricity Newsletter* I want to wish Professor Cross continuing good health and much joy and satisfaction in his important work.

AD MULTOS ANNOS!

Rudolf Panholzer  
Editor-in-Chief

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## **Ferroelectricity Newsletter**

Volume 11, Number 2  
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<b>MEIPIC-4 PAPERS</b>
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**THE FOURTH CONFERENCE ON MAGNETOELECTRIC INTERACTION PHENOMENA IN CRYSTALS (MEIPIC-4)**

Organized by the Russian Academy of Sciences, the Ministry of Training of the Russian Federation, the Institute of Radioengineering and Electronics of the Russian Academy of Sciences, and the Yaroslav the Wise Novgorod State University and supported by the Russian Foundation for Basic Research, the **Fourth Conference on Magnetoelectric Interaction Phenomena in Crystals (MEIPIC-4)** was held in Veliky Novgorod, Russia, on 16-19 October 2001.

The first three conferences were held in USA (Seattle, 1973), Switzerland (Ascona, 1993), and Russia (Novgorod, 1996). Leading scientists from the USA, Japan, China, the Republic of South Africa, Ukraine, Byelorussia, and Russia were participating in MEIPIC-4.

The proceedings were published in *FERROELECTRICS*, Volumes 279 and 280 (2002) and guest edited by **Mirza Bichurin**. In the guest editorial we read that unfortunately many foreign scientists could not come to the conference because of the tragic events of September 11 in the USA. Mirza Bichurin goes on to quote a part of the message Prof. H. Schmid (Geneva University) sent: "... I think that the time has now come for the younger generation to follow step in the field ...". As a matter of fact, a good number of young scientists participated in the conference, showing considerable interest in the research field of magnetoelectric phenomena.

There were three sections: "Phenomenological and microscopic theory," chaired by Prof. I. Chupis (Verkin Physicotechnical Institute for Low Temperature UNAS, Kharkov, Ukraine); "Linear and higher order magnetoelectric and related effects," chaired by Prof. V. Orlov (Russian Research Center "Kurchatov Institute," Moscow, Russia); and "Magnetoelectric materials and devices," chaired by Prof. B. Krichevtsov (A.F. Ioffe Physicotechnical Institute of the RAS, St. Petersburg, Russia).

**PHENOMENOLOGICAL AND MICROSCOPIC THEORY**

New mechanism of a surface magnetic polaritons formation in magnet with the linear magnetoelectric effect

*S.V. Tarasenko and V.G. Shavrov*

Long-periodic magnetic structure in magnetoelectrics

*A.A. Khalfina and M.A. Shamsutdinov*

Microscopic theory of optical second-order magnetoelectric susceptibility in the boracite  $\text{Co}_3\text{B}_7\text{O}_{13}\text{I}$

*A. Yu. Zyuzin and B.B. Krichevtsov*

The energy spectrum of an ion  $\text{Cr}^{3+}$  in antiferromagnet  $\text{Cr}_2\text{O}_3$

*D.A. Filippov and I.S. Nikiforov*

The theory of resonance magnetoelectric effect in  $\text{Cr}_2\text{O}_3$  on the basis of the one-ion model

*O.V. Antonenkov, D.A. Filippov, and I.S. Nikiforov*

Monte-Carlo study on phase transitions of ferroelectromagnets

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

Transformations of the multipole response fields D and H for mag-

netic media

*O.L. De Lange and R.E. Raab*

**LINEAR AND HIGHER ORDER MAGNETOELECTRIC AND RELATED EFFECTS**

Magnetoelectric phenomena in nonlinear optics

*V.V. Pavlov, R.V. Pisarev, M. Fiebig, D. Fröhlich, and Th. Lottermoser*

Second order magnetoelectric susceptibility in the optical region

*B.B. Krichevtsov*

Ultrafast optical spectroscopy of hexagonal manganites  $\text{RMnO}_3$  (R = Y, Er, Sc)

*A.V. Kimel, R.V. Pisarev, F.*

<b>MEIPIC-4 PAPERS</b>
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*Bentivegna, and Th. Rasing*

Magnetolectric effect in  $\text{YMn}_2\text{O}_5$  in strong pulsed magnetic fields

*Yu. F. Popov, A.M. Kadomitseva, S.S. Krotov, G.P. Vorob'ev, and M.M. Lukina*

Magnetolectric effect in  $\alpha\text{-Bi}_2\text{O}_3$

*V.I. Nizhankovskii, A.I. Kharkovskii, and V.G. Orlov*

Theory of the switching in ferroelectrics

*S.A. Kukushkin and A.V. Osipov*

Thermodynamics and kinetics of switching in ferroelastics-ferroelectrics. The initial stage

*S.A. Kukushkin and M.A. Zakharov*

Thermodynamics and kinetics of switching in ferroelastics-ferroelectrics. The bulk switching and Ostwald ripening stages

*S.A. Kukushkin and M.A. Zakharov*

Mössbauer studies on high temperature solution grown  $\text{Pb}(\text{Fe}_{1/2})\text{O}_3$  single crystals

*Y. Yang, H.B. Huang, J.-M. Liu, and Z.G. Liu*

A new Van Pauw disk to enhance geometric magnetoresistance at room temperature

*G.L. Yuan, J.-M. Liu, X.Y. Chen, and Z.G. Liu*

### MAGNETOELECTRIC MATERIALS AND DEVICES

Magneto-electrical properties of rare earth molybdates

*B.K. Ponomarev*

Two types of photo-induced voltages in terbium molybdate

*B.K. Ponomarev, V.D. Negri, and B.S. Red'kin*

Structure and ferroelectricity of  $\text{RMn}_2\text{O}_5$

*Isao Kagomiya, Kay Kohn, and Tomohiro Uchiyama*

On the peculiarities of the temperature dependence of the magnetolectric susceptibility of chromium oxide

*S.S. Krotov, Yu. F. Popov, A.M. Kadomtseva, D.V. Belov, G.B. Vorob'ev, and A.V. Lisniak*

Magnetolectricity of multiferroic composites

*C.W. Nan, Yuanhua Lin, and Jin H. Huang*

Modelling of magnetolectric effect in ferromagnetic/piezoelectric multilayer composites

*M.I. Bichurin, V.M. Petrov, and G. Srinivasan*

Magnetolectric effects in composites of nickel ferrite and barium lead zirconate titanate

*V.M. Laletin and G. Srinivasan*

Resonance magnetolectric effect in multilayer composites

*M.I. Bichurin, V.M. Petrov, I.A. Kornev, A.S. Tatarenko, Yu.V. Kiliba, N.A. Konstantinov, and G. Srinivasan*

Magnetolectric sensor of magnetic field

*M.I. Bichurin, V.M. Petrov, R.V. Petrov, Yu.V. Kiliba, F.I. Bukashev, A.Yu. Smirnov, and D.N. Eliseev*

Electrodynamics analysis of strip line on magnetolectric substrate

*M.I. Bichurin, V.M. Petrov, R.V. Petrov, F.I. Bukashev, and A. Yu. Smirnov*

Magnetolectric microwave devices

*M.I. Bichurin, V.M. Petrov, R.V. Petrov, G.N. Kapralov, Yu.V. Kiliba, F.I. Bukashev, A. Yu. Smirnov, and A.S. Tatarenko*

### Publisher's Note:

Due to time constraints, the following articles were not able to be published, as scheduled, in the MEIPIC-4 proceedings issues:

New types of surface polaritons induced by a dynamic magneto-electric interaction

*I.E. Chupis and D.A. Mumaluy*

Toroidal and phonon polariton modes at the boundary with an ideal metal in a constant magnetic field

*I.E. Chupis and A.A. Mischenko*

Both articles can be found in Volume 281 of **FERROELECTRICS**.

□

<b>ICFLC- 8 PAPERS</b>
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**THE EIGHTH INTERNATIONAL CONFERENCE ON FERROELECTRIC LIQUID CRYSTALS**

The conference, the eighth in a series of biennial conferences starting in 1987, was held on 5 - 10 August 2001 at Georgetown University in Washington, DC, and was attended by 220 participants from 25 countries.

There were 235 papers presented in 17 sessions—six plenary talks (H. Takazoe, J.W. Goodby, T.C. Lubensky, R.B. Meyer, N.A. Clark, and S.T. Lagerwall), 21 invited papers, 50 oral contributions, and 158 poster presentations. The main themes at this conference were: New materials, bent core liquid crystals, antiferroelectrics, V-shaped switching, polymer stabilized liquid crystals, electronic effect, structure and dielectric spectroscopy. Tutorials were also given by the following participants: John W. Goodby—Ferroelectric and antiferroelectric materials; Jonathan V. Selinger—Order and frustration in chiral liquid crystals; David M. Walba—Bent-core shaped molecules; and Michael D. Wand—Display applications.

The proceedings, guest edited by **R. Shashidhar**, were published in volumes 276, 277, and 278 (2002) of the international journal **FERROELECTRICS**.

The following is a list of titles and authors of the conference presentations.

**NEW MATERIALS**

New liquid crystals with dichlorostilbene unit showing monotropic SmC\* phase

*Alexej Bubnov, Vera Hamplová, Miroslav Kaspar, and Milada Glogarová*

Effect of the position of fluorine substituent introduced into the benzene ring system on the electro-optical properties of phenylbiphenyl carboxylate series of AFLCs

*Jin Wook Choi and Yong Bae Kim*

Mean-field behavior of the paraelectric-ferroelectric phase transition of a fluorinated compound

*A. Fafara, D. Ganzke, W. Haase, M. Marzec, S. Wróbel, C. Zapczynski, and R. Dabrowski*

Liquid crystalline polysiloxane with 45° molecular tilt in the SmC\* phase

*G. Galli, M. Ragnoli, E. Chiellini, L. Komitov, and G. Andersson*

Ferroelectric liquid crystals with

extremely wide SmC\* phase range

*Vera Hamplová, Miroslav Kaspar, Vladímira Novotná, and Milada Glogarová*

Synthesis and mesomorphic properties of naphthyl propionate ferroelectric liquid crystals

*Kyung-Tae Kang, Chang Mo Kim, Seng Kue Lee, Myung Soo Shin, Kyung Uk Lee, and Jong Gun Lee*

Smectic phases exhibited by dissymmetric liquid crystals: Mesomorphic properties of liquid crystals having a lateral long alkoxy group

*Shunsuke Takenaka, Kazuhide Ota, Yuki Morita, and Hiroaki Okamoto*

Smectic phase exhibited by dissymmetric liquid crystals: Effect of a terminal fluoromethyl group on mesomorphic properties

*Takeyasu Tasaka, Shunsuke Takenaka, Koji Kabu, Yuki Morita, and Hiroaki Okamoto*

Structural effects on the mesomorphic properties of chiral liquid

crystal materials derived from optically active (R)-3-alkylmercapto-2-methylpropionic acids

*Shune-Long Wu, Kuan-Jen Wang, and Mei-Ching Yu*

**BANANA-SHAPED FLCs**

Towards banana-shaped liquid crystals incorporating carbazole

*Maura Belloni, M. Manickam, and Jon A. Preece*

Field-induced behavior in a liquid formed by achiral banana-shaped molecules in the vicinity of the phase transition isotropic-B<sub>2</sub> phase

*V. Bourny, V. Lorman, J. Pavel, B. Mettout, and H.T. Nguyen*

Surface effects on liquid crystals of bent-shaped molecules

*A. Jáklí, Geetha G. Nair, S. Abeygunarartna, R.P. Sun, C.K. Lee, and L.C. Chien*

The order of the system composed of polar Gay-Berne molecules with bend

*Toshikuni Miyazaki and Mamoru Yamashita*



<b>ICFLC- 8 PAPERS</b>
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Polarization loops observed in liquid crystal with a new banana-shaped ligand

*J.-P. Rivera, H. Nozary, and C. Piguet*

Electric field mediated growth habits in B7

*Y. Yusuf, Y. Hidaka, S. Kai, H.R. Brand, P.E. Cladis, W. Weissflog, and G. Pelzl*

### ANTIFERROELECTRICS, FERROELECTRICS AND TGB

Effect of enantiomeric excess on electro-optical properties of antiferroelectric liquid crystal: 4-(1-trifluoromethyl-6-ethoxyheptyloxy carbonyl)phenyl-4'-nonoxybiphenyl-4-carboxylate (TFMEOHPNBC)

*Jin Wook Choi and Yong Bae Kim*

DSC studies of systems with induced antiferroelectric phase

*K. Czuprynski, S. Gauza, and W. Drzewinski*

Induced antiferroelectric smectic C<sub>A</sub>\* phase structural correlations

*S. Gauza, R. Dabrowski, K. Czuprynski, W. Drzewinski, and K. Kenig*

The design, synthesis and structure-property relationships of ferroelectric and antiferroelectric liquid crystal materials

*Michael Hird, John W. Goodby, Paul Hindmarsh, Robert A. Lewis, and Kenneth J. Toyne*

Anchoring at the grain boundaries and dielectric properties of the TGB<sub>A</sub> and TGB<sub>C</sub> phases

*M. Ismaili, F. Bougrioua, N. Isaert, C. Legrand, and H.T. Nguyen*

Ferro-, ferri-, antiferroelectric and TGB phases created by chiral twin liquid crystals

*Isa Nishiyama, Jun Yamamoto, John W. Goodby, and Hiroshi Yokoyama*

A unified description of switching in antiferroelectric liquid crystals

*Lesley A. Parry-Jones and Steve J. Elston*

Dielectric properties of the MHPB(H)PBC and MHPB(F)PBC antiferroelectric liquid crystals

*P. Perkowski, Z. Raszewski, J. Kedzierski, J. Rutkowska, W. Piecek, J. Zielinski, and S. Klosowicz*

Refractive indices of the MHPB(H)PBC and MHPB(F)PBC antiferroelectric liquid crystals

*Z. Raszewski, J. Kedzierski, P. Perkowski, W. Piecek, J. Rutkowska, S. Klosowicz, and J. Zielinski*

Suppression of the pretransition by polymer in antiferroelectric liquid crystals

*Jeong-Seon Yu, Jeong-Geun Yoo, Dong-Jin Jeong, Seong-Chon Park, Young-Joo Chang, and Hong-Geun Yang*

### OPTICS, ELECTRO-OPTICS AND ELASTIC PROPERTIES

Hysteresis inversion frequency for V-shape electrooptical switching controlled by dynamic impedance of ferroelectric SmC\* phase

*L.M. Blinov, E.P. Pozhidaev,*

*F.V. Podgornov, A. Sinha, and W. Haase*

Some experimental investigations on type II chiral liquid crystals

*Surajit Dhara, R. Pratibha, and N.V. Hadhusudana*

Electro-optic behavior of ferroelectric hexatic smectics in the vicinity of phase transitions

*A.K. Ghosh, I. Dierking, and W. Haase*

Elastic constants of an achiral smectic-C material

*Alison Findon and Helen F. Gleeson*

Electrorheological properties of chiral smectic-C liquid crystals observed by using shear horizontal wave propagation

*Masaru Inoue, Katsumi Yoshino, Hiroshi Moritake, and Kohji Toda*

Influence of surface anchoring energy and mesogenic polymer-stabilization on the electro-optic characteristics of FLCs exhibiting half-V-switching

*Tetsuji Ishitani, Yuji Murakami, and Shunsuke Kobayashi*

Chiral azobenzene liquid crystals under illumination: Thickness influence and spontaneous polarization variations

*G. Joly, A. Anakkar, M. Ismaili, P. Cluzeau, N. Isaert, and H.T. Nguyen*

Optical properties of polymer stabilized cholesteric liquid crystals

*V. Laux, F. Roussel, and J.-M. Buisine*

## ICFLC- 8 PAPERS

“V-shaped” electro-optical characteristics in FLC gels

*Jianjun Li, Xinyu Zhu, Li Xuan, and Ximin Huang*

In-plane switching of a homeotropically aligned, thin smectic C\* liquid crystal

*G. McKay and K.R. MacKenzie*

Effect of electric field on the TGBC\* phase

*Geetha G. Nair, S. Krishna Prasad, and C.V. Yelamaggad*

Stability criterion for V-shaped characteristics in FLC and AFLC

*Herman Pauwels and Artur Adamski*

Investigation of the electroclinic effect at the liquid crystal-substrate interface

*S.M. Said, S.M. Beldon, and S.J. Elston*

Optical Bragg reflections from a series of antiferroelectric heterocyclic esters

*U. Singh, H.F. Gleeson, J.W. Goodby, and M. Hird*

Scaled chiral indices for ferroelectric liquid crystals

*Miklos Solymosi, Robert J. Low, Martin Grayson, Maureen P. Neal, Mark R. Wilson, and David J. Earl*

Domain walls and electro-optic switching in an antiferroelectric B<sub>2</sub> liquid crystalline freely suspended film

*R. Stannarius, C. Langer, and W. Weissflog*

V-shaped switching in a ferroelec-

tric liquid crystal with the phase sequence of N\*-SmC\*

*Jong-Min Wang, Yu-Jin Kim, Chang Ju Kim, and Kyu-Sik Kim*

Novel thickness-dependent thermal behavior and anticlinic coupling in chiral smectic free-standing liquid crystal films

*Pin-Jiun Wu, Chih-Yu Chao, Chien-Rong Lo, Michael Veum, Darren R. Link, Joseph E. MacLennan, and Noel A. Clark*

### SPECTROSCOPY AND DIELECTRIC PROPERTIES

Transitions from the SmC\* or SmC\*<sub>A</sub> phases to the tilted hexatic phases studied by the dielectric spectroscopy

*M. Glogarová, V. Novotná, I. Rychetsky, M. Kaspar, and V. Hamplová*

Nonlinear dielectric response of antiferroelectric liquid crystals

*Hiroshi Isono, Yasuyuki Kimura, and Reinosuke Hayakawa*

Effect of electric field on the correlation between the phenyl ring and the alkyl chain of an antiferroelectric liquid crystal using polarised FTIR spectroscopy

*M.M. Jamshidi, J.K. Vij, and H.T. Nguyen*

Surface- and field-induced AFLC structures detected by dielectric spectroscopy

*Jan Lagerwall, Per Rudquist, Sven Lagerwall, and Bengt Stebler*

Flow induced by director relaxation in smectic C\* materials

*P.D. Woods, N.J. Mottram, and I.W. Stewart*

### STRUCTURES, DEFECTS AND FREE-STANDING FILMS

Defect-free surface-stabilized ferroelectric liquid crystals fabricated by lowering smectic-A to -C\* phase transition temperature in the surface regions

*Hirokazu Furue, Isa Nishiyama, Jun Yamamoto, and Hiroshi Yokoyama*

Observations of the ferroelectric deformed helix mode in a large pitch smectic C\* sample

*F. Ghoddoussi, M.A. Pantea, P.H. Keyes, R. Naik, and P. Vaishnav*

Twist disclinations in ferroelectric liquid crystals as sources of induced polarization space charges

*Lubor Lejcek*

V-shaped switching: Models and physical reasons

*W. Haase, M. Gorkunov, L. Beresnev, and S. Pikin*

Vibration characteristics of freely suspended ferroelectric liquid crystal film

*Hiroshi Moritake, Masaru Inoue, Masanori Ozaki, Katsumi Yoshino, and Kohji Toda*

The biaxiality of the chiral smectic subphases in very thin freestanding films

*V.P. Panov, S.S. Seomun, N.M. Shtykov, J.K. Vij, and H.T. Nguyen*

<b>ICFLC- 8 PAPERS</b>
------------------------

In-layer defects in smectic C materials

*A. Ramage and N.J. Mottram*

Long range order and correlation in layered structure pertaining to  $\text{SmC}^*_A$

*Satoshi Tanaka and Mamoru Yamashita*

Lowest energy layer structure for twist states SSFLC device

*Chenhui Wang, Satyendra Kumar, Michael Wand, Mark Handschy, and Philip J. Bos*

## THEORY

Computer simulation of polar rod-like molecules

*Stephen J. Johnston, Robert J. Low, and Maureen P. Neal*

The uniform  $\varphi$ -theory for the Sony mode in FLC

*Herman Pauwels and Hua Zhang*

## ALIGNMENT

Liquid crystal alignment effects on the photo-crosslinkable copolymer surfaces containing cholesteryl moiety

*Jeoung-Yeon Hwang, Yong-Bae Kim, and Dae-Shik Seo*

Liquid crystal aligning capabilities on new photo-crosslinkable polyimide based polymer by the photodimerization method

*Jeoung-Yeon Hwang, Yong-Bae Kim, and Dae-Shuk Seo*

Field-induced alignment of ferroelectric liquid crystal with the phase sequence of  $\text{N}^*-\text{SmC}^*$  in a uniform external electric field

*Chang Ju Kim, Yu Jin Kim, Jong Min Wang, and Kyu Sik Kim*

The study of the surface electroclinic effect using different aligning materials

*Sanseong Seomun, Vitaly P. Panoc, and Jagdish K. Vij*

Influence of annealing on the dielectric properties of ferroelectric liquid crystal

*D. Shenoy, A. Lavarello, J. Naciri, and R. Shahidhar*

Application of photo-alignment techniques to ferroelectric liquid crystal cell

*Dong-Myung Shin, Ji-Hye Moon, Kyoung Hoon Jung, and Dong Mee Song*

## APPLICATIONS

Dynamical phase distortion sensing with nonlinear Zernike filter based on FLC light valve

*Leonid Beresnev, Mikhail Vorontsov, and John Gowens*

Effect of the surface anchoring energy on the electro-optical properties in monostable ferroelec-

tric liquid crystal display

*Yu-Jin Kim, Kyu-Sik Kim, and Yong Bae Kim*

Equivalent circuit model simulation of ferroelectric liquid crystals showing analogous switching

*Tatsuo Saishu, Hajime Yamaguchi, Ray Hasegawa, Rieko Fukushima, and Kohki Takatoh*

Development of large capacity and low-crosstalk holographic switching using LCOS spatial light modulators

*C. Uche, B. Fracasso, W.A. Crossland, J.L. de Bougrenet de la Tocnaye, and T.D. Wilkinson*

Applications of ferroelectric liquid crystal LCOS devices

*T.D. Wilkinson, W.A. Crossland, and A.B. Davey*

Reflective configuration of vertically aligned deformed-helix ferroelectric liquid crystal display

*Doo-Hwan You, Chang-Jae Yu, and Sin-Doo Lee*

## *Ferroelectricity Newsletter*

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## PAPERS ON ANTIFERROELECTRICITY

### *THE 50TH ANNIVERSARY OF THE DISCOVERY OF ANTIFERROELECTRICITY IN PbZrO<sub>3</sub>*

Antiferroelectricity was first discovered in PbZrO<sub>3</sub> in 1951 by **E. Sawaguchi**, **G. Shirane**, and **Y. Takagi**. To celebrate the 50th anniversary of this important event, the international journal *FERROELECTRICS* published a special issue – Volume 266 (2002) – guest edited by **Akira Onodera** (Sapporo, Japan) and **V. Hugo Schmidt** (Bozeman, USA).

The guest editors give a concise summary of the accomplishments of the three discoverers of antiferroelectricity, noting that “all three professors are still fine and continuing to contribute to the work of the ferroelectric community.” They also describe further developments, concluding that “we, researchers of ferroelectric phenomena, will be able to see advances in the science of ferroelectrics and enjoy the coming innovations soon.”

The following is the list of articles in this special issue.

Lead zirconate – half a century ago  
*Masaaki Takashige*

Micro-Brillouin scattering and central peaks of 0.91Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)-0.09PbTiO<sub>3</sub> single crystals  
*Fuming Juang and Seiji Kojima*

Order parameters in the structural phase transition of antiferroelectric PbZrO<sub>3</sub>  
*Hideshi Fujishita*

Low-temperature properties of Pb(Zr<sub>1-x</sub>Ti<sub>x</sub>)O<sub>3</sub> solid solutions near the morphotropic phase boundary  
*L. Bellaiche, Alberto García, and David Vanderbilt*

Anisotropy of piezoelectricity near morphotropic phase boundary in perovskite-type oxide ferroelectrics  
*Macoto Iwata, Hiroshi Orihara, and Yoshihiro Ishibashi*

Local and average structure of lead titanate based ceramics

*J. Frantti, S. Ivanov, J. Lappalainen, S. Eriksson, V. Lantto, S. Nishio, M. Kakihana, and H. Rundlöf*

Phases in the PZT ceramics  
*V.A. Isupov*

Thermal behavior of ferroelectric switching properties of SBT thin films  
*Masahiro Tanaka, Katsuyuki Hironaka, and Akira Onodera*

Modeling of domain processes in piezoceramic materials  
*V.I. Aleshin and A.G. Luchaninov*

An attempt to observe surface morphology of NaKC<sub>4</sub>H<sub>4</sub>O<sub>6</sub>·4H<sub>2</sub>O by atomic force microscope  
*Masaaki Takashige and Sin-Ichi Hamazaki*

The phase transition of (ND<sub>4</sub>)<sub>3</sub>D(SO<sub>4</sub>)<sub>2</sub> studied with Raman scattering  
*M. Kashara and T. Yagi*

Thermal behavior and phase transition in PZT near the morphotropic phase boundary  
*T. Yamazaki, A. Onodera, H. Fujishita, Y. Ishikawa, and M. Tanaka*

Isotopically induced ferroelectric phase transition of SrTi<sup>18</sup>O<sub>3</sub> studied by Brillouin and Raman scattering  
*T. Yagi, M. Kasahara, Y. Tsujimi, M. Yamaguchi, H. Hasebe, R. Wang, and M. Itoh*

Central peak in Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>/90° PbTiO<sub>3</sub> relaxor studied by 90° Brillouin scattering  
*Yoshihiro Gorouya, Yuhji Tsujimi, Yohachi Yamashita, Tohru Ifukube, and Toshirou Yagi*

Dielectric relaxation in disordered polar dielectrics  
*S.A. Gridnev*

Bibliography of early studies in perovskite ferroelectrics  
*Koichi Toyoda*



UPCOMING MEETINGS
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## 55 years of ferrolectrics

A symposium to mark the 80<sup>th</sup> birthday of Professor Eric Cross

**Marriott Hotel, Leeds, UK**  
**21<sup>st</sup> to 23<sup>rd</sup> September 2003**

The contribution of Eric Cross to the field of ferroelectric materials and their applications is universally recognized by those active in the field. Eric was born in Leeds, England in 1923. He obtained his BSc in Physics in 1948 and his PhD in 1952, both from the University of Leeds, where he remained as a lecturer and ICI Research Fellow until 1954. Following a period with the UK Electrical Research Association, Eric left for the New World in 1961, where he helped create one of the most enduring and influential research groups in ferroelectric materials at The Pennsylvania State University.

To mark the occasion of Eric's 80<sup>th</sup> birthday, the University of Leeds, in collaboration with The Pennsylvania State University, is hosting a symposium highlighting his influence on ferroelectric science, at which Eric will be the guest of honour.

The organising committee would like to invite you to attend and participate in this unique and memorable event, which will comprise oral and poster presentations from those whose past and recent work has been influenced by Eric. Attendance and presentations by those who have worked closely with Eric are particularly encouraged.

The event is expected to be extremely popular and as places may be limited, the committee would be grateful if you could help them in their organization, and ensure that you receive future information, by registering your interest in the symposium. Please return this form, by mail, e-mail or fax. It is likely that **only those who respond to this first announcement will receive registration details.**

**Organising committee:** A.J. Bell (Chair), F.W. Ainger, A. Bhalla, D. Damjanovic, R. Guo, R.E. Newnham, C.A. Randall, I.M. Reaney, N. Setter, T.R. Shrout, T. Takenaka, S. Wada, R.W. Whatmore, Y. Xi  
Arranged with the aid of the UK Ferroelectric Materials Network

*Return to: Prof. A.J. Bell, Institute for Materials Research, University of Leeds, LEEDS, LS2 9JT, UK  
or FAX to: +44-113-242-2531 or e-mail to: [a.j.bell@leeds.ac.uk](mailto:a.j.bell@leeds.ac.uk) by 7<sup>th</sup> April 2003*

Name: \_\_\_\_\_ Affiliation: \_\_\_\_\_  
Address: \_\_\_\_\_  
Email: \_\_\_\_\_

*I intend to attend the symposium "55 years of ferrolectrics", 21<sup>st</sup> - 23<sup>rd</sup> September 2003: YES/NO.*

*I would like to provide an oral presentation entitled: \_\_\_\_\_*

*I intend to present a poster: YES/NO*

**UPCOMING MEETINGS**

**Fifteenth American Conference on Crystal Growth & Epitaxy (ACCGE-15)  
The 11th Biennial Workshop on OMVPE, and  
The 3rd International Symposium on Laser and NLO Materials (ISLNOM)  
20 - 24 July 2003  
Keystone, Colorado, USA**

**ACCGE-15**

ACCGE-15 will provide a forum for the presentation and discussion of recent research and development activities in all aspects of epitaxial thin film and bulk crystal growth; sessions will integrate fundamentals, experimental and industrial growth processes, characterization and applications. Contributed papers are requested in all relevant areas. In addition to focused sessions on the topics listed below, additional sessions will be organized based upon the topical distribution of contributed papers.

**Plenary Speaker**

Chris Murray, IBM, "Assemblies of semiconductor nanocrystals"

**Special Session**

Future directions and requirements of industry and government

A special session will be held at the meeting, in which key industrial and government speakers will present their views on future opportunities and challenges for crystal growth technologies. Special session organizer: N.B. Singh, Northrop Grumman, nsingh@northropgrumman.com

**Focused Session**

- Epitaxy
- Bulk crystal growth and modeling
- Crystal growth fundamentals
- Industrial crystal growth
- Oxides
- Microgravity
- Biocrystallization
- Correlated electron crystals and neutron scattering
- Nanocrystalline systems
- Characterization
- Epitaxial superlattices and nanostructures

**Program Chair**

Lynn Boatner, Oak Ridge National Laboratory  
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phone: +865-574-5492; fax: +865-574-4814; email: boatnerla@ornl.gov

**11th Biennial Workshop on OMVPE**

The eleventh biennial workshop on organometallic vapor phase epitaxy (OMVPE) will be held jointly with the 15th American Conference on Crystal Growth and Epitaxy for the first time in 2003. The workshop continues a tradition first started in Cornell in 1983, of bringing together specialists in the OMVPE field from industry, academia, and government laboratories, in an informed atmosphere and scenic surroundings. The workshop is an excellent opportu-

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<b>UPCOMING MEETINGS</b>
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nity to present and discuss new results in the OMVPE field, as well as providing a venue for newcomers to the field to familiarize themselves with OMVPE science and technology. The format of the conference is designed to maximize interaction both amongst OMVPE specialists, and within the context of the wider crystal growth community represented at the ACCGE.

**Publication of Proceedings**

The proceedings of the 11th Biennial Workshop on OMVPE will be published in a special volume of the *Journal of Crystal Growth*.

**Program Chair**

Prof. Simon Watkins, Physics Department, Simon Fraser University  
Burnaby, BC V5A 1S6, Canada  
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**3rd International Symposium on Laser and NLO Materials**

The International Symposium on Laser and Nonlinear Optical Materials (ISLNOM) provides a unique forum for discussing recent progress in the field of optical and optoelectronic materials, including growth technology, device applications, performance, and materials characterization. It is the purpose of this symposium to bring together scientists and engineers from around the world to discuss the most exciting new developments in this field. It covers a wide range of materials, including oxides, fluorides, nitrides, II-VI and III-V compounds. In recent years other topics have also been incorporated into this symposium, including scintillator materials and industrial manufacturing issues.

**Topics**

- Science and technology of crystal growth of optical materials
- Bulk crystals, thin films, fibers, shaped crystals
- Crystal characterization, defects and devices
- Oxide, fluoride and nitride solid state lasers
- Semiconductor, high power and UV/Blue lasers
- Nd, Yb, and Cr doped IR lasers
- Ceramic lasers
- Organic optical materials
- Nonlinear materials
- Second order nonlinear borates and KTA
- Waveguide structures
- Quasi-phase matching
- Photorefractive and magneto-optic materials
- Scintillators
- Manufacturing issues concerning crystal and device production

**Program Chair**

Prof. Robert Feigelson, Geballe Lab. for Advanced Materials  
McCulloch Bldg., 476 Lomita Mall, Stanford University, Stanford, CA 94305-4045  
phone: +650-723-4007; fax: +650-723-3752 or 3044; email: feigel@soe.stanford.edu

**For additional information contact:**

Tony Gentile, ACCGE-15 Secretariat; email: aacg@lafn.org; <http://www.crystalgrowth.org/ACCGE15/>

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### CALENDAR OF EVENTS

Jun 8-11 • Polar Oxides: Properties, Characterization and Imaging, Capri, Italy (see *Ferroelectricity Newsletter*, Vol. 10, No. 4, p. 22)

Jun 29-  
Jul 4 • 3rd Asian Meeting on Electroceramics (AMEC-3), Singapore (see *Ferroelectricity Newsletter*, Vol. 11, No. 1, p. 9)

Jul 20-24 • 15th American Conference on Crystal Growth & Epitaxy, 11th Biennial Workshop on OMVPE, 3rd International Symposium on Laser and NLO Materials (ISLNOM), Keystone, Colorado, USA (see p. 10)

Aug 3-8 • 10th European Meeting on Ferroelectricity (EMF2003), Cambridge, UK (see *Ferroelectricity Newsletter*, Vol. 11, No. 1, p. 12)

Aug 24-29 • 9th International Conference on Ferroelectric Liquid Crystals (FLC2003), Dublin, Ireland (see *Ferroelectricity Newsletter*, Vol. 11, No. 1, p. 14)

Sep 15-18 • 4th (9th) International Seminar on Ferroelectrics Physics, Voronezh, Russia (see *Ferroelectricity Newsletter*, Vol. 11, No. 1, p. 15)

Sep 21-23 • 55 years of ferroelectrics, Leeds, England (see p. 9)

Dec 14-17 • 4th Asian Meeting on Ferroelectrics 2003, Bangalore, India (see *Ferroelectricity Newsletter*, Vol. 10, No. 3, p. 22)

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