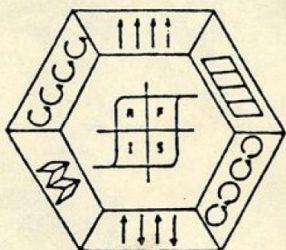


Fifth International Meeting on Ferroelectricity



(IMF-5)

August 17-21, 1981

The Pennsylvania State University
University Park, Pennsylvania, USA

Guest Editorial

The Fifth International Meeting on Ferroelectricity (IMF-5) was held on the Campus of The Pennsylvania State University, U.S.A. from October 17 to 21, 1981. The setting of a young small university town in the rural heartland of the Quaker State that bears the name of William Penn is in marked contrast to the venerable traditions of the historic cities that have served as hosts for the preceding International Meetings on Ferroelectricity: Prague, Kyoto, Edinburgh and Leningrad. Yet Penn State was selected for IMF-5 because it qualifies well with over three decades of research on ferroelectricity that has contributed much to the emergence and growth of this young discipline.

The international character of the conference is apparent from the list of participants, which includes scientists from 27 countries in four continents. Although the attendance roll somewhat short of the number of expected participants, the over 300 who came proved that their dedication to the cause of ferroelectricity prevailed over air travel casualties and delays resulting from the air controller's stacked workload.

The program at the conference included 31 invited talks presented in the mornings, mostly in parallel sessions. All contributed papers were presented at seven concurrent poster sessions during the first three evenings of the conference.

The afternoons were kept free for informal discussions and for the refereeing of all contributed papers. The official social event featured a country-style picnic at nearby Stone Valley Lake to the sound of a bluegrass band and closed at dusk with the participants and their family members joining for a traditional American square dance.

In the Physics community, there is legitimate aversion to the poster method of presentation. However, at this meeting the many close knots of participants in lively discussion around posters, the manner in which people were moving between sessions, and the fact that the dedicated had to be swept out by the janitors who took up the building, suggest that at least at IMF-5 this format was successful and permitted the exchange of information and ideas which at this depth and detail would have been impossible otherwise.

While IMF-5 did not witness the emergence of revolutionary new ideas or organic evolution of well established aspects and methods was apparent, ranging from Landau-Devonshire models and group theory to the characterization and properties of ceramic materials and composites for device applications. Moreover, promising new areas that had emerged at the Fourth European Meeting on Ferroelectricity in Helsinki, Yugoslavia have grown in importance, especially the study of incommensurate systems. The general spirit is evoked from the traditional linear effects in solid state

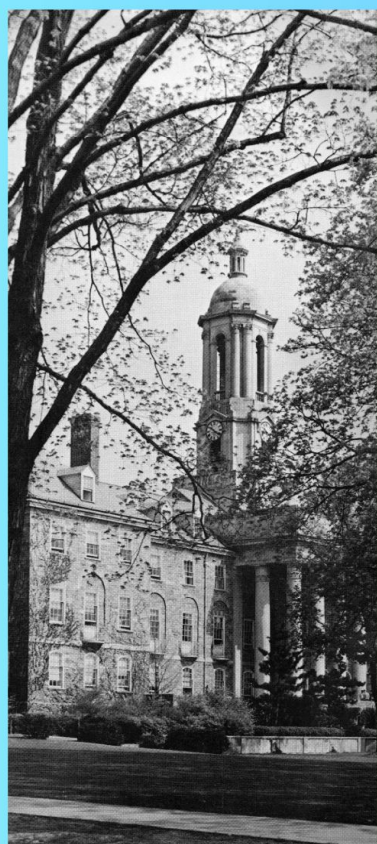
physics to nonlinear phenomena with entirely novel features, such as those of solitons, is also affecting the field of ferroelectricity. Furthermore, experimental studies of critical phenomena have entered the main stream of research in ferroelectricity. One rather consequential reevaluation of group calculation for the Ising model provided a "justification" for the validity of the classical Landau-Devonshire paradigm. The conference also saw a closing of the gap between theory and experiment pertaining to crystal imperfections ranging from the dynamics of point defects to surfaces and domain walls, but a microscopic theory of the latter remains a challenging task for the future. More compelling evidence for the presence of ferroelectricity in polymers was presented at the conference. Applications of ferroelectricity included improved materials and techniques for well-proved devices, like detectors, imaging, memory and data processing devices, transducers, surface acoustic wave devices, acoustoelectric and electrooptic modulators, tunable microwave generators and receivers. Furthermore, fast response-time liquid crystals may offer the possibility of optical correlation several orders of magnitude faster than available now. All in all, the conference proved that the field of ferroelectricity is still in active development and is contributing both to the enhancement of basic knowledge of the natural world and to the engineering applications of this knowledge. It goes without saying that the conference

participants are united by the family of all people and nations in the hope that these applications may be used for the benefit of humankind.

These conference proceedings include 26 invited papers in the form they were submitted. All contributed papers submitted before or during the conference were reviewed and, if necessary and feasible, revised and resubmitted during or shortly after the conference. Contributions included in abstract form were either not submitted as camera-ready manuscripts or required substantial revision and may be published in future issues of FERROELECTRICS. In order to limit the size of these proceedings the four-page limit set for contributed papers was strictly adhered to. As the usefulness of conference proceedings is enhanced by rapid publication the camera-ready copy was sent to the publisher five weeks after the conference.

It is a pleasure to acknowledge the extensive support of the conference chairman, of the editors of FERROELECTRICS, the help of my colleagues and collaborators and the efficient and skillful work of the secretarial staff in the preparation of these proceedings. Special credit is due to the session chairman for coordinating the review process within their sessions, and to all referees for their dedication and for maintaining high scientific standards. Finally, I would like to thank the invited speakers and all authors and participants for their contributions that made IMF-5 a very successful conference that is bound to be of lasting respect and value.

Richard A. Creswell
The Pennsylvania State University



INTERNATIONAL ADVISORY COMMITTEE

R. Blinc (Yugoslavia), R. Cowley (United Kingdom), J. Fousek (Czechoslovakia), A.M. Glass (USA), L. Godefroy (France), J.A. Gonzalo (Spain), J. Kobayashi (Japan), R. Krishnan (India), S.B. Lang (Israel), I. Lefkowitz (USA), W. Merz (Switzerland), H. Müser (FRG), T. Nakamura (Japan), G. Schmidt (GDR), L.A. Shuvalov (USSR), G. Smolensky (USSR), J. Stankowski (Poland), Zhi-wen Yin (China).

The International Advisory Committee met during the Conference and it was decided that the next International Meeting on Ferroelectricity (IMF-6) would be held in Japan in 1985.

ORGANIZING COMMITTEE

I. Lefkowitz (Chairman, IMF-5), A. Glass (Co-Chairman, IMF-5), L.E. Cross (Local Organization Chairman), R.E. Newnham (Secretary), F.G. Ullman (Program Chairman), J. Hardy (Program Co-Chairman), C.E. Land (Publicity Co-Chairman), G. Samara (Publicity Co-Chairman), V.H. Schmidt (Treasurer), J. Axe, J. Birman, M. Broadhurst, G. Burns, H.Z. Cummins, S. Edelman, P. Fleury, C. Frazer, I.P. Kaminov, M. Kay, J.A. Krumhansl, S.K. Kurtz, R. Landauer, W. Lawless, M. Lines, D. Lynch, R. Meyer, R. Pepinsky, C.J. Pulvari, E. Pytte, J.F. Scott, G. Shirane, B.D. Silverman, S. Ushioda, L. Young.

SPONSORS

The International Union of Pure and Applied Physics
(IUPAP) in cooperation with

The Office of Naval Research (ONR)
The Army Research Office (ARO)
The National Science Foundation (NSF)
The Institute of Electrical and Electronic Engineers (IEEE)
The American Ceramic Society (ACS)
International Rockwell Company
North American Philips Company



FIFTH INTERNATIONAL MEETING ON FERROELECTRICITY

List of Participants

ARGENTINA

H. Lanza de Dassel, M.A. Rodriguez de Benavides

AUSTRIA

G. Bauer, E. Kittinger, F. Schwabl

BELGIUM

K.H. Michel

BRAZIL

F.C. Sa Barreto, A.S. Pires, A. Silva-Moreira

CANADA

M. Fujimoto, J. Grindlay, F. Holuj, D.J. Lockwood, L. Young

CHINA

Y.Y. Li, J.S. Shie, B.M. Wang, Q.C. Xu, Z.K. Yin

CZECHOSLOVAKIA

V. Janovec

FRANCE

J. Bouilliot, C. Carabatos, M. Clin, G. Errandonea, J.-C. Fayet, M. Fontana, F. Gervais, G. Godefroy, M. Guilly, M. Medoux, B. Jannot, G. Kugel, J. Lejczak, R. Le Gouez, J.F. Legrand, F. Micheron, J. Mouet, J. Ravez, J. Schneec, J.-C. Toledano, M. Vallade

GERMANY (BRD)

J. Albers, K. Binder, U. Buchenau, A. Bussmann-Holdner, T. Chen, K.-H. Ehses, S.E. Kapphan, U. Kleemann, G. Meissner, H.E. Moberg, J. Petersson, G. Schack, A.X. Traubner, H.G. Umm, D.T. Vignier, H. Vogt, R. Von Baltz, W. Wersing, K.H. Weyrich

GREECE

F. Milia

HOLLAND

T. Janssen, F. Tuinstra

INDIA

A. Bhanumathi, B.K. Chaudhuri, R.S. Krishnan, S.C. Mocher, E. Subbarao, R. Vijayaraghavan

ISRAEL

M. Adam, A. Agranat, L. Benguigui, S. Havlin, S.B. Lang, Y. Yacoby

ITALY

V. Paolo

JAPAN

R. Abe, Y. Aikawa, M. Fukui, K. Hamano, K. Hidaki, T. Hikita, T. Hosokawa, M. Ichikawa, T. Imamura, Y. Ishibashi, F. Iwasaki, H. Iwasaki, M.S. Jang, W. Kinase, J. Kobayashi, S. Kojima, A. Koma, J. Kuroda, Y. Makita, T. Matsubara, E. Matsushita, K. Morase, T. Nagatomo, T. Nakamura, S. Nomura, K. Okada, K. Okazaki, K. Sakata, T. Sakudo, M. Sato, A. Sawada, T. Takanaka, I. Tatsuzaki, H. Toraiuchi, Y. Tominaga, K. Uchino, K. Uchinokura, M. Udagawa, Y. Uesu, T. Yagi, Y. Yamada

KOREA

S.H. Choh, J.J. Kim

MOROCCO

B. Elouadi

NORWAY

E. Fjær, J.D. Fossum

POLAND

B. Hilszner, J. Stankowski

SOUTH AFRICA

J.S. Clark

SPAIN

J. Del Corno, J. Fernandez, J.A. Gonzalo, D. Jimenez, A. Lopez Echarri, E. Maurer, L. Montoto, M. Tello Leon

SWITZERLAND

H. Arend, P. Guenther, R. Künd, J.P. Rivera, D. Rytz, N. Setter, H. Schmid, H. Thomas

UNITED KINGDOM

A.J. Bell, A.D. Bruce, J.C. Burfoot, U. Cochran, N. Darlington, A.M. Glazer, H.L. Heng, R.J. Holmes, R. Wilmshere, D.Q. Xiao, C.J. Yin

UNITED STATES

B.H. Acher, A. Ahmed, B.H. Aho, B.A. Auld, A.A. Buzdhan, T. Badzian, G. Barrie, P. Bettle, P.D. Bole, H.P. Boorman, A. Bonerjee, A.S. Bhalla, J.V. Bigger, A.R. Bishop, P.E. Blomfield, J.D. Blau, L. Boyer, R.A. Brattton, M.G. Broadhurst, P.S. Brody, G. Burns, R. Capek, N.H. Chan, D.E. Chandralekha, J.P. Chang, L.L. Chase, H.C. Chen, Z.L. Chen, Z.Y. Chen, C. Chess, D.L. Chess, N. Clark, L.B. Colanin, P.J. Cressman, D. Cross, L.E. Cross, H.Z. Cummins, M. Delat, T. Demirey, A.S. De Reggi, J.P. Dougherty, P. Eisenberger, K. Etzold, P. Fleury, S. Gadekar,

UNITED STATES (CONT.)

T.K. Gaylord, A.M. Glass, D. Graves, B.Y. Gupta, T.R. Gururaja, G. Haertling, W.F. Hall, A. Halliyal, J.R. Hardy, M.J. Haug, J.H. Henkel, T. Iizuka, S.J. Jang, G.E. Johnson, S.J. Jetter, M. Kay, W. Kim, D.S. Kim, Y.S. Kim, A. Kingston, M. Klein, R.R. Knapfel, Y. Komo, R.B. Lal, C.E. Lar, R. Landauer, J. Laughner, W.R. Lawless, C.D. Leedy, I. Lefkowitz, J.C. Lin, M.E. Lines, D.B. Litvin, S.T. Liu, G.M. Lofacore, S.V. Lynn, K.B. Lyons, M.A. Marcus, J.J. Marron, M.E. Mason, V.P. McIvor, R.A. McKinstry, J. McKitterick, B.H. Melan, A. Mehrotra, A.H. Meitzler, S. Mendelson, S.H. Morgan, L. Moly, P.-C. Muen, J. Nag, R.R. Neaghenkar, R. Newbhar, R.B. Olson, S.M. Park, R.S. Parker, J.S. Patel, D. Paz, R. Pepinsky, R.C. Pohanka, Y. Porat, R. Prater, J.E. Prendergast, C.F. Pulvari, H. Ramanani, J. Revelli, C. Rice, K. Rittenmeyer, M.R. Roy, M. Royer, A. Safai, V.H. Schmidt, P. Schwackenberg, M.A. Schu, J.F. Scott, M.S. Soemra, A. Shaulov, G. Shirane, T.R. Shrivastava, E. Silberman, D. Skinner, P. Sliva, M.A. Smith, D.M. Smy, K.B. Snyder, J. Spang, R. Soares, J.M. Springer, D. Stewart, S.E. Stokowski, S. Stollav, F.E. Steierler, S. Swartz, G.M. Taylor, P. Toledano, B. Tuttle, F.G. Ullman, S. Ushioda, K. Uchino, S. Venkateraman, D. Voss, V. Vashwan, T.T. Wang, K.L. Weil, C.E. Wheeler, M. Wong, V.E. Wood, Y.H. Xu, X. Tao, R.W. Youngblood, X.L. Zhang

USSR

K.S. Aleksandrov, E.G. Fesenko, V.M. Frid, A.E. Krut'ny, V.Y. Leshner, A.P. Levanyuk, L.A. Shuvalov, G.Q. Smolensky, T.R. Volk

VENEZUELA

A. Sa-Hito

YUGOSLAVIA

R. Blinc, S. Zumer