



## Molecular Crystals and Liquid Crystals Incorporating Nonlinear Optics

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### Preface

J. A. Janik<sup>a</sup>

<sup>a</sup> The Henryk Niewodniczariski Institute of Nuclear Physics,  
31-342, Kraków, Poland

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## PREFACE

The conference was held in Kraków, from August 28th to September 1st, 1989. The organizing institutions were the Institute of Physics of the Jaghiellonian University and the Henryk Niewodniczański Institute of Nuclear Physics, Kraków, Poland. The Rector of the Jagiellonian University, Professor Aleksander Koj was chairman of the Honorary Committee. Docent Stanisław Urban from the Institute of Physics of the Jagiellonian University was chairman of the Organizing Committee. Dr. Waław Witko from the H. Niewodniczański Institute of Nuclear Physics was secretary. Professor Jerzy A. Janik from the H. Niewodniczański Institute of Nuclear Physics was chairman of the Scientific Committee. Professor Dietrich Demus from Sektion Chemie of the Martin Luther University in Halle, DDR, was chairman of the International Advisory and Steering Committee.

The total number of participants amounted to 400 scientists. There were 330 from the socialist countries, and 75 from other countries. It is worth noticing that the term "socialist country" is not precise, especially in view of rapid political and system changes taking place in some of the countries. It is perhaps more appropriate to say which of the European countries should be regarded as hosts of the conference. These are: Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Roumania, the Soviet Union and Yugoslavia. We regret that such outstanding scientists as Professor Glenn Brown from Kent, USA, Professor Horst Sackmann from Halle, DDR, and Professor V.N. Tsvetkov from Leningrad were unable to come. We highly appreciate the fact that many distinguished scholars were able to join us, with Professor S. Chandrasekhar from Bangalore, India, and Professor Marian Mięsowicz from Kraków among them.

48 Lectures and 230 posters were presented at the conference during the following sessions: A. New Substances: Synthesis and General Characterization of Mesomorphic States, B. Macroscopic Physical Properties, C. Phase Structures and Phase Transitions; Surface and Interfaces, D. Molecular Theories, Molecular Aspects and Dynamics, E. Defects, Chiral States and Ferroelectrics, F. Applications and Display Technologies, G. Amphiphilic Liquid Crystals and Biological Systems, H. Polymer Mesophases, I. Irreversible Thermodynamics and Instabilities. Most of the lectures and poster contributions can be found in this special issue of our Journal.

The above presentation of the conference was formal and as such objective. I think, however, that it would not be improper to add some undoubtedly subjective remarks here.

The first one concerns a gradual change of the paradigm in science and in physics in particular. A hundred years ago the division of matter into solids, liquids and gases belonged to this paradigm. Moreover, the properties of liquids were ex definitione

isotropic. Even the discovery of liquid crystals did not quite violate this paradigm, since not many physicists were then involved in liquid crystal research and the majority of physicists treated those subjects as marginal. Chemists were ahead of physicists in those studies. And now we may see that the last two decades have brought a dramatic change in the paradigm, as a result of the studies which led to the notion of the "soft matter", containing classical liquid crystals, amphiphilic systems, colloidal solutions, membranes, Langmuir-Blodgett films, etc.

The next thought concerns the richness of the phase polymorphism of the soft matter. It is no doubt illuminating to consider this matter as undergoing frustration and as relaxing this frustration through a disclination creation—a process facilitated by the fluidity of structural elements. In this connection the molecular level with its molecular translations and rotations, which, on the one hand, give rise to the above mentioned fluidity and on the other eo ipso produce the basis for the rich polymorphism of the soft matter is certainly worth considering.

The third thought is about still another change of the paradigm, this time connected with a departure from the so far generally accepted road from order to chaos. In the last decades we have witnessed discoveries of various dissipative structures in non-equilibrium systems, which no doubt violate the classical paradigm in this matter. I would like to say that the consequences of those phenomena for the subject of soft matter must come and that the results will be far reaching and penetrating genetic codes, evolution and other aspects of biology.

The reader will judge for himself how relevant those reflections are to the material presented at 8th Liquid Crystal Conference of Socialist Countries and printed in this issue.

J.A. JANIK  
*The Henryk Niewodniczański Institute  
 of Nuclear Physics  
 31-342 Kraków  
 Poland*