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## Molecular Crystals and Liquid Crystals Science and Technology. Section A. Molecular Crystals and Liquid Crystals

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### Foreword

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## FOREWORD

The first European Conference on Molecular Electronics (ECME '92) was held in Padua, Italy, from August 24–28, 1992. The Conference has provided a European forum for exchanges amongst scientists from different disciplines sharing a common interest to put into practical use the great potentialities of molecular systems and materials for signal transduction and transport, and for information processing and storage. To achieve this goal, a number of fundamental questions pertaining to the energetics and dynamics of basic molecular processes and to the structure-property relationships must be addressed and clarified. This challenging task offers great opportunities to carry out application oriented basic research at the crossroads of molecular and solid state science, biology and technology.

Rather than restricting the scope of the Conference to a few selected topics, the emphasis was placed into highlighting the main results and ideas emerging from various fields. Scientific sessions were devoted both to molecular scale processes (electron and proton transfer and molecular switching, structural control by supramolecular chemistry and self-assembly, scanning tunneling microscopy, single molecule spectroscopies and persistent spectral hole burning) and to macroscopic and cooperative properties of molecular materials (conductivity and superconductivity, magnetism, nonlinear optical properties). The 160 scientists attending the conference (some from non European countries like Israel, U.S.A., India, Japan and Australia) took part in a rather exacting scientific program composed of ten general lectures, fifty invited and contributed talks (all delivered in plenary sessions) and two poster sessions. Lively discussions at the presentation of the 129 papers and continuous informal exchanges testified that the interest of the participants was well alive all along the five days of the Conference. It was decided that ECME '92 will have a follow up and a second edition is planned in about two years in Germany.

The papers collected in these proceedings provide a rather comprehensive coverage of the scientific results reported at ECME '92 but cannot fully render the atmosphere of excitement aroused by recent advances that open new perspectives to Molecular Electronics. Examples are the use of self-assembly methods to achieve improved structural control over molecular and supramolecular systems, the development of new means of addressing single molecules by scanning tunneling microscopy and by ultra-sensitive spectroscopic techniques, the rapid progress in the understanding and control of intramolecular electron transfer and switching phenomena. Although a true molecular scale electronics remains a future goal likely placed quite a few decades from now, work in that direction is in many ways related with the steady progress in developing molecular materials for electronics and information technologies. Rewarding efforts are being devoted to identifying new material concepts, understanding the structure-property relationships and exploring new opportunities of technological applications.

ECME '92 was organized as the 1992 annual joint meeting of the European Physical Chemistry Divisions/Associations. In setting up the scientific program we, as representatives of the Associazione Italiana di Chimica Fisica and Divisione di Chimica Fisica della Società Chimica Italiana, had the pleasure to cooperate with André Barraud (Division de Chimie Physique de la Société Française de Chimie), Friedrich Hensel (Deutsche Bunsen Gesellschaft für Physikalische Chemie) and Allan Underhill (Faraday Division of the Royal Society of Chemistry) to whom we express our deep gratitude. For the scientific success of the meeting our thanks go chiefly to the authors who

presented the latest results of their work and took part in the formal and informal discussions. The organization of the Conference would have been impossible without the generous financial support by the National Research Council of Italy (C.N.R.) also through its Application Oriented Project M.S.T.A., by the University of Padua and by Gordon and Breach, Science Publishers, S.A., which are gratefully acknowledged. It is a great pleasure to thank Ines Zanon, Danilo Pedron, Moreno Meneghetti and many other colleagues and friends for their invaluable help in the local organization of the Conference and in the preparation of these proceedings.

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