

## New Publication

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### Molecular Electronics—a 'Chemistry for the 21st Century' monograph

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The study of molecular electronics has an ambitious but realistic goal, the use of synthesis, assembly and miniaturization on the molecular level to achieve a huge diversity of devices: molecular wires, rectifiers, switches, transistors and memories. It foresees applications not only in standard electronics but also some unique to molecular systems, for instance sensors based on molecular recognition, and molecular interfaces with biological systems.

*Molecular Electronics* recognizes its subject as a multidisciplinary area of research, tracing its origins in both physics (with attempts to replicate on the molecular level devices from solid-state electronics) and biology (where nature has arrived at organic solutions for functions such as memory and photosensitivity). The book, co-edited by IUPAC Vice-President and President-Elect Prof. Joshua Jortner, provides an up-to-date set of authoritative overviews spanning molecular electronics and assessing its future directions.

The first chapter, written by the two co-editors, serves as an introduction, providing a review of some of the goals, concepts, problems, ideas, experiments and theoretical arsenal of molecular electronics. Included is a description of the different categories of devices that have been envisioned—molecular wires, switches, memory elements, electrodes, energy conversion, sensors, optics and optical switches, displays, electrochemical devices, heterostructure and quantum-well devices, information processing, diodes and rectifiers and intrinsically novel molecular devices. The authors relate them to standard solid state systems, and point out their possible uses in actual devices. Then follows a section devoted to the basic chemical physics



**Prof. Joshua Jortner**

underlying much of molecular electronics, including electron transfer, proton transfer, photo absorption, non-linear optics, descriptions of localization and relaxation, and the coupling of subcomponents. An example analysis based on molecular wires is also presented. The chapter concludes with a consideration of some of the intrinsic limitations and promise of the field of molecular electronics.

Fourteen further chapters, featuring contributors from around the world, deal with topics ranging from molecular control of electron and hole transfer processes to protein-based memories and processors.

*Molecular Electronics*—a 'Chemistry for the 21st Century' monograph. Edited by J. Jortner, School of Chemistry, Tel Aviv University, Ramat Aviv, Israel, and M. Ratner, Department of Chemistry, Northwestern University, Evanston, Illinois, USA. Published by Blackwell Science, Osney Mead, Oxford OX2 0EL, UK, 1997. 485 pp. + viii. ISBN 0 632 04284 2. Price: USD 125; GBP 75.