



# Electrons in Molecules: From Basic Principles to Molecular Electronics

*By Jean-Pierre Launay, Michel Verdaguer*

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**Electrons in Molecules: From Basic Principles to Molecular Electronics** By Jean-Pierre Launay, Michel Verdaguer

The purpose of this book is to provide the reader with essential keys to a unified understanding of the rapidly expanding field of molecular materials and devices: electronic structures and bonding, magnetic, electrical and photo-physical properties, and the mastering of electrons in molecular electronics.

Chemists will discover how basic quantum concepts allow us to understand the relations between structures, electronic structures, and properties of molecular entities and assemblies, and to design new molecules and materials. Physicists and engineers will realize how the molecular world fits in with their need for systems flexible enough to check theories or provide original solutions to exciting new scientific and technological challenges. The non-specialist will find out how molecules behave in electronics at the most minute, sub-nanosize level.

The comprehensive overview provided in this book is unique and will benefit undergraduate and graduate students in chemistry, materials science, and engineering, as well as researchers wanting a simple introduction to the world of molecular materials.

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## **Editorial Review**

### Review

"In *Electrons in Molecules*, Launay and Verdaguer have provided us with a marvellous book reflecting their multidisciplinary knowledge of, contribution to, and perspective on current professional practice at the interface of physics, chemistry, and materials science" --*American Journal of Physics*

"The undeniable strength of this book is its interdisciplinary perspective ... This book is highly valuable for undergraduate and post-graduate students of chemistry, physics and materials science, and electrical engineering who want to get an initial but comprehensive overview of the most important aspects of molecular electronics" --*Angewandte Chemie*

"The material is topical and the book is an interesting read." --*Chemistry World*

"Launay and Verdaguer's *Electrons in Molecules* will be useful for research workers entering fields such as electron transfer and photophysics and for chemists teaching final-year undergraduates in these fields." --*The Times Higher Education Supplement*

### About the Author

Jean-Pierre Launay, *Emeritus Professor, Universite Paul Sabatier, Toulouse and Institut Universitaire de France*, Michel Verdaguer, *Emeritus Professor, Universite Pierre et Marie Curie, Paris*

After studies at Ecole Normale Supérieure (ENS) de Saint-Cloud, Jean-Pierre Launay was Assistant Professor at Université Pierre et Marie Curie in Paris from 1967. His research was on the electrochemistry of polyoxoanions, and mixed valence systems. He was appointed Professor in 1983 and developed investigations on molecular electronics. In 1989, he moved to Toulouse, and led the "Centre for Materials Elaboration and Structural Studies", a CNRS laboratory, from 2003 to 2010. He has been a member of Institut Universitaire de France. He has also worked on molecular machines such as rotary motors and switching elements. He holds awards from the French Chemical Society and the French Academy of Sciences.

Following a career as a secondary school teacher and Assistant Professor at Ecole Normale Supérieure (ENS) de Saint-Cloud, Michel Verdaguer became Professor at the Université Pierre et Marie Curie in Paris in 1988. His research endeavours concentrate on molecular magnetism, in which field he has developed a rational approach to new systems, from quantum chemistry to applications (Haldane's gap, high spin molecules, room-temperature magnets, single molecule magnets). He developed synchrotron radiation

studies in the field of molecular materials. He led the "Inorganic Chemistry and Molecular Materials Laboratory", associated to CNRS, from 1994 to 2001. He is presently engaged in the study of molecular multifunctional magnetic materials. He holds awards from the Spanish and French chemical societies and from the French Academy of Sciences.

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