

Preface to the French Edition

The series of books on the nanosciences originally instigated by Marcel Lahmani and Philippe Houdy already comprises four multi-author books with a largely didactic objective, each tackling one of the main scientific disciplines, and aimed at readers who have already reached graduate level. The first volume, entitled *Nanotechnologies et nanophysique*, was published in 2004 and reedited twice in 2006 and 2009. This was followed in 2006 by a second volume, entitled *Nanomatériaux et nanochimie*, reedited in 2012. Then came *Nanobiotechnologies et nanobiologie* in 2007 and *Nanotoxicologie et nanoéthique* in 2010.¹

The original French versions of the series were nominated four times for the Roberval Prize and the series as a whole was awarded the *Trophée Roberval*, the highest award attributed by this institution. Naturally, all the credit must go to the researchers and engineers who wrote the contributions, along with Belin for the French publication and Springer for the English version, but not forgetting perhaps the stubborn determination of those who initiated the project.

The present work differs significantly from its predecessors. Indeed, the main motivation here is to give a didactic overview of the key areas of science that relate in some way to nanotechnology, and this for a broad non-specialist public. The book thus stands out by the diversity of themes covered, each illustrated by a broad range of examples, leading to numerous applications of immediate interest to the world of industry. It refers to all the scientific disciplines whose development is in some way affected by nanoscientific endeavour, from physics in the form of electronics and photonics, through chemistry and materials science to biology and medicine, not forgetting the inherent toxicological issues. In the last part of the book, there is a guide to, or rather an inventory of, all the current actors on the French scene, including research institutes, educational establishments, and industrial sites. This is intended to provide students, researchers, and engineers with

¹Concerning the English edition, the first volume, entitled *Nanotechnologies and Nanophysics*, published in 2007, was followed by a second, entitled *Nanomaterials and Nanochemistry*, the same year. Then came *Nanobiotechnology and Nanobiology* in 2010 and *Nanotoxicology and Nanoethics* in 2011.

a clearer picture of all the nano activities going on in our country. The book ends with a review of possible social implications of nanotechnology and current regulation. A glossary of some 200 terms has been compiled to provide the reader with the terminology needed to get a good grasp of the subject matter in each chapter.

The second aim was to update the themes in each of the disciplines covered in the previous volumes and thereby bring out the cross-disciplinary nature of nanoscience and nanotechnology and the high level of interaction they generate between research and industrial applications. Particular stress has been put on recent progress in research at the interfaces between physics and chemistry, physics and biology, chemistry and medicine, and between physics and chemistry and the life sciences.

To illustrate the links between research and industry, we have included with the main chapters short articles describing the prospects for nanotechnology in industrial sectors which will in certain cases come as something of a surprise to the general public.

And last but not least, our third aim has been to answer the following question: will nanoscience and nanotechnology lead to a scientific and industrial revolution, as was announced some fifteen years ago?

The reader will soon realise the enormous amount of research that has been carried out in recent years, and will no doubt understand the need to pursue this exploration of the nanoworld for some time to come, knowing that chance will surely surprise us with further extraordinary discoveries as only she knows how!

Acknowledgements

First and foremost, we thank all the authors of the different chapters for their commitment to this undertaking and the quality of their contributions. The choice of authors was made with a view to updating the topics discussed in the previous volumes of the series, including the latest work by several researchers, teachers, and professionals responsible for presenting recent nanotechnological applications. There is also an exhaustive inventory of the relevant resources available in France, together with the latest regulations currently in force.

The main task of the editorial committee has been to dialogue with the authors and edit the resulting manuscripts with an eye for didactic content and the aim of producing a coherent whole. The entire project was supervised by Jean-Michel Lourtioz.

We would particularly like to thank Jean Dutour for the many illustrations, Jean-François Pône for his invaluable assistance at various stages in the preparation of the book, Stephen N. Lyle for his excellent translation of the French edition, EMRS and Springer for their financial support to the English edition and Cécile Foullon, who provided the interface with the publisher Belin, for the huge task of formatting and finalising the submitted texts to make them accessible to as broad a readership as possible.

We also extend our warmest thanks to Patrick Couvreur who kindly accepted to write the foreword to our book.

This project was backed both morally and financially by UniverSud Paris and Labex NanoSaclay, to whom we express our gratitude. From 2007 to 2014, the association UniverSud Paris has brought together three universities and three *Grandes Ecoles*,² and in 2015 it has been incorporated into a still larger association, of international importance, the University of Paris-Saclay. The Labex NanoSaclay will house all the nano research teams of this future university.

September 2013

Jean-Michel Lourtioz
Marcel Lahmani
Claire Dupas-Haeberlin
Patrice Hesto

²*Université Paris-Sud, Université de Versailles–St-Quentin-en-Yvelines, Université d'Évry–Val-d'Essonne, École Centrale de Paris, École supérieure d'électricité, and École normale supérieure de Cachan.*

Nanosciences and Nanotechnology

Evolution or Revolution?

Lourtioz, J.-M.; Lahmani, M.; Dupas-Haeberlin, C.; Hesto,
P. (Eds.)

2016, XXIV, 438 p., Hardcover

ISBN: 978-3-319-19359-5