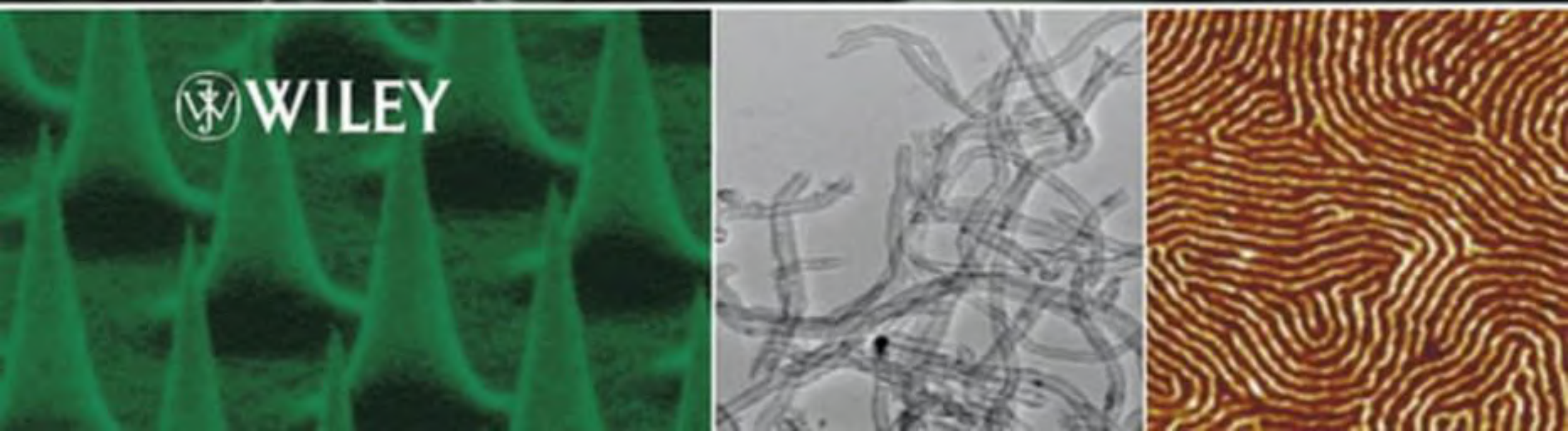


NANOSCALE SCIENCE AND TECHNOLOGY

EDITED BY | ROBERT KELSALL | IAN HAMLEY | MARK GEOGHEGAN

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Nanoscale Science and Technology

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Preface

In the two years since we first started planning this book, so much has been written about nanotechnology that the subject really needs no introduction. Nanotechnology has been one of the first major new technologies to develop in the internet age, and as such has been the topic of thousands of unregulated, unrefereed websites, discussion sites and the like. In other words, much has been written, but not all is necessarily true. The press has also made its own, unique contribution: ‘nanotechnology will turn us all into grey goo’ makes for a good story (in some newspapers at least), and then there’s the 1960s image of nanotechnology, still present today, of Raquel Welch transported in a nanosubmarine through the bloodstream of an unsuspecting patient. This book isn’t about *any* of that! One thing that the recent press coverage of nanotechnology has achieved is to draw attention to the possible hazards which accompany any new technology and to pose relevant questions about the likely impact of the various facets of nanotechnology on our society. Whilst we would certainly encourage investigation and discussion of such issues, they do not fall within the remit of this book.

Nanoscale Science and Technology has been designed as an educational text, aimed primarily at graduate students enrolled on masters or PhD programmes, or indeed, at final year undergraduate or diploma students studying nanotechnology modules or projects. We should also mention that the book has been designed for students of the physical sciences, rather than the life sciences. It is based largely on our own masters course, the Nanoscale Science and Technology MSc, which has been running since 2001 and was one of the first postgraduate taught courses in Europe in this subject area. The course is delivered jointly by the Universities of Leeds and Sheffield, and was designed primarily by several of the authors of this book. As in designing the course, so in designing the book have we sought to present the breadth of scientific topics and disciplines which contribute to nanotechnology. The scope of the text is bounded by two main criteria. Firstly, we saw no need to repeat the fine details of established principles and techniques which are adequately covered elsewhere, and secondly, as a textbook, *Nanoscale Science and Technology* is intended to be read, in its entirety, over a period of one year. In consideration of the first of these criteria, each chapter has a bibliography indicating where more details of particular topics can be found.

The expertise of the authors ranges from electronic engineering, physics and materials science to chemistry and biochemistry, which we believe has helped us achieve both breadth and balance. That said, this book is inevitably our take on nanotechnology, and any other group of authors would almost certainly have a different opinion on what should be included and what should be emphasised. Also, in such a rapidly developing

field, our reporting is in danger of fast becoming out of date (one of our co-authors, who was the most efficient in composing his text, paid the rather undeserved penalty of having to make at least two sets of revisions simply to update facts and figures to reflect new progress in research). We should certainly be grateful to receive any information on errors or omissions.

Although most of the chapters have been written by different authors, we were keen that, to better fulfil its role as a textbook, this volume should read as one coherent whole rather than as a collection of individual monographs. To this end, not only have we as editors made numerous adjustments to improve consistency, and avoid duplication and omission, but in some places we have also made more substantial editorial changes. We should like to acknowledge the tolerance of our co-authors throughout this process. We are all still on speaking terms – just! It is not really necessary for us to tabulate in detail exactly who contributed what to each chapter in the final manuscript, except that we note that the nanostructured carbon section in Chapter 6 was provided by Rob Kelsall. Finally, we should like to acknowledge Terry Bambrook, who composed virtually all of the figures for chapters 1 and 2.

Robert W. Kelsall, Ian W. Hamley and Mark Geoghegan

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