BOOK REVIEW

Atomic Force Microscopy

Ricardo Franco*

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***BOOK*:**

Atomic Force Microscopy
Peter Eaton and Paul West
256 pages | 150 b/w line and halftone illustrations, 9 color figures | 246x171mm
978-0-19-957045-4 | Hardback | 25 March 2010

Review: Atomic Force Microscopy is one of the major scientific tools responsible for the emergence of modern nanotechnology. This general book about AFM describes the technique in a straightforward yet profound manner. The most interesting feature of the book is that while it is an introductory text to a technique that is becoming more and more widely applied, expert users of the technique will also find it extremely motivating to go over the more specialized content.

The book is organized into seven chapters, each one broadly covering one area of the technique: instrumentation, data acquisition, data manipulation and analysis, and finally clarification of common misconceptions and sources of interference. Each chapter is self-contained and can be read individually. In fact, this is an excellent reference book about AFM, as special care has been taken in indexing, and more than 740 bibliographic references are cited. There is an extensive use of exemplary pictures, schemata, and drawings, making explanations and discussions easy to follow. The book features over 150 black and white images and schemata, and 9 color plates have been included in cases where color is essential to clarify a specific topic. Three extremely useful appendices on "AFM standards", "Scanner calibration", and "Third party AFM software" add to the book's reference value. The latter appendix is especially useful as it addresses a common problem in AFM data manipulation, namely, the multitude of data file formats.

Equally useful is chapter 3 on "AFM modes", in which simple models are used to explain the ideas to someone who wants to use the technique for the first time, or is just curious about it. Then the intricacies of AFM modes are detailed for the experienced user, who is sure to find it an interesting and in-depth discussion of the different AFM modes of measurement. Another chapter worth mentioning is chapter 4 on "Measuring AFM images". Here, details on sample preparation are discussed, including types of substrates, and how sample preparation features (*e.g.*, cleanliness of the solvent) can greatly influence the final AFM image. In this chapter, actual technical details are given on the optical alignment of the instrument, setting selection and optimization of scan conditions. These details are clearly oriented towards the practice, not merely the theory, of AFM. Chapter 6 is especially useful from a practical point of view, as it is dedicated to AFM image artifacts, including probe-induced artifacts, scanner artifacts and image processing artifacts. As a final example, chapter 7 provides solid coverage of "Applications of AFM", spanning more than 40 pages. It ranges from the more "classical" applications in materials sciences and nanotechnologies to the most recent applications in life sciences, as well as the expanding field of industrial applications.

Written in a very accessible but technically accurate manner, this book will certainly prove to be essential for anyone preparing and/or running AFM samples, or who simply needs to interpret a particular AFM image.