There is no doubt that imaging of nanometer-scaled materials (nano-imaging) is one of the important research areas in science and technology including bioscience. Among various kinds of experimental techniques, electron microscopy is positioned as one of the most effective methods for analyses of atomic structures, compositions, and physical and chemical properties.

The present volume is a textbook on nano-imaging by transmission electron microscopy (TEM) and scanning transmission electron microscopy (STEM) for graduate students and early career researchers. Although there are already many textbooks for TEM, the significance of the present publication is in describing the principle of nano-imaging and its application. For this purpose, I have limited my explanation of details of electron diffraction patterns and diffraction contrast of images, and let readers refer to appendices and other references. Instead of such details, I have made efforts to describe the physical meaning of imaging using electrons on the basis of Fourier transform, particularly electrons as waves.

This book starts with the physical nature of waves and extends to its application of imaging of atoms and crystalline lattices using electron waves. A number of appendices and footnotes are incorporated in order to include advanced knowledge of TEM and STEM for Ph.D. students and career researchers. They guide them to further study of related publications.

This book was preceded by *Nano-imaging by Electrons*, written in Japanese and published by Uchida-Rohkakuho (2009, Tokyo), but it is not a simple translation into English. I have reconsidered carefully the contents and order of chapters and added new information from scientific papers.

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