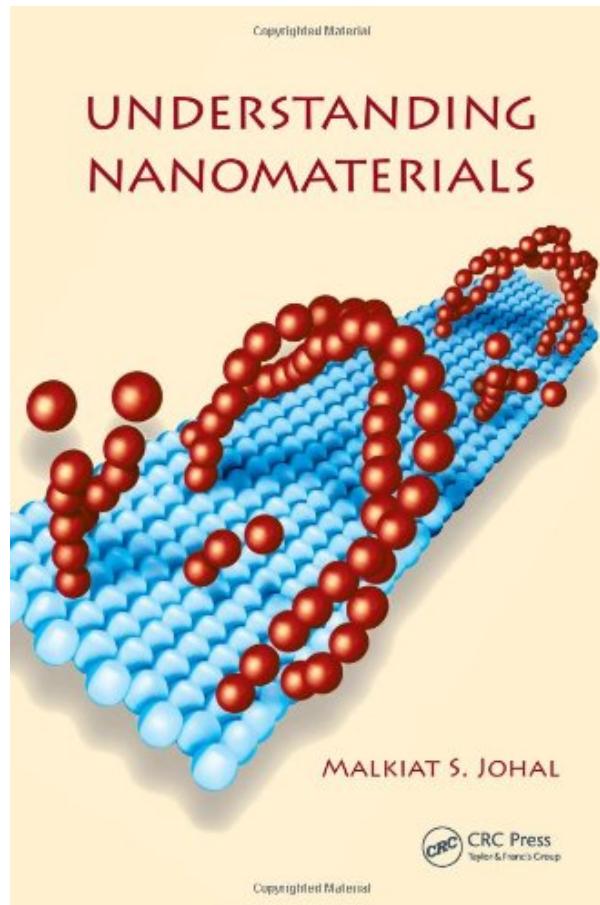


# UNDERSTANDING NANOMATERIALS BY MALKIAT S. JOHAL

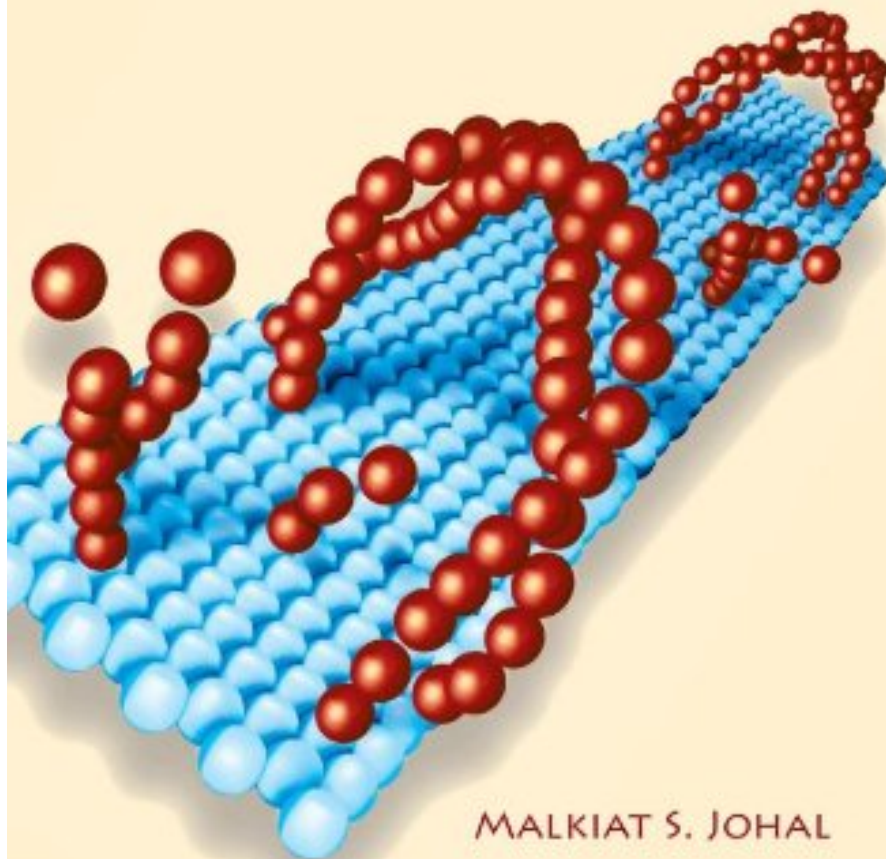


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... physical chemists will enjoy building their teaching around the well-explained material in this book ... students will find it clear and informative. In particular, the end- of-chapter questions are valuable.

?Chemistry World

... will serve students well in their goal to gain a greater understanding of why nanoscaled systems are of great interest, how they are fabricated, and how they are characterized using a wide variety of analytical instrumentation very commonly found in university and industrial settings.

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?Lisa Klein, Rutgers University, Piscataway, New Jersey, USA

## About the Author

Pomona College, Claremont, California, USA

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With a selective presentation of topics that makes it accessible for students who have taken introductory university science courses, *Understanding Nanomaterials* is a training tool for the future workforce in nanotech development. This introductory textbook offers insights into the fundamental principles that govern the fabrication, characterization, and application of nanomaterials.

Provides the Background for Fundamental Understanding

Assuming only a basic level of competency in physics, chemistry, and biology, the author focuses on the needs of the undergraduate curriculum, discussing important processes such as self-assembly, patterning, and nanolithography. His approach limits mathematical rigor in the presentation of key results and proofs, leaving it to the instructor's discretion to add more advanced details, or emphasize particular areas of interest.

With its combination of discussion-based instruction and explanation of problem-solving skills, this textbook highlights interdisciplinary theory and enabling tools derived from chemistry, biology, physics, medicine, and engineering. It also includes real-world examples related to energy, the environment, and medicine.

Author Malkiat S. Johal earned his Ph.D. from the University of Cambridge in England. He later served as a post-doctoral research associate at Los Alamos National Laboratory, New Mexico, where he worked on the nonlinear optical properties of nanoassemblies. Dr. Johal is currently a professor and researcher at Pomona College in Claremont, California. His work focuses on the use of self-assembly and ionic adsorption processes to fabricate nanomaterials for optical and biochemical applications.

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?Lisa Klein, Rutgers University, Piscataway, New Jersey, USA

About the Author  
Pomona College, Claremont, California, USA

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1 of 1 people found the following review helpful.

Great overview of the basics of nanomaterials

By Bob

Johal's book gives a basic overview of the common electrostatic forces and interactions which are important at the nanoscale and it covers a lot of the common techniques used to characterize and study nanomaterials-- spectroscopy, SPR, ellipsometry, light scattering, electron microscopy, etc. The book is not too technical and should be quite accessible to the undergraduate reader, providing him/her with a good starting point upon which to pursue further in-depth study and/or research.

2 of 3 people found the following review helpful.

Wish I had when I was an undergrad

By AvogadroGreen

Arguably the most valuable experience that a chemistry student can have is conducting original research, especially if it leads to publication in a refereed journal. Johal's book is one of those rare gems that can open just such a door to an ambitious undergrad. His book makes a compelling case for educating undergrads in nanoscience and the design of nanomaterials. This book is great for those interested in nanoscience, and students looking to find a fruitful niche to build a body of research experience. Even students with some exposure to developments in nanomaterials will be drawn in by Johal's lively discussion of some of the more innovative applications in the field, such as the optical functionalization of surfaces. For example, how cool is it to coax a material into doubling the frequency of a laser beam by coating it with a nanofilm - a film that you've crafted cleverly enough to assemble itself? Many if not most undergrad labs contain the instrumentation needed to conduct research in nanomaterials. How many even more remarkable materials await discovery by future graduates?

But what if research and publication isn't your goal? Thankfully, Johal succeeds in making nanomaterials accessible to the lay reader. After reading this book, even students with little knowledge of nanoscience will be able to thoughtfully engage the literature. Johal bridges the gap between fundamental knowledge and functional use by providing a theoretical overview of critical concepts, as well as detailed descriptions of lab techniques for creating and characterizing nanomaterials. Particularly helpful to the general chemistry student is Johal's overview of intermolecular forces - a topic all too often neglected in college-level curricula. In fact, I have found this material very helpful when tutoring advanced non-chemistry students.

Well worth the read!

0 of 0 people found the following review helpful.

Excellent introduction to nanomaterials

By Rita

I really enjoyed reading this book, and use it as my pocket guide to nanomaterials. It breaks down the concepts in a very clear and easy to understand level, making it great for quick review. I also like to recommend this book to anyone who is new to the field because it describes nanomaterials in a non-intimidating way. In addition I personally really liked the exercises in the book. I find that it is a great way to refresh my memory on concepts that I have not used in some time. Overall, highly recommend to students, and folks who need the quick refresher.

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