



“Physics in Canada”  
Book Review

“La Physique au Canada”  
Critique de livre

“**Introduction to Nanophotonics**” by Sergey V. Gaponenko, Cambridge University Press, 2010, pp: 465, ISBN: 978-0-521-76375-2 (hbk), price: 78.00

The book entitled “Introduction to Nanophotonics” by Professor Sergey Gaponenko, is an excellent reference on contemporary nanophotonic research. Simply stated, nanophotonics is the physics of spatial confinement of light and electron waves in complex media and nanostructured solids. This book provides in-depth coverage of multiple phenomena related to nanophotonics in four basic sections: electron confinement effects on the optical properties of matter, light wave confinement phenomena in structured dielectrics, quantum optics nanostructures, and metal-dielectric nanostructures.

In this book the author provides a comprehensive and a broad introductory description of light interaction with complex nanostructures, including propagation, emission, absorption, scattering and a comparison between wave optics and wave mechanics. The book is well written, and organized. It provides a clear exposure of physical principles in electromagnetism and quantum mechanics. In addition it contains excellent demonstrations of state-of-the-art nanophotonic applications and experiments such as nanoplasmonics, photonic crystals, and light waves in non-periodic complex media. Mathematical derivations are at a level such that they can easily be followed by a physics graduate student. In particular, intermediate steps are presented whenever they are needed. Furthermore, the book contains many concise and clear figures and useful tables. This not only facilitates understanding, but it also serves as many useful references through the rest of the book.

Gaponenko's “Introduction to Nanophotonics” can be a very useful reference for senior undergraduate and graduate students interested in learning about nanophotonics. The first few introductory chapters summarising quantum mechanics and electromagnetism could probably be omitted by the reader familiar with these subjects. I believe nonetheless that this book would be a useful reference for many physicists, electrical engineers and material scientist doing research in the area of nanophotonics.

Fatemeh Fani Sani  
Ph.D. Student  
University of Alberta