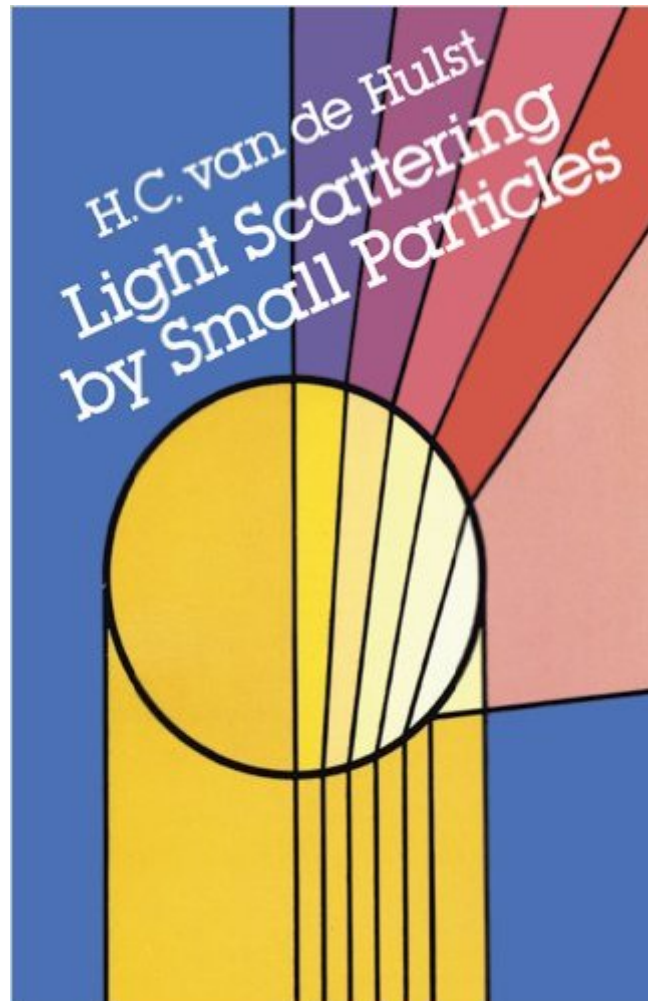


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Light Scattering By Small Particles (Dover Books On Physics)



Synopsis

"A must for researchers using the techniques of light scattering." — S. C. Snowdon, Journal of the Franklin Institute

The measurement of light scattering of independent, homogeneous particles has many useful applications in physical chemistry, meteorology and astronomy. There is, however, a sizeable gap between the abstract formulae related to electromagnetic-wave-scattering phenomena, and the computation of reliable figures and curves. Dr. van de Hulst's book enables researchers to bridge that gap. The product of twelve years of work, it is an exhaustive study of light-scattering properties of small, individual particles, and includes a survey of all the relevant literature. Beginning with a broad overview of basic scattering theory, Dr. van de Hulst covers the conservation of energy and momentum; wave propagation in vacuum and in a medium containing scatterers; and polarized light and symmetry relations. The heart of the book is devoted to the rigorous scattering theory for spheres of arbitrary size (Mie theory) and to various modes of approximation such as the Rayleigh-Gaas approximation, the perfect reflection approximation, the geometrical-optics approximation, and others. Methods of computation are given with respect to different kinds of particles, bodies and phenomena: particles small or very large compared to the wavelength, absorbing and nonabsorbing spheres, water drops, circular cylinders, edge phenomena and surface waves, and many others. In the last part, the author covers the use of scattering and extinction experiments as a practical tool, including applications in chemistry, meteorology and astronomy. This book's comprehensive, lucid coverage of the field makes it a valuable source for all those interested in light-scattering theory. It is absolutely essential for researchers needing to employ light-scattering measurements, and its republication will be welcomed especially by those who have found this necessary source difficult to obtain. Over 400 references. 46 tables. 59 graphs. Subject and name indexes. 44 illustrations.

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Customer Reviews

van de Hulst has written an extremely useful treatise on light scattering by small particles. The essential assumptions in every derivation are specified, noting the range of validity of most expressions, and the physical interpretation and intuition is expressed through words as well as through mathematics. The book is very readable for people coming from all kinds of disciplines. A background in optics and electrodynamics is definitely useful in understanding the text better. Being a Dover publication, the book is very affordable and must be on the shelf of every serious student of scattering. The book starts by stating the "limitation", essentially defining the range of topics and physical behavior that is covered in the book, then wave propagation in vacuum and in media is described and the matrix methods associated with polarization are introduced. In part II, the author covers Rayleigh and Rayleigh Gans scattering, i.e. scattering by particles small compared to the wavelength of light, and then describes Mie scattering (rigorously true for spheres of all sizes). Thereafter he discusses several special cases important to meteorologists, material scientists, atmospheric scientists, physicists and chemists. These include particles large compared to wavelength of light, optics of raindrops and rainbows, absorbing and non absorbing spheres and particles with some other shapes (spheroids and cylinders), etc. The lasting popularity of the book is not only because it provides essence of a large body of work on scattering, it is perhaps in the deep insight of the author that is inspirational and educational in every respect, and found in every page of the book!

This book gives an excellent overview on light scattering by small particles and is a must-have for everybody working on scattering phenomena. Whether you are a physicist, mathematician or engineer, it provides a solid basis for the problems encountered. Further comment is not needed - just consider how often this book is referenced to in scientific publications!

Useful for people that work with scattered light from many types of scattering particles. Good for a summary and equation viewpoint, less useful if you want a deep derivation.

This was a Father's Day gift for my dear husband. He was really happy to get this. Dear Hubs is a scientist so this is fun reading for him.

Classic!! Thorough!! Really nothing more to say about this book. If you decided to buy this book, then I'm sure you already know what this book is about and how classic it is. Help me a lot for understanding and programming for the Mie scattering.

okay, this book is highly utilized by a great deal of people in the field, but I find the book lacking in readability. It generalizes far too much. It gives too little detail. It reminds me of an outline for a scattering text book. It is a reference text in the truest sense of the word. Its obvious intent is a reminder for those who already know the information, but it is so generalized...it alone is not very useful for the student learning scattering.

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