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Books and Multimedia Reviews

Physical Principles of Remote Sensing, second edition by W. G. Rees, Cambridge University Press, New York, New York, USA, 2001, 343 pp., $39.95 (ISBN 0-521-66948-0).

The second edition of *Physical Principles of Remote Sensing* remains true to and improves upon the popular and well-received first edition by focusing on quantitative approaches to remote sensing and adding significant discussions of new techniques, such as synthetic aperture radar interferometry and the global positioning system (GPS). Consequently, the new edition is somewhat longer than its predecessor, but still remains a concise treatment of the field. In taking this approach, the author provides the scientific community with a resource that it needs: a clear and to-the-point overview of the equations that govern remote sensing. The book successfully occupies an area at the boundary between theory and applications, emphasizing the mathematical and physical principles of the propagation of electromagnetic radiation and its interaction with Earth's surface and atmosphere in the first four chapters prior to describing types of sensors and their applications in the next five. The equations are presented in their simplest forms and important properties are explained. For example, the author derives the Fourier transform in addition to using it in a specific case.

One of the text's many strengths is the inclusion of a chapter dedicated to the discussion of remote sensing platforms that also describes the different types of satellite orbits. Although this is basic and important information, it is frequently missing in remote sensing texts. Another appealing aspect is the quantitative description of techniques, such as radar altimetry and scatterometry, laser profiling, and LIDAR, that receive cursory mention by most authors in favor of lengthy descriptions of more traditional and established techniques. The discussion of atmospheric sounding is also new and noteworthy, including an extensive treatment of the radiative transfer equation and atmospheric propagation. The final chapter introduces data processing. Similar to the first edition, the text includes problems at the end of each chapter and provides partial solutions and hints in a separate section after the references.

The book can be used as both a scholarly reference and a textbook for a senior undergraduate or graduate level course in remote sensing. As such, the second edition can be recommended highly to a broad community. However, the reader should be forewarned. As the author himself states in the preface, the text is aimed at the individual who has adequate preparation in college-level physics and mathematics. Someone who is searching for a remote sensing source that contains numerous beautiful color images that illustrate a wide range of applications will be disappointed. On the other hand, the student, researcher, or remote sensing professional who needs a concise, quantitative reference that hits all the major points can find it in this text.

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