

**Exploration of the Solar System by Infrared Remote Sensing 2nd Ed,** by R. A. Hanel, B. J. Conrath, D. E. Jennings & R. E. Samuelson (Cambridge University Press, Cambridge), 2003. Pp. 518, 25 × 18 cm. Price £80 (hardbound; ISBN 0 521 81897 4).

The first edition of this book was published in 1992 and is rightly considered an authoritative work covering most aspects of the study of planetary atmospheres and surfaces in the infrared (see review in this Magazine, 113, 159). At that time, this field had recently undergone significant development following analysis of observations from spacecraft such as Pioneer and Voyager. This new edition comes in a slicker format (glossy cover, bigger font equations), and has been expanded to include advances from the last decade, for example from the Galileo and the Mars Global Surveyor missions.

The first four chapters launch straight into derivations of theories such as those describing the interaction of electromagnetic radiation with matter. While these may appear daunting, even to the initiated, the material is actually quite readable because the authors have included the (fully referenced) historical context. The same style is continued into the fifth chapter, comprising one third of the book, which deals with infrared instrumentation. Again the evolution of this field is comprehensively documented, although the discussion of more recent developments, especially regarding the now ubiquitous detector arrays, is still lacking. The last four chapters concern observations of the solar system's planets as well as their interpretation. The style is pedagogical with the amazingly diverse properties of the solar system's planets providing plenty of *laboratory experiments* with which to showcase the principles derived earlier in the book.

My main complaint is with the way in which this book has been updated. Some of the new material fits in seamlessly with the pedagogical nature of the book, but quite often what has been added is an (incomplete) inventory of new observations or instrumentation; the new sections on comets and asteroids seem particularly incongruous. It's as if the authors started by trying to include every infrared study of the solar system, but then realised that this would be too momentous a task. That this book does not

succeed in providing a complete review of planetary science is not a problem though, as its main strength is as a textbook which shows what affects the infrared spectrum of a planet, how this can be measured, and how to interpret such observations (in roughly equal quantities). At this it is very successful, and the concepts developed here are just as applicable to many other areas of astrophysics, not least to the study of extra-solar planetary systems — which is apt, because little is said about what the future holds for planetary science, and I feel that an opportunity may have been missed to inspire young researchers in this direction. In short, this new edition reasserts the status of this book as an invaluable resource for students and well established researchers alike, and not just those dedicated to planetary science. — MARK WYATT.