BOOK REVIEW

THE SOLAR-TERRESTRIAL ENVIRONMENT: an introduction to geospace
J. K. Hargreaves, Cambridge University Press, Cambridge, 434 pp., 1992, $37.95 US paperback.

This textbook is a revised and expanded successor to the author's earlier book "The Upper Atmosphere and Solar-Terrestrial Relations". The scope of the book is impressive, ranging from the Sun and its electromagnetic and particle radiations, through the magnetosphere and ionosphere to the base of the stratosphere. The author has purposely sacrificed depth of treatment to breadth of coverage, and has produced an introductory work that will reward both the thorough student and the professional seeking information on a specific topic.

The first chapter provides a quick overview of the territory to be covered, and some nomenclature (including the term "geospace"). The second chapter surveys the physics of geospace, devoting the major part to radio and plasma wave propagation through magnetized plasmas. An extensive discussion of techniques for observing geospace follows, covering direct, indirect, and remote sensing methods. The treatment is only as mathematical as necessary and, as in all subsequent chapters, references are given liberally, both to tutorial works and to more detailed review papers.

Chapters 4 - 9 form the core of the book. Here the author discusses, in turn, the neutral atmosphere, the solar wind and the magnetosphere, and then the intermediate region, the ionosphere, with chapters devoted to both the principles and the phenomena of the ionosphere at middle and low latitudes, and to the high-latitude ionosphere. The coverage is everywhere appropriate to an introductory survey, but the discussion of ionospheric principles in Chapter 6 is particularly thorough. A brief chapter on magnetospheric waves is also included.

The final chapter concerns technical applications of geospace science, including communications, earth current effects, space operations, and activity monitoring and forecasting. This discussion is particularly valuable in light of the steadily increasing social and economic importance of these applications, and will be helpful to anyone wanting to know more about the practical impact of space science.

The book is aimed at upper-level undergraduate and fresh graduate students. Here it succeeds as an introduction, which will leave readers amply prepared for more detailed study using other recent books. Its breadth will also make it useful to professionals qualified in other fields who want information about Sun-Earth relations. The author's perspective and personal tone will (I dare say) make it enjoyable.

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NOTE TO EDITORS:
Please edit/compress this review as necessary.