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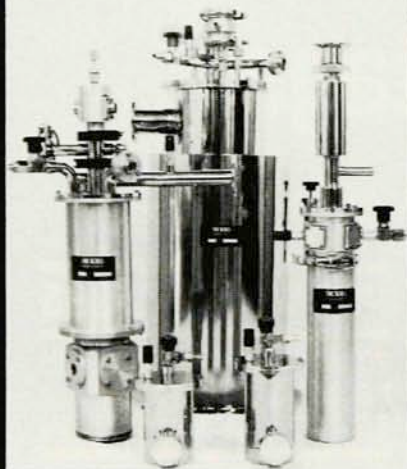
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Introduction to the Physics and Techniques of Remote Sensing

Charles Elachi

Wiley, New York, 1987. 413 pp.

\$44.95 hc ISBN 0-471-84810-7

Remote sensing is the name given to an ensemble of techniques by which we learn the properties of an object without actually having the measuring instruments in contact with it. When a commanding presence in a rapidly evolving scientific field writes a book to introduce nonspecialists to current research it should be cause for excitement. Charles Elachi is just such an author, and *Introduction to the Physics and Techniques of Remote Sensing* is intended to demonstrate the power and illustrate some of the applications of long-range observation of planetary surfaces and atmospheres.

The book succeeds admirably at part of that goal. Nowhere else will the professional or student who suddenly develops an interest in remote sensing, or who develops a need to use remotely sensed data, come close to finding as much information on the physics of using emitted and reflected electromagnetic energy to infer information about the surface below. All of the major methods of measurement are described: radar sounding, microwave and infrared radiometry and spectroscopy, and imaging in visible light and other wave bands. Elachi describes the second-order effects from which the real details of a planet are actually inferred. He shows how the subtle pulse spreading in a radar echo reveals the surface roughness, and describes the complex interactions of electromagnetic radiation with atmospheres and the way in which appropriate corrections are made.

Unfortunately, what should have been—and appeared to be—a perfect introduction to the whole field of remote sensing turns out not to be that. Elachi's choice of topics is overly skewed to the field of active radar sounding, where his own professional contributions have been so important. The most commercially important step in the use of remotely sensed data is precisely the area that receives short shrift: Although the book has many beautiful illustrations using satellite imagery of all kinds, there is not a word about the construction, processing, production or enhancement of images—the principal way in which most of us put remote sensing to use.

Such images need not be acquired

in visible light; radar and infrared imaging are among the most useful sources of data. The importance of image construction techniques is that the human eye gathers quantitative and qualitative information from pictures faster than in any other way. Indeed, Elachi's home institution, the Jet Propulsion Laboratory, has given us some of the most beautiful techniques for enhancing raw image data to permit the eye to discern the subtlest details. It is therefore all the more surprising and disappointing to find such an important area so badly neglected.

PETER D. ZIMMERMAN
Carnegie Endowment
for International Peace
Washington, DC

BOOK NOTE

Theory of Planetary Atmospheres: An Introduction to Their Physics and Chemistry

Joseph W. Chamberlain and
Donald M. Hunten

Academic, San Diego, Calif.,
1987. Second edition. 481 pp.
\$49.50 hc ISBN 0-12-167251-4

After nearly a decade of accumulation of data from planetary probes—Vikings, Veneras and Voyagers—*Theory of Planetary Atmospheres* has come out in a new edition. This comprehensive text provides an understanding of the essential physics and chemistry of planetary atmospheric structures. There is an assortment of well-chosen problems, and bibliographies prepare the reader for a venture into the research literature. Unfortunately the notorious Antarctic ozone-hole problem is too recent to have been included. The first edition (reviewed in *PHYSICS TODAY*, August 1979, page 56) and the second edition are volumes 22 and 36, respectively, in the ongoing International Geophysics Series published by Academic Press.

—PER H. ANDERSEN

NEW BOOKS

Acoustics

Acoustics of Solids. A. I. Beltzer.
Springer-Verlag, New York, 1988. 235 pp.
\$59.00 hc ISBN 0-387-18888-6. *Monograph text*

Acoustics Source Book. *Science Reference Series.* S. Parker, ed. McGraw-Hill,

New York, 1988. 333 pp. \$35.00 hc ISBN 0-07-045508-2

Musical Acoustics: Selected Reprints. T. D. Rossing, ed. Am. Assoc. Phys. Teachers, College Park, Md., 1988. 51 pp. \$16.00 pb ISBN 0-917853-30-0

Astrophysics

Active Galactic Nuclei. *Lecture Notes in Physics 307.* Proc. Conf., Atlanta, Ga., October 1987. H. R. Miller, P. J. Wiita, eds. Springer-Verlag, New York, 1988. 438 pp. \$41.70 hc ISBN 0-387-19492-4

Annual Review of Astronomy and Astrophysics, Vol. 26. G. Burbidge, ed. Annual Reviews, Palo Alto, Calif., 1988. 703 pp. \$47.00 US (\$51.00 elsewhere) hc ISBN 0-8243-0926-X

Astrophysics of the Sun. H. Zirin. Cambridge U.P., New York, 1988. 433 pp. \$49.50 hc ISBN 0-521-30268-4; \$22.95 pb ISBN 0-521-31607-3. *Monograph text*

Atlas of the Ultraviolet Sky. R. C. Henry, W. B. Landsman, J. Murthy, P. D. Tennyson, J. B. Wofford, R. Wilson. Johns Hopkins U.P., Baltimore, Md., 1988. 457 pp. \$65.00 hc ISBN 0-8018-3738-3

Atmospheric Diagnostics of Stellar Evolution: Chemical Peculiarity, Mass Loss and Explosion. *Lecture Notes in Physics 305.* Proc. IAU Colloq. 108, Tokyo, September 1987. K. Nomoto, ed. Springer-Verlag, New York, 1988. 468 pp. \$45.70 hc ISBN 0-387-19478-9

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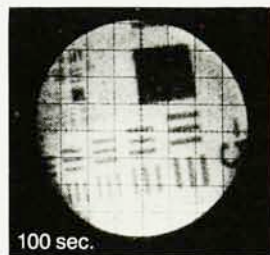
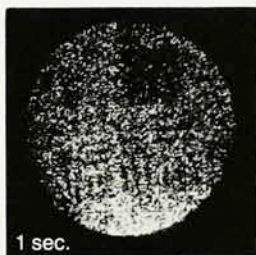
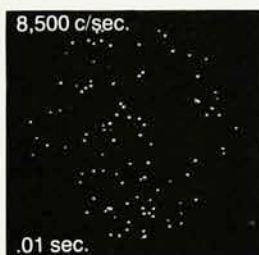
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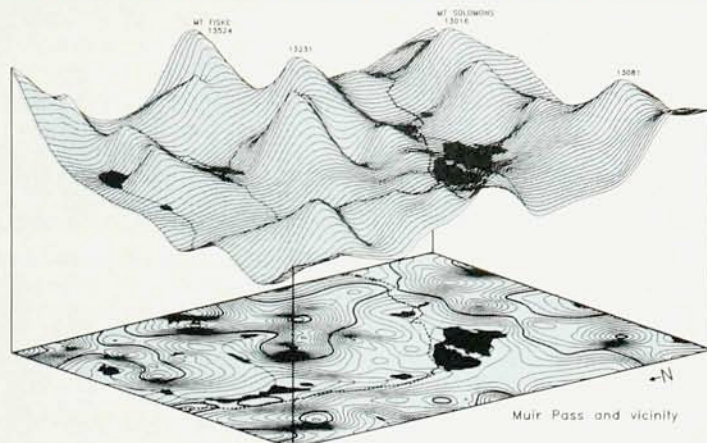
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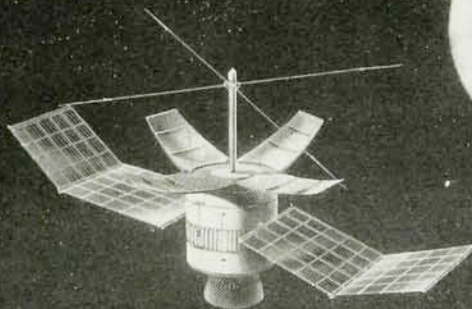
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