these points, of the digital algorithms for interferometric image reduction in the photon-counting mode, and of the study work made on telescope arrays in space is found in *High Resolution Astronomy* (Geneva Observatory, Sauverny, Switzerland, 1985)—the 15th advanced course of the Swiss Society of Astronomy and Astrophysics.

The standing problem with text books for students has always been to convey the beauty of what is done, the fascination and excitement felt by researchers involved in major breakthroughs. Reflecting the latest advances is also difficult, of course, owing to publishing delays, and this proves particularly difficult in a blooming field such as interferometry. Electronic publishing is clearly the way to go, for this reason and also for saving the last forests where those superb birds and butterflies, with their bright interference colors, still survive. Thus, the image of interferometry presented to student readers does not reflect the latest and most exciting developments.

In spite of its limited scope, Hariharan's book is a good study tool owing to its clear presentation of the basic principles underlying these beautiful new applications.

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The Aesthetic Dimension of Science

Edited by Deane W. Curtin
145 pp. Philosophical Library, New York, 1982.
ISBN 0-8022-2393-1. $12.50

The 18th Nobel Conference, held in 1980 at Gustavus Adolphus College in Minnesota, brought together two physicists, a chemist, a musician, and a philosopher to discuss the question of aesthetics and its role in science. Their talks, together with transcripts of the discussions, comprise this brief volume.

Nobel laureates William Lipscomb and Chen Ning Yang give a series of choice quotations from researchers who have articulated the beauty of science, and they laud the compelling power of symmetries in theoretical physical science. Polymath Freeman Dyson compares the styles of Manchester and of Athens, the diversifiers versus the unifiers; his essay is wondrously idiosyncratic, stimulating, and of dubious relevance to the matter of aesthetics. New England Conservatory of Music President Gunther Schuller presents a capsule history of changing musical aesthetics—"kaleidoscopic" is his term—and although he says that "beauty" was a bad word just a couple of decades ago, beauty is now being rehabilitated although undefined. Philosopher Charles Hartshorne, writing on "Science as the search for the hidden beauty of the world," has the deepest of the essays, filled with provocative discussions of materialism, determinism, dualism, metaphysics, and the idea of God.

Henri Poincaré wrote: "Science is useful because it is beautiful." His cryptic statement seems to provide about as much insight into the vexed question of aesthetics in science as any of these essays. At dramatic moments in the history of science one can see the entire enterprise propelled to a new level by a visionary with an aesthetic sense. Copernicus opted for a heliocentric system because it was "pleasing to the mind," something he saw in mind's eye but could not support with any observational proof. But at the same time he was treacherously misguided in his aesthetic that celestial motions must be composed of uniform, circular parts: he spent more effort eliminating Ptolemy's offending equant than in purging geocentric "fossils" from his cosmology.

Such questions do not enter this rather superficial set of musings into the aesthetic dimension of science, and as a whole the collection does not provide any really satisfactory framework for such an inquiry. Nevertheless, at least for me, Hartshorne's and Dyson's essays made reading the book worthwhile.

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new books

Acoustics

Acoustic Waves: Devices, Imaging, and Analog Signal Processing. *Prentice–Hall Signal Processing Series.* G. S. Kino. 601 pp. Prentice–Hall, Englewood Cliffs, N. J., 1987. ISBN 0-13-003047-3. $64.00. *Graduate text*

Nonlinear Underwater Acoustics. B. K. Novikov, O. V. Rudenko, V. I. Timoshenko (translated from Russian by R. T. Beyer; M. F. Hamilton, tech. ed.). 261 pp. AIP, New York, 1987. ISBN 0-88318-522-9. $25.00. *Monograph*

Astronomy, cosmology and space physics

The Analysis of Starlight: One Hundred and Fifty Years of Astronomical Spectroscopy. J. B. Hearnshaw. 531 pp. Cambridge U. P., New York, 1986. ISBN 0-521-25548-1. $79.50. *Monograph*