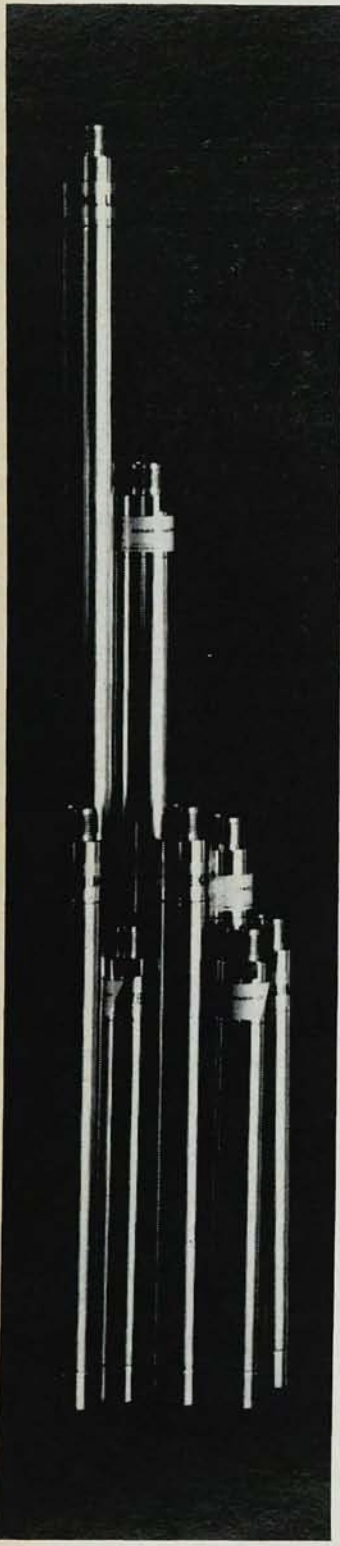




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who is interested in the topic to do without the book.

The reviewer, a scientific advisor for the Centre de Recherches Routières in Sterrebeek, Belgium, is currently engaged in research on viscoelastic layered systems.

Radio astronomy report

PROGRESS IN RADIO SCIENCE 1960-1963. VOLUME V, RADIO ASTRONOMY. Report of Commission V during the XIV URSI General Assembly (Tokyo, Sept. 1963). E. Herbays, ed. 140 pp. American Elsevier, New York, 1966. \$12.50.

by H. J. Hagger

The progress and the overall development in radio astronomy during the period 1960 through 1963 are reported in this booklet. It contains the opening papers to each subject in full and a review of the discussions and the shorter contributions. Commission V of URSI (Union Radio Scientifique Internationale) has always been a very active commission and very interesting reports have been presented at URSI General Assemblies.

For galactic radio astronomy the investigation of the 21-cm line with the largest radio telescopes available is of topmost interest. Still very important, but of lesser interest are the discrete galactic sources and the background radiation and its polarization. In the first section of the booklet a good survey is given of what has been done in this field in the period under consideration. In the second section both experimental and theoretical results of investigations of radio sources are summarized. Chapters 3 and 4 report on the quiet and the active sun respectively. In the case of the quiet corona the resolving power of the radio instruments is inadequate, and in this field much work has to be done in the future for a better understanding of solar physics. In the case of the active sun the radio spectrum has been extended down to 25 MHz. In our days of space explorations with manned or unmanned spacecraft the radio astronomy of the moon and of the planets has gained in importance. Moon, Venus, Mars are under radar observation to measure the exact distances from the earth and to gain more

knowledge of the surfaces of the planets by reflection-coefficient measurements. But passive measurements at different wavelengths still disclose some mysteries of "surface temperature." It should be mentioned that during the period covered by this report



measurements of Doppler frequency shifts due to rotation of a planet were undertaken. Two most interesting companions in the solar system, Jupiter and Saturn show surprising results both at microwave frequencies and at lower frequencies in the range of decimeter wavelengths. In the last chapter observational techniques are dealt with and some newer radio telescopes and interferometers are briefly described. To each chapter a large number of references of the period (1960-1963) are attached, which are most helpful for further studies.

This small book does not only reproduce the papers given at the Tokyo General Assembly of URSI, but also acts as a survey of the state of the art, a survey of the interests radio astronomers have at present and an easy to follow report of the investigations in radio astronomy in the period 1960-1963.

Dr. Hagger, who is a specialist in electronics, is associated with Albiswerk/Zürich in Switzerland.

Deciphering x-ray diffraction patterns

COMPUTING METHODS IN CRYSTALLOGRAPHY. J. S. Rollet, ed. 256 pp. Pergamon Press, New York, 1965. \$12.00.

by J. Gillis

A meeting of crystallographers in Britain, nearly 20 years ago, discussed the use of punched-card equipment for deciphering x-ray diffraction patterns. In spite of the then recent success of the method in the attack on penicillin the general conclusion of the meeting was negative. A cold calculation showed that machines were more expensive than an assistant with cardboard strips—and the assistant could also perform other services, such as making the tea!

Things have changed since then, however. The development of electronic computers made it possible to handle huge numbers of reflections, and this raised hopes of accuracy that justified a substantial improvement in the precision of measurement. The two developments have continued, and the 20% agreement factor which satisfied crystallographers of

the 1940's has now come down to 5% and less.

At a summer school held in Oxford in 1962 students were taught how to go from the crystal to its structure by way of the electronic computer, and the book under review is a report of the lectures given. It contains a great deal of useful information, including even an introduction to FORTRAN programming.

There is always the danger in a book of this sort that hardware, software, and relevant experimental techniques may advance fast enough to make it out of date before it reaches the bookstore. This has not happened here, chiefly because the lecturers placed the main emphasis on fundamental ideas.

There would appear to be some omissions. No reference at all is made to phase-limiting inequalities. Again the Harker section technique, surely suitable for automatic computation, is also entirely ignored.

In spite of minor faults of this kind the book will certainly prove valuable



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