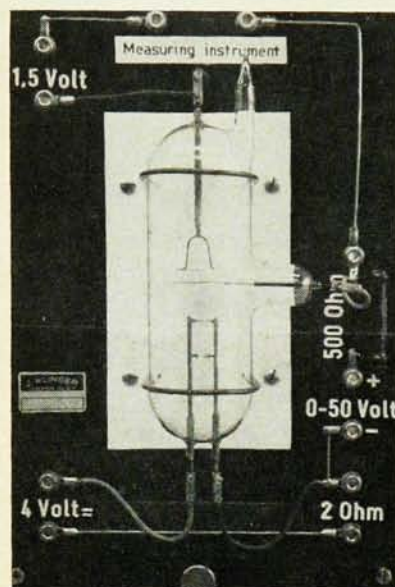


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A microammeter used as a current indicator will show two distinctive maxims and minims. Spectroscopically, several spectral lines corresponding to the quantum transition of the excited atoms can be seen.

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ace, "The reader of literary works does not expect his reading to be effortless; he expects to exert himself to understand what the author is saying. Those reading about science must make a similar effort."

In the opinion of this reviewer, those who are prepared to expend such effort will find uncommonly rich rewards in this short volume.

Interplanetary Dynamical Processes. By E. N. Parker. Vol. 8 of Monographs & Texts in Physics & Astronomy, edited by R. E. Marshak. 272 pp. Interscience, New York, 1963. \$12.50.

Reviewed by **Gerald Johnson Jr.**, *Space Science Laboratory, Pennsylvania State University.*

In contrast to a text on planetary motion, which is usually thought of as the subject for planetary dynamics, this comprehensive work is concerned with solar, magnetic, and particle effects.

Indicating tabular data from the extensive observations that have been made since the advent of space probes is easy, as technical reports indicate, but much more difficult is the ability to transcribe these results into a readable logical form. The transition from topic to topic has been done very capably by the author.

The actual balance of information between the experimental and theoretical aspects is one that each reader will have to decide, however the theoretical outlook requires a deep understanding of the concepts of astrophysics.

With the selection of a dynamic rather than a static solar atmosphere as the basis of all activity, the author obtains Bernoulli's equation by integrating the expansion of the dynamic corona along streamlines. These hydrodynamic equations are then used as a basis to explain the existing data by means of a certain model. Although the model for such equations is incomplete, the results when applied to the solar wind prove of excellent value. By the application of hydro-magnetic equations, the approach to the explanation of the solar wind is carried out in excellent detail.

The mathematics involved in these solutions is not worked out step by step, but is given in sufficient detail such that the equations can be fol-

lowed in form. The handling of both relativistic and nonrelativistic cases, as well as irregular solutions to equations, certainly is a pleasure to find.

Extensive calculations are made on cosmic-ray effects and energetic solar particles. These both give the most important means of measuring the magnetic conditions of interplanetary space. The relation of measured results and the solar flares which cause the perturbation of the interplanetary magnetic field is worked out for various models. The general results of these perturbations over and above the eleven-year variation could be used as a general guide by one concerned with solar fluxes in the coming year—The International Year of the Quiet Sun 1964-65.

Such a timely work could well find its way into the personal libraries of those who are interested in a wide view of astrophysical phenomena through the magnetic effects in the universe.

Der Transistor. Physikalische und technische Grundlagen. By H. Salow, H. Beneking, H. Krömer, W. von Münch. Vol. 15, Technische Physik in Einzeldarstellungen, edited by W. Meissner and M. Nöbauer. 426 pp. Springer-Verlag, Berlin, 1963. DM 82.

Reviewed by **Hans J. Hagger**, *Albiswerk Zürich, Switzerland.*

It is difficult for an editor to give a homogeneous character to a monograph written by several authors, particularly when the subject concerns a circuit element which has not yet attained such a classical standard of interpretation as the electron tube has at present. The title of this monograph does not exactly represent its content. One expects under the title *The Transistor*, with the subtitle *Physical and Technical Principles*, a book exclusively on the physics and techniques of such an element, but in this case about half of the content deals with the application of transistors. In the first part, Dr. Krömer explains the physical principles, i.e., the energy band model, *p-n* junctions, the physical meaning of the elements in the equivalent circuit, etc. Then Dr. Salow gives the reader a very good picture of technological processes in transistor manufacture, the technology of semiconductor materials, the testing of

basic materials, the alloying and diffusion processes, and the surface effects. The third part, written by Professor Beneking, deals with circuit theory. Quite a respectable space is occupied by equivalent circuits of an unspecified transistor. As examples some circuits using European transistors are given. The last part, by Dr. von Münch, gives an introduction to the measuring techniques and helpful curves, which—apart from being shown only for some German transistors—may disclose the principal relationship between transistor parameters and temperature as well as supply and bias voltages. Finally, the author considers briefly special semiconductor elements, i.e., photo- and field-effect transistors, four-layer diodes, unijunction transistors, and tunnel diodes.

References on the subject are given for each part, and the book finishes up with a very helpful index. The difficulty of getting the whole picture of transistors from the opinions of four writers remains with the reader. Nevertheless, by combination of the different parts and by adjusting oneself to the points of view expressed, the picture is quite complete. In the reviewer's opinion, the part on transistor circuits could have been omitted, because the scope of such a monograph differs from a book dealing with applications. For a reader with no profound knowledge of the German language, the book is not easy to understand in all its details, because linguistically it is not simple writing.

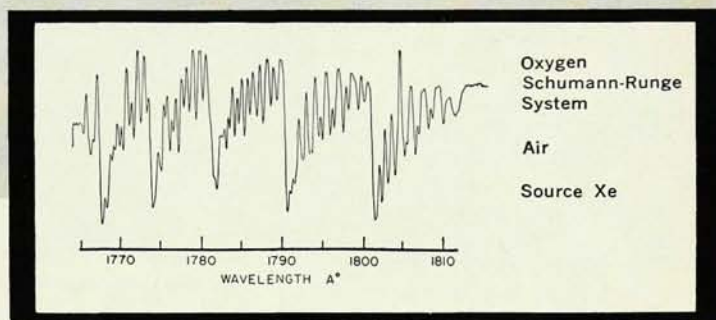
Combustion. Proc. of 9th Internat'l Symp. (Cornell Univ., Aug.-Sept. 1962). 1091 pp. Academic, New York, 1963. \$42.00.

Reviewed by **Henry Wise**, Stanford Research Institute.

This biennial Symposium on Combustion differed somewhat from the preceding ones in format. In addition to the contributed papers on various aspects of combustion, the Symposium included two discussions on detonations and fundamental flame processes, and three colloquia on modeling principles, phase changes in supersonic flow, and reciprocating engine combustion research.

During the discussions on fundamental flame processes, the most recent

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