ing with it from the sun a radially extended magnetic field of the order of 10^{-5}–10^{-4} gauss in the earth's velocity.

Solar-wind problems are far from being exhaustively interpreted, and the book everywhere underlines uncertainties in this respect. Also, the author's treatment is laconic and presumes considerable background knowledge by the reader, who will often have to consult other sources to obtain clear understanding of theory and fact.

Therefore, the stated aim of the text, destined for the "advanced undergraduate ... the beginning graduate student" and "scientists in other fields," may be somewhat over-optimistic. A reader who will master and understand the book completely, will have to perform much more work and thinking than simply reading it as it stands. After that, he may qualify as a full-fledged researcher in the field, far more than merely an "undergraduate." Thus, while being a hard nut to crack for an unprepared reader, the monograph may offer good training toward independent thinking. This in particular refers to some incomplete labelling of the copious illustrations, to half-finished sentences, or to obvious slips of the pen such as the contention (on page 8) that electrostatic repulsion leads to one-half "the effective proton mass," "mass" being here confused with "weight." However, the algebra is generally correct.

Ernst J. Öpik
Armagh Observatory, Northern Ireland and the University of Maryland

Interpretation of Spectra and Atmospheric Structure in Cool Stars

***By* Y. Fujita**
145 pp. University Park Press, Baltimore, Md., 1970. $10.00

The study of the atmospheric structure of cool stars has become a very active field of research in the past decade. Y. Fujita has summarized in this book some of the work done in this area up to 1968. Fujita and his associates in Japan have been working on cool stars for a long time. This book deals primarily with their work.

The topics discussed in this book include: identification of spectral lines, dissociative equilibrium, opacities and model atmospheres, spectral classification, quantitative analysis of spectra and chemical composition. The book gives a fairly detailed discussion of the observed spectra of cool stars, and quite a few spectrograms and tracings have been included. I was surprised not to see any discussion of the observations on mass loss from cool stars, on infrared stars and on flare stars. The discussions of opacities and model atmospheres are brief and dated. There is no mention of the early work on nongray atmospheres of cool stars by Owen Gingerich and his colleagues. Convective energy transport plays an important role in the atmospheres of cool stars and a detailed discussion of this problem should have been given.

Fujita's contributions to the study of carbon stars are well known, and the book gives a fairly detailed discussion of these stars. One chapter of the book is devoted to the interesting problem of the C^{12}/C^{13} ratio in carbon stars.

Although this book deals only with selected topics concerning cool stars, I am sure that all workers interested in this rapidly developing field will find it very useful. The book is handsomely produced and reasonably priced.

Shiv. S. Kumar
University of Virginia, Charlottesville

Nuclear Collective Motion: Models and Theory

***By* D. J. Rowe**
340 pp. Barnes and Noble, New York, 1970. $17.50

The subject matter of this book is appropriately divided into two parts. The first part treats the purely phenomenological aspects of collective nuclear motion, while the second delves into the microscopic theory. The author avoids an historical development, as ample scientific perspective now exists on this subject for a more logical presentation. The material is well organized, and his logical approach is quite successful.

One of the primary highlights, in my opinion, is a large number of clever pedagogical examples that the author uses to clarify comparatively subtle theoretical aspects of the model. Many of these examples are real gems, not readily available elsewhere in the literature. In general, even the most sophisticated aspects of the subject are presented with exceptional clarity. The book is particularly well suited for graduate students and physicists who are encountering the material for the first time. The academic level is appropriate to a second-year graduate student who has had a standard course in quantum mechanics and a rudimentary knowledge of nuclear physics. Specialized mathematical methods are conveniently presented in the appendices.

Most of the defects are pointed out by D. J. Rowe himself. No attempt was made toward complete referencing. I would strongly recommend that an extensive bibliography for this text should be compiled, if the author contemplates a revised edition. Similarly, I would like to see a larger selection of

nuclear data used to illustrate the theory presented. Frequently, only one or two examples are given to demonstrate an important physical theorem. An extensively organized presentation of the actual data would give the reader a chance to judge for himself the validity of the theoretical arguments. Although the collective nuclear model has certainly come of age, it is not yet so well understood that we can afford to forget the data and references on which it is based. The basic framework for a first-class reference volume is present in this text, and it would be a pity not to utilize it as such in the future.

A less important omission (but still worthy of note) is the SU(3) description for collective nuclei. Rowe argues that this approach is "not *really* rotational." This is true, but SU(3) can certainly be used to describe certain rotational nuclei. Personally, I would have liked to have seen a chapter of the book devoted to this subject.

There are a few other omissions, such as the description of the fission process (as the author notes in the preface). Several topics (notably: Hartree–Fock calculations in the 2sld-shell, the Peierls–Yoccoz method, and the work of Abe Klein and his collaborators) are only given very brief attention. The emphasis in the book is definitely centered about the author's own research interests. Thus, the discussion of the "equations of motion" approach is one of the clearest treatments of this topic to be found in the literature. This more than makes up for the omissions listed above. After all, any expert is bound to emphasize his own speciality.

In summary, Rowe has written a very pedagogical book of great value to physicists encountering the concepts of collective nuclear motion for the first time. The framework for a primary reference volume in nuclear physics is present, and could be exploited by expanding the data presentation and including an extensive bibliography.

Paul Goldhammer
University of Kansas, Lawrence

Introduction to Electrodynamics and Radiation

W. T. Grandy, *ed.*
284 pp. Academic, New York, 1970. $12.50

Despite some 40 years of intensive research in nuclear physics (strong and weak interactions) and 55 years of gravitation theory, there is little doubt that of the three fundamental interactions the electromagnetic ones are by far the best understood. Their application in almost every aspect of our highly technological civilization has become common knowledge. The study of the foundations of electromagnetic theory is therefore a standard part of the graduate education of every physicist. This includes classical as well as quantum electrodynamics. The difficulty here is that the latter seems relatively inaccessible, especially to those who do not wish to delve into relativistic quantum field theory.

Here is an attempt at a solution of this difficulty, and I might add a successful one. This book is written for the first- or second-year graduate student who has had at least one graduate semester each of quantum mechanics and of electrodynamics but who has not had much more mathematics than these courses ordinarily require.

Of the 16 chapters half are devoted to classical electrodynamics (mostly relativistic), the other half to quantum electrodynamics of which only the last chapter is relativistic. The first half includes radiation theory and a fine introduction to the classical theory of charged particles. The treatment here is much more complete than in most books on electrodynamics and clarifies many misconceptions still to be found in the current research journals.

In the second half, the author succeeds in showing a great deal of the physics (including comparisons with experiments) and of the computational techniques (Feynman diagrams and radiative corrections) of quantum electrodynamics to a reader with only nonrelativistic quantum mechanics as background. Extensive references to more advanced texts and to original articles are provided.

This text is an ambitious undertaking. It covers a great deal of ground in only 270 pages. Of course, the reader must also pay for it; he is on his own in finding his way between some of the equations, because no step-by-step derivations are given. The average student on this level may not always have the mathematical facility to fill in the gaps; at times he may have to consult some of the various references; this is especially important for the classical theory where a working knowledge is the desirable aim. The exercises and numerous problems in each chapter are posed with this end in mind. In any case, the conscientious teacher using this text must be alert to these difficulties.

The author, of necessity, had to make a selection of topics; this is always a rather subjective matter. For example, arguments in the preface to the contrary, I would have preferred one or two other subjects in place of a chapter on Riemannian geometry in a book entirely devoted to flat-space physics.

Nevertheless, this concisely written but utterly readable book is a success in its unorthodox task: It gives a well-rounded introduction to electromag-