A New Method for Making Advanced Textbooks

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The Space Science Series has developed a method of publishing advanced text and source books that provide up-to-date information on fast-moving fields. Seventeen books have been published, ranging in length from 484 to 1,294 pages. They are produced in between a year and two years at a price below $56. This article describes the procedure by which topics are selected and articles solicited and refereed, as well as editorial and production processes. Fundraising and budgets are also described. The series might be used as a model for similar series in other scientific disciplines and for books on global issues that need advanced interdisciplinary study.

A conventional textbook, written by a single author or by a few authors, is indispensable for presenting the basics of a science, but an array of advanced topics can be reported only by those who actually work in these fields. Thus, textbooks for high school and undergraduate students are best written by a single author who can survey the field and present the subject in a unified manner. However, textbooks to teach the state of the art to advanced graduate students are best written by the experts working in their respective areas of expertise. Unfortunately, such researchers rarely write textbooks, precisely because they are so involved in their research. A type of book that is sometimes available to researchers and graduate students consists of papers assembled from presentations at scientific meetings in “conference proceedings,” but these are not good textbooks because they usually are no more than a collection of papers giving the viewpoints of single scientists and their close associates, without providing the background or any other views on the topic. Compendia and review papers are also sometimes available, but these have their own limitation, usually covering only particular aspects of a discipline, seen from a restricted and often personal point of view.

At the University of Arizona we have been working on the problem of creating advanced textbooks since 1971. Because such texts did not exist in planetary sciences, we developed a new type of advanced source book by adopting and modifying the strengths of the two existing types—compendia and conference proceedings.

In this article I describe the Space Science Series that we developed and explain how the topics are chosen. In addition, I describe the organization, procedures, and funding of the series which is done through grants-in-
support for these specialized books of limited readership. Finally, I address the question of whether our example might be applied to other disciplines.

The Method

The purpose of the Space Science Series, published by the University of Arizona Press, is to provide up-to-date coverage of all major aspects of the solar system. (The present listing of books in the series, published and in preparation, is given in the Appendix.) The volumes serve as source books for researchers in the field as well as graduate-level textbooks. The series was developed to combine the advantages of conference proceedings and compendia.

Conference proceedings, containing papers presented at a meeting of workers in a given area, are usually published with minimal editing and revision so that their contents remain up-to-date. The approach encourages contributions from many researchers and thus achieves a broad, democratic survey of current topics and viewpoints in the field. Proceedings can be published quickly, with the results of the conference available in printed form within months. Usually, however, there is no time for close editing of contributions, for authors’ revisions in response to new data, or even for including appreciable comments from the conference itself. There may be a lack of unity and some repetition among the papers. For an advanced source book, where one explores the frontier, it is, of course, instructive to see the differences in methods and the results of various authors. However, the editors of proceedings can rarely ensure full and balanced treatment of the various topics, including reviews of past work; and time rarely permits thorough review, cross-referencing, or refereeing. The editors cannot determine the structure of the chapters, and they usually do not provide a glossary or index. Conference proceedings therefore tend to be too imperfectly organized, repetitious in some topics and lacking in others, for use as standard texts. They also tend to be expensive and may therefore not be generally available in science libraries. (Incidentally, the quality of conference proceedings in the planetary sciences has improved recently, and this may be due in part to the example of the Space Science Series.)

Compendia, which are supervised by a general editor, avoid some of these shortcomings, but there are substantial objections to this type of book, too. Compendia chapters are usually written by the best people in the field, but they are busy people and their contributions are usually slow to be written when the stimulus of a conference is lacking. These are serious concerns for rapidly developing fields. Furthermore, compendia and monographs tend to be produced under the direction of only a few people, rather than by a broader organizing committee. This does not engender the breadth and objectivity in the representation of diverse results or views that are characteristic of the “open forum” style of a conference.

The Space Science Series was designed to overcome the limitations of both