lar reaction dynamics, and it is a most welcome and useful text for advanced courses in kinetics or molecular collision dynamics.

The authors set themselves the goal of providing an understanding of chemical reactivity and physical rate processes from a microscopic point of view. The emphasis is on phenomena and their conceptual interpretation rather than on the details of experimental techniques or theories. Among the topics discussed are dynamics of molecular collisions; intermolecular potentials and potential energy surfaces; molecular- and ion-beam scattering; "direct" versus "complex" modes of reaction; reagent state selection and product analysis; photofragmentation and multiphoton dissociation; electronic, vibrational and rotational energy transfer; chemical lasers and laser chemistry; van der Waals molecules and clusters; molecule–surface interactions and reactions; and stereospecific dynamics.

The seven chapters of this book will provide a very enjoyable experience for those who are learning chemical reaction dynamics for the first time. The text is exciting to read, and the enthusiasm of the authors for molecular reaction dynamics is both encouraging and contagious. Every subject and every example are treated carefully and presented clearly, and the authors have refrained from injecting their own personal biases into their predictions for future developments. Through detailed and lucid presentations, the authors have successfully included all the basic elements of molecular-level chemical kinetics that one might wish to cover in an advanced chemical kinetics course. More importantly, they provide a very clear picture of what has been accomplished in the past, what is going on at present, and what exciting directions await for us to develop further.

For those who are familiar with the literature of chemical reaction dynamics, this book offers a very useful source of data on reaction mechanisms and an excellent review of this fast-moving field. The extensive and exhaustive collection of references will be of great help to novices who seek a historical perspective as well as a firm grounding in fundamental chemical kinetics.

It is certainly rare to find a book that can serve as a beginning text and at the same time provide an extensive and up-to-date review of the microscopic approach to chemical reactions. This text is clearly the culmination of decades of exceptional research and teaching by both Levine and Bernstein, who have drawn extensively from their experience in writing and editing numerous books on the subject. *Molecular Reaction Dynamics and Chemical Reactivity* should be recommended to every working chemist and every graduate student without reservation.

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Fiber Optic Communications

Joseph C. Palais
Prentice–Hall, Englewood Cliffs, N. J., 1988. Second edition. 291 pp. $30.00 hc
ISBN 0-13-314527-1

Fiberoptic communications continues its significant and rapid expansion in data telecommunications and other applications where photonics-based information processing offers an advantage. This revision of a 1984 book incorporates information on some of the major advances in the field as well as adding problems to each chapter to improve the book's usefulness as an introductory tutorial.

Quite a few books of similar title have appeared over the past decade, with contents ranging from compilations of loosely connected paper reprints to highly theoretical or technical discussions at the lightwave component and system level. Within this spectrum, Joseph Palais's treatment of the subject is a fundamental one, aimed at explaining design and physical operational principles to the person new to the subject. It is easy to read and provides excellent block diagrams and figures to illustrate concepts. The book is organized in a logical manner: The reader first learns the general system elements and their integration, then specific principles and component functions, and finally the considerations that go into designing, specifying and evaluating a fiberoptic system and its components. The problems and their solutions, which are richly embedded throughout the chapters of the book, provide one with an immediate opportunity to test one's understanding.

The book stands as one of the best textbook introductions to fiberoptic systems written to date, and I recommend it for use in the college classroom as well as for scientists and practicing engineers entering the field. The author is a professor of electrical and computer engineering at Arizona State University, and his treatment of the subject results from his extensive experience in delivering short courses. Much of the content is

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focused on the fundamental underlying principles of lightwave technology, and therefore is timeless. Some recent advances, such as the shift from short-wavelength (0.8–0.9 μm) to long-wavelength (1.3–1.6 μm) operation, and direct versus coherent detection systems, are included. However, this book is not aimed at the state of the art. Rather, it provides a framework that allows the reader to more knowledgeably explore and understand such advances.

The book is not without its shortcomings and limitations. Some of the information is dated, despite Palais's revisions, and the reader is cautioned to consider the data illustrative rather than typical of current performance characteristics. While Palais has cited many references and included an in many ways excellent bibliography, these are spotty in places and by no means comprehensive. Lastly, some performance characteristics that are critical to fiberoptic system design and implementation are explicitly not considered in this treatment; as a result, the book falls short of the author's goal of allowing the reader who has mastered its content to design systems. Specifically, I am disappointed by the sketchy treatments of the importance of mechanical properties and of long-term reliability issues. Despite these criticisms, this book represents an important contribution to the field.

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Managing Nuclear Operations

Edited by Ashton B. Carter, John D. Steinbruner and Charles A. Zraket

Brookings Inst., Washington, D. C., 1987. 751 pp.
$39.95 hc ISBN 0-8157-1314-2; $18.95 pb ISBN 0-8157-1313-4

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