



Optical Fiber Telecommunications IV: Systems and Impairments

Ivan Kaminow and Tingye Li
Academic Press, 2002
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1000 pages, \$110.00 (hardcover)

REVIEWED BY STEVE M. HONG

Optical Fiber Telecommunications IV is composed of articles written by experts that cover recent technical developments in different sectors of the optical fiber telecommunications field.

The book is organized in two parts: system design and system impairments. The system design section begins with an overview of optical networks, followed by four chapters on the long-haul segment, including undersea, ultralong haul, time-division multiplexing and soliton telecommunications.

Metropolitan and access optical networks are covered in two chapters. Gigabit Ethernet technology is also discussed. The history of system simulation tools is the focus of another chapter; here, the reader learns how system simulation tools work and what they can be used to achieve. Other chapters in this section cover digital communications and recent developments in the

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field of analog communication technology, such as CATV.

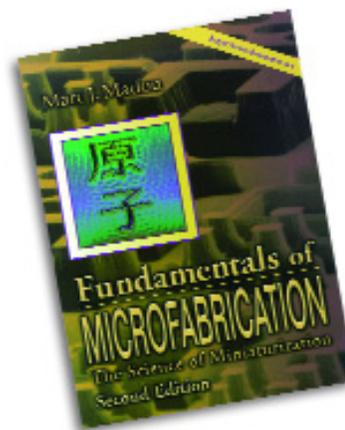
In the section on impairments, two separate chapters focus on the important issues of system performance degradation resulting from chromatic dispersion and polarization-mode dispersion. One particularly interesting chapter in this section covers the various modulation formats that can be “borrowed” from radio engineering to achieve more efficient spectral usage in optical communications. Also covered is forward error correction technology, which allows network operators to boost system performance without investing excessive resources. The final two chapters present various techniques for mitigating transmission impairments.

Those who have read *Optical Fiber Telecommunications III* will find the reach of this book much broader. Because of the number of technologies covered and the level of detail in which they are described, *Optical Fiber Telecommunications IV* is not intended for beginners or to be used as a textbook. It is more suitable for readers who already have some background in optical communication system design and want to learn more about the most recent developments. It is also a very good reference book for communication system and

device design engineers. A comprehensive list of references at the end of each chapter helps readers dig deeper into selected topics. One particularly helpful aspect: Ivan Kaminow, an editor of the volume, describes in an overview at the beginning the content of each chapter. I strongly suggest readers study the overview before they take on the 1000-page book as

a whole. Each chapter can be read on its own since each covers a separate topic. The overview provides a panorama of the entire field of optical telecommunications and will probably give readers a good idea of where to start.

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Fundamentals of Microfabrication

2nd Edition

Marc J. Madou
CRC Press, 2002
ISBN 0849308267

723 pages, \$99.95 (hardcover)

REVIEWED BY BOGDAN HOANCA

Few of life’s pleasures can lead an adult to feel like a kid in a candy store. But one might get this feeling when browsing through *Fundamentals of Microfabrication*, a large, well-written and lavishly illustrated book that conveys a wealth of information on a new and exciting topic: miniaturization, or making systems smaller and more highly integrated.

The book is so vast and encyclopedic that each of its ten chapters on microfabrication techniques could almost stand as a book on its own. Even the scale of what is presented spans many orders of magnitude: from microelectromechanical systems (MEMS), small but still visible objects, to nanoelectromechanical systems (NEMS), down to biomimetics (engineering inspired by biological systems) and nanochemistry (the building of new molecular and macromolecular aggregates or, in other words, atomic and molecular structures).

The author, Marc J. Madou, a professor of mechanical and aerospace engineering at the University of California-Irvine, is an internationally recognized expert on sensors and sensor instrumentation, as well as a leading

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authority on nanotechnology and micro-fabrication. Given his academic background, it is no surprise that the book includes problems at the end of each chapter. Because the book covers such an extensive range of topics, it is hard to believe that instructors could use this volume in its entirety in a single class, other than for self study. For those interested, the author has made available an instructors' manual.*

In any case, the text is an ideal reference. Each self-contained section features an introduction, a description of tech-

niques, rich mathematical derivations, applications and sometimes even computer simulations. Numerous references at the end of each chapter, figures (many in color), a comprehensive index and a glossary help the reader absorb the information presented. The list of recommended reading includes not only books but also the most relevant journals and conferences. In the spirit of the times, as appropriate for a young science that is growing explosively, a brief “living book” appendix is in fact a pointer to a Web site on which the author updates content on the fly: problems, recent publications, company names, references to online

resources (including many multimedia tutorials), all help the reader keep pace with the latest developments.

For the business user as well as the technical user (and sadly, for those who today may be full-time job hunters), a list of companies active in the field is a welcome addition. Names of foundries and design services are provided for the potential user.

All in all, it is very hard to think of any aspect of microfabrication that is not covered in this compendium. Among the many books that attempt to capture parts of a vast and growing field, *Microfabrication* is the most up to date, the most comprehensive and, judging by Amazon.com sales, the most popular.

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* Available by calling 949-824-6585.