

## Heterogeneous Materials I and II

Muhammad Sahimi  
Springer, 2003, \$ 99.95, (hardcover)

This book covers several major properties of heterogeneous materials: electric and thermal conductivity; dielectric properties, including optical characteristics; elastic properties; and dielectric breakdown fields. In the literature, these properties are commonly discussed based on transport process analysis. The author expands such a discussion to two additional models—the continuum model and the discrete model—leading to a better understanding of both classical models, where effective properties of disordered materials are depicted as macroscopic averages, and exact models, where their morphology must be taken into consideration.

The book will be quite useful for engineers working on composite materials; it will allow them to look into not only the optical properties of these materials, but also their mechanical and thermal characteristics.

[ Review by Hiroshi Matak, senior researcher, KRI, Inc., Kyoto, Japan. ]



## Long-Wavelength Infrared Semiconductor Lasers

Hong K. Choi, ed.  
Wiley Series in Lasers and Applications; \$ 95.00 (hardcover)

Strong molecular absorption in the wavelength range of 2 to 1000  $\mu\text{m}$  underpins a wide range of spectroscopic activities, with applications spanning from environmental sensing to molecular biology to homeland security. These applications create a demand for corresponding lasers—specifically, compact laser sources that can be used in both laboratory and engineering situations. This book provides an overview of long-wavelength semiconductor lasers that are being developed for such use.

The book comprises seven chapters written by key players in the field. It explores InP-based strained quantum well lasers for 2  $\mu\text{m}$  operation, mid-infrared sources in antimonide and lead-chalcogenide material systems, and InP and GaAs quantum cascade MIR lasers. It also introduces hot-hole semiconductor lasers for far-infrared emission and addresses terahertz generation via optical heterodyning. The chapters are laid out well, with clear figures and appropriate referencing. The book provides an effective means for getting up to speed on practical long-wavelength lasers.

[ Review by K. Alan Shore, Department of Informatics, University of Wales at Bangor, United Kingdom. ]



## Stimulated Brillouin Scattering, Principles and Applications

M. J. Damzen, V. I. Viad, V. Babin and A. Mocofanescu  
Institute of Physics, U.K., 2003, \$95.00 (hardcover)

This book elegantly separates spontaneous Brillouin scattering from stimulated Brillouin scattering (SBS). It demonstrates the existence of both Stokes and anti-Stokes waves in Brillouin scattering, and only Stokes waves in SBS, confirming the fact that SBS is a parametric interaction. SBS has a threshold for oscillation of infinity gain, and is not governed by amplified noise with an exponential gain. The problem is that, in the coupled-wave analysis, the all-important phonon wave is not included. This approach overlooks the key role played by phonons and phonon loss and fundamentally alters the interaction picture.

Readers who wish to familiarize themselves with phonon excitation are referred to the *Journal of Nonlinear Optical Physics and Materials* **10** (3), 2001, before reading the later parts of the book on applications of SBS.

[ Review by Hsiung Hsu, Department of Electrical Engineering, Ohio State University. ]

## Integrated CMOS Circuits for Optical Communications

Mark Ingels and Michiel Steyaert  
Springer Verlag, 2004. \$79.95 (hardcover)

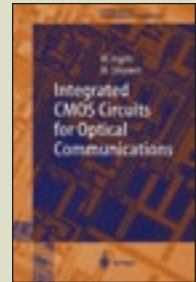
This is a six-chapter publication in the Springer Verlag Advanced Microelectronics Series. The authors consider the design and testing of integrated CMOS integrated circuits (IC) transferring at up to 1 Gb/s, and make the argument that these circuits have come of age for mass production.

The authors introduce the transimpedance amplifier and discuss its single and multiple stage manifestations. Then, they lay out in different configurations an integrated CMOS optical receiver circuit with minimal biasing resistors and almost all transistor circuitry. The book also covers the trade-offs involved in selecting transistor width-to-length ratios, bandwidth and receiver sensitivity.

One chapter is dedicated to integrated CMOS optical transmitters, while another takes on the necessary mixed mode digital and analog signals for the fully integrated CMOS IC optical communication system; this chapter addresses noise and electrical interference at the CMOS level and offers solutions for power supply decoupling, RLC decoupling and the use of guard rings.

The final chapter makes the case for CMOS-based optical communication circuits. This book is primarily intended for CMOS designers, but anyone with a background in microelectronics or solid-state devices would benefit from it. The mathematics and theory it covers are not difficult to understand.

[ Review by David Finsmith, optoelectronics consultant. ]



## Let OSA Manage Your Next Meeting

OSA's strong track record of successful meetings and professional staff make it an attractive choice to help plan your meeting.

For more information about OSA Meeting Services, call 202.416.1993.

**OSA**

## Great Performance, Great Price!



NEW! Amplified 10 GHz Photodetectors  
26 dB Gain, Free space or Fiber-coupled

ET-3500A/AF InGaAs 1500-1650 nm  
ET-4000A/AF GaAs 450-870 nm

**EOT**

Electro-Optics Technology, Inc.  
Phone: 800-697-6782 | Email: sales@eotech.com  
Order online at: [www.eotech.com](http://www.eotech.com)

Delivering High Quality  
Photodetectors since 1987