

## **BOOK REVIEW**

### **LIGHT**

#### **Introduction to Optics and Photonics**

by J. Donnelly and N. Massa

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#### **Reviewed by**

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#### **Summary:**

This book is a textbook for the Physics of Light (Optics) and Photonics Applications (Photonics) primarily intended for students in Secondary and Post-Secondary (Community College or Gymnasium) science and technology studies. This book could also serve as a non-calculus introduction to the topical matter for undergraduate engineering students.

#### **Introduction/Overview:**

In the quest for **good, well-written, and multi-topical** Optics/Photonics books that will reach a wide variety of learners, teachers in high schools and community college settings usually come up empty handed. The authors of this text have done a fine job, production-wise, technically, and pedagogically, of reaching many learning levels... not at all a trivial task. Within the range of **mathematically fitting and technically correct material for the intended learners**, they have presented a broad scope of sometimes-difficult subject matter in an engaging and interesting format. The fifteen chapters include nine on both geometrical and physical optics, with a well-written chapter on Laser Physics (albeit leaving the reader wanting to read a complete text on Lasers), as well as six on up-to-date applications in areas such as Lasers, Imaging, Fiber Optics, Holography, Metrology/Instrumentation, and Biophotonics. There are two helpful appendices on explanations of textual equations and answers to odd numbered problems.

#### **Review:**

At the outset, the initial chapter on **Laser Safety** is particularly timely, well written, and well placed. Recent advances in and availability of diode lasers and sophisticated laboratory equipment mandate the chapter. Perhaps, a general statement/paragraph on laboratory safety preceding the topical laser safety text would serve to round out a healthy respect for the laboratory.

The entire section on the **Physics of Light** is both sequentially appropriate and very understandable. In particular, the chapters on **Geometric Optics, Lenses and Mirrors**,

**Polarization, and Optical Instruments** give a solid backbone to the section. The problems at the end of all the chapters are excellent and well thought out for the teacher and for the level of the students for whom the book is written. The careful handling of the more difficult wave and non-classical (laser, polarization) chapters helps to bridge this section with the following applications section.

The section on **Photonics Applications** takes the chapters on **Lasers, Fiber Optics, Imaging, Holography, Manufacturing, and Biophotonics** and weaves an easy to read and “coherent” presentation of topical matter, about which individual books have been written. The guest authorship of selected chapters and the blending into the text by the principle authors is the right combination for the somewhat formidable task of skillfully fitting this somewhat complex material into a user-friendly text. The graphics, drawings, and photos are very helpful and clear. Once again, the problems are carefully written and non-trivial, teaching as much as the text which preceded them.

Finally, the **references** are up to date and very helpful for those who wish to “dig deeper”. The **websites** allow for both the student and teacher to develop the topical matter to whatever level they deem fit. This is a real plus in texts that are designed to reach the broad base that this one targets.

Since this reviewer knows of no quality texts available **at this level with this scope** (there are many fine texts that cover one or more of the topics included in this book), this reviewer sees a fine future for this publication in serving the secondary and post-secondary market.

**Conclusion:**

**LIGHT: Introduction to Optics and Photonics** is a fine text primarily intended for students in Secondary and Post-Secondary (Community College or Gymnasium) science and technology studies. This book could also serve as a non-calculus introduction to the topical matter for undergraduate engineering students. In addition to its value as a text, this book could serve the technician and non-optical engineer in the workplace as a valuable “companion desk reference”.