

🖶 Get Print Book

# **Optical Materials**

By Joseph Simmons, Kelly S. Potter



# Optical Materials By Joseph Simmons, Kelly S. Potter

*Optical Materials* presents, in a unified form, the underlying physical and structural processes that determine the optical behavior of materials. It does this by combining elements from physics, optics, and materials science in a seamless manner, and introducing quantum mechanics when needed. The book groups the characteristics of optical materials into classes with similar behavior. In treating each type of material, the text pays particular attention to atomic composition and chemical makeup, electronic states and band structure, and physical microstructure so that the reader will gain insight into the kinds of materials engineering and processing conditions that are required to produce a material exhibiting a desired optical property. The physical principles are presented on many levels, including a physical explanation, followed by formal mathematical support and examples and methods of measurement. The reader may overlook the equations with no loss of comprehension, or may use the text to find appropriate equations for calculations of optical properties.

- Presents the optical properties of metals, insulators, semiconductors, laser materials, and non-linear materials
- Physical processes are discussed and quantified using precise mathematical treatment, followed by examples and a discussion of measurement methods
- Authors combine many years of expertise in condensed matter physics, classical and quantum optics, and materials science
- The text is written on many levels and will benefit the novice as well as the expert
- Explains the concept of color in materials
- Explains the non-linear optical behavior of materials in a unified form
- Appendices present rigorous derivations

**<u><b>Download**</u> Optical Materials ...pdf

**Read Online** Optical Materials ...pdf

# **Optical Materials**

By Joseph Simmons, Kelly S. Potter

## Optical Materials By Joseph Simmons, Kelly S. Potter

*Optical Materials* presents, in a unified form, the underlying physical and structural processes that determine the optical behavior of materials. It does this by combining elements from physics, optics, and materials science in a seamless manner, and introducing quantum mechanics when needed. The book groups the characteristics of optical materials into classes with similar behavior. In treating each type of material, the text pays particular attention to atomic composition and chemical makeup, electronic states and band structure, and physical microstructure so that the reader will gain insight into the kinds of materials engineering and processing conditions that are required to produce a material exhibiting a desired optical property. The physical principles are presented on many levels, including a physical explanation, followed by formal mathematical support and examples and methods of measurement. The reader may overlook the equations with no loss of comprehension, or may use the text to find appropriate equations for calculations of optical properties.

- Presents the optical properties of metals, insulators, semiconductors, laser materials, and non-linear materials
- Physical processes are discussed and quantified using precise mathematical treatment, followed by examples and a discussion of measurement methods
- Authors combine many years of expertise in condensed matter physics, classical and quantum optics, and materials science
- The text is written on many levels and will benefit the novice as well as the expert
- Explains the concept of color in materials
- Explains the non-linear optical behavior of materials in a unified form
- Appendices present rigorous derivations

### Optical Materials By Joseph Simmons, Kelly S. Potter Bibliography

- Sales Rank: #2622394 in Books
- Published on: 1999-11-01
- Original language: English
- Number of items: 1
- Dimensions: 9.02" h x .94" w x 5.98" l, 1.67 pounds
- Binding: Hardcover
- 391 pages

**<u>Download</u>** Optical Materials ...pdf

**<u>Read Online Optical Materials ...pdf</u>** 

# **Editorial Review**

#### Review

"For technically intermediate or advanced readers, Simmons (U. of Florida-Gainsville) and Potter (Sandia National Laboratories, Albuquerque) explore the underlying mechanisms that make optical materials what they are and determine how they behave. They group characteristics of the materials into classes with similar behavior and present a broad range of optical materials behavior in order to show which properties are held in common and which differ between various classes of materials. They emphasize atomic composition and chemical makeup, electronic states and band structure, and physical microstructure." --Book News, Inc.®, Portland, OR

#### From the Back Cover

This book presents, in a unified form, the underlying physical and structural processes that determine the optical behavior of materials. It does this by combining elements from physics, optics, and materials science in a seamless manner, and introducing quantum mechanics when needed. The book groups the characteristics of optical materials into classes with similar behavior. In treating each type of material, the text pays particular attention to atomic composition and chemical makeup, electronic states and band structure, and physical microstructure so that the reader will gain insight into the kinds of materials engineering and processing conditions that are required to produce a material exhibiting a desired optical property. The physical principles are presented on many levels, including a physical explanation, followed by formal mathematical support and examples and methods of measurement. The reader may overlook the equations with no loss of comprehension, or may use the text to find appropriate equations for calculations of optical properties.

#### About the Author

Joseph H. Simmons is a Professor in the Department of Materials Science & Engineering and an Affiliate Professor in the Department of Physics at the University of Florida, where he has been for the past 14 years. His prior posts were in the Physics Department of the Catholic University of America (10 years), the National Bureau of Standards (currently NIST) (8 years) and the National Aeronautics and Space Administration (4 years). Dr. Simmons graduated with a BS (University of Maryland), an MS (John Carroll University) and a PhD (Catholic University) in Physics. His studies have spanned numerous topics in condensed matter physics, optical physics and computational modeling. His current research programs include: (1) fundamental studies of quantum-size effects in nanoclusters, (2) time-resolved measurements of optical properties and carrier dynamics in wide bandgap semiconductors, (3) investigations of the processes underlying linear and non-linear optical behavior in inorganic glasses, including electronic Kerr non-linearity and permanent and transient photosensitivity of glass films, (4) atomistic simulations of optical and mechanical properties of various solids, and (5) non-linear viscous flow and rheological behavior of molten glasses. Dr. Simmons is the author of over 110 refereed journal articles, 13 US patents, 4 book chapters and the editor of 2 books.Dr. Simmons is the Co-Director of the International Laboratory for Ultrafast Laser Spectroscopy at the University of Florida, and Editor of the Journal of Non-Crystalline Solids. He is past Trustee of the American Ceramic Society, Member of the Steering Committee of the International Congress on Glass and Fellow of the American Ceramic Society. Other past offices include Chair of the Glass & Optical Materials Division of the American Ceramic Society, Chair of the Gordon Conference on Glass, and member of various award committees. His most recent award was the George W. Morey Award 1997, presented for excellence

Kelly S. Potter is a Principal Member of the Technical Staff at Sandia National Laboratories in the Physical

and Chemical Sciences Center. She received her Bachelors of Science in Physics from Florida State University in December of 1986, Cum Laude, and obtained her Masters of Science and Ph.D. from the Optical Sciences Center at the University of Arizona in 1990 and 1994 respectively. Her doctoral studies encompassed a broad range of topics including geometrical optics, radiometry, quantum optics and nonlinear optics. Her doctoral research focused on the study of nonlinear optical effects in waveguides, specifically the investigation of photosensitivity in fiber and planar waveguide systems. Professional experience prior to arriving at Sandia includes the study of fluoride glass properties at the Universite de Rennes, France, investigation of frictional properties of sol-gel glass coatings at the Massachusetts Institute of Technology, examination of nonlinear viscosity in glass fibers at the Catholic University of America, development of an ellipsometric system for the analysis of glass thin films on glass substrates at the University of Florida, and tenure at the Naval Research Laboratory investigating electron paramagnetic resonance in photosensitive germanosilicate fibers and thin films. Dr. Potter joined Sandia in 1994. Research activities at Sandia have focused on the examination of single and multi-photon processes leading to both linear and non-linear response in optical materials as a result of exposure to either ionizing or non-ionizing radiation. Specifically relevant has been the investigation of the relationship between materials processing and defect formation and the correlation between defect structures and optical behavior. Particular emphasis has been placed on the impact of such relationships on waveguide device design and on optimization of optical device performance through manipulation of relevant defect processes.Dr. Potter is the autho

# **Users Review**

#### From reader reviews:

#### **Michael Campbell:**

Why don't make it to be your habit? Right now, try to prepare your time to do the important take action, like looking for your favorite e-book and reading a book. Beside you can solve your short lived problem; you can add your knowledge by the e-book entitled Optical Materials. Try to stumble through book Optical Materials as your buddy. It means that it can to be your friend when you experience alone and beside that course make you smarter than in the past. Yeah, it is very fortuned in your case. The book makes you considerably more confidence because you can know every little thing by the book. So , let's make new experience and knowledge with this book.

#### **Daniel Miller:**

People live in this new day of lifestyle always try to and must have the spare time or they will get lot of stress from both lifestyle and work. So, whenever we ask do people have spare time, we will say absolutely sure. People is human not really a robot. Then we inquire again, what kind of activity are there when the spare time coming to you of course your answer will unlimited right. Then do you ever try this one, reading books. It can be your alternative in spending your spare time, the actual book you have read is Optical Materials.

#### John Augustine:

Optical Materials can be one of your starter books that are good idea. All of us recommend that straight away because this book has good vocabulary that will increase your knowledge in vocab, easy to understand, bit entertaining but nevertheless delivering the information. The article writer giving his/her effort to place every

word into delight arrangement in writing Optical Materials however doesn't forget the main place, giving the reader the hottest as well as based confirm resource details that maybe you can be certainly one of it. This great information could drawn you into fresh stage of crucial imagining.

#### William Farley:

Do you like reading a publication? Confuse to looking for your selected book? Or your book ended up being rare? Why so many problem for the book? But almost any people feel that they enjoy for reading. Some people likes looking at, not only science book and also novel and Optical Materials or perhaps others sources were given knowledge for you. After you know how the fantastic a book, you feel want to read more and more. Science guide was created for teacher or even students especially. Those publications are helping them to bring their knowledge. In other case, beside science e-book, any other book likes Optical Materials to make your spare time considerably more colorful. Many types of book like here.

# Download and Read Online Optical Materials By Joseph Simmons, Kelly S. Potter #X13OJP78FWQ

# **Read Optical Materials By Joseph Simmons, Kelly S. Potter for online ebook**

Optical Materials By Joseph Simmons, Kelly S. Potter Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Optical Materials By Joseph Simmons, Kelly S. Potter books to read online.

# Online Optical Materials By Joseph Simmons, Kelly S. Potter ebook PDF download

# **Optical Materials By Joseph Simmons, Kelly S. Potter Doc**

Optical Materials By Joseph Simmons, Kelly S. Potter Mobipocket

Optical Materials By Joseph Simmons, Kelly S. Potter EPub