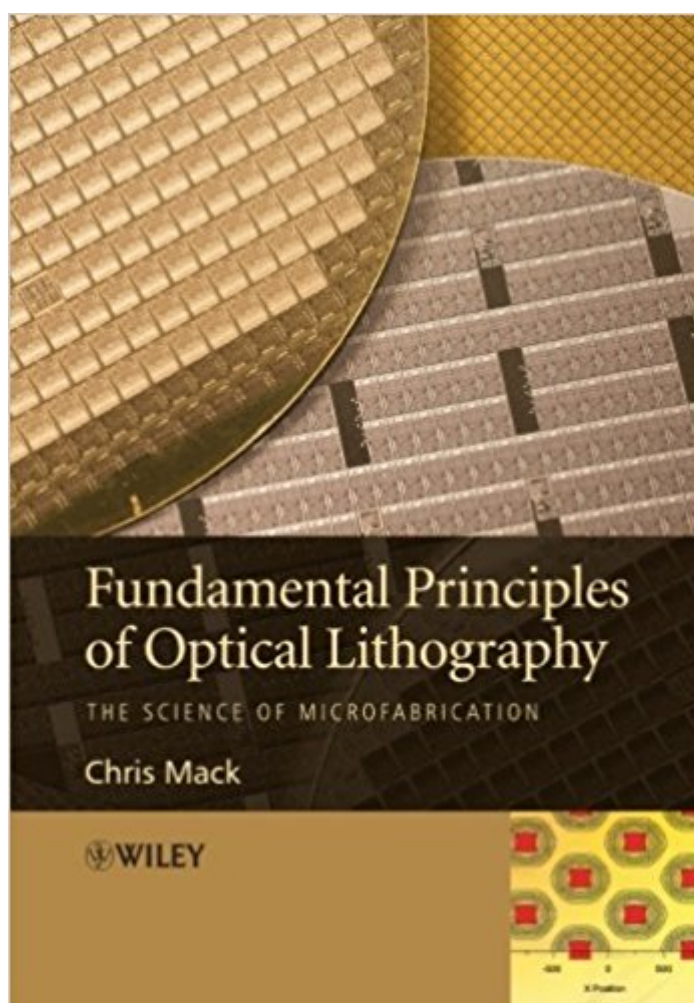


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# Fundamental Principles Of Optical Lithography: The Science Of Microfabrication



## Synopsis

The fabrication of an integrated circuit requires a variety of physical and chemical processes to be performed on a semiconductor substrate. In general, these processes fall into three categories: film deposition, patterning, and semiconductor doping. Films of both conductors and insulators are used to connect and isolate transistors and their components. By creating structures of these various components millions of transistors can be built and wired together to form the complex circuitry of modern microelectronic devices. Fundamental to all of these processes is lithography, ie, the formation of three-dimensional relief images on the substrate for subsequent transfer of the pattern to the substrate. This book presents a complete theoretical and practical treatment of the topic of lithography for both students and researchers. It comprises ten detailed chapters plus three appendices with problems provided at the end of each chapter. Additional Information: Visiting <http://www.lithoguru.com/textbook/index.html> enhances the reader's understanding as the website supplies information on how you can download a free laboratory manual, Optical Lithography Modelling with MATLAB<sup>®</sup>, to accompany the textbook. You can also contact the author and find help for instructors. --This text refers to the Hardcover edition.

## Book Information

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Microlithography is the main technical driving force behind one of the most important phenomenon in the history of technology - microelectronics and the incredible shrinking transistor. These dramatic increases in electronic functionality per unit cost each year for early five decades, have transformed

society. The gating piece of technology in this marvel of manufacturing progress has always been the process of lithography - the photochemical printing of circuit patterns onto semiconductor wafers. This text attempts a difficult task - to capture the fundamental principles of the incredibly fast-changing field of semiconductor microlithography in such a way that these principles may be effectively applied to past, present and future microfabrication technology generations. Its focus is on the underlying scientific principles of optical lithography, rather than its practice. It will serve equally well as a university textbook (each chapter has an extensive set of problems) and as an industry resource. Much of the material contained in this book is, of course, a tutorial review of the published literature on lithography and related sciences, but a significant portion is new work, never before having been published. There is no other single book that covers the wide breadth of scientific disciplines needed in the practice of optical microlithography. The major topics covered within this text are optics (imaging and thin film interference effects), photoresist chemistry (chemical reactions, diffusion, and development phenomenon), lithography as a manufacturing process (process control, critical dimension control, and overlay), and resolution enhancement technologies. --This text refers to the Hardcover edition.

Dr. Chris A. Mack developed the lithography simulation software PROLITH, and founded and ran the company FINLE Technologies for ten years. He then served as Vice President of Lithography Technology for KLA-Tencor for five years, until 2005. In 2003 he received the SEMI Award for North America for his efforts in lithography simulation and education. He is also an adjunct faculty member at the University of Texas at Austin. Currently, he writes, teaches, and consults on the field of semiconductor microlithography in Austin, Texas. --This text refers to the Hardcover edition.

This book is well known in the lithography community. So probably no need for this review. The book is well written and has broad coverage. It builds concepts step by step. So at the end, you might want to summarize what you learned to make it stick. My background: Optical Scientist working in computational lithography

This book changed my life. I was poor, living in a dumpster and ignorant about the principles of optical lithography - and then I found this book. Now, I have a successful career and am a much happier person. Whatever you do, wherever you go, buy this book!

A bible, my life saver. Best book on lithography for both experts and starters. Thank you Chris! tip:

also watch the youtube series from Chris Mack on lithography and chemical processes.

good product with high quality. this price is valuable. I have owned many knives over the years, but this is the first real" bread product that I have ever owned. I really like the construction and design. It works exactly as advertised. I have used it on bread and tomatoes and it did the job perfectly well. I would recommend this product to anyone who needs a quality bread product." very good. my family

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