Confocal Scanning Optical Microscopy and Related Imaging Systems

By Gordon S. Kino, Timothy R. Corle

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This book provides a comprehensive introduction to the field of scanning optical microscopy for scientists and engineers. The book concentrates mainly on two instruments: the Confocal Scanning Optical Microscope (CSOM), and the Optical Interference Microscope (OIM). A comprehensive discussion of the theory and design of the Near-Field Scanning Optical Microscope (NSOM) is also given.

The text discusses the practical aspects of building a confocal scanning optical microscope or optical interference microscope, and the applications of these microscopes to phase imaging, biological imaging, and semiconductor inspection and metrology.A comprehensive theoretical discussion of the depth and transverse resolution is given with emphasis placed on the practical results of the theoretical calculations and how these can be used to help understand the operation of these microscopes.

- Provides a comprehensive introduction to the field of scanning optical microscopy for scientists and engineers
- Explains many practical applications of scanning optical and interference microscopy in such diverse fields as biology and semiconductor metrology
- Discusses in theoretical terms the origin of the improved depth and transverse resolution of scanning optical and interference microscopes with emphasis on the practical results of the theoretical calculations
- Considers the practical aspects of building a confocal scanning or interference microscope and explores some of the design tradeoffs made for microscopes used in various applications
- Discusses the theory and design of near-field optical microscopes
- Explains phase imaging in the scanning optical and interference microscopes

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Editorial Review

From the Back Cover
This book provides a comprehensive introduction to the field of scanning optical microscopy for scientists and engineers. These microscopes have been designed to overcome the problems associated with submicrometer imaging of complex three-dimensional structures. The book concentrates mainly on two of these instruments: the confocal scanning optical microscope (CSOM), and the optical interference microscope (OIM). In these instruments a defocused image disappears rather than blurs as it does in a standard microscope. As a result, researchers can visualize submicrometer structures, determine their surface profiles, and observe a selected cross section of transparent materials withut cutting the sample into thin slices. A comprehensive discussion of the theory and design of the near-field scanning optical microscope (NSOM) is also given.

The text also discusses the practical aspects of building a confocal scanning optical microscope or optical interference microscope and also considers the applications of these instruments to phase imaging, biological imaging, and semiconductor inspection and metrology. A comprehensive theoretical discussion of the depth and transverse resolution is included, with emphasis placed on the practical results of the theoretical calculations and their uses in understanding the operation of these microscopes.

Users Review

From reader reviews:

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