

More Theory Than Meets the Eye

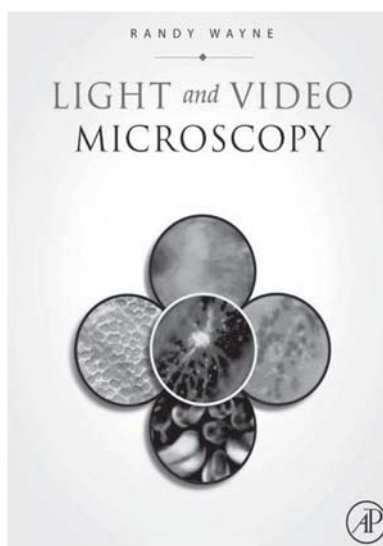
Light and Video Microscopy
 By Randy Wayne
 312 pages. Academic Press. \$99.95

Review by Christopher S. Palenik

I showed this book to several microscopists and a class of students studying pigment microscopy and asked them what they would expect to see on its pages based on the appealing title and cover image. The responses were universal and included: “a book with lots of pictures” and “a book about digital and video imaging.” The cover, which hints at an atlas of color images and a primer on digital imaging techniques, actually yields to a survey of image formation and light microscopy theory. The digital and video imaging section is limited to Chapter 13, and there are only two color plates in the entire book.

Moving beyond expectations and into actual content, readers will find a textbook on light microscopy based on a college-level course that author Randy Wayne taught at Cornell University. It is important to note that Wayne is a biologist, and this field is the source for almost every practical example that he discusses in his book. He begins by defining the relation between object and image and builds on this by navigating through image formation and into various types of contrast methods. Topics discussed include brightfield, darkfield, reflection, polarization, interference, DIC and fluorescence microscopies, among others.

The book’s strength lies in its accessible descriptions of fundamental image-formation concepts. Historical references that not only describe a theory but also tell how it evolved through time are abundant, especially in the first several chapters. This in-depth approach helps build a memorable appreciation and instant context for the topics presented. The text is also supported by good line drawings that illustrate concepts such as optical paths and wave interactions.



Wayne also adds supporting equations, which he attempts to present in a palatable way by walking readers through them step by step. This treatment of mathematical equations is more effective in some sections than others but will serve as a good reference to the more mathematically inclined students. Anyone who works their way through this book will indeed gain a good understanding of the theories supporting light microscopy. So it is important to keep in mind that it is written to convey theory and is not a laboratory manual or practical guide to microscope use (despite a few basic exercises included in the back).

Like its title, the book’s intended audience is a bit enigmatic. While the topics and concepts are of universal interest to microscopists in any discipline, the biological basis for nearly all examples in the text (as well as the photos and exercises) will undoubtedly limit the use of this book to biologists. Wayne would have strengthened the book’s appeal by broadening the scope of examples and applications — particularly when rich microscopical examples are so bountiful in every scientific discipline. After all, microscopy is an inherently colorful and photogenic subject, and the book would benefit by having more color images. Its two color plates are relegated to the back pages and contribute little to the text.

Regardless of any shortcomings, I would recommend “Light and Video Microscopy” as a solid classroom textbook for any microscopy course as long as it is complemented by a strong laboratory component. There is plenty of accessible and well-organized information along with interesting historical commentary that will provide a strong fundamental understanding of image formation. The examples, while limited to biology, can teach something valuable to any microscopist who takes the time to read the book.