

NEW RMS HANDBOOK REVIEW

By Jeffrey M. Hollified, McCrone Research Institute

Contrast Techniques in Light Microscopy

Authors: S. Bradbury (Pembroke College)
and P.J. Evennett (University of Leeds)

Paperback, 136 pages, 44 line illustrations, 9 half-tones
Available from Microscopy Today at \$34.00 plus \$5.00 S&H

When one thinks of contrast techniques, the terms "phase contrast", "differential interference contrast", "modulation contrast", or "staining" usually come to mind. Perhaps this is because the terms themselves incorporate the word "contrast" or imply contrast. In writing *Contrast Techniques in Light Microscopy*, Dr. Bradbury and Dr. Evennett have succeeded in assembling a comprehensive yet concise work covering many contrast techniques, including the basic ones which are sometimes overlooked, such as using a mounting medium with a refractive index different from that of the specimen.

The authors begin by establishing the importance of contrast with respect to resolution and magnification. They maintain that objects must first be resolved, then made visible to the human eye by various contrast techniques, and finally enlarge for viewing or recording. A theme throughout the book is that if the contrast methods presented are used properly, good contrast may be achieved without sacrificing a significant amount of resolution.

A good foundation is laid for developing an understanding of how light interacts with a specimen and how sometimes it is necessary to convert a phase object into an amplitude object. The authors then proceed to describe various contrast techniques including advantages, disadvantages, appropriate applications, and how the microscope should be arranged for each. Some of the techniques covered include dark-ground, oblique lighting, etching, chemical and optical staining, Rheinberg illumination, dispersion staining, polarized light, phase contrast, differential interference contrast, modulation contrast, and fluorescence. Variations of these methods are discussed, along with how the microscopist may utilize the inherent contrasting properties of items designed for other purposes, such as a first-order red compensator.

Importance is also given to careful choosing the direction of the light source. Should the microscopist use transmitted light or reflected light ... epi or oblique ... annular oblique or axial oblique? The answer to these questions, and the consideration given to details, such as adjusting room lighting to avoid ocular glare, make this an excellent book for learning and using contrast techniques.

The last chapter describes contrast techniques specifically for recording images. These methods include making wise choices in film selection, enhancing images digitally, and manipulating gray levels or adding artificial color to histograms.

Following the last chapter is an Appendix on vector theory with respect to phase contrast and an Index.

The diagrams included are kept simple, and they complement the next nicely by exhibiting ideas in a manner which allows the reader to visualize concepts as a glance.

Numerous references are provided at the end of each chapter and are listed alphabetically. The authors refer the reader to several of these for more thorough and technical explanations which have intentionally not been included in this introductory text. One additional reference that might be mentioned is *Special Methods in Light Microscopy* by Robert McLaughlin (available from the McCrone Research Institute). This book covers serrated methods and has a chapter on improving contrast, including a section of Schlieren microscopy.

Contrast Technologies in Light Microscopy is an excellent addition to the Royal Microscopical Society Microscopy Handbook series. It will be an asset to the beginner in learning and understanding contrast, and it will serve the experienced microscopist well as a reference for reviewing a particular technique and as a guide for improving and developing contrast.

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COMING EVENTS

✓ **CCD Imaging Workshops (Photometrics)** Tucson, AZ. Lisa Soroka: (520)889-9933, Fax: (520)295-0299. Oct 3/4 '96

✓ **First Wed. of Each Month in '96: New Strategies & Tactics in Image Analysis.** Iowa City, IA. Dr. J.K. Beddow, (319)337-2427, Fax: (319)337-2474.

✓ **Materials TEM Specimen Preparation Workshops.** (AMC Group). Scottsdale, AZ. Dr. Farhad Shaapur: (602)949-4203, Fax: (602)473-9421

Nov. 6/8 '96: FIB Cross-sectioning for SEM/TEM

Nov. 13/15 '96: TEM Wedge-Polishing

Nov. 18/20 '96: Basic Ultramicrotomy

Nov. 21/22 '96: Advanced Ultramicrotomy

✓ **Orientation Imaging Microscopy Workshops (TexSEM Labs),** Provo, UT. (801)344-8990, Fax: (801)344-8997.

Feb. 24/28 '97

June 23-27 '97

Sept. 29/Oct. 3 '97

✓ **Oct. 23/30 '96: Optical Microscopy and Imaging in the Biomedical Sciences.** Marine Biological Lab., Woods Hole, MA. Carol Harnel: (508)289-7401.

✓ **Oct. 25/27 '96: 15th Annual Symposium on Advances in Microscopy.** (Duke University & NC Soc. for Microscopy & Microbeam Analysis). Wrightsville Beach, NC.

✓ **Nov. 3/6 '96: Basics of Cryo-Electron Microscopy.** (Purdue Univ.) West Lafayette, IN. Susan Umberger: (317)494-7217.

✓ **Nov. 13 '96: 24th Scottish Microscopy Group Symposium.** Aberdeen, Scotland. Kevin MacKenzie: 01224-272847, Fax: 01224-272396.

✓ **Dec. 2/6 '96: Symposium on Materials Issues in Art and Archaeology V.** (Smithsonian Inst.) Boston, MA. Pamela Vandiver: (301)238-3700, Fax: (301)238-3709.

✓ **Dec. 4/6 '96: 26th Annual Conference of the Microscopy Society of Southern Africa.** Durban, South Africa Dr. Fiona Graham, +27-31-260-2174, Fax: +27-31-261-6550.

✓ **Dec. 12/13 '96: Joint Meeting of the Belgian and Dutch Societies for Microscopy.** Gent. Nick Schryers: http://www.ruca.ua.ac.be/~BVM_SBM/progr_net.html

✓ **Jan. 8/11 '97: Atomic Structure of Interfaces Winter Workshop** (Arizona State Univ.) Tempe, AZ. Sharon Willison: (602)965-4424, Fax: (602)965-9004

✓ **February 8/14 '97: Photonics West '97.** (SPIE). San Jose, CA. Marilyn Gorsuch: (360)676-3290, Fax: (360)647-1445.

✓ **February 24/28 '97: LIM Academy: Course in Orientation Imaging Microscopy.** (TSL). Klaus Behnert: (801)344-8990, Fax: (801)344-8997

✓ **March 16/21 '97: PITTCON '97 - Atlanta, GA.** (412)825-3220, Fax: (412)825-3224.

✓ **April 19/22 '97: SCANNING '97 (FAMS, Inc.)** Monterey, CA. Mary K. Sullivan, (201)818-1010, Fax: (201)818-0086

✓ **May 19/23 & 26/30 '97: PASEM 97 SEM Short Course.** (Univ. of Maryland). College Park, MD. Tim Mangel: (301)405-6898, Fax: (301)314-9358.

✓ **June 4/7 '97: 24th Annual Meeting of the Microscopical Society of Canada.** Edmonton. Ray Egerton: (403)492-5095, Fax: (403)492-0714.

LEHIGH UNIVERSITY MICROSCOPY COURSES:

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Advanced Scanning Electron Microscopy with Digital Image Processing

Quantitative X-ray Microanalysis of Bulk Specimens & Particles

June 17/20 '97: Atomic Force Microscopy & other Scanned Probe Microscopies.

Bethlehem, PA. David B. Williams, (610)758-5133, Fax: (610)758-4244.

✓ **June 4/7 '97: 24th Annual Meeting of the Microscopical Society of Canada.** Edmonton, Canada. Ray Egerton: (403)492-5095, Fax: (403)492-0714.

✓ **June 9/14 '97: ACHEM 97 - International Meeting on Chemical Engineering, Environmental Protection and Biotechnology.** Frankfurt am Main. +49(69)7564-280, Fax: +49(69)7564-201.

✓ **June 23/27 '97: 13th Annual Short Course on Molecular Microspectroscopy.** (Miami University) Oxford, OH. (513)529-2874, Fax: (513)529-7284

✓ **July 6/9 '97: CRYO '97 - Low Temperature Microscopy and Analysis.** (Royal Microscopical Society). Univ. of York, RMS: +44(0)1865 248768, Fax: +44(0)1865 791237

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The following is an update to the list in a previous issue of this publication - and will be further updated in the future.

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- Advanced Surface Technology: <http://www.advsurftex.com>
- Beckman Instruments: <http://www.beckman.com>
- Brucker Instruments, Inc.: <http://www.brucker.com>
- Carl Zeiss: <http://www.zeiss.com>
- Custom Medical Stock Photos: <http://www.cmssp.com>
- Delaware Diamond Knives: <http://www.ddk.com>
- Diatome Diamond Knives: http://www.mwrn.com/page/diatome/dia_995.htm
- Digital Instruments: <http://www.di.com>
- Eastman Kodak: <http://www.kodak.com>
- Electroscan: <http://www.electroscan.com>
- Energy Beam Sciences: <http://www.mwrn.com/ebs/ebs.html>
- Ernest F. Fullam: <http://www.fullam.com/>
- ETP-USA: <http://www.etp-usa.com>
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- LEO Electron Microscopes: <http://www.mwrn.com/leo/>
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- Nanoprobes: <http://www.tiac.net/users/everlast/nano>
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- Nissei-Sangyo Canda: <http://www.nstcoronto.com/nissei-sangyo>
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- Oxford Instruments (Microanalysis Group): <http://www.oxinst.com>
- Park Scientific Instruments: <http://www.park.com>
- Philips Electronic Instruments: <http://www.peo.philips.com>
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- Polysciences, Inc.: <http://www.polysciences.com>
- Princeton Gamma-Tech: <http://www.pgt.com>
- Scott Scientific: <http://ScottScientific.com>
- Small World: <http://members.aol.com/smworld100/index.htm>
- Southbay Technology, Inc.: <http://southbaytech.com>
- Soquelec Ltd.: <http://www.soquelec.com>
- Spectra-Tech Inc.: <http://www.spectra-tech.com>
- SPI Supplies: <http://mail.ccbi.chester.pa.us/spi/spihome.html>
- Ted Pella Inc.: <http://www.tedpella.com>
- TSL - TexSEM Labs: <http://www.itsnet.com/~tsl>
- Thomson Scientific Instruments: <http://werple.net.au/~tsi/>
- Topomertix Corporation: <http://www.topometrix.com>
- Vacuum Generators: <http://WWW.surface.fisons.co.uk/vacgen/vg-home.html>
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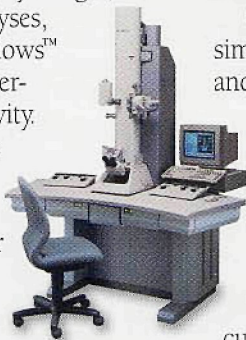


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