

Books on Microscopy and Related Subjects



Electron Microscopy - General

The Principles and Practice of Electron Microscopy 2nd Edition by Ian M Watt

This revised edition contains expanded coverage of existing material bringing the book completely up-to-date. Computer controlled microscopes, energy filtered imaging, cryo and environmental microscopy, high resolution scanning and transmission microscopy are now all described. The highly praised case studies have been expanded and all improvements to technique have been included by an author who has over thirty years of experience of EM. A very readable laboratory reference and technique manual.

B272 Principles and Practice of EM 2nd edition Hardback

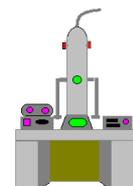
B273 Ditto Paperback

Procedures in Electron Microscopy edited by A W Robards and A J Wilson

This two volume 1500 page guide is the most comprehensive laboratory manual available for electron microscopy. A key feature is the loose-leaf, updateable format which allows new or replacement pages to be inserted on a regular basis ensuring the manual always contains the latest techniques in EM. Supplements are published on a regular basis to allow the immediate inclusion of new and emerging technologies and applications. Step-by-step procedures are included with a full listing of materials required, trouble shooting, references and experimental samples to indicate expected results. Purchase price includes two updates.

B237 Procedures in Electron Microscopy

B237/U Updates



Transmission Electron Microscopy - Biological

A Manual of Applied Techniques for Biological Electron Microscopy by Michael J Dykstra

This very thorough procedural manual is filled with time-tested approaches to the full range of techniques employed by biological electron microscopists. It is carefully structured to maximise its usefulness, and clearly defines the objectives of each technique, the materials needed, the steps involved and the results expected. Common difficulties are noted. The author also provides cytochemistry, immunocytochemistry and photographic methods.

B312 A Manual of Applied Techniques for Biological TEM 270pp Spiral bound

Biological Electron Microscopy, Theory, Techniques, and Troubleshooting by Michael J Dykstra

This work is a basic introduction to the fundamentals of specimen preparation, instrumentation, and photography for the advanced undergraduate level student. The text has valuable explanations of the basic principles of fixation, describes a wide range of approaches to obtain usable ultrastructural work, and details strategies for solving common problems encountered in all phases of electron microscopy work

B313 Biological EM etc. 380pp

Artifacts in Biological Electron Microscopy edited by Richard F E Crang & Karen L Klomparens

This instructive volume highlights the obvious artifactual problems that can confront microscopists in transmission, scanning and analytical electron microscopy. Contributors identify the underlying physical and chemical causes of specific artifacts and offer suggestions for correcting or avoiding them.

B314 Artifacts in Biological EM 254pp

Stains and Cytochemical Methods by M A Hayat

This volume presents a complete discussion of the principles and practise of cytochemical procedures for TEM. Professor Hayat includes new stains providing increased specificity, as well as the more commonly used techniques.

B310 Stains and Cytochemical Methods 474pp

Practical Electron Microscopy - A Beginners Illustrated Guide by Elaine Hunter

An extensively illustrated laboratory manual of TEM techniques for the life sciences technician, student or researcher. The methods and techniques outlined have been tested for over ten years in clinical and research laboratory situations and are entirely reliable. 192pp

B274 Practical EM paperback

Rapid Freezing, Freeze Fracture and Deep Etching Edited by N J Severs & D M Shotton

Includes novel developments such as freeze fracturing and shadowing under low temperature and ultra-high vacuum, improvements in rapid freezing and cytochemical methods utilising lectins and antibodies for labelling specific cellular components. The topics are covered by researchers instrumental in their development and applications.

B249 Rapid Freezing, Freeze Fracture and Deep Etching 320pp

**Cryopreparation of Thin Biological Specimens for Electron Microscopy
Methods and Applications by N Roos & N J Morgan**

The basic principles of TEM cryo techniques are explained in this guide. Prior knowledge of EM is assumed but not of cryo techniques. Contents:

Freezing methods; Cryoultramicrotomy; Section transfer to TEM; Imaging & analysis of frozen hydrated specimens in the TEM; Vitrified thin films & cryosections; Cryosections & immunocytochemistry; Other low temperature methods; Safety; References.

B268 Cryopreparation of thin biological specimens

**Negative Staining & Cryo Electron Microscopy - The Thin Film Techniques
by J R Harris**

This book provides detailed practical methods for specimen preparation for negative staining and cryo electron microscopy of thinly spread samples of biological particulates. The different possibilities are emphasised and the benefits to be gained by the various techniques clearly explained. Contents include:

Introduction; *Negative staining*; historical background and technical development; preparative procedures; some specialised approaches and problems; selected applications; *Unstained vitrified specimens*; Technical background; preparation procedures; selected applications; *Future prospects*; Computer processing for 2D & 3D image reconstruction.

B278 Negative staining etc 224pp

**Three-Dimensional Electron Microscopy of Macromolecular Assemblies
by Joachim Frank**

This is the first systematic introduction to single particle methods for reconstruction. It covers correlation alignment, classification, 3-D reconstruction, restoration and interpretation of the resulting 3-D images of macromolecular assemblies.

- Presents methods that offer an alternative to crystallographic techniques for molecules that cannot be crystallised
- Describes methods that have been instrumental in exploring the three dimensional structure of
- Nuclear pore complex • Calcium release channel • Ribosome • Chaperonins

Contents: Introduction: EM of Macromolecular Assemblies: Two-Dimensional Averaging Techniques: Multivariate Statistical Analysis and Classification of Images: 3-D Images of Macromolecules: Example for application: Calcium Release Channel: Appendix 1:

: Software Implementations: Appendix 2: Macromolecular Assemblies Reconstructed from Micrographs of Single Macromolecules: Bibliography: Subject Index.

B298 3-D EM of Macromolecular Assemblies

**Electron Tomography 3-D Imaging with the Transmission Electron Microscope
edited by Joachim Frank**

Electron tomography covers the theory, working methods and applications of electron tomographic techniques for imaging asymmetric noncrystalline biological specimens.

Contributors discuss topics such as image formation, overcoming artifacts due to missing angular data, and the visualisation of three-dimensional scalar data.



B319 Electron Tomography 412pp

Transmission Electron Microscopy - Materials

Transmission Electron Microscopy A Textbook for Materials Science by David B Williams & C Barry Carter

A complete text in **one** volume (hardback) or **four** volumes (paperback) including all the advances made in the field of TEM in the last 30-40 years. A thorough account of the information required to be a competent electron microscopist in the physical sciences and giving the ability to interpret the resulting images. A fundamentally practical work with over 600 clear figures and diagrams, hints, and descriptions of how to put concepts into practise.

Ideal for laboratory or classroom use this publication covers the **basics** of TEM including scattering and diffraction; beam damage; electron sources; lenses; apertures and resolution; pumps and holders; the instrument; specimen preparation. It includes **Diffraction** patterns; reciprocal space; diffracted beams; Bloch waves; Kikuchi diffraction phenomenon; using convergent beam techniques etc. **Imaging** in the TEM; thickness and bending effects; planar defects; strain fields; weak beam dark field microscopy; phase contrast images; high resolution etc. **Spectrometry**; X Ray spectrometry; the XEDS-TEM interface; qualitative X-Ray analysis & quantitative X-Ray microanalysis; spatial resolution & minimum detectability; electron energy loss spectrometers etc.

B305 Transmission Electron Microscopy 4 volumes paperback 756pp

B304 Transmission Electron Microscopy 1 volume Hardback 756pp

Specimen Preparation for TEM of Materials by P J Goodhew

Details the practical steps that must precede microscopy and lists the methods by which sheet or disc specimens are prepared. Details use of final thinning techniques with particular reference to practical problems. Also describes mounting and storing of specimens and gives a list of suppliers.

B151 Specimen Preparation for TEM of Materials

Light and Electron Microscopy by Elizabeth M Slayter

This book describes the principles of operation of each type of microscope currently available and used by biomedical and materials scientists. It explains the mechanisms for image formation (contrast and its enhancement), accounts for ultimate limits on the size of observable details (resolving power and resolution) and finally provides an account of Fourier optical theory. Principles behind the photographic methods used in microscopy are described and there is some discussion on image processing methods.

B275 Light and Electron Microscopy Hardback 256pp £37.50 **B276** Paperback 256pp

Analysis in the Electron Microscope

Light-Element Analysis in the TEM WEDX & EELS by P M Budd & P J Goodhew

A practical explanation of X-ray analysis without a window (WEDX) and electron energy-loss spectroscopy (EELS) as techniques for deducing the local chemical composition of the specimen with an electron microscope.

Contents:

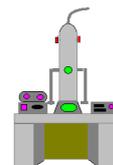
Windowless energy dispersive X-ray analysis; WEDX quantification and limits; Electron energy-loss spectrometry; Quantification of EELS data; Comparison of the two techniques; Appendices; Some of the more useful low-energy X-ray lines; Mass absorption coefficients for light element K lines; Some low-energy edges.

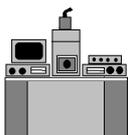
B206 Light Element Analysis in the TEM

Low Temperature Microscopy and Analysis by Patrick Echlin

This work excellently summarises the history and practise of low temperature techniques. It explores all aspects of the preparation, examination and analysis of organic, hydrated and biological specimens emphasising the problems and advantages associated with converting liquid samples to their solid phase. Profusely illustrated with over 200 photographs, tables, figures and charts, this comprehensive volume contains a thorough discussion on the recognition of artifacts.

B322 Low Temperature Microscopy & Analysis 564pp





Scanning Electron Microscopy and X-ray Microanalysis 3rd edition
A Text for Biologists, Materials Scientists and Geologists
J Goldstein, D Newbury, P Echlin, D Joy, A Romig Jnr, C Lyman, C Fiori, E Lifshin

The third edition of this widely acclaimed book is recommended for every electron microscope laboratory and for students who intend using the microscope. It is a comprehensive introduction to SEM and X-ray microanalysis techniques valuable to both the novice and the experienced user. It continues to emphasise the practical aspects of various SEM-EPMA methods and features a completely new chapter that describes quantitative X-ray microanalysis of bulk samples.

The text has been thoroughly revised and updated to describe current advances in theory and report on emerging capabilities of the basic SEM and EPMA. **New topics** in this 3rd edition include:

Variable pressure SEM: Electron backscatter diffraction: Low voltage operation: Extensive material on high resolution SEM: New specimen preparation techniques: New X-ray detectors: Colour & digital mapping: Digital imaging: Standardless X-ray analysis.

A companion CD-ROM is included to enhance text chapters. It also contains a database of useful parameters for SEM and X-ray microanalysis.

B316 SEM and X-ray Microanalysis

**Scanning Electron Microscopy, X-ray, Microanalysis
and Analytical Electron Microscopy**
A Laboratory Workbook by C Lyman, D Newbury, et al

Carefully conceived to illustrate comprehensively important practical aspects of SEM yet remain understandable for "hands-on" learning in the laboratory. This workbook offers a series of fundamental experiments to aid the learning of instrumentation techniques. The text features thirty one laboratories utilising key techniques in the field, such as digital imaging, environmental SEM and X-ray microanalysis of thin specimens.

B317 Scanning EM, X-ray Microanalysis & Analytical EM, Spiral bound 420pp

Electron Energy-Loss Spectroscopy in the Electron Microscope - Second Edition
by R F Egerton

Since the publication of the First Edition in 1986, electron energy-loss spectroscopy (EELS) has developed into an established technique for chemical and structural analysis of thin specimens in a transmission electron microscope. The new, extensively revised *Second Edition of Electron Energy-Loss Spectroscopy in The Electron Microscope* provides an up-to-date account of progress in the field. This book represents the only complete and comprehensive work on advances in EELS theory, techniques, instrumentation and applications.

The Second Edition follows the text's original format, incorporating the most recent EELS innovations. The chapter on applications has been completely rewritten to reflect the tremendous growth in this area over the last decade. Egerton describes ELNES fingerprinting and the use of white line ratios and chemical shifts, as well as the latest findings that show how EELS, used in combination with electron microscopy and diffraction, has contributed new information in different branches of applied science.

Other new features of the Second Edition include:

- data on parallel-recording detectors and image filtering systems
- an updated account of prespectrometer lenses, with attention given to the influence of chromatic aberration on quantitative spectroscopy
- discussions on the angular distribution of plural scattering, the effect of a collection aperture on Poisson's law, and the validity of the dipole approximation in core-loss spectroscopy
- a description of the plasmon wake and its relation to the begrenzungs effect
- expanded material on near-edge fine structure and current information on curvefitting procedures, difference spectra and elemental analysis of thicker specimens.

The text is enhanced by 80 new figures, over 900 references to original publications and updated appendices, including listings (source codes) of computer programs for commonly used methods of spectral processing

B307 Electron Energy-Loss Spectroscopy in the EM

X-ray Microanalysis for Biologists by Alice Warley series editor Audrey M Glauert

This latest volume in the Practical Methods in Electron Microscopy series describes the theory of electron probe X-ray microanalysis (EPXMA) and the instruments used. It also gives practical advice about the preparation of biological specimens and standards for EPXMA.

Detailed and fully illustrated descriptions are given of:

• the theoretical aspects of EPXMA • beam specimen interactions • the instruments used • preparation of biological specimens • quantification theory • practical aspects of quantification • digital X-ray mapping.

Contents include:

- What is EPXMA?
- Production of X-rays
- Interaction of the electron beam with the specimen
- The generation and collection of X-rays
- Spectrum processing and methods for quantitation
- Specimen preparation
- Quantitative analysis of the specimen
- Qualitative analysis of the specimen
- Mapping techniques

B323 X-ray microanalysis for biologists paperback 280pp

B324 hardback

Electron Microprobe Analysis and Scanning Electron Microscopy in Geology By S J B Reed

The techniques of electron microprobe analysis (EMPA) and scanning electron microscopy (SEM) are important in many branches of geology including mineralogy, petrology, and sedimentology. EMPA is used to obtain chemical analyses of rocks and minerals on a micro-scale and SEM produces three dimensional images of geological samples including fossils, sediment grains and mineral textures. Avoiding unnecessary technical detail in order to be easily accessible to novices, the book forms an up-to-date for geological postgraduates and researchers in universities and industrial laboratories.

B280 Electron Microprobe Analysis & SEM in Geology Hardback 220pp

B281 " " " " " Paperback 220pp

Reflection Electron Microscopy and Spectroscopy for Surface Analysis by Zhong Lin Wang

A self contained book on EM and spectroscopy techniques for surface studies. RHEED, REM, and EELS techniques are comprehensively reviewed for the first time. The text is written to combine basic techniques with special applications, theories with experiments, and the basic physics with materials science, so that a full picture of RHEED and REM emerges. The book is written for materials scientists and graduate students. FORTRAN source codes are provided for calculating crystal structure data and electron energy-loss spectra in different scattering geometries.

B279 Reflection Electron Microscopy & Spectroscopy for Surface Analysis 456pp Hardback

Elastic and Inelastic Scattering in Electron Diffraction and Imaging by Zhong Lin Wang

Professor Wang's text is the first to thoroughly cover the diffraction and imaging of inelastically scattered electrons. It also discusses elastic scattering theories and illustrates the application of *both* to quantitative structure characterisation using TEM and STEM. Diffraction and imaging of thermal diffusely scattered, valence loss and atomic inner-shell scattered electrons are emphasised.

Elastic scattering is thoroughly reviewed in Part 1, which includes the most comprehensive review of reflected high-energy electron diffraction (RHEED) available.

Part 2 however, provides the books main focus - *inelastic scattering*.

B315 Elastic & Inelastic Scattering etc. 476pp

Atomic Force and Scanning Tunnelling Microscopy

Atomic Force Microscopy/Scanning Tunneling Microscopy Edited by Samuel H Cohen, Mona T Bray, & Marcia C Lightbody

A host of interdisciplinary experts discuss the broad range of applications of Atomic Force Microscopy/Scanning Tunnelling Microscopy (AFM/STM) in 44 chapters that cover materials science, polymer research, physics, biology, and biotechnology.; recent developments in probe microscopies and possible directions for future research. A *must* for researchers in this field using these advanced technologies.

B308 Atomic Force etc. 464pp

Atomic Force Microscopy/Scanning Tunneling Microscopy 2 Edited by Samuel H Cohen & Marcia L Lightbody

A useful addition to the first volume introducing many new and novel techniques being broad based and interdisciplinary.

Contents:

Semiconductor and Adsorbate Characterisation: STM for VLSI Inspection, STM based Fabrication of Nanometer Scale Structures: Chemical Vapour Deposition Diamond Film Growth....: STM Characterisation of Biopolymer Films: Gelatin or Mica, Gasification of Graphite Surface by STM etc, etc.

Biological & Chemical Nanostructure: Visualisation of Surface Degradation of Biomedical Polymers *in Situ* with AFM: Characterisation of Ploy(tetrafluoroethylene) Surfaces by AFM - Results & Artifacts: Scanning Probe Microscopy Studies of Isocyanide Functionalised Polyaniline Thin Films, etc. etc.

New Developments in AFM/STM: Topographic & Spectroscopic Imaging: Advances in Piezoresistive Cantilevers for AFM: Nanometer Scale Qualitative Analysis... etc. etc.

AFM/STM in Materials Science: Optical Fibre Research: Stainless Steel Passive Layer Exposed to HCl in the STM: Magnetic Force Microscopy in Magnetic Recording: SEM, STM & AFM Studies of Selected Videotapes: Surface Characterisation of Thin Films by AFM etc.

B320 AFM/STM 2

The Handbook of Surface Imaging and Visualisation by A T Hubbard

This exciting materials science handbook investigates the characterisation of surfaces. It emphasises experimental techniques for imaging of solid surfaces and theoretical strategies for visualisation of surfaces. These are areas where rapid progress is currently being made.

Contents include:

Atomic Force Microscopy; Chemical imaging using ion microscopy; Collision induced surface processes; Electron microscopy; High resolution Electron Energy-Loss Spectroscopy; Metal surface reconstructions; Nuclear Magnetic Resonance; Optical imaging of particles.

B 283 Handbook of Surface Imaging and Visualisation 1008pp hardback

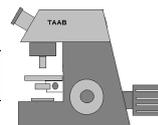
Scanning Probe Microscopy - Methods and Applications by Roland Wiesendanger

Provides a clear and comprehensive introduction to scanning tunnelling microscopy and related scanning probe techniques. Gives the theoretical background to techniques, the design and instrumentation of practical STM and associated systems and the application of techniques in a variety of fields. Over 1200 references and 350 illustrations.

B284 Scanning Probe Microscopy 520pp hardback

B285 " " " paperback

Optical Microscopy



Introduction to Light Microscopy by S Bradbury and B Bracegirdle

Using straightforward language this book describes why we need to use a microscope, interactions of light with matter and the use of the stereo low power microscope. Subsequent chapters describe the high power compound microscope, the basic optics of the instrument and the use of the different components to obtain the best image. Care of the instrument is described together with a checklist of potential problems and how to cure them.

B331 Introduction to the Optical Microscope (replaces B150)

Light Microscopy - Essential Data edited by C P Rubbi

This pocket size volume provides the key data to optimise the analysis of biological samples using the light microscope irrespective of the method used. Provides rapid access to core data required by researchers on a daily basis.

B238 LM - Essential Data 128pp

Microscopy and Histology for Molecular Biologists: A User's Guide edited by J A Kiernan & I Mason

A very practical guide for the preparation, sectioning, staining, examination and recording of specimens for researchers in biochemistry, developmental biology, cell biology, immunology, molecular biology and neurosciences. It is also eminently suitable for researchers in other fields who lack the microscopical and specimen preparation training for these procedures.

Contents: Methods of light photomicroscopy; Digital & confocal photomicrography; Three-dimensional microscopy; Photomicrography; Fluorescent staining of living cells; Freezing & fixation; Tissue processing & sectioning; Staining & counterstaining to show structural features; Immunohistochemical methods; Staining sections of whole animals; Metabolic mapping by enzyme histochemistry; Detection of cell division and cell death; *In situ* hybridization to RNA in tissue sections; *In situ* hybridization and sectioning of whole embryos and tissues.

B417 Microscopy & Histology for Molecular Biologists HB 400 pages

Contrast Techniques in Light Microscopy by S Bradbury and P J Evennett

Contrast in an image is essential to distinguish features from one another and from the background. This practical handbook describes the ways in which light interacts with the specimen in the microscope and the manner in which this is used to generate contrast in the image of the specimen. It shows ways in which such interactions are used in practice and includes examples and case studies of contrast enhancement.

Both transmitted and reflected light techniques are described together with the effects of the refractive index of the mounting medium for bright field and dark ground, polarised light, phase and modulation contrast, interference and fluorescence and also contrast manipulation outside the microscope.

B277 Contrast techniques in LM paperback

Scientific PhotoMACROgraphy by Brian Bracegirdle

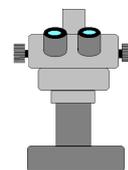
A detailed practical guide to the choice of equipment and methods for transmitted and reflected light photography at the macro level.

Includes:

- Lens selection
- Supporting the specimen and the camera
- Illuminating methods
- Estimating exposure
- Recording and processing the image

Essential reading for all who wish to record photographic images at moderate magnifications whether relative novices or workers with more experience.

B250 Scientific PhotoMACROgraphy 105pp



Modern PhotoMICROgraphy by B Bracegirdle and S Bradbury

An up-to-date introduction to the theory and practise of producing high quality photomicrographs. The book offers practical guidance on obtaining a clear image and recording this accurately with details on:

- current imaging methods
- choice of films and film speed
- recording the image in monochrome and colour
- calibration of equipment
- preparing results for publication

Essential reading for all practising microscopists who wish to record images at magnifications above 50X. The companion volume to Scientific PhotoMACROgraphy, the two books should be read in conjunction to provide a complete overview of methods for photographing magnified images.

B297 Modern PhotoMICROgraphy

Electronic Light Microscopy edited by D M Shotton

An excellent laboratory reference work offering practical guidelines for properly applying digital image processing techniques to electronic light microscope images.

It includes:

- Video enhanced contrast
- Digital intensified fluorescence
- Confocal scanning light microscopy

B239 Electronic light microscopy 366pp

Surface Preparation and Microscopy of Materials edited by B Bousfield

A book dedicated to the systematic preparation of a vast range of material surfaces looking in detail at the problem of microstructural traceability. Designed to be of practical use the book has been written in two parts. The first defines the essential procedures involved in surface preparation, the second illustrates the best use of microscopy by discussing in depth the different features that contribute to informative analysis.

B243 Surface preparation & microscopy of materials 356pp Hardback

**The Role of Microscopy in Semiconductor Failure Analysis
by B P Richards and P K Footner**

A valuable practical guide containing many illustrated case histories and micrographs of many failure mechanisms.

B251 The role of microscopy in semiconductor failure mechanisms 108pp

Ore Microscopy and Ore Petrography by J R Craig and D Vaughn

Thoroughly researched and well illustrated, this edition has been updated to reflect the latest in theoretical and technical advances and new data on the most important ore types

Also covered are:

- Basic sample preparation and examination techniques
- Qualitative properties used for mineral identification
- Textures and numerous examples of the major mineral associations

B241 Ore microscopy and ore petrography 261pp hardback

Microscopy of Textile Fibres by P H Greaves and B P Saville

An up-to-date manual with recent advances in microscopy and fibre technology. It includes fibre identification and measurement, polarised light microscopy and special preparation techniques for light microscopy, TEM and SEM. Readership is textile technologists, fibre scientists, microscopists, forensic scientists and materials analysts.

B264 Microscopy of textile fibres 112pp

Soil Microscopy and Micromorphology by E A Fitzpatrick

The first book of its kind with comprehensive coverage of the subject. Soil thin sections, the use of TEM, SEM, X-ray microprobes and microbiology are described to gain insight into the behaviour of soils.

Contains analysis of soil fabric, structure and porosity, mineralogy and other weathering microenvironments in soil, results of soil/organism interactions and structure deteriorations.

B242 Soil microscopy and micromorphology 320pp

Atlas of Microscopy Techniques by U Aebi and A Engel

This book emphasises the various types of microscopy data in use today. It contains clear and concise chapters on the various light microscopies as well as the emerging scanning probe microscopies. An enclosed CD-ROM presents many 3-D reconstructions that, in conjunction with the book, present a comprehensive view of the field today.

No Longer Available

B299 Atlas of Microscopy

Resin Microscopy and On-Section Immunocytochemistry by G R Newman J A Hobot

Fixation, resin embedding and immunocytochemistry, the subject of innumerable publications are organised into a comprehensive and coherent scheme showing how the various methodologies interrelate. The book includes detailed protocols which can be quickly selected and easily applied.

Commercially available resins and their uses are described and the book considers the advantages for cytochemistry and immunocytochemistry of matching tissue fixation to processing and resin embedding.

B255 Resin microscopy & on-section immunocytochemistry hardback

Food Microscopy by Olga Flint

This is a practical guide to examining the microstructure of food ingredients and food products using the light microscope. The emphasis is on rapid methods which have been tried, tested and modified by the author to ensure that they work.

Contents:

Choice of equipment; Preparation of food for the stereomicroscope; Simple preparation techniques for the compound microscope; Use of the cryostat in food microscopy; Contrast techniques for food constituents; Fat in food; Food starches; Meat, fish and their products; Vegetable proteins; The Howard mould count of tomato products; Food gums; Food emulsions.

B247 Food microscopy

Biological Microtechnique by J. Sanderson

The first new practical guide to biological specimen preparation in twenty years. As a result of the recent resurgence of interest in light microscopy, particularly confocal techniques, this up-to-date book will benefit all those seeking to sustain specimen preparation to match increasingly demanding observation technology.

New and classical methods are described in an easy-to-read format and this book provides a firm grounding in methods of preparation for the light microscope.

Contents Include:

- Fixation • Tissue processing • Microtomy • Other preparative methods • Staining and dyeing
- Finishing the preparation • Safety • Refractive indices

B267 Biological Microtechnique

Embedding and Staining Soft Biological Specimens in Resin Media for Microscopy
A TAAB Publication

Our own publication explaining how to make the most appropriate choice of resin for particular applications in LM or EM when using plastic for embedding. Contains sections on specimen preparation and staining methods, problem solving, safe handling, recipes and references. An invaluable laboratory bench guide.

Colour plates 28pp

B108 Embedding & Staining etc.

The Microwave Tool Book - A Practical Guide for Microscopists
Gary R Login & Ann M Dvorak

Addresses the most common issues voiced by many laboratory people on microwave methods - namely their frustration encountered in adapting the published protocols to their microwave oven. The Microwave Tool Book is a step-by-step guide that teaches how to calibrate and standardise all microwave ovens for many laboratory applications. It teaches how to make a variety of simple tools to help see hot and cold spots in the oven, measure warm up time and cycle time and monitor temperature easily and inexpensively.

There are copious illustrations, explanations and a Trouble Shooting Guide to accompany exercises which emphasise the key learning issues in each section.

B295 The Microwave Tool Book

Microscopy, Immunohistochemistry and Antigen Retrieval Methods
For Light & Electron Microscopy by M A Hayat

This excellent book deals with the activities of chemical components of cells (histochemistry) and the functions of cell types in tissues and organs (immunohistochemistry). The book is really a laboratory manual focusing on antigen retrieval particularly in disease related antigens.

Contents: Antigens & Antibodies: Fixation & Embedding: Factors Affecting Antigen Retrieval: Problems in Antigen Retrieval: Antigen Retrieval: Antigen Retrieval on Resin Sections: General Methods for Antigen Retrieval: Other Applications of Microwave Heating: Cell Proliferating Antigens: Estrogens: HER-2 (c-erbB-2) Oncoprotein: References.

BXXX Microscopy, Immunohistochemistry & Antigen Retrieval Methods 360pp Hardback (Sept 2002)

Video Microscopy The Fundamentals - Second Edition
by Shinya Inoué & Kenneth R Spring

Video microscopy has improved in performance in recent years, particularly with the information processing power of computers helping to overcome the poor contrast and shallow depth of field previously associated with microscopy at high resolution and magnification.

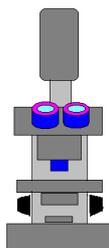
The second edition still retains the fundamentals with extensive reviews of optical microscopy, video detectors and display devices of the original work, but has been expanded to reflect technological advances in electronic imaging, processing, recording and analysis. The review of microscope imaging has been vastly expanded to include point spread functions, contrast transfer functions, modes of contrast generation and scanning microscopy.

A new section on the electronic detection of light, covering vidicon tube cameras, has been added. Three completely new chapters deal with solid state detectors, both video-rate and slow scan; image intensification; and colour video signal and colour video cameras. Yet another new chapter treats practical aspects of the design and use of video microscope systems.

The volume has 512 illustrations (including 126 half-tones) and features a glossary of terms, detailed tables of specifications and a list of manufacturers.

Contents: Why video? Microscope image formation; Practical aspects of microscopy; Physiological characteristics of the eye; Video signal fundamentals; Detection of light and vidicon tube cameras- monochrome; Solid state detectors and cameras; Low-light level cameras; Colour video signal and colour cameras; Video monitors; Projectors and printers; Video recorders; Digital image processing; System integration; References; Glossary; List of manufactures; Index.

B303 Video Microscopy 713pp + index



**Video Microscopy edited by Greenfield Sluder and David E Wolf
Methods in Cell Biology Volume 56**

This publication instructs researchers in the principles and practice of video microscopy for a whole variety of research applications. Because video microscopy involves an integrated package of sophisticated instruments that must be co-ordinately optimised, the knowledgeable use of these instruments is essential to the acquisition and display of specimen information. Articles by leaders in the design and application of video methods for biological microscopy cover the full range of commonly used video technologies. The basics of each component or technology are presented in a non technical fashion that allows the the reader to avoid common mistakes that lead to artefacts.

Key features:

- Commonly used video techniques in biological research
- Non technical presentation of principles
- Emphasis on the practical aspects of instrument use
- Avoiding pitfalls in instrument use that can lead to artefacts
- Tailored to the established researcher with little or no knowledge of video microscopy in biology
- Extensively illustrated with photographs, diagrams and drawings

B325 Video Microscopy - Methods in Cell Biology Vol 56

Fluorescence Microscopy & Fluorescent Probes edited by Jan Slavik

This unique work provides the most thorough, up-to-date evaluation available of the theory, instrumentation and practical application of fluorescence microscopy and fluorescent probes. 127 natural scientists, physicians, technicians and microscope manufacturers contribute to the discussion of this non-destructive analytical tool. Special emphasis is given to new techniques in confocal fluorescence microscopy, lifetime imaging and computerised digital processing of fluorescent microscopic images.

Contents;

- Fluorescence Microscopy and Fluorescent Probes (9 chapters).
- Ion-Sensitive Fluorescence Probes (9 chapters).
- Membrane Potential-Sensitive Fluorescent Probes (5 chapters).
- Fluorescent Probes for Nucleic Acids (6 chapters).
- Fluorescent Labels, Fluorescent and Fluorogenic Substrates (10 chapters).
- Digital Image Analysis (7 chapters).
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B311 Fluorescence Microscopy etc

Confocal Laser Scanning Microscopy

Confocal Laser Scanning Microscopy by C Sheppard and D Shotton

The basic principles and applications of confocal laser scanning microscopy are described in this concise handbook. It gives information on different imaging modes and guidance on sample preparation and imaging protocols. The limitations and sensitivity of each method is discussed, imaging applications are illustrated and recent developments in the field are described. It contains information on confocal fluorescence microscopy, biological and industrial applications and the future of confocal microscopy.

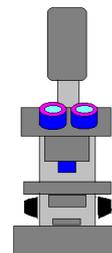
An Ideal quick reference work for undergraduates, postgraduates and researchers.

B263 Confocal Laser Scanning Microscopy

Confocal Microscopy Methods in Cell Biology Vol 70 edited by Brian Matsumoto

This volume contains integrated and up-to-date coverage of the many and various techniques and uses of the confocal microscope. Techniques are described completely so that methods are made accessible to users. An important volume for all researchers in the field of cell biology and other life science disciplines with details of how to set up and run a "Confocal Microscope Core Facility"

B418 Confocal microscopy - methods in cell biology 600 pp over 170 figs. PB



Confocal Scanning Optical Microscopy and Related Imaging Systems
by Timothy R Corle & Gordon S Kino

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 included.

Key Features

- 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
- Considers the practical aspects of building a confocal scanning or interference microscope and explores some of the design tradeoffs
- Discusses the theory and design of near-field optical microscopes
- Explains phase imaging in the scanning optical and interference microscopes

B329 Confocal Scanning Optical Microscopes and related imaging systems 360pp

Handbook of Biological Confocal Microscopy - Second Edition
edited by James B Pawley

This extremely useful reference work gives a detailed survey of the latest developments in the instrumentation and application of confocal microscopy to biological research. Each of the 36 chapters covers one aspect of the field comprehensively. Highlights of the second edition include a comprehensive index and over 475 high quality colour plates, halftones, and line drawings that reinforce material covered in the text.

Practical and user friendly, the *Handbook* is extensively cross-referenced, includes an annotated bibliography and features a unique tutorial chapter showing novice researchers how to locate the information they need within the book.

B309 Handbook of Biological Confocal Microscopy 2nd Edition 656pp

Other Microscopies

Advances in Acoustic Microscopy edited by Andrew Briggs

Volume 1. Leading international researchers focus on techniques and methods of analysis for quantitative measurement. The discussions cover interior imaging of materials and electronic devices, short fatigue cracks, surface wave measurements, and applications of acoustic microscopy to problems in biology. Other contributions describe the extension of surface wave measurements to 20Ghz by Brillouin spectroscopy and near-field scanning probe acoustic microscopy.

B306 Advances in Acoustic Microscopy Volume 1 382pp

Volume 2 of this multivolume work continues to plot the remarkable strides being made worldwide in application and techniques of high resolution acoustic imaging. Like its predecessor, Volume 2 examines testing of acoustic microscopes for imaging both biological and inert materials to exceptionally resolutions, exploiting the latest proven techniques both in industry and development.

Contents; Characterisation of electronic components by acoustic microscopy; Principles and applications of high-frequency medical imaging; Interaction of acoustic waves with solid surfaces; Scanning acoustic microscopy with phase contrast; Ultrasonic focusing with time reversal mirrors; Each chapter contains references & index.

B318 Advances in Acoustic Microscopy Vol 2 288pp, 275 illustrations

Light Spectroscopy by D A Harris

Spectrometry and spectrofluorimetry are core techniques used throughout the life sciences and medicine. These techniques evolve continuously and this book provides information on the latest advances in spectroscopic methods. *Light Spectroscopy* begins by describing the basic principles and then provides practical guidance on the wide range of current techniques for their application and analysis of the results obtained.

Contents:

Principles; What to look for in spectrophotometer design; Geometry, light paths and beam splitting; Measuring absorbance and fluorescence; Measuring an absorption spectrum and a fluorescence spectrum; Measuring at a fixed wavelength; Probing the environment; Glossary; Suppliers; Further reading;

Suitable for advanced undergrads. in bio sciences, postgrads, researchers & hospital staff. 192pp

B282 Light Spectroscopy

Modern Microscopies - Techniques and Applications Edited by P J Duke & A G Michette

Modern Microscopies introduces a number of new imaging techniques to supplement and expand the information that can be obtained from traditional electron microscopy. Particular emphasis is given to an extended discussion of X-ray microscopy, including the electron synchrotron storage ring, the high power laser plasma and new methods of aberration-free X-ray.

Cryo-electron microscopy, X-ray holography, scanning tunnelling microscopy, NMR imaging, and many other contemporary techniques are also detailed.

Contents: Electron microscopy of biological macromolecules; Frozen hydrated methods and computer imaging; Radiation sources for X-ray microscopy; Amplitude and phase contrast in X-ray microscopy; Scanning X-ray microscopy; X-ray microradiography and shadow projection X-ray microscopy; Progress and prospects in soft X-ray holographic microscopy; Prospects for NMR microscopy; NMR microscopy of plants; Confocal optical microscopy; Acoustic microscopy; Scanning tunnelling microscopy in biology; Resolution: A biological perspective; Index.

B321 Modern Microscopies 266pp

Raman Microscopy Developments & Applications edited by G Turrell & J Corset

One of the first books devoted entirely to the subject of Raman microscopy, this volume addresses the issues of interest to researchers in this area of science. The book is written by several world recognised experts who summarise the Raman effect before discussing the hardware and software involved in today's instruments. All important applications including those in materials and earth science are covered in depth.

- Includes extensive description of the instrumentation, the Raman microspectrograph, the treatment of data and micro Raman imaging
- Summarises the Raman effect
- Discusses new uses for this technology

B330 Raman Microscopy

Image Analysis

The Image Processing Handbook Third Edition by John C. Russ

Thoroughly updated and delivering an impressive array of concepts and techniques to take full advantage of high-end imaging software. The ultimate image analysis reference work 752pp

New to the third edition:

- surface imaging including stereoscopy, structured light & Moiré patterns, SEM+X-ray analysis, ion probe confocal LM, stylus instruments and scanned probe microscopes
- Visualisation methods - range images with and without colour coding; rendering, wire frame & ray tracing; multiplane images etc
- Coverage of the latest developments in digital camera and video
- 3D image processing update and much, much more

B252 The Image Processing Handbook

Practical Handbook on Image Processing for Scientific Applications by B Jaehne

This volume provides basic knowledge of image processing with many references to general concepts widely used in natural sciences. It includes carefully selected methods that are theoretically sound and proved by applications. Contains over 400 illustrations, tables and photos with numerous practical tips.

Contents:

From objects to images; Quantitative visualisation; Image formation; Imaging sensors; Digitalisation and quantitation; Enhancing, restoring and reconstructing images; Pixels; Geometry; Transmission; Storage; Data bases; Edges; Orientation; Scale; Texture; Segmentation; Size and shape; Matching and tracking; Classification. 464pp

B270 Practical handbook on image processing for scientific applications, hardback

Fractal Imaging by Ning Lu

Fractal image compression technology, one of the major digital image compression techniques has been a well kept secret for many years. **Fractal Imaging** presents the logic, technology and various uses of fractal imaging by analysing a complete, usable fractal representation system. The book begins with a brief mathematical background of fractal image representation, guides the reader through a detailed study of the spatial transform and the intensity transform, translation and rescaling, the block match searching method, quadtree splitting, leading up to the introduction to fractal imaging, colour image compression and decompression algorithms. The final chapter illustrates the magic of fractal zooming with dazzling real-life images and introducing a new image enhancement technique.

B333 Fractal Imaging 400pp

Microscopy Related Techniques

Vacuum Methods in Electron Microscopy by Wilbur C Bigelow series editor Audrey M Glauert

Vacuum Methods in Electron Microscopy provides full details and advice for scientists in the understanding and practical operation of the vacuum systems found in electron microscope laboratories. Detailed and fully illustrated descriptions are given of:

- basic vacuum processes
- functioning of pumps and vacuum gauges
- correct operating procedures for different types of vacuum systems
- procedures for detecting and repairing leaks in vacuum systems

Essential reading for all scientists, technicians and engineers who are responsible for the operation of vacuum systems on electron microscopes and other scientific equipment

B326 Vacuum methods in electron microscopy paperback 512pp

B327 hardback

***In Situ* Hybridization by A R Leitch, T Schwarzacher, D Jackson & I J Leitch**

This powerful link between cellular and molecular biology is described in this practical guide which covers the technique from basic principles to detailed methodology and applications.

Contents:

Nucleic acid sequences located *in situ*; The material; Nucleic acid probes, labels and labelling methods; Denaturation, hybridization and washing; Detection of the *in situ* hybridization sites; Imaging systems and the analysis of the signal; The *in situ* hybridization schedule (including troubleshooting); Future of *in situ* hybridization. Appendix; Suppliers of reagents and kits; Buffers. 128pp

B265 *In situ* Hybridization

**Enzyme Histochemistry - A Laboratory Manual of Current Methods
by C J F van Noorden and W M Frederiks**

This practical Laboratory handbook contains the most important enzyme histochemical techniques currently available for light microscopy. The methods included were chosen because of their reliability and specificity, and all are clearly detailed in easy-to-follow protocols. The book will be of interest to all researchers in cell biology, pathology, biochemistry and cell physiology.

B256 RMS Microscopy Handbook Series, No.26, 122 pp

Antibody Technology by J E Liddell & I Weeks

Describes what antibodies are, how polyclonal, monoclonal, chimeric and humanised antibodies are produced and how they can be used to answer a variety of questions.

For the newcomer to the field there is information on conventional methods of antibody production and widely used immunoassays and detection methods. For the experienced there are substantial sections on the new generation of engineered antibodies and the latest developments in immunoassay techniques and applications, ranging from therapy to ecology.

After reading the book the reader will be up-to-date on the current status of antibody technology and able to make informed decisions on the best choice of antibody with regard to cost, time and final application.

B260 Antibody Technology 160pp

**Microscopy, Immunohistochemistry and Antigen Retrieval Methods
For Light & Electron Microscopy by M A Hayat**

This excellent book deals with the activities of chemical components of cells (histochemistry) and the functions of cell types in tissues and organs (immunohistochemistry). The book is really a laboratory manual focusing on antigen retrieval particularly in disease related antigens.

Contents: Antigens & Antibodies: Fixation & Embedding: Factors Affecting Antigen Retrieval: Problems in Antigen Retrieval: Antigen Retrieval: Antigen Retrieval on Resin Sections: General Methods for Antigen Retrieval: Other Applications of Microwave Heating: Cell Proliferating Antigens: Estrogens: HER-2 (c-erbB-2) Oncoprotein: References.

B405 Microscopy, Immunohistochemistry & Antigen Retrieval Methods 360pp Hardback (Sept 2002)

Animal Cell Culture by S J Morgan & D C Darling

A readable and comprehensive introduction to current techniques and the equipment needed to set up a tissue culture facility. The book gives a background to each method as well as applications in modern cell and molecular biology.

Contents:

Aseptic techniques; Media preparation; Culturing continuous cell lines; Primary culture; Cell cloning and fusion; Cytotoxicity assays; Separation and immortalisation of lymphocytes; Animal cell transfection; Suppliers.

B259 Animal Cell Culture

Radioisotopes by D. Billington, G G Jayson, & P J Maltby

An introductory volume for those wishing to understand and apply radioisotopes in their research.

Contents include:

An introduction to radioactivity • Production of radioisotopes • Measurement of radioactivity • Radioimmunoassay • Tracer techniques • DNA sequencing • *In situ* hybridization • Radiopharmacology • Organ imaging

B248 Radioisotopes

RNA Isolation and Analysis by P Jones, J Qiu, & D Rickwood

A comprehensive, easy-to-read account of all the key techniques in the area of RNA isolation and analysis. An ideal book for those new to the subject and valuable for experienced researchers.

Contents:

RNA structure and function; Methods for isolating RNA; Characterisation of RNA size; Functional analysis of RNA; Isolation and analysis of ribonucleoproteins; Suppliers; Glossary. 208pp

B286 RNA isolation and analysis paperback

Lipid Histochemistry by O Bayliss High

A practical handbook which describes reliable and straightforward methods which are within the scope of the general microscopist and selective for individual lipids.

Contents:

Structural, chemical and physical properties of lipids; The physiological roles of lipids; Applications of lipid histochemistry to pathology; Preparation of tissues for lipid histochemistry; Control sections; Limitations and artefacts; Microscopic techniques for tissue lipids; Recent advances in lipid histochemistry; List of methods.

B154 Lipid histochemistry

New Titles**Biomedical Electron Microscopy - Illustrated Methods & Interpretations
by Arvid B Maunsbach & Björn A Afzelius**

This atlas explains how best to evaluate electron micrographs and presents an easy-to-use source that will illustrate both the correct image as well as a variety of incorrect images that result from any number of technical/environmental errors. By presenting correct and incorrect images side by side researchers and students have an immediate reference should questions arise.

This comprehensive work illustrates optimal preparation methods in biological electron microscopy compared with common methodological problems. As well as the presentation of basic methodologies of TEM such as fixation, microtomy, the authors also endeavour to illustrate more specialised techniques such as negative staining, autoradiography, cytochemistry, immuno electron microscopy and computer-assisted image analysis.

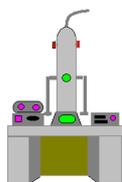
Key Features:

- Written by the leaders in biological electron microscopy
- Illustrates both optimal and suboptimal or artefactual results in a variety of EM disciplines
- Introduces workers in the field on how to 'read and 'interpret' electron micrographs.

Contents:

Preface; Acknowledgements; Micrograph interpretation; Fixatives; Fixative vehicles; Fixative application; Dehydration and embedding; Freezing and freeze substitution; Support films; Ultramicrotomy; Section staining; Microscopy; Image recording; Photographic and digital printing; Negative staining; Autoradiography; Cytochemistry; Immunocytochemistry; Freeze fracture; and shadowing; Sampling and quantitation; Image processing; 3-D reconstructions; Appendix; Practical methods; Index.

B328 Illustrated methods in biomedical EM 600pp casebound



Electron Microscopy in Microbiology by A Holzenburg and M Hoppert

This book provides detailed descriptions of electron microscopy techniques relevant to all fields of microbial research. In numerous protocols, all standard techniques required for the structural characterisation of unicellular organisms and subcellular components are described. 160pp

Contents:

Specimen support films for TEM; Preparation techniques for TEM; Negative staining; Metal shadowing; Visualisation of nucleic acids; Cryo-immersion fixation; Freeze dried, metal shadowed specimens, Freeze fracturing and freeze etching; Thin section studies; Chemical fixation; Embedding media for immunocytochemistry; Cryofixation and cryosubstitution; Cryofixation for cryoultramicrotomy

B332 Electron Microscopy in Microbiology

Fluorescence Microscopy 2nd Edition by B Herman

A comprehensive revision of a successful book that combines the theoretical and practical aspects of fluorescence microscopy. The book describes the principles involved, the equipment required and the major applications of fluorescence microscopy. Detailed practical advice is provided to allow readers to use the methods and applications without recourse to other sources. A comprehensive trouble-shooting section ensures that the reader is also able to overcome any problems encountered with the techniques described.

Contents:

Introduction to fluorescence; The fluorescence microscope; Practical fluorescence microscopy; Applications of fluorescence microscopy; Quantitative fluorescence microscopy; Digitised video microscopy; Single & multiphoton confocal laser scanning microscopy; Fluorescence photomicroscopy; Trouble shooting; Further reading; Index

B334 Fluorescence microscopy 184pp

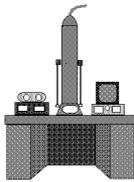
Scientific Papers and Presentations by Martha Davis

Scientific papers and Publications provides *a concise guide to writing what must be written*: proposals, literature reviews, theses, journal articles, slide presentations, posters or grants. The author also discusses conventions in writing, proof reading, copy writing as well as methods for searching and citing scientific literature, composing reviews, preparing data presentations, communicating visually, and public speaking. No other reference provides guidelines and practical advice for so many forms of communication. Advice laden appendices include actual example of papers annotated by the author.

Key features

- Provides protocols and criteria for a wide range of written and spoken communication
- Presents logical, sensible approaches to communicating with diverse audiences
- Written in conversational style for easy reading
- Includes guidelines, examples, processes and answers to questions about theses, proposals, posters, slide presentations, publications and related issues
- Helps to improve overall communication skills
- Serves as companion handbook to your style manual
- Detailed, annotated appendices provide practical examples and commentary

B337 Scientific Papers and Presentations 209pp Paperback



Biological Specimen Preparation for Transmission Electron Microscopy
by Audrey M Glauert and Peter R Lewis

This, the latest volume in the 'Practical Methods in Electron Microscopy' series, contains all the necessary information for anyone wishing to obtain electron micrographs showing the most accurate ultrastructural detail in thin sections of any type of biological specimen.

For the first time in a textbook of this kind, the molecular events occurring during fixation are analysed in detail. The reasons for choosing particular specimen preparation methods are explained and guidance is given on how to modify established techniques to individual requirements.

This volume was written by two acknowledged experts in the application of transmission electron microscopy to biological problems and it is an essential guide to all the latest reliable methods for use by beginners and experts alike.

B338 Biological Specimen Prep etc 1998, 320pp, paperback

B339 Biological Specimen Prep etc hardback

Biomedical Applications of Microprobe Analysis
by P Ingram, J Shelburne, V Roggli, A LeFurgey

This book is a combination reference/laboratory manual for the use of microprobe analysis in both clinical diagnostic and research settings. Also called microchemical microscopy, microprobe analysis uses high energy bombardment of cells and tissue in combination with high resolution EM or confocal microscopy to provide a profile of the ion, metal, and mineral concentrations present in a sample. This allows insight into the physiology and pathophysiology of a wide variety of cells and tissues.

B341 Biomedical applications of microprobe analysis 448pp, casebound

Fluorescent and Luminescent Probes 2E
A Practical Guide to Technology for Quantitative Real-Time Analysis
by W T Mason

The use of fluorescent and luminescent probes to measure biological function in living and dead cells has increased dramatically since the publication of the first edition due to their improved speed, safety, and power of analytical approach. This new edition contains 19 new chapters, over two thirds new material and is a must for all life scientists using optical probes.

The contents include discussions of new optical methodologies for detection of proteins, DNA and other molecules, as well as probes for ions, receptors, cellular components and gene expression. Emerging and advanced technologies for probe detection such as confocal laser scanning microscopy are also covered. This book will be essential reading for those embarking on work in the field or using new methods to enhance their research.

Key features:

- Revised and updated with 19 new chapters
- Describes emerging technologies and probes in detail
- **The reference work for scientists wishing to use optical probes**

Coverage includes:

- Single and multiphoton confocal microscopy
- Applications of green fluorescent protein and chemiluminescent reporters to gene expression studies
- Applications of new optical probes for imaging proteins in gels as exemplified in high throughput screening techniques for proteomics, probes and detection technologies for imaging membrane potential in live cells
- Use of optical probes to detect microorganisms
- Raman and confocal raman microspectroscopy
- Fluorescent lifetime imaging microscopy
- Digital CCD cameras and their application in biological microscopy

B342 Fluorescent and luminescent probes 2E 630pp paperback

Cytochemical Staining Methods for Electron Microscopy
by P R Lewis and D P Knight ed Audrey Glauert

In this latest volume 14 in the Practical Methods in Electron Microscopy Series, the staining techniques for TEM are described including contrast staining for ultrastructural studies, specific cytological staining methods, and enzyme cytochemical techniques.

The chemical basis of cytochemical methods is discussed and analysed in a straightforward manner and with great clarity. This will help all researchers and students to choose between the bewildering variety of published technical procedures. Electron Microscopists will find this volume to be an invaluable and compact source-book for all those cytochemical techniques that have proved to be both reliable and convenient to use.

B344 Cytochemical Staining Methods for EM 321pp Paperback Hardback

Advanced Computing in Electron Microscopy by E J Kirkland

A modern easily readable work with an associated CD-ROM filled with immediately applicable PC programs. The introduction covers terminology and general techniques of transmission electron microscopy in both scanning and imaging modes. Chapters 3 and 4 cover basic background of linear systems transfer theory for electron microscopes with some typical Fourier space techniques and artefacts. Chapters 5 to 7 include stepwise image formation derived from the interaction of electrons with atoms with the image calculation for very thin objects and the dynamical diffraction in terms of the multislice method.

The final chapter is directly related to the operation of the CD-ROM. Excellent literature hints appear in every chapter comprising books for further reading and there is an exhaustive final reference list.

A high quality book for expert and less experienced workers alike

B345 Advanced Computing in EM 250pp with CD-ROM Hardback

Advances in Imaging and Electron Physics Volume 107
edited by Peter W Hawkes, Benjamin Kazan and Tom Mulvey

Advances in Imaging and Electron Physics merges two long running serials - *Advances in Electronics & Electron Physics* and *Advances in Optical & Electron Microscopy*. The series features extended articles on the physics of electron devices (especially semiconductor devices), particle optics at high and low energies, microlithography, image science and digital image processing, electromagnetic wave propagation, electron microscopy, and the computing methods used in all these domains.

Contents:

J.P. Bird, R. Akis, D. Ferry and M. Stopa, Magneto-Transport as a probe of Electron Dynamics in Open Quantum Dots. *M.A. Karim*, External Optical Feedback Effects in DFB Semiconductor Lasers. *A. Rosenauer and B. Gerthsen*, Atomic Scale Strain and Composition Evaluation from High-Resolution Transmission Electron Microscopy Images, *R.C. Staunton*, Hexagonal Sampling in Image Processing, *J. Wood*, The Group Representation Network: A General Approach to Variant Pattern Classification.

B347 Advances in Imaging and Electron Physics Volume 107

Advances in Imaging and Electron Physics Volume 108
edited by Martin Berz, Kyoko Makino, Khodr Shamseddine, and Weishi Wan

A reference work for researchers in electrical engineering, optical science and technology, materials science, image processing and mechanical engineering.

Contents:

Dynamics, Differential Algebraic Techniques, Fields. Maps: Calculation. Maps: Properties. Spectrometers. Repetitive Systems.

B348 Advances in Imaging and Electron Physics Volume 108

Understanding the Light Microscope by Daniel J Goldstein

Understanding the Light Microscope consists of four original computer programs with an explanatory book. The book provides understanding at a deeper level than exists in currently available texts and in a form accessible to microscope users, particularly biologists. It covers simple ray optics, the aberrations of "real" (thick) lenses, polarised light and the influence of diffraction imaging. The book can be read alone, but appreciation of its contents is greatly enhanced when used in conjunction with the programs. The Zernicke program allows simulation of the effects of aperture, spherical aberration and focus of the objective lens as well as coherence of the illumination. There is a range of imaging systems including; Bright Field; Phase Contrast; Dark Field; Schlieren; Modulation Contrast; Apodization; Interference Microscopy; Fluorescence; and Confocal Scanning.

The **Köhler program** is interactive and is intended to teach the operation of Bright Field and Phase Contrast microscopes. Microscope settings can be made random for adjustment practice. The **Nicol program** simulates aspects of quantitative Polarised Light microscopy.

The handbook acts not only as a guide to the use of the programs but also as an introduction to diffraction theory applied to the microscope. The level is intermediate between an elementary text book and rigorous standard texts on the theory of optical microscopy.

Key Features:

- Aids insight into microscope operation and limitations
- The approach is non-mathematical yet in-depth
- Ideal for learning assignments
- Includes a help function for all four programs
- The programs have been tried and tested by 2nd and 3rd year biology undergraduates

B349 Understanding the Light Microscope Computer Programs and Book paperback 160pp

Electronic Handbook of Optical Constants of Solids by Edward Palik & Gorachand

The Electronic Handbook of Optical Constants takes the highly praised five-volume set, *Handbook of Optical Constants of Solids*, to a new level of 'information mining' with seamless integration of dynamic data tables, 2D and 3D displays, property calculations and technical information. The program is designed for material scientists, spectroscopists, and optical device designers working with dielectric materials including metals, semiconductors and insulators.

The CD-ROM features Database Pathways, Data Representation Tools, Extensive Graphics, Calculation Pathways, Information Pathways and Export Results.

B350 Electronic Handbook of Optical Constants CD-ROM and spiral wire bound

Introduction to Immunocytochemistry 2nd Edition by J M Polak & S Van Noorden

Immunocytological Techniques are essential in diagnosis and biomedical research. This new edition which has been extensively rewritten and updated describes the rationale behind the various techniques, explains the problems of specificity and sensitivity, and provides troubleshooting advice. Practical instructions for immunostaining methods using fluorescent, enzyme and gold labels are also outlined in detail.

This book is a must for all those involved in light microscope immunocytochemistry.

Partial Contents:

Requirements for immunocytochemistry; Specificity problems and essential control; Enhancement of standard methods; Multiple immunostaining; Post embedding immunocytochemistry for the TEM; *In-vitro* methods for testing antigen/antibody reactions; Applications of Immunocytochemistry. 160pp Paperback.

B300 Introduction to Immunocytochemistry 2nd Edition

Atomic Force Microscopy/Scanning Tunneling Microscopy 3
 edited by Samuel H Cohen & Marcia L Lightbody

Based on the proceedings of the third Atomic Force Microscopy/Scanning Tunneling Microscopy symposium, the purpose of the meeting being to provide an interface between scientists, engineers, representatives of industry, government and academia. The papers have been written by experts in probe microscopy from around the world, representing a wide range of disciplines, including physics, biotechnology, nanotechnology, chemistry and materials science.

Contents and Contributors

- * Keynote paper: A practical approach to understanding metrology and its applications; *C A Brown*
- * Applications of Scanning Probe Microscopy in materials science; Examples of surface modification and quantitative analysis; *P. von Blanckenagen*
- * Scanning Probe Microscopy with potential applications in forensics; *J Vesenka, E Morales*
- * Atomic manipulation of hydrogen on hydrogen-terminated silicon surfaces with the Scanning Tunneling Microscope; *D H Huang, Y Yamamoto*
- * Apollo 11 Lunar samples: An examination using tapping mode Atomic Force Microscopy and other microscopic methods; *E C Hammond, et al*
- * Novel micromachined sensors for Scanning Near-Field Microscopy; *W Scholz, et al*
- * Imaging of cell surface structure by Scanning Probe Microscopy; *V A Fedirko, et al*
- * A force limitation for successful observation of atomic defects; Defect trapping of the Atomic Force Microscopy tip; *I Y Sokolov et al*
- * A new approach to examine interfacial interaction potential between a thin solid film or a droplet and a smooth substrate; *R Mu, et al*
- * Nanometer scale patterning of surfaces using self-assembly chemistry. 1. Preliminary studies of polyaniline electrodeposition on self-assembled mixed monolayers; *W A Hayes, C Shannon*
- * Local rate of electroless copper deposition by Scanning Tunneling Microscopy; *C J Weber, et al*
- * Atomic Force Microscopy of olivine; *C Wilson, et al*
- * The study of sublimation rates and nucleation and growth of TNT and PETN on silica and graphite surfaces by Optical and Atomic Force Microscopy Ellipsometry; *Y S Tung, et al*
- * Peculiarities of the Scanning Tunneling Microscopy probe on porous gallium phosphide; *V M Ichizli, et al*
- * Influence of doping concentration on the etching rate of GaAs studied by Atomic Force Microscopy; *R S Freitas, et al*
- * Comparative Scanning Tunneling Microscopy studies of CoFe₂O₄ nanoparticles of ferrofluids in acidic medium; *D Dai, et al*
- * From laboratory measurements to the first in-situ analysis of pristine cometary grains; *J Romstedt, et al*
- * Synthesis of prebiotic and oligonucleotides on clay mineral surfaces: A Scanning Force Microscopy study; *T L Porter, et al*
- * Surface structure and intercalative polymerization studies of smectite clay thin films; *T L Porter, et al*
- * Atomic Force Microscopy - a new complementary tool in asphalt research compared to Scanning Electron Microscopy; *L Löber, et al*

B363 Atomic Force Microscopy/Scanning Tunneling Microscopy 3

Electron Microscopy and Analysis 2nd Edition by P J Goodhew and F J Humphries

A comprehensive introductory text, extensively revised and up-dated to cover the physical basis and operation of the common types of electron microscope with illustrations of their applications. In addition, electron microscopy is compared with other modern techniques for examining both crystalline and non-crystalline materials.

Contents:

Microscopy with light and electrons; Electrons and their interaction with the specimen; Electron diffraction; The transmission electron microscope; Chemical analysis in the electron microscope; Electron microscopy and other techniques.

B 364 EM and analysis 2nd edition

Practical Stereology 2nd Edition by John C Russ & Robert T Dehoff

Stereology is the science that relates three dimensional-structure to the two-dimensional images that can be measured. This technique is common in microscopy of biological tissue samples and man-made materials. This book covers the applications and terminology in both fields and emphasises sampling strategies to avoid bias due to directionality and non-uniformity. The classic techniques that measure size distributions, surface curvature etc that are extremely useful are covered as they appear not to have been covered in other recent texts. This text covers the use of simple manual procedures using counting and grids but also the use of modern desktop computers for image analysis and processing to obtain and interpret stereological data.

B419 Practical stereology 2nd edition OUT OF PRINT