

EMAG 77

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EMAG 77

GLASGOW, 12–15 SEPTEMBER 1977

The EMAG 77 conference on developments in electron microscopy and applications, organised by the Electron Microscopy and Analysis Group of The Institute of Physics in association with the Royal Microscopical Society, is to be held at Glasgow University on 12–14 September.

The conference is intended to present the most recent developments in all aspects of electron microscopy (SEM, TEM and STEM) and analysis with the specific exception of high voltage electron microscopy. The content will be towards the physical sciences but a separate one-day symposium has been arranged on 'Aspects of elemental and image analysis in biological microscopy' and this will be held on 15 September.

A comprehensive trade exhibition including equipment from many major SEM and TEM manufacturers will be held concurrently with the two meetings, i.e. 12–15 September.

A list of exhibitors and brief descriptions of the exhibits they plan to show (where known) are given below.

AEI Kratos Ltd

Barton Dock Rd, Urmston, Manchester
(061-865 4466)

Agar Aids

A liquid nitrogen alarm system to protect solid state detectors will be one of the exhibits of Agar Aids. The system, called the 'Digimonitor', provides a multipurpose monitor, with alarm and switching functions, for the level of liquid nitrogen in dewars. The monitor may also be programmed to give alarm signals from a variety of causes: temperature change, water flow or gas pressure for example.

Also on display will be several modules for use with scanning electron microscopes, the 'Kneesworth Electron Development' scan rotation unit being an example. This unit, which is intended primarily for use with the Stereoscan S600, allows rotation of the column scans through a full 360°; the image can be rotated without defocusing. A tilt correction is also provided as is a variable magnification of up to $\times 2.5$ on each fixed magnification range.

127a Rye St, Bishop's Stortford, Herts
(0279 52708)

Balzers High Vacuum Ltd

North Bridge Rd, Berkhamstead, Hertfordshire (04427 2181)

Cambridge Consultants Ltd

The design and construction of special mechanisms for vacuum instrumentation – electron beam equipment for example – requires a high degree of skill. With its exhibit at EMAG 77 Cambridge Consultants, which offers a design and construction service, hopes to show that it possesses such expertise.

An example of the use of this skill to produce a commercially available instrument is the 'Hemispherical Electron Spectrometer' which is based upon an instrument developed by Professor Martin Prutton's surface physics group at York University. The device is a high resolution Auger electron spectrometer which combines flexibility with high sensitivity and resolution. The detector which may be an electron multiplier, a channeltron or a channel plate assembly, can be used in either analogue or digital mode for plotting an energy distribution or, capacitively coupled to a lock-in amplifier, for plotting a differential energy distribution when modulation is applied to either the spectrometer element or to the sample.

Cambridge Consultants also produces a range of thermal and field-emission sources – for instrument or research applications – which will be included in the exhibit.

Barr Hill, Cambridge (0223 62466)

Cambridge Scientific Instruments

Melbourn, Royston, Hertfordshire
(0763 60611)

Du Pont (UK) Ltd

Du Pont Instruments Sorvall is showing a range of microtomes and tissue sectioning equipment.

MT2B ultramicrotome: This is noted for its simplicity of operation. The mechanical advance system gives reproducible results, reliability as well as affording the operator minimum flexibility.

FTS/LTC frozen thin sectioner: This attaches to the MT2B in minutes and is capable of reaching -150°C . This accessory will section frozen specimens thinner than 1000 \AA with relative ease. The FTS will also prove invaluable for sectioning nonbiological materials such as polymers, elastomers, rubber and rubber-like materials.

JB4 microtome: Designed for light microscopy the JB4 will section large (up to 12 mm × 16 mm) plastic blocks as thin as 0.25 µm. This technique is rapidly becoming established in the routine clinical laboratories, as well as important research procedures. Accessories which may be fitted in a few seconds will convert the JB4 into a paraffin wax microtome, sectioning up to 10 µm.

GKM glass knife maker: This is the first showing of this unique instrument. The GKM will break glass 0.5 in thick routinely – ideal for the JB4. Also handling 0.25 in and 0.375 in glass, the GKM will produce constantly knives with a wider usable edge for the most discerning ultramicrotome.

TC2 tissue sectioner: The TC2 provides rapid tissue sectioning for AGAR held specimens. The thickness range is variable continuously from 20–230 µm with variable cutting speed. The TC2 is a convenient efficient means of preparing specimens without the 'freeze-thaw' cycle common to cryostat preparation.

Wilbury House, Wilbury Way, Hitchin,
Hertfordshire (0462 52671)

Edax UK Ltd

90 Dunstable St, Ampthill, Bedford
MK45 2JP (0525 404991)

Edwards High Vacuum

Edwards, which has long been known for its range of high vacuum equipment, will be displaying a range of electron microscopy equipment which demonstrates the expertise the firm has acquired. Preparation of samples for electron microscopy has become a fine art and since careful control is needed to achieve the best results, Edwards has tried to ensure that just such control is available.

The company manufactures both vacuum and sputter coaters along with various accessories. The vacuum coater, which was specially designed for microscopy, enables a wide range of operations to be performed: deposition of support and replica films; shadow casting of specimens and replicas; freeze fracture and production of etch specimens; coating of specimens for scanning electron microscopy; ion etching of surfaces and thinning of specimens. An electron beam source for use with the vacuum coater is also produced. The sputter coater provides a unit that deposits conducting material uniformly and quickly even on irregular and re-entrant surfaces.

Along with an ion beam thinner Edwards also produces a penetration switch, which allows easy monitoring and control of penetration.

Manor Royal, Crawley, Sussex (0293 28844)

Electron Technology

Box 107, Cambridge

EMscope Laboratories Ltd

EMscope offers a wide range of equipment suitable for use in all styles of electron microscopy. As one of the displays on its stand at EMAG 77, EMscope will have a range of graphite specimen stubs for use when undertaking analytical investigations using its graphite paste as an adhesive. This combination results in an x-ray spectrum free from artificial elements and with a considerably reduced background when compared with other methods of specimen support and adhesive.

On a larger scale EMscope will also be displaying closed circuit water cooling units, a sputter coater and a carbon coating unit. EMscope closed circuit water cooling units, designed for use with electron optical instruments, are compact, quiet and easily maintained; they will be in use with all of the instruments requiring water cooling at the EMAG exhibition.

A new addition to the EMscope range of capital equipment is the TEMcoat carbon coating unit. It is a compact floor standing unit and has facilities for carbon evaporation, metal evaporation, shadowing and aperture cleaning. TEMcoat is a semi-automatic system designed for both reliability and simplicity while there is sufficient room for the unit to be upgraded with the addition of cold traps, etc, if required.

374 Wandsworth Rd, London SW8 4TE
(01-720 6861 or 6150)

Ion Tech Ltd

Ion Tech has developed a comprehensive range of ion equipment for the preparation of specimens for transmission and scanning electron microscopy. The Microlap ion thinning unit has been used to thin a wide range of metals, semiconductors and insulators including fragile and porous specimens and composites and materials of more than one phase which are difficult to thin by other means. The unit contains two fine beam saddle-field ion sources which thin the specimen from either side, and which may be set at any angle between glancing and normal incidence whilst the rotating specimen remains horizontal. Saddle-field ion sources operate at low pressure (below 1 mTorr) and the beam shape is determined by the internal electrode system and not by the cathode aperture. During operation the beam characteristics (100 µA in a 2 mm diameter beam) and therefore the thinning rate are maintained as the cathode aperture slowly enlarges.

For scanning electron microscopy, the fine beam sources are replaced by a wide beam source. In the Microlap surface preparation unit, the specimen is rotated and the source rocked over the specimen to randomise the angle of incidence of the beam and so minimise the introduction of artifacts. The ion treatment reveals surface features obscured as a result of previous mechanical preparation or by contaminant layers due to chemical action.

Other exhibits include UHV compatible sources for surface analysis equipment (Auger, ESCA), a 'Microworkshop' for ion machining and a 'Microsputter' for fine controlled sputtering applications.

2 Park St, Teddington, Middlesex TW11 0LT
(01-977 9306)

International Scientific Instruments Inc (UK)

ISI of Newmarket, Suffolk, will display for the first time in the UK the ISI System 100 – a new scanning electron microscope for advanced research which combines the very latest SEM technology with ISI guaranteed performance and reliability.

Resolution on the System 100 is a guaranteed 60 Å with magnification of ×10 to ×200 000 with ×3 zoom. Dual magnification on two high resolution CRTS allows close examination of the specimen at two different magnifications at the same time. Dual screen imaging allows display of two signals at the same time. Accelerating potentials are from 1–40 kV stepped and compensated. The specimen chamber provides full coverage of a 4 in diameter specimen with ease and flexibility. There are five scanning modes: TV, variable frame speed, reduced raster and two photography speeds to optimise a 2000 line record CRT. Other built-in features include dynamic focusing, four-level gamma control, autoemission, automatic brightness/contrast, automatic vacuum control and alphanumeric.

The systems capability of the System 100 will be demonstrated at the exhibition with an x-ray microanalyser. Other systems available include wavelength spectrometers, scanning transmission detection, electron beam blanking and pseudo-Kikuchi pattern systems.

On display at the Edax stand will be the ISI Super IIIA – an advanced SEM with 70 Å guaranteed resolution, split screen dual magnification and many more features.

Waterwitch House, Exeter Rd, Newmarket, Suffolk (0638 5031/2)

JEOL (UK) Ltd

Jeol House, Grove Park, Colindale, London NW9 0JN (01-205 6376)

Link Systems Ltd

The equipment to be shown on the Link Systems' stand will be the current production model of the well established 290 analyser. The system will be shown in conjunction with a small scanning electron microscope.

Particular emphasis for this exhibition will be on microanalysis techniques including the latest developments in data reduction. The system on show will be capable of performing fully quantitative analysis of suitable specimens.

Halifax Rd, High Wycombe, Buckinghamshire (0494 446011)

LKB Instruments Ltd

A range of instruments designed to make ultramicrotomy easier and quicker and yet, at the same time, give greater precision and reproducibility will be displayed by LKB Instruments. The total range marketed by LKB includes such accessories as vibration damped tables and target markers, but the exhibit at EMAG 77 will be limited to the 'Ultratome IV', the 'Cryo-ultramicrotome' and the 'Knifemaker'.

The Ultratome IV is a precision ultramicrotome capable of producing ultrathin

sectioning, large-area semi-thin sectioning and precise pyramid trimming using a variety of knife settings; the cutting speed is variable continuously from 0.1–50 mm s⁻¹. The Cryo-kit is an attachment for the Ultratome III, converting it to a cryo-ultramicrotome and making available the advantages of cryo-ultramicrotomy. Since the performance of any microtome is affected by the knife used, the Knifemaster, which, LKB claims, allows glass knives of a consistently high standard to be made, is an obvious accessory for any ultramicrotomy laboratory.

232 Addington Rd, Selsdon, South Croydon, Surrey (01-657 8822)

Materials Science North West Ltd

Materials Science North West will be demonstrating a selection from its wide range of specimen preparation equipment for both TEM and SEM.

The products include saws for high and low speed slitting of bulk specimens; thin foil preparation equipment including the popular 'Metalthin'; specimen handling and storage units; foil cutting and disc punching devices, and miscellaneous items for general laboratory use.

New products shown for the first time will include an electronic temperature indicator with a range of -100 °C to +100 °C, a miniature pump with low voltage power supply and speed control for circulation of liquid nitrogen and a laboratory spark erosion unit. The latter product provides a facility for drilling, trepanning and slicing of foil, rod

and bar specimens. The unit is completely portable, semiautomatic in operation and offers a practical alternative to the more expensive 'machine shop' types of equipment.

Visitors to the stand are invited to bring samples of their material to be prepared by the equipment.

North West House, Beverley Avenue, Poulton-le-Fylde, Lancashire (0253 884038)

Micro Measurements Ltd

The 'Optomax' image analyser, which Micro Measurements will be featuring at EMAG 77, is designed to obtain quickly and accurately information contained in a micrograph. Measurement of inhibition zones on microbiological assay plates, for example, can be performed more quickly and accurately using Optomax, particularly in those cases where the zones are irregular (due, say, to distorted assay trays or uneven AGAR layers). Using the particle size analyser many hundreds of particles in one field of view can be measured in less than 5 s for a 50 step size distribution.

Optomax may also be used as an on-line inspection system capable of counting articles and blemishes on articles (holes for example), evaluating surface area and horizontal size of articles and making projections onto the vertical axis which can be used to classify the vertical shape of an object.

London Rd, Pampisford, Cambridge CB2 4EF (0223 834420)

Nanotech (Thin Films) Ltd

Nanotech will be exhibiting two types of coating instruments for specimen preparation, high vacuum coating and sputter coating units. The vacuum coaters are designed for use in all aspects of TEM and SEM specimen preparation. The series of five units ranges from the desk top Microprep 250E to the sophisticated Microprep 300S. The sputter coater on display enables conducting coats for SEM to be deposited on specimens in 2–5 min.

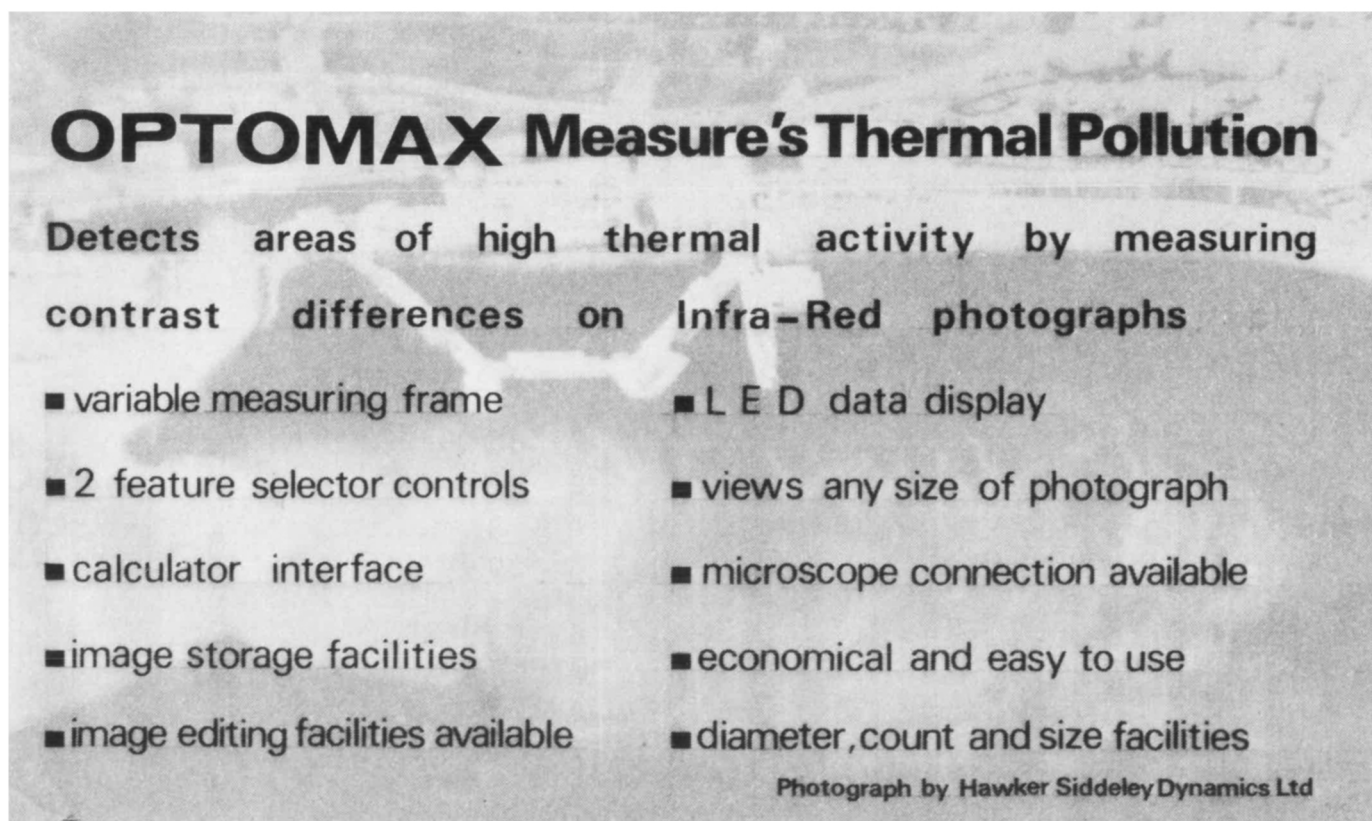
A plate and film degassing unit and a plasma chemistry unit will also be on display.

Sedgley Park Trading Estate, Prestwich, Manchester (061-773 8514)

Perkin-Elmer Ltd

The H300 microscope, which combines both transmission and scanning electron microscope features into a single unit, will be the Perkin-Elmer exhibit at EMAG 77. In the transmission mode the magnification range is from $\times 250$ –100 000 with an optimum resolution of 4.5 Å. In scanning mode the resolution of the secondary electron image is 100 Å with a magnification range from $\times 50$ –150 000 possible. Optional extras include a dual magnification display unit, allowing an area of a specimen to be displayed at greater magnification.

Also on display will be the new S450 SEM which has a guaranteed resolution of 60 Å. Other features include a goniometer stage capable of mounting specimens up to 4 in in diameter, simple pushbutton



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Post Office Lane, Beaconsfield, Buckinghamshire (049 466161)

Pye Unicam Ltd

Pye will be exhibiting its new SEM501, a medium-priced scanning electron microscope suited to industrial applications in the fields of primary and fabricated metals, electronics, pharmaceuticals, textiles, plastics and metallic powders. Within these applications it can be used for quality control (IC manufacture), failure analysis (structural metals), product development or as a pure research tool.

York St, Cambridge (0223 58866)

Reichert-Jung

Among the new products which Reichert-Jung will exhibit is the EM Tissue Dehydrator, which is designed to relieve technicians of the purely mechanical routine of dehydration by the progressive dilution process. Specimens are accommodated in porous capsules and the dehydration process is achieved in automatically controlled stages which can be precisely timed to conform with existing procedures.

The new EM Tissue Processor, also on display, provides an entirely reliable method of preparing biological specimens for elec-

tron microscopy and eases the laboratory technician's task by automating his current manual procedures. Electronic programming eliminates the possibility of error and all the chemical and physical procedures involved in the preparation of specimens for encapsulation are thus performed with reproducible consistency.

The MPO/AMO 1 Quantitative Image Analysis System which will be demonstrated is a low cost analyser needing no special skills for its operation and allows even junior research workers or technicians to evaluate the geometric outlines of an image by simply following the outline with a pencil. Reichert-Jung's new 'Omnicon Alpha', which is a low cost quantitative image analysis system giving speed, accuracy and reproducibility of result in a wide range of applications, will also be on display.

820 Yeovil Rd, Slough (0753 31351)

Siemens Ltd

Siemens will not be exhibiting any hardware at the exhibition. Instead it will display literature on a new family of electron microscopes, details of which will be announced at the exhibition.

Great West House, Great West Rd, Brentford, Middlesex (01-568 9133)

Tracor Europa

2a High St, Inverkeithing, Fife 7 (03834 6826)

VG Microscopes Ltd

The Birches Industrial Estate, Imberhorne Lane, East Grinstead, Sussex (0342 25011)

Carl Zeiss (Oberkochen) Ltd

Although an instrument will not be available, a comprehensive literature stand will provide the latest technical information on the range of equipment available from Carl Zeiss (Oberkochen). Newest in the range of microscopes is the Novascan 30 for scanning electron microscopy with the unique top opening chamber, which provides maximum access for easy specimen loading and detector alignment.

The Zeiss high resolution EM10, of which more than 100 have been sold throughout the world, now has a wide range of accessories which soon will include items to provide STEM facility. This supplements the range of special cartridges for goniometry, x-ray analysis, heating, cooling, tensile, each of which can be interchanged without modification to the stage of electron optical column, thus not impairing the performance and maintaining potential resolution at 1.44 \AA grating (3 \AA point to point).

The EM9 is still being produced after many years because of its reputation of simple operation combined with performance, specification and the Zeiss policy of providing opportunity to update existing instruments as improvements to each new series are made.

31-36 Foley St, London W1P 8AP (01-636 8050)

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