

NEW AND INTERESTING AT M&M 2005

Herzan is proud to announce the next generation of **active vibration isolation systems: the AVI-400**. The AVI-400 system provides superior vibration isolation performance in all six degrees of freedom. The AVI is a modular system that can be adapted to specific sizes and loads, making it ideal for any SEM, TEM, STM, UHV-SPM, or any large-scale microscope. This active system lacks a low frequency resonance and is 500 times stiffer than passive systems. This translates into isolation over a greater range of frequencies and less settling time than other vibration isolation systems. The AVI-400 features a low profile which makes it ergonomically sound and perfect for areas where space is limited. This system is simple to install and requires minimal adjustment, making it not only the highest performance system on the market but also the easiest to use. Check out the AVI and the rest of Herzan's vibration isolation and acoustic isolation products at www.herzan.com. Alex Gorman, Phone: 949.363.2905

Princeton Gamma-Tech's Sahara II Silicon Drift Detector (SDD) is PGT's latest addition to our extensive line of X-ray detectors. Evolving from the original Sahara SDD, introduced in 2001, Sahara II features high performance with no liquid nitrogen, no moving parts, no vibration and no maintenance. Sahara II is the ideal solution for people looking to relieve the burden and cost of liquid nitrogen and still maintain excellent X-ray performance.



And because it's vibration-free, the Sahara is the best choice when working at high magnifications (>50,000X.). Compatible with all types of electron microscopes, Sahara detectors are available with PGT's exclusive Variable Z interface, which guarantees

optimum geometry regardless of the microscope's configuration or application. Sahara's high count rate performance and ability to maintain resolution and calibration over an extremely wide count rate range makes it the perfect solution for rapid collection on electron tolerant samples (metals, ceramics, composites, etc.), and excellent efficiency on all samples. Environmental and low vacuum SEMs, FESEMs and TEMs benefit from the excellent low-end sensitivity and trouble free operation of these detectors.

Eastman Kodak Company confirms the continued availability of **KODAK Electron Microscope Film 4489 and KODAK Electron Image Film SO-163**. Investment in on-going product formulation reviews and improvements demonstrate Kodak's commitment to delivering the highest quality film materials for TEM imaging. Readily available from Kodak and authorized KODAK Microscopy Products dealers worldwide, refer to www.kodak.com/go/molecular for dealer listings. Kodak has also introduced the **KODAK Image Station In-Vivo FX Imaging System** for small animal imaging. Equipped with a 4 million pixel, cooled CCD camera and specialized filter/ phosphor screen system in a light tight cabinet, this system is capable of detecting multi-wavelength fluorescence, luminescence and radioisotopic labels from 380 – 780 nm. An integrated x-ray module allows co-registration of anatomical images with optical molecular markers for precise signal localization and quantification. KODAK Image Station In-Vivo FX Imaging System is a single multimodal center for improved understanding of labeled biomarker

distribution in small animals, organs, tissues and plants. Refer to www.kodak.com/go/molecular for additional information.

Attendees went Sub-Ångstrom at M&M 2005 with FEI! **FEI** unveiled it's new **Titan S/TEM**, the world's highest resolution, commercially-available microscope, yielding powerful sub-Ångstrom imaging and analysis capabilities, and opening a new level of nanoscale discovery. Titan repeatedly demonstrated excellent stability—even on the busy convention center floor—routinely achieving 0.7 Å image resolution throughout the show. FEI also offered demonstrations of the Tecnai™ G² Spirit TEM for 2D and 3D imaging of cells, cell organelles, and soft matter such as polymers; Nova NanoSEM for high resolution characterization of charging and/or contaminating nano-materials or -devices; Quanta™ 3D DualBeam™ SEM/FIB for "Any Sample, All Data, Any Dimension" characterization, analysis, and diagnostics; and Nova NanoLab for nanoscale prototyping, characterization, and analysis.



Thermo Electron Corporation exhibited new detector technology and software for its NORAN System SIX x-ray microanalysis system. The **NanoTrace EDS detector** is an improved low energy performance lithium drifted silicon (Si[Li]) detector with guaranteed performance on the electron microscope—including Mn resolution down to 129 eV, F resolution down to 65 eV, and C resolution down to 62eV. All testing methods are compliant with ISO 15632. The NanoTrace detector compliments Thermo's existing line of LN-Free detectors, which include UltraDry SDD, SuperDryII Si(Li) and CryoCooled Si(Li). **NORAN System SIX version 1.8** features a new 4-dimensional display of spectral image data that combines electron image, composition and x-y location, maximal spectra data extraction from Spectral Images based on work done by David Bright and Dale Newbury at NIST, and automatic match and naming of x-ray phases to a library of compounds. For more information contact Carl Millholland at +1 (608) 276-6112 Carl.Millholland@thermo.com www.thermo.com/microanalysis

JEOL USA demonstrated a broad range of high performance instruments and capabilities at M&M-2005. Working closely with the Hawaii Convention Center, Pacific DirectConnect and the University of Hawaii, JEOL demonstrated **TEM operation at a remote site**. An Internet connection was established to a JEM-2100F field emission TEM at Northwestern University in Evanston, IL, which was outfitted with STEM, multiple CCD cameras, an Oxford EDS System and Gatan Tridium energy filter. A variety of experiments ranging from simple imaging experiments to complex ones were run during the four days of the show. A new **low vacuum system designed to work with JEOL's easy-to-use JSM-7000F thermal FE-SEM** was demonstrated. The retrofittable attachment allows for imaging and microanalysis of non-conductive samples and improves spatial resolution, low kV microanalysis capabilities, and high resolution at low kV. New **TEM and SEM sample prep tools** were also on display. The SEM cross section polisher (CP)

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Introducing the MaxView Plus Digital Camera Attachment System

The MaxView Plus kit includes adapters to fit microscopes & optical devices with any of the following attachments; C-Mount, C/S-Mount, T-Mount, 23mm Eyepiece Port, 30mm Eyepiece Port, and 1.25" Eyepiece Ports



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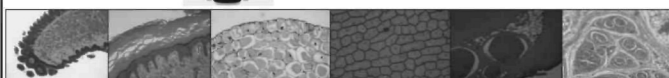
The MaxView Plus can also be used as a high quality wide angle eyepiece with the included thread-on eyeguard. The MaxView Plus is "T" threaded on top so you will need the appropriate Attachment Kit to mate it to your particular digital camera. We carry dozens of attachment kits to fit most all popular digital cameras and we update them regularly so your MaxView Plus will not become obsolete when it is time to upgrade to a new camera. If using it with a 35mm SLR you will need the appropriate T-Ring for your brand of camera.



The heart of the MaxView system. A wide field 40mm focal length four element symmetrical (Plossl) lens assembly specially mounted in a carefully designed custom cell. The lens is mounted only 1mm from the top to maintain the close coupling required to reduce vignetting. The cell features a unique sliding collar assembly which serves several important functions, it allows quick and easy removal of the camera, it allows you to adjust eyeguard height for easy visual use, allows you to adjust magnification when used with a 35mm camera, **and allows you to adjust lens position to minimize vignetting with a digital camera.**



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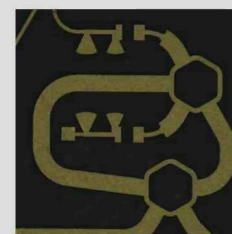
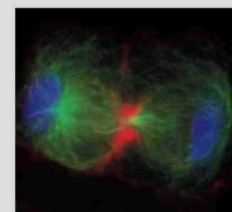
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NEW AND INTERESTING AT M&M 2005

was shown to be especially suited to microscopists working in failure analysis who need fast, clean and nondeformed cross section results. CP uses an ion beam to slice and polish a wide variety of very difficult materials. The **Seiko/JEOL dual beam FIB, model SMI3050**, with unique, easy-to-program automated TEM specimen preparation capabilities was installed in the booth and demonstrated during the week. The **xCLent system, a unique, easy-to-use, high-throughput detector system designed for the JEOL JXA-8200 and JXA-8500F EPMA**s, allows for simultaneous x-ray (EDS and WDS) and multichannel CL spectra acquisition in each pixel while mapping a fresh, non-destructed surface. A wide variety of sample applications were presented.

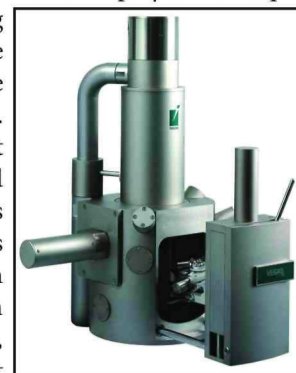
Fischione Instruments featured the new **Model 1040 Nano-Mill** (Patent Pending). The NanoMill is an excellent tool for creating the high-quality thin specimens needed for advanced transmission electron microscopy (TEM) imaging and analysis. It is ideal for both post-FIB (focused ion beam) processing and conventional specimen preparation. The NanoMill incorporates two types of gaseous ion source technology. The electron impact ion source (EIS) features ion energies as low as 50eV and a beam diameter of 8 microns. It allows specimens to be prepared without amorphization, implantation, or re-deposition. Fischione also presented its expanded line of **Advanced Tomography Holders**, affording high tilt and extended fields of view in TEMs possessing restrictive pole piece gaps. The Single-Tilt, Ultra-Narrow Gap, and the Dual-Axis Tomography Holders are ideal for life and physical sciences as well as any other application requiring high specimen tilt. The NanoLab TEM Holders allow in-situ, dynamic TEM experimentation. NanoLab Holders are ideal for physical science applications including imaging, analysis, electron tomography, holography, and Lorentz microscopy. They facilitate the application of an electrical field/bias, a magnetic field, nanoprobng, and mechanical strain at elevated temperatures.

The hot Hawaiian sun, was no match for the hot technological developments released by **Evex** this year. Evex's **QDD-Violin LN Free detector technology** was once again in the spotlight. The Evex-QDD-Violin LN free detector was proud of its boron light element detection, and its new increased detector area. The Evex-QDD-Violin LN Free detectors coupled with the Evex NanoAnalysis System IV are unparalleled in the industry, being both the technology and performance leaders at an affordable price. Evex also introduced a fully integrated NanoTensile machine that simultaneously records spectra and image of the tensile experiment from within the electron microscope or a light microscope. Please visit or contact your representative at 800-211-8421 or visit our website at www.evex.com for more information.

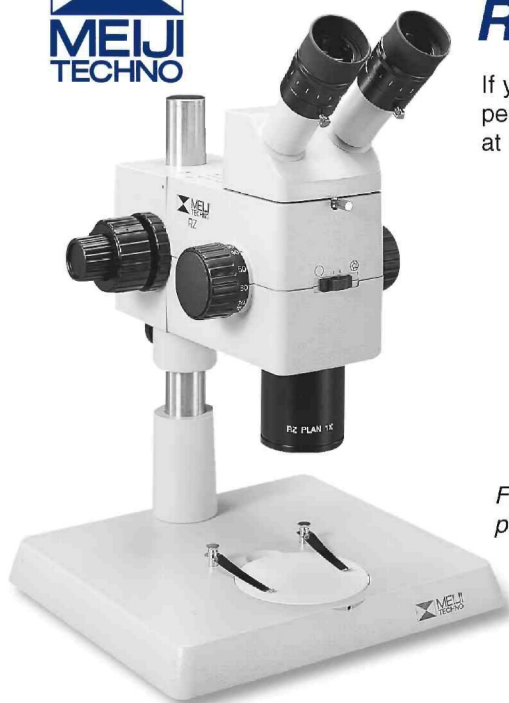
XEI Scientific, Inc. showed a new accessory, the "**Gentle Asher™**" plasma cleaning chamber for the **Evactron® De-Contaminator system**. Evactron cleaning power was demonstrated by removing skin oil deposits on a mirror in less than 30 seconds inside the Gentle Asher chamber. The Gentle Asher specimen

cleaning chamber has four ports for mounting an Evactron D-C, pumping line, and TEM sample holders. The clear top allows observation of the cleaning process and can be opened to insert larger SEM samples. The Evactron Gentle Asher cleaner allows for gentle hydrocarbon removal from specimens by oxidative-chemical etch rather than sputtering. It uses air rather than Argon or expensive gas mixtures for plasma cleaning. This prevents the surface damage and heating from hot ion bombardment common to other plasma cleaners. The Evactron D-C features low-vacuum, viscous-flow plasma cleaning and purging that allows the use of inexpensive rotary-vane pumps with the Gentle Asher chamber without backstreaming or recontamination. The Gentle Asher chamber and the Evactron D-C can be separated so that the Evactron D-C can be used in the normal fashion to clean a FIB or SEM chamber. The Gentle Asher and Evactron D-C combination allows for the purchase of a plasma cleaning system for samples that costs less than half the price of the leading desktop plasma cleaners.

TESCAN is proud to announce the launch of the new **Mira series of field emission scanning electron microscopes**. The Mira FE SEM uses a high brightness Schottky-emitter for high-resolution / high-current / low-noise imaging, that also provides excellent stability for high-throughput large-area automation, like automated particle analyses. The Mira employs a unique **Wide Field Optics™** design offering a variety of imaging modes that use the Tescan proprietary Intermediate Lens for beam aperture optimization. The Mira also uses real-time **In-Flight Beam Tracing™** for performance and spot optimization. The Mira shares the control system used in Tescan's Vega-II, tungsten-emitter SEM which includes: a **Wide Field Optics™** column with Fisheye and depth mode imaging, fully automated set-up and alignment of the electron gun and column, and an integrated suite of imaging software designed for multiple user environments that includes functions for acquisition, archiving, measurement, analysis and reporting of images and data. Network and remote SEM operation are standard functions on every Tescan SEM. Each Mira and Vega-II SEM includes a Back-channel diagnostics system that monitors several hundred points throughout the microscope allowing Tescan engineers to keep each instrument running at peak performance. For more information please contact Jack Mershon at Tescan USA, info@tescan-usa.com, tel. 724-772-7433, or visit: www.tescan-usa.com.



Carl Zeiss SMT – Nano Technology Systems Division introduces the new **ULTRA CDS FESEM** with 3 detection system integrated in the proprietary **GEMINI®** Column. The newly developed Energy selective Backscattered (EsB) and Angle selective Backscattered (AsB) represent the latest developments of the renowned **GEMINI®** technology. The ULTRA CDS now incorporates the **GEMINI®** In-lens SE detector for crisp topographic imaging, the EsB detector for clear compositional contrast and the AsB for fast crystallographic information. Simultaneous real-time imaging and



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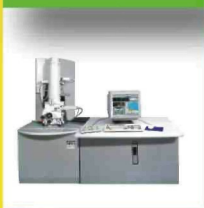
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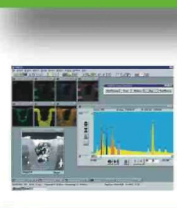
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Evex = NanoAnalysis

SEM Imaging



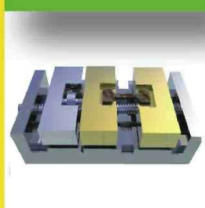
X-ray Analysis



TEM Imaging



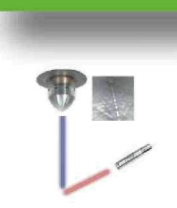
MicroTensile



Detectors



MicroXRF/XRD



Electronics



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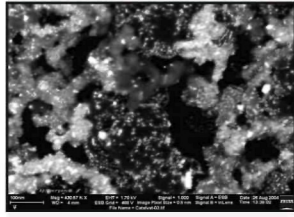
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mixing of signals offers extensive imaging capabilities. The EsB detector comprises a filtering grid which enables ultra high resolution imaging revealing previously unseen images details. Benefits of the ULTRA CDS FESEM: All direct detection systems without conversion plates; Ultra high resolution SE/BSE imaging at ultra low



kV; High efficiency EsB/AsB detectors for nano scale compositional contrast; Ultra high resolution on magnetic materials with low working distance; No adjustments needed when changing from low to high kV; Working distance as low as 1mm; Suppresses charging effects on non-conducting materials; Ultra stable current mode for X-ray analysis; GEMINI® STEM imaging system for sub-nanometer resolution. The attached image is an example of the imaging capabilities of the ULTRA CDS: The EsB micrograph taken at 1.7 kV clearly shows 5 nm particles on a catalytic membrane which contains 5 different polymers.

INDUSTRY NEWS

Eastman Kodak Company's Molecular Imaging Systems Group announces the availability of **KODAK Molecular Imaging Software, version 4.0 (MI 4.0)** for acquisition, quantitative analysis, manipulation, and databasing of scientific images. KODAK MI 4.0 software's enhanced Region of Interest definition and analysis tools include a Magic Wand tool, Peak Finder algorithm, ROI Mass Standards, and the ability to define and analyze multiple ROI sets on a single image. A new Multiple Lane Set feature facilitates analysis of high capacity gel formats. New image comparison tools include Differential Display for lane to lane comparison within an image, and Gel Comparison for band pattern similarity/differences between images. New Feature Masking and Image Overlay simplify simultaneous display of multiplexed features of interest. A new Image Database allows archival of image projects and convenient search and retrieval capability using a variety of project attributes including key words, user, time and date, standards, and more. An all-new navigational structure features workflow driven tool palettes for improved ease of use. Each palette contains the toolbars and commands specific to an area of workflow, such as Image, Lanes, Manual ROIs, Auto ROIs, Grid ROIs, Annotations, and Database. For additional information, <http://www.kodak.com/go/molecular>, or call 1-877-747-HELP, option 7.

Carl Zeiss is pleased to introduce **SteREO Discovery.V12**. This **stereomicroscope** represents a totally new instrument concept in stereomicroscopy with many unique features designed for convenience, ease of use and unparalleled stability and image quality. Considerably more image information is obtained through new optical design that offers high-contrast images with excellent color reproduction, depth of field, high resolution and unparalleled 3D brilliance. SyCoP (System Control Panel) is an entirely new concept in stereomicroscopy. Designed as a computer mouse it combines all of the major control functions of the stereomicroscope, such as zoom, focus, contrast and illumination. It also supplies current data on object field, resolution and depth of focus. For the first time, it is possible to operate the microscope intuitively, fast and error-free without any need for the users to lift their eyes from the microscope. Calling up complex instrument settings at the push of a button saves time and provides additional

INDUSTRY NEWS

safety. The new stand design allows focusing in steps of up to 350 nm over a wide range of 340 nm. It ensures highest precision and stability. Furthermore, a scratchproof stage plate (250 mm x 410 mm) provides ample space in the object area. In addition, SteREO Discovery.V12 offers a new LED illumination and contrasting systems, Ergo-phototube, specimen protection, 3-position nosepiece, and a light and focus speed manager. These are only a few of the many innovative solutions of this new stereomicroscope for the materials sciences. The AxioVision 4.3 software turns the SteREO Discovery.V12 into a complete imaging system with integrated microscope control, image recording, processing, analysis, management and archiving.



Carl Zeiss MicroImaging is pleased to introduce a new **Axio Imager upright microscope system** for materials applications with a new illumination system that markedly improves image quality in all contrasting techniques – brightfield, darkfield or C-DIC – and provides optimum information. Axio Imager comes in 4 different stand configurations tailored to specific applications in industry such as metallography, materials research, and quality assurance. Modular design is one of the outstanding benefits of the system which can be upgraded as your requirements grow from an analog to a motorized version, up to the digital system with Z-focus. Every Axio Imager microscope is equipped with the new reflected-light illumination. A core element in the stand, called stable cell, ensures optimum stability as well as ideal measuring and image results. High sample throughput in serial tests and high repeat accuracy of measurements are assured through the motorization of all stand functions. The line of EC Epiplan-Apochromat objectives meets the highest demands and provides optimum results in routine and research materials microscopy.

Carl Zeiss is pleased to introduce the new **AxioCam HS high speed digital camera** designed for high-speed imaging of living cells. AxioCam HS records image sequences at more than 50 images per second in the basic resolution mode (660 x 494 pixels) and up to 140 images per second in the 5x5 binning mode. This allows highly precise, time sensitive examinations of fast processes in living objects in neurobiology, developmental biology, virology and zoology. AxioCam HS has been optimized for extremely fast reading of high-resolution image information: 660 x 494 pixels with up to 60 images and up to 200 images in the 5x5 binning mode. With short exposure times, the high rate of image sequence is guaranteed because exposure and sensor reading processes can overlap. Special application software enables direct storage of the image data on the hard drive in complete 12-bit quality without any loss from compression, avoiding compression artifacts. This means that the maximum recording time would only be limited by the hard drive capacity. With appropriately equipped systems, the AxioCam HS can record image sequences as digital films ("movies") in scientific image quality. Further technical accessories for fast recording of multidimensional images are in development. For more information on any of these products contact Carl Zeiss MicroImaging, Inc., Thornwood, NY 10594, 800-233-2343, www.zeiss.com/micro, or email at micro@zeiss.com

In a move that could revolutionize the way we view the world, **ALIS Corporation** today announced that it is developing a next-generation microscopy tool that may be able to see things never before