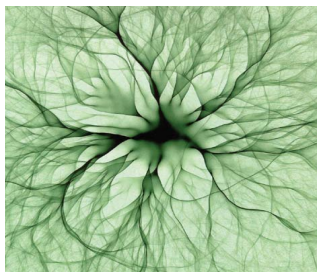
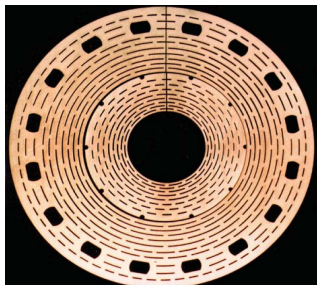


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American Physical Society

2006 March Meeting

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#800,802

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Advanced Research Systems

#407

Manufactures, services & designs the ARS DISPLEX 1.7K, 4K, 6K or 9K closed cycle cryocoolers (DE-202, DE-204 & DE-210) and the ultra low vibration HELITRAN LT-3 open cycle cryostats that operate in the 1.7 to 800K temperature range. ARS integrates the cryostats providing standard & custom interfaces, instrumentation, vacuum shrouds, radiation shields, sample holders, temperature controllers and vacuum systems for each cryocooler.

AJA International

#601

Sputtering and E-beam Systems for R&D and Pilot Production. Static and Rotating Magnetron Sputter Sources for HV and UHV, Substrate Holders with Rotation, RF Biasing, Heating and Cooling; Sputter Targets, Microwave, RF and DC Power Supplies, Microwave Components and Plasma Sources, RF Ion/Plasma Sources.

American Institute of Physics

#504,506

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American Institute of Physics/ Education Division

#112

American Magnetics

#410

Offers superconducting magnet systems to meet any custom requirement and are available in helium cooled or cryogen free versions. Our multi-axis MAXES systems are also available in an optical cryostat and our systems are configured for use with 3rd party He3 inserts or dilution fridges. AMI also manufactures cryofree magnet systems for X-ray diffraction application for use at synchrotron facilities and are designed to fit in compact goniometers. AMI routinely manufactures customized magnet systems for beam lines applications, resonance spectroscopy & STM applications. Other product offerings include power supplies for superconducting magnets, vapor cooled current leads, liquid helium level instrumentation and cryogenic autofill systems.

American Physical Society

#701,703

Publisher of the world's most prestigious and widely-read physics research journals: Physical Review A, B, C, D, E, Physical Review Letters, Reviews of Modern Physics, PROLA (Physical Review Online Archive), PR-Special Topics-Accelerators and Beams, PR-Special Topics-Physics Education Research and PR Focus. PROLA's fully searchable content and full-text articles includes everything published by APS back to 1893.

Amuneal Manufacturing Corporation

#318

Designs and fabricates custom magnetic shield components and assemblies for both room temperature and cryogenic applications, and is a world leader in providing cost-effective shielding solutions to the applied

physics community. From shield design and attenuation calculations to 3D modeling, we work with you to provide the optimum design for your specific application. All Amuneal fabricated magnetic shields are hydrogen annealed in our in-house heat treat center for maximum shielding properties.

Andeen-Hagerling

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Manufactures the world's most precise capacitance/loss bridges and capacitance standards. AH bridges are fully automatic and resolve sub-attofarad measurements. Loss (dissipation factor) is measured down to 1.5×10^{-8} tan. Capacitance standards are available from 0.1pF to 100+pF. Standards have a temperature coefficient of .01ppm/C, stability of 0.3ppm/year, and are NIST traceable to 2ppm accuracy.

Applied Surface Technologies

#603

Surface cleaning with the CO2 Snow Jet will be demonstrated. The Snow Jet is a simple, yet novel surface cleaning process that can remove particles of all sizes and also organic residues from surfaces. This cleaning process works well for cleaning substrates, vacuum parts, analytical samples (AFM), optics, and many other applications. The Snow Jet process is, nondestructively, residue-free with no environmental limitations. Bring test samples!

AR Worldwide

#815

RF/Microwave Instrumentation will be exhibiting its new broadband amplifiers, model 800A3 (800 watts, 10kHz - 3MHz), for applications that required high voltage and high impedance. The 800A3 drives loads without mismatch by a switchable transformer at 12.5, 25, 50, 100, 150, 200 and 400 ohms. If higher impedance is required, a version of the 800A3

is available. For higher power requirements, model 5000A3 provides 5000 watts of power.

Asylum Research #215
Featured is the MFP-3D™ Atomic Force Microscope with unprecedented precision, accuracy and image clarity with sensed closed loop operation in all three axes. The system features built in nanolithography and manipulation, advanced 3D rendering, and open software for advanced research. New environmental control capabilities include a polymer heater and humidity cell.

Attocube Systems AG #312, 314
Manufactures and distributes a complete line of easy-to-use scanning probe microscopes and nanopositioning systems for temperatures ranging from 300K down to 10mK! The innovative nanopositioners are also compatible with HV and UHV environments as well as high magnetic fields up to 15T.

Blake Industries #419
Will be exhibiting the Blake-Huber line of x-ray and synchrotron instruments and accessories, including rotary tables, goniometers, translation stages and Eulerian Cradles.

Bruker BioSpin Corporation, EPR Division #400
Highlighting the ELEXSYS line of EPR spectrometers featuring Linux workstations and advanced electronics for L-, S-, X-, K-, Q-, and W-Band operation with both conventional and superconducting magnets. Complementing the EMX Series, the ELEXSYS spectrometers provide the ultimate in CW, Pulse-FT-EPR, CW and Pulse ENDOR/Triple instrumentation. The ELEXSYS line offers cryostats and accessories for a wide range of applications and meets the most demanding needs of the EPR community.

Cambridge Magnetic Refrigeration #904, 906
Will be displaying its mFridge range of general purpose demagnetization refrigerators for hassle free cooling to as low as 30mK. You will be able to talk to our scientists about how ADR technology can benefit your work and discover the full temperature range and convenience of the modular and reliable mFridge family. CMR - Setting new standards in cooling technology.

Cambridge University Press #200,202
Stop by the Cambridge University Press booth to receive a 20% discount on the latest in Physics, including Mathematical Methods for Physics and Engineering 3rd Edition by Riley, Hobson, and Bence, Condensed Matter Field Theory by Altland and Simons, and Quantum Physics by Le Bellac.

Cryo Industries of America #806
Helium 3 (LHe or Cryogen Free models), manipulator probe stations, microscope with NOMOVE and more! Closed cycle 4K refrigerators can replace LHe in your next application. Our SM6 leads the way in split coil superconducting magnet systems with - large optical access, interchangeable 3He insert and 8 Tesla horizontal field

Cryogenic Control Systems #402
A manufacturer of precision electronic instrumentation for both laboratory and industrial process control applications. On display will be two and four channel cryogenic tem-

perature controllers, monitors and our expanding line of sensors. Featured will be the upgraded four channel temperature monitor which incorporates the most recent technology upgrades available in the instrumentation industry.

Cryomagnetics #606
Offers a complete superconducting magnet system, related electronic instrumentation, and cryogenic accessory line. New to 2006 is a redesigned power supply for superconducting magnets. Cryomagnetics is committed to staying at the forefront of superconducting magnet technology and welcomes the opportunity to discuss your requirements.

Cryomech #913
Manufactures cryorefrigerators, cryostats and liquid nitrogen plants. All of Cryomech's products are based on the Pulse Tube and Gifford-McMahon Cycle Cryorefrigerators that we manufacture. For Superconductivity applications we have several options at 4K, 20-30K and 77K. Our 4K Pulse Tube cryocoolers work for a wide array of applications and can be fitted with a variety of low vibration options. For 20-30K and 77K, we manufacture a full line of single-stage Gifford-McMahon Cycle Cryocoolers with up to 40 watts @ 20K, 100 watts @ 30K, 300 watts at 77K, and the brand new AL600 which meets 600 watts at 77K specifications.

DCA Instruments #912
Designs and manufactures a wide range of UHV deposition systems and components. The products includes MBE, UHV sputtering, PLD and UHV cluster tools. These DCA deposition systems are suitable for deposition of thin films of semiconductors, magnetics, oxides, metals under UHV

Easylab Technologies #920
Develops, manufactures and markets innovative scientific equipment that extend the current boundaries of experiments into the extreme conditions of ultra-high pressures. Our products include high-pressure cell modules that are vital to physics and chemistry research.

Elsevier #204,206
Encyclopedic Dictionary of Condensed Matter Physics, Encyclopedia of Modern Optics, and the reference works Encyclopedia of Condensed Matter Physics and Encyclopedia of Mathematical Physics (March 2006). New journals: Photonics and Nanostructures, Physics of Life Reviews. Up to 30% saving on books (Academic Press, Elsevier, and North Holland imprints)

GMW Associates #420
Sensors and instruments for magnetic field control and mapping: Fluxgates for low fields; 1-and 3-component Hall Transducers and Teslameters; NMR Teslameters for very high resolution and accuracy. Laboratory Electromagnet Systems for fields to about 3T. Applications to device testing, biological studies, magneto optics, EPR, FMR and NMR.

Hamamatsu Corporation #502
A leading manufacturer of devices for generation and measurement of visible, ultraviolet, and infrared light. Hamamatsu's unique corporate philosophy stresses the advancement of photonics through extensive research, and yields products regarded as state of the art

Hinds Instruments #900
Hinds Instruments PEM-90 photoelastic modulators (PEMs) operate in the vacuum UV to mid-IR spectral regions at frequencies of 20 to 100 kHz. These devices provide polarization modulation for applications including Stokes polarimetry, chopping of a light beam, ellipsometry, magneto-optic Kerr effect and measurement of low-level birefringence.

Horiba Jobin Yvon #902
Displaying optical spectroscopy products for photoluminescence, fluorescence, raman, and all products include: spectrometers, imaging spectrographs, diffraction gratings, ccd's, ingaas arrays, pmt, ir detectors, samples compartments, and customized spectroscopy solutions.

ICEoxford® #218
Offers standard and tailor-made superconducting and cryogenic solutions. We design and manufacture cryogenic systems from liquid nitrogen temperatures down to <7 mK in liquid Helium cooled and cryogen free configurations. We will be exhibiting our standard dilution unit system and various 3He system inserts through our collaboration with Scientific Magnetics. Whether you require a simple a bath cryostat or a system with new or unusual features, you should be talking to us.

IEE/Inspec #306
The IEE, Europe's largest engineering society, publishes a wide range of publications in electrical and electronic engineering and related subjects. They also publish Inspec®, the world's largest Sci-tech database in the fields of physics, electronics, electrical engineering, computer science, control engineering, information technology and manufacturing, production and mechanical engineering.

IOP Publishing #305,307
Institute of Physics (IOP) Publishing, a not-for-profit society publisher, will be displaying all of our world-class journals, including the prestigious "Journal of Physics" series. Stop by booth #305 for a free demo of our award winning electronic journals service and to see what's new in 2006. Free sample issues and unique give-aways will be available.

J.A. Woollam Co. #604
Spectroscopic ellipsometers (in situ and ex situ) for non-destructive materials analysis: multi-layer thicknesses, optical constants, growth and etch rates, composition, and more. Offering spectroscopic ellipsometers covering spectral ranges from the Vacuum ultra-violet (VUV) to the Far infrared (IR) to meet most all optical characterization needs

Janis Research Company #706
Recipient of NASA achievement awards (1996 & 2000), R&D-100 award (1998), offers a complete line of standard and customized cryogenic systems. These include dilution refrigerators (10mK), ADRs (50mK), He-3 & He-4 superconducting magnet systems (0.3K & 6-17T), cryocoolers (3K-800K), VT cryostats (2K-800K), noble gas cold traps, micromanipulated probe stations, and more.

Keithley Instruments #501,503
Keithley experts will demonstrate materials research solutions for nanotechnology, thermoelectrics, ferroelectrics, superconductiv-

ity, and ceramics, including a multi-channel I-V test solution, a benchtop characterization system that combines pulsed I-V and DC test capabilities, a temperature controller, high performance current sources, and a nanovoltmeter that simplifies making differential conductance, resistance, and pulsed I-V measurements.

Kimball Physics #607

UHV electron guns and ion guns: beam energies 1eV to 100keV. cathodes, cathode cartridges, filaments; Faraday cups, phosphor screens. System options: energy sweeping, rastering, fast pulsing, emission current stabilization, labview control. UHV components: Multi-CF Fittings, vacuum chambers, eV Parts. Applications: surface physics, vacuum physics, space physics, charge neutralization, cathodoluminescence, phosphor testing, semiconductor processing, RHEED, ESD. Custom designs.

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Kurt J. Lesker Co. #901

We offer systems and components for applications including: magnetron sputtering, electron beam evaporation, organic materials evaporation, MOCVD, and atomic layer deposition (ALD). KJLC manufacturers: vacuum chambers; subassemblies; and standard and custom vacuum hardware including a large variety of electrical, instrumentation, and thermocouple feedthroughs. Stocking distributor of scroll, rotary vane, turbomolecular, diaphragm, roots, and piston-style pumps. Visit www.lesker.com.

Lake Shore Cryotronics #500

With over 38 years of experience, Lake Shore offers the most comprehensive line of cryogenic measurement instrumentation and sensors. Temperatures down to 20 mK can be measured and controlled with our controllers, monitors, transmitters, and AC resistance bridge. Temperature sensors include Cernox, platinum, germanium, and ruthenium oxide resistive sensors, as well as silicon and GaAlAs diodes, and thermocouple wire. Other products include a superconducting magnet power supply, a full line of magnetic measurement instrumentation, Hall probes and field sensors, Helmholtz coils, electromagnets, magnet power supplies, VSM systems, Hall effect measurement systems, and probe stations. Our knowledgeable staff will be on hand to discuss your research requirements.

Lay Tec GmbH #914

A leader in the field of in situ monitoring systems for MOCVD, MBE and other thin-film processes. Our sensors measure epitaxy growth properties: growth rate, layer thickness, doping levels, ternary material composition, surface roughness, wafer surface temperature and wafer bowing with an extreme

precision already during the deposition process!

MacKichan Software #600

New! Scientific WorkPlace 5.5 simplifies writing, sharing, and doing mathematics. A click of a button allows you to typeset in LaTeX. The integrated computer algebra system lets you solve and plot equations; animate 2D and 3D plots; rotate, move, and fly through 3D plots; create 3D implicit plots; and more.

Mad City Labs #404,406

One of the largest American manufacturers of precision nanopositioning systems. The proprietary PicoQ sensing technology incorporated into all nanopositioner designs provides usable resolution down into the picometer range. Applications for nanopositioners include AFM, NSOM, Scanning Probe Microscopy, fiber positioning, interferometry, single molecule spectroscopy and nanolithography.

Mantis Deposition #219

Dedicated to the manufacture of high quality UHV deposition components thin film growth for MBE, surface science or PVD. Product offerings include: nanocluster deposition sources and systems, RF atom and RF ion sources, e-beam evaporators, k-cells and thermal gas crackers as well as full turnkey deposition systems.

Molecular Imaging #906

Agilent Technologies, the leader in test and measurement tools, has recently acquired Molecular Imaging, the premier manufacturer of Atomic Force Microscope (AFM) and Scanning Probe Microscope (SPM) systems. This product portfolio brings to Agilent a family of high-resolution AFM instruments designed for imaging in fluids or ambient air under controlled temperature and environmental conditions that are ideal for nanometer scale imaging and quantitative measurements.

NanoAndMore USA Corp. #319

NanoAndMore is a distributor of nanotechnology products for the laboratory including atomic force microscope probes from NANOSensors®, NanoWorld and Budget Sensors. These high quality probes include specialties like the AdvancedTEC probe, SuperSharp probes, High Aspect Ratio probes, Diamond Coated probes, as well as Silicon Nitride probes.

Nanomagnetics Instruments #804

Provides a wide range of scanning probe microscope products for research, industry and education. The easy-to-use Nanosurf Mobile S AFM will be featured in our booth. Stop by to see the latest in ease-of-use, attractive design, and SPM capabilities. Our wide range of AFM products include the nanoAnalytics Q-control, Budgetsensors & Nanosensors AFM probes, Carbon Nanotube AFM tips, SPM post-processing software, and a variety of accessories for your AFM and STM.

Nanonics Imaging Ltd. #1009

Ultimate resolution AFM/NSOM/SPM systems including the first two probe SPM system. Hallmarked by free optical and electron/ion beam axis integration including confocal, microRaman, SEM's, TEM's, FIB's, 10 K operation. Exposed AFM probes/tips surpassing nanotube profiling with deep

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National Nanotechnology Infrastructure Network #921

NNIN is a network of 13 leading university laboratories providing user access and support for advanced nanotechnology research. Over 900 major instruments are available along with thousands of process supporting all areas on nanotechnology, including electronics, MEMS, photonics, biophysics, chemistry, and solid state physics.

National Research Council of the National Academies #116

Offers awards for independent postdoctoral and senior scientific research in all disciplines of science and engineering to be conducted at participating U.S. government laboratories. Awards include generous stipend, relocation, professional travel and health insurance. Deadline dates and application instructions are at www.national-academies.org/rap

Nature Publishing Group #315

Committed to publishing high quality, rigorously peer-reviewed research, review and reference material in print and online. NPGs dynamic portfolio totals over 50 leading international scientific and medical journals, including Nature and the Nature Clinical Practice series of review journals.

Neocera #903

Nor-Cal Products #405

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NRC Research Press #213

Stop by for submission and subscription information on the Canadian Journal of Physics - one of 16 international journals we publish online and in print. Features include rapid online publication, web-based manuscript submission, and no page charges. Take advantage of our special conference discount on our monographs.

Ocean Optics #602

A leading supplier of miniature spectrometers, offers optical-sensing products for thin film measurement, ellipsometry and plasma monitoring; fluorescence and photoluminescence monitoring of quantum dots, carbon nanotubes and nanomaterials; and high-resolution spectrometers for laser characterization. New SpectraSuite spectroscopy software is the first to operate on Windows, Macintosh and Linux.

Omicron Nanotechnology USA #414

A premier supplier of UHV instruments for nanoscience-related research. From our award winning Variable Temperature AFM/STM instruments, to our family of Multiprobe UHV systems for multi-technique surface science research. OMICRON is contin-

uously striving to develop new tools with increased performance for UHV microscopy and spectroscopy research

Origin Lab Corporation #211

Origin is a software application that combines point-and-click interfaces for scientific graphing and analysis with a powerful programming environment. Over 60 built-in plot types allow you to quickly create 2D, 3D, contour, and image graphs. Advanced data analysis tools include statistics, signal processing, curve fitting and peak analysis.

Oxford Instruments Superconductivity #801,3,5,7

World leaders in superconductivity and ultralow temperature cryogenic environments, Oxford Instruments is driving innovation in these fields. The Company's leading-edge technologies support research in nanotechnology, solid state and condensed matter physics. These technologies also drive analytical instrumentation such as NMR and FTMS that are vital tools for drug discovery and life science applications. Combining outstanding technical expertise, original thinking and a commitment to meeting customer's needs, Oxford Instruments Superconductivity enables real advances both in research and commercial applications by providing the high quality technological environments needed to meet demanding experimental requirements

Oxford University Press #205,207

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Photonics Spectra #110

Photonics Spectra is the leading photonics magazine serving industries that use photonic technology: lasers, imaging, fiber optics, optics, electro-optics, and photonic component manufacturing. It presents the latest news articles and in-depth reports on photonics technology. It is distributed free to those who use or apply photonics.

Physics Today #114

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Manufactures the highest speed & linearity nano-scanning stages and nano-focus devices for applications such as: optical tweezers, scanning microscopy (nsnm, near field, afm, spm, sem, confocal); ultrafast beam scanners and tilt-mirrors; advanced digital piezo controllers (improved linearity, trajectory control, settling). piezo-scanner tubes, pzt actuators & controllers; advanced hexapod 6-d micro-positioners; capacitive position sensors (0.01 nm resolution).

Princeton University Press #301

We are excited to be in the midst of a major

new initiative the re-launch of the Princeton Series in Physics, which will grow under the guidance of our new series editors, Paul Steinhardt, Curt Callan (both Princeton University), and Paul Chaikin (New York University). This series has included the likes of Peeble's Principles of Physical Cosmology, Wess and Bagger's Supersymmetry and Supergravity, and O Raifeartaigh's The Dawning of Gauge Theory, and it will be expanded to include graduate level textbooks, monographs, and other major synthetic works encompassing emerging areas of study.

Quantum Design #811,813

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Raith USA #605

Presenting the new e-LiNE series, an e-beam lithography system with many advanced options for all applications in nanotech research, including: Imaging, Metrology, EBID, EDX, Nano-manipulators and more. Raith offers a variety of E-Beam Lithography systems for research and development. Our EBL systems range from add-on attachments for SEMs and FIBs, to complete, Turnkey systems with full wafer and mask handling capabilities. Raith also manufactures ultra-high precision laser stages and CAD-navigation packages for failure analysis applications.

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Scientific Magnetics Ltd. #220

Formerly Space Cryomagnetics Ltd. Scientific Magnetics offers standard and tailor-made superconducting and cryogenic solutions. We design and manufacture magnet systems from low and high temperature superconducting material, in liquid Helium cooled and cryogen free configurations. We will be exhibiting our SciMag standard solenoid systems with integrated Variable temperature, Helium-3 or dilution refrigerator inserts through our collaboration with ICEoxford®. Whether you require a simple solenoid in a bath cryostat or a system with new or unusual features, you should be talking to us.

Scientific Instruments #303

Engineered for the advanced researcher and systemized for the first-time buyer, RHK's

products are leaders in performance, scalability, compatibility, and value. Celebrating 20 years of commitment to customer and quality, we partner with our users to customize and support the products we make over a lifetime of experimental inquiry.

Smithsonian/NASA ADS #1015

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SPECS Scientific Instruments #311

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Stanford Research Systems #505,507

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VAT #911
An industry leader in vacuum sealing technology, manufactures high quality vacuum valves for a variety of applications ranging from rough to extreme UHV. Products include: gate, angle, fast-closing, throttle, pressure control, all-metal and customized valves. Visit the VAT booth #911 while visiting APS.

Veeco Instruments #700,702,704
A leader in producing tools for nanoscale sci-

ence and technology, will unveil our New atomic force microscopes including the Digital Instruments BioScope II Scanning Probe Microscope (SPM), specifically designed to facilitate advanced biological research. The BioScope II offers the highest resolution on an inverted microscope, compatibility with off-the-shelf optical components, and enhanced ease-of-use features.

Vericold Technologies GmbH #314
Specializes in cryogen-free low temperature cooling equipment as well as X-ray spectrometers based on superconducting sensors. Products include low vibration 70 K and 4 K pulse tube coolers, 4K cryostats, Adiabatic Demagnetisation Refrigerators (ADR) and 3 He/4 He dilution refrigerators (DR). Thoroughly competent in cryogenic engineering as well as customized adaptations.

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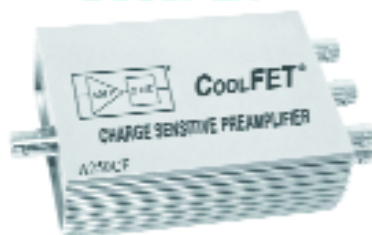
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Manufacturer of modular, high resolution optical and scanning probe microscopes including NSOM, confocal Raman microscopy and AFM. WITec will showcase the new alphaControl, a fully digital controller for SPM. Its radical new system architecture allows unique features to be realized, resulting in speed, flexibility, accuracy, expandability and versatility.

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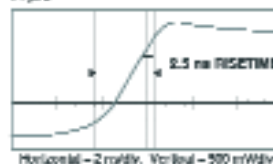
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~76 electrons RMS
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11.5 eV/pF with high C_{in} FET
Fast Rise Time: 2.5 ns

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- Easy to use

STATE-OF-THE-ART A250

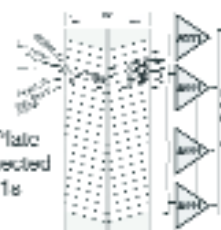
External FET
FET can be cooled
Noise: <100 e⁻ RMS (Room Temp.)
<20 e⁻ RMS (Cooled FET)
Gain-Bandwidth f_c : >1.5 GHz
Power: 19 mW typical
Slew rate: >175 V/ μ s



THE INDUSTRY STANDARD A111



A Microchannel Plate (MCP) Array Connected to Multiple A111s



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