

Preview: 2009 MRS Spring Meeting
Moscone West and San Francisco Marriott Hotel, San Francisco, Calif.
Meeting: April 13–17 • Exhibit: April 14–16
www.mrs.org/S09



2009 MRS
spring meeting

Meeting Chairs:

Paul R. Besser
CMOS Industry

Peter Fratzl
Max-Planck-Institute of Colloids and Interfaces

Nicola Spaldin
University of California, Santa Barbara

Terry M. Tritt
Clemson University

The 2009 Materials Research Society Spring Meeting will be held April 13–17, 2009 in San Francisco, Calif. The technical meeting and exhibits will be located at the Moscone West Convention Center, and will include 42 symposia. To complement the scientific sessions, tutorials will provide a detailed introduction to particularly exciting areas of research, Symposium X on Frontiers of Materials Research will feature topics at the forefront of materials science and engineering, and the Equipment Exhibit will showcase products of interest to the materials community.

The scientific sessions will include many new and developing areas of materials research as well as some well-established and popular topics. The cluster on **Electronic and Optical Materials** (comprising Symposia A–K) will include amorphous and polycrystalline silicon thin films, molecular and organic electronics, chemical and mechanical planarization, multiferroics, high-throughput synthesis, as well as topics important to the integrated circuit community including junctions, memories, gate stacks, interconnects, and packaging.

The cluster on **Energy and the Environment** (Symposia L–S) features symposia on

recent advances in photovoltaics and water purification, as well as materials for energy generation, conversion, and storage.

The cluster on **Nanomaterials and Devices** (Symposia T–W, Y–JJ) will feature a number of talks on nanoscale heat transport, nanocrystals, nanowires, nanocomposites, metamaterials, and spintronics, as well as characterization techniques at the nanoscale.

The cluster on **Soft Matter, Biological and Bio-Inspired Materials** (Symposia KK–PP) will address structure–property relations, architected materials, hierarchical synthesis, active polymers, stretchable electronics, and lab-on-the-chip applications.

The Spring Meeting will feature a one-day Festival on Materials for the Developing World to inform the international community of materials researchers about the needs and opportunities for materials science-related activities in the developing world. Nobel laureate Walter Kohn of the University of California, Santa Barbara will present a plenary lecture on the topic of photovoltaics and solar energy in the developing world as well as screen his documentary film, “The Power of the Sun,” on the same topic. In the Symposium X lunchtime series, Scott Lacy in the Anthropology Department at Emory University and Richard LeSar in Materials Science and Engineering at Iowa State University will present talks on materials engineering projects in remote developing world locations. These presentations will be complemented with exhibit booths showcasing products and activities from various companies and organizations, including MBA Polymers and the Bamboo Bike Project.

Poster sessions will be held in the Moscone Exhibit Hall on Tuesday from 5:00 p.m. to 7:00 p.m., and in the Marriott Hotel on Wednesday through Thursday evenings from 8:00 p.m. to 11:00 p.m. The meeting chairs will sponsor a Best Poster Award competition, selecting recipients


each night on the basis of the posters’ technical content, appearance, graphic excellence, and presentation quality.

An awards ceremony will be held at which this year’s Outstanding Young Investigator will be recognized, MRS Fellows will be honored, and Gold and Silver Graduate Student Awards will be presented to graduate students for symposium papers that exemplify significant and timely research.

Government-sponsored seminars on topics of interest to the broad materials community are planned. MRS will also host a Career Center; services offered to attendees include access to current job postings, a resume file for prospective employers, and on-site interview opportunities.

Graduate students and members of MRS University Chapters are invited to attend the student mixer reception. Also, chapter officers and faculty advisors are invited to attend a meeting of MRS University Chapter representatives to compare notes on recent activities and brainstorm on new projects and issues of common concern. Those interested in starting new chapters are welcome.

See the following pages for a matrix of symposium sessions, a list of tutorials, profiles of exhibitors, and information on hotel and transportation arrangements. International travelers are reminded to begin the visa process early. The date, time, and location of various special events will be announced in the *Program & Exhibit Guide* at the meeting.

For additional information on the meeting, contact MRS Member Services, Materials Research Society, 506 Keystone Drive, Warrendale, PA 15086-7573, USA; e-mail info@mrs.org, tel. 724-779-3003, and fax 724-779-8313. The deadline to preregister for the meeting is **March 27, 2009**. The MRS Web site can be accessed for updated information on confirmed talks and details on special events, visas, and preregistration at www.mrs.org. 

See page 124 for a list of PRINT PROCEEDINGS available from the 2009 MRS Spring Meeting

2009 MRS SPRING MEETING REGISTRATION AND LODGING

Pre-registration deadline: March 27, 2009 · Hotel reservations deadline: March 18, 2009

REGISTRATION

Pre-Registration Rates

Valid through Friday, March 27, at 5:00 p.m. EST:

■ Member:	\$485
■ Student Member:	\$105
■ Nonmember:	\$585
■ Student Nonmember:	\$130
■ Retired:	\$130
■ Unemployed:	\$130

Tel. 724-779-3003; Monday–Friday 8:00 a.m.–5:00 p.m. EST

Online: www.mrs.org/s09_registration

On-Site Registration Rates

Valid AFTER 5:00 p.m. EST on Friday, March 27:

■ Member:	\$585
■ Student Member:	\$135
■ Nonmember:	\$685
■ Student Nonmember:	\$160
■ Retired:	\$160
■ Unemployed:	\$160

LODGING

The Materials Research Society has negotiated special discounted hotel room rates at the San Francisco Marriott Hotel, 30 minutes from the San Francisco International Airport. Your patronage of the official hotel makes the meeting possible by securing the space needed for this event at a greatly reduced cost. Evening poster sessions and other networking events will be held in the Marriott for the convenience of our attendees.

The discounted MRS rate will be \$154 single/double. There will be a \$20 charge for each additional person. Rates do not include applicable taxes.

San Francisco Marriott Hotel

55 Fourth Street

San Francisco, California 94103

Phone: 1-801-832-4532 or 1-801-266-9432

Fax: 1-415-486-8153

Online: www.mrs.org/s09_lodging

2009 MRS SPRING MEETING SYMPOSIUM TUTORIALS

MOSCONE WEST CONVENTION CENTER

SYMPOSIUM A

Thin-Film Silicon Materials and Devices for Large-Area and Flexible Solar Cells and Electronics

Monday, April 13, 9:00 am–5:00 pm; Room 2004, Moscone West

SYMPOSIUM C

Advanced CMOS—Substrates, Devices, Reliability, and Characterization

Monday, April 13, 9:00 am–5:00 pm; Room 2006, Moscone West

SYMPOSIUM H

Physics of Emerging Nonvolatile Memories

Monday, April 13, 9:00 am–5:00 pm; Room 2007, Moscone West

SYMPOSIUM I

Fundamentals of Magnetoelectric Interactions in Multiferroic Composites

Monday, April 13, 1:30–5:00 pm; Room 2012, Moscone West

SYMPOSIUM M

Young Scientist Tutorial on Characterization Techniques for Thin-Film Solar Cells

Monday, April 13, 9:00 am–5:00 pm; Room 2011, Moscone West

SYMPOSIUM N

Applications of Thermoelectric Technology

Monday, April 13, 1:30–5:00 pm; Room 2010, Moscone West

SYMPOSIUM O

Light-Emitting Diodes and Solid-State Lighting

Monday, April 13, 1:30–5:00 pm; Room 2024, Moscone West

SYMPOSIUM GG

Introductions to Electron Crystallography and Precession Electron Diffraction

Monday, April 13, 1:30–4:45 pm; Room 2002, Moscone West

SYMPOSIUM JJ

Nanoscale Electromechanics and Piezoresponse Force Microscopy—Recent Advances and Applications to Ferroelectric and Biological Systems

Wednesday, April 15, 1:30–5:00 pm; Room 3000, Moscone West

Tutorial times are tentative, and may change. Please check the MRS Web site for the most current information on the 2009 MRS Spring Meeting tutorials.

TUTORIAL ATTENDANCE IS OPEN TO ALL MEETING ATTENDEES AT NO EXTRA CHARGE.

2009 MRS SPRING MEETING SYMPOSIUM SESSION LOCATOR

SYMP.	TITLE	LOCATION	MONDAY, APRIL 13			TUESDAY, APRIL 14		
			Moscone	a.m.	p.m.	eve.	a.m.	p.m.
A	Amorphous & Polycrystalline Thin-Film Silicon Science & Technology	Room 2004	Tutorial**	Tutorial**		A1: Large Area & Flexible Processing A2: Characterization	A3: Light Trapping in Solar Cells A4: Defects & Metastability	A5, A6, A7: Posters
B	Concepts in Molecular & Organic Electronics	Room 2001	B1: Molecular-Scale Electronics I	B2: Molecular-Scale Electronics II		B3: Molecular-Scale Electronics III	B4: Molecular-Scale Electronics IV	B5: Posters
C	CMOS Gate-Stack Scaling—Materials, Interfaces, & Reliability Implications	Room 2006	Tutorial**	Tutorial**		C1: Dielectrics I—Advanced Doped & Epitaxial Oxides C2: Devices I—Novel Devices	C3: Electrodes for Advanced Gate Stacks C4: Dielectrics II—Development & Analysis	
D	Materials, Processes, & Reliability for Advanced Interconnects for Micro- & Nano-Electronics	Room 2003				D1: Low-k Dielectrics I	D2: Low-k Dielectrics II	D3: Posters
E	Science & Technology of Chemical Mechanical Planarization (CMP)	Room 2005				E1: Polishing, Conditioning, & Wear Mechanisms on the Pad E2: Multiscale & Fundamental Modeling of CMP	E3: CMP of Emerging Materials	
F	Packaging, Chip-Package Interactions, & Solder Materials Challenges	Room 2002						
G	High-Throughput Synthesis & Measurement Methods for Rapid Optimization & Discovery of Advanced Materials	Room 2009						
H	Materials & Physics for Nonvolatile Memories	Room 2007	Tutorial**	Tutorial**		H1: Advanced Flash I	H2: Charge-Trap Memory I H3/FF3: Magnetic Resistive RAM	H4, H5, H6: Posters
I	Engineered Multiferroics—Magneto-electric Interactions, Sensors, & Devices	Room 2012		Tutorial**		I1: Ferrite-Piezoelectric Composites	I2: Composite Multiferroics	I3: Posters
J	High-Temperature Photonic Structures	Room 2009				J1: From Photonics to High-Temperature Photonics	J2: Spectral Control of Thermal Radiation	
K	Materials Research for Terahertz Technology Development	Room 3000				K1: Meta/Engineered THz Materials K2: Time-Domain Spectroscopy I K3: In-Room Poster Session K4: THz Applications I	K5: Applications II K6: Time-Domain Spectroscopy II & Theory K7: Carbon Potential	
L	Nuclear Radiation Detection Materials	Room 2008				L1: Scintillator I L2: Materials I	L3: CdTe & CdZnTe Detectors I L4: Materials II	
M	Thin-Film Compound Semiconductor Photovoltaics	Room 2011	Tutorial**	Tutorial**		M1: Characterization of Absorber Materials	M2: Materials Deposition & Process Monitoring	
N	Materials & Devices for Thermal-to-Electric Energy Conversion	Room 2010		Tutorial**		N1: Applications & Devices	N2: Nanocomposites & Nanostructured Materials I	N3: Posters

*Poster Sessions: Wednesday and Thursday evening poster sessions--San Francisco Marriott Hotel; Tuesday poster sessions--Moscone West Exhibit Hall

**Refer to Tutorial Schedule Shaded Blocks: No Session

2009 MRS SPRING MEETING SYMPOSIUM SESSION LOCATOR

WEDNESDAY, APRIL 15			THURSDAY, APRIL 16			FRIDAY, APRIL 17	
a.m.	p.m.	eve.*	a.m.	p.m.	eve.*	a.m.	p.m.
A8: Novel Device Applications A9: Film Growth I	A10: Solar Cells A11: Nanostructured Silicon		A12: Crystallization A13: Light Trapping in Solar Cells II	A14: Thin Film Transistors A15: Transport	A16, A17, A18, A19, A20, A21: Posters	A22: Film Growth II A23: Hydrogen in Silicon	
B6: Understanding Interfaces	B7: Charges & Transport I		B8: Charges & Transport II	B9: Photovoltaics	B10: Posters	B11: Processing, Sensing, & Memory	B12: Light Emission
C5: Devices II—Silicon-Based Device Scaling C6: Interface I—Germanium Substrates	C7: Devices III—Dielectric Engineering C8: Characterization I—Characterization of Advanced Gate Stacks	C9: Posters	C10: Interface II—III-V Substrates C11: Characterization II—Characterization of Bulk & Surfaces of Dielectrics	C12: Reliability of HiK/Metal Gate Stacks C13: Dielectrics III—Alternate Channel Materials			
D4: Metallization I	D5: Metallization II		D6: Reliability	D7: Emerging Interconnect Technologies		D8/F6: Interconnect & Packaging	
E4: Advances in Slurry Particle Mechanism of Metal & Dielectric CMP E5: Chemical & Physical Mechanism of Metal & Dielectric CMP I	E6: Chemical & Physical Mechanism of Metal & Dielectric CMP II E7: CMP Process Simulation, Monitoring, & Experimentation	E8: Posters	E9: Alternative Planarization Techniques & CMP in Emerging Technologies E10: CMP in Memory & Data Storage Technologies E11: Challenges in CMP for Next-Generation 45NM & Beyond	E12: Tool/Process Development such as eCMP & Low-Shear CMP			
F1: Mechanics & Chip-Package Interaction	F2: Reliability & Interfacial Reaction for Solders		F3: Thermal Interface & 3D Interconnects	F4: System-in-Packages & Integration F5: In-Room Poster Session—System-in-Package & Integration		F6/D8: Interconnect & Packaging	
	G1: New Combinatorial Methods & Applications		G2: Magnetic & Metallic Alloys	G3: Hydrogen Storage Materials & Materials Informatics	G4: Posters	G5: Functional Oxides	G6: Polymers
H7: Organic Memory I	H8: Ferroelectric Memory II		H9: Resistive-Switching RAM I	H10: Resistive-Switching RAM II	H11, H12: Posters	H13: Phase—Change RAM II	H14: Phase—Change RAM III
I4: Multiferroic Sensors & Devices	I5: Multiferroic Microwave Devices		I6: Multiferroic Bismuth Iron Oxide	I7: Single-Phase Multiferroics			
J3: Spectral Control & Protection Coatings							
K8: Devices & Components K9: Nonlinear Optical Sources/Materials	K10: Detectors K11: Quantum Cascade Lasers & Laser Theory						
L5: CdTe & CdZnTe Detectors II L6: Neutron Detectors	L7: Scintillator II L8: Materials III	L9: Posters		L10: CdTe & CdZnTe Detectors III	L11: Scintillator III		
M3: Device Modeling & Characterization	M4: New Materials & Devices	M5: Posters	M6: Grain Boundaries & TCOs	M7: Commercialization Issues	M8: Posters	M9: Advanced Devices & Materials Characterization	
N4: Nanocomposites & Nanostructured Materials II	N5: Theory		N6: Bulk Materials I	N7: Applications, Devices, & Metrology N8: Bulk Materials II		N9: Novel Oxides	

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SYMP.	TITLE	LOCATION	MONDAY, APRIL 13			TUESDAY, APRIL 14		
			a.m.	p.m.	eve.	a.m.	p.m.	eve.*
O	Compound Semiconductors for Energy Applications & Environmental Sustainability	Moscone Room 2024		Tutorial**		O1: Compound Semiconductor for PV Application	O2: Compound Semiconductor for Lighting	O3: Posters O4: Posters
P	Three-Dimensional Architectures for Energy Generation & Storage	Room 2022				P1: 3D Battery Architectures— From Design Concepts to Functional Devices	P2: Multiple Junction & Novel Structure Solar Cells	
Q	Materials Science of Water Purification	Room 2020				Q1: Membranes I	Q2: Membranes II	Q3: Posters
R	Materials for Renewable Energy at the Society & Technology Nexus	Room 2018				R1: Energy & Environment	R2: Photovoltaics	
S	Materials in Photocatalysis & Photoelectrochemistry for Environmental Applications & H ₂ Generation	Room 2016				S1: TiO ₂ -Based Photocatalyst Systems	S2: Fe & W-Based Photocatalyst Systems	
T	Nanoscale Heat Transport—From Fundamentals to Devices	Room 3002				T1: Biological & Nanofluids	T2: Organic Materials & Polymers	
U	Electrofluidic Materials & Applications— Micro/Biofluidics, Electrowetting, & Electrospinning	Room 3004				U1: Electrofluidics Overview U2: Electrofluidics & Membranes	U3: Electrofluidic Transistors U4: Microfluidic Mechanisms	
V	Functional Metal-Oxide Nanostructures	Room 3001				V1: Complex Oxide Nanostructures	V2: Devices & Bottom-Up Synthesis	V3: TiO ₂ Nanostructures
W	Novel Functional Properties at Oxide-Oxide Interfaces	Room 3003				W1: Theory & Experiment I	W2: Theory & Experiment II	W3: Posters
X	Frontiers of Materials Research						X1	
Y	Nanocrystalline Materials as Precursors for Complex Multifunctional Structures through Chemical Transformations & Self Assembly	Room 3006				Y1: Nanocrystalline Building Blocks	Y2: Chemical Transformation of Nanostructures	Y3: Posters
Z	Computational Nanoscience— How to Exploit Synergy between Predictive Simulations & Experiment	Room 2000		Panel on Emerging Research for Materials Modeling (see Program & Exhibit Guide for details)		Z1: Interface Issues in Catalysis, Fuel Cells, & Hydrogen Storage Materials I	Z2: Interface Issues in Catalysis, Fuel Cells, & Hydrogen Storage Materials II	
AA	Semiconductor Nanowires—Growth, Size-Dependent Properties, & Applications	Room 3008				AA1: III-V Nanowire Devices	AA2: III-V Nanowire Growth & Characterization	AA3: Posters
BB	Material Systems & Processes for Three-Dimensional Micro- & Nanoscale Fabrication & Lithography	Room 3005				BB1: Direct Laser Writing	BB2: Interference Lithography & Optical Tweezing BB3: Chemical & Physical Deposition	

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**Refer to Tutorial Schedule Shaded Blocks: No Session

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WEDNESDAY, APRIL 15			THURSDAY, APRIL 16			FRIDAY, APRIL 17	
a.m.	p.m.	eve.*	a.m.	p.m.	eve.*	a.m.	p.m.
O5: Compound Semiconductors for Energy	O6: Compound Semiconductors for Sensing		O7: Materials Growth & Characterization				
P3: 3D Battery Architectures—Materials & Fabrication Methods	P4: Solar Cells with 3D Architectures	P5: Posters	P6: Nanostructured Materials for Capacitors	P7: Organic/Hybrid Solar Cells		P8: Synthesis & Fabrication Routes for 3D Architectures	
Q4: Ion Exchange & Adsorption	Q5/S4: Environmental Applications of Photocatalytic Materials & Systems	Q6: Posters	Q7: Aqueous Interfaces & Catalysis	Q8: Disinfection	Q9/S8: Posters		
R3: Fuel Cells & Hydrogen I	R4: Fuel Cells & Hydrogen II	R5: Posters	R6: Batteries	R7: Novel Materials			
S3: Photoelectrochemical Cells & Devices	S4/Q5: Environmental Applications of Photocatalytic Materials & Systems		S5: Heterostructures & Water Splitting	S6: Heterostructures & Process Control	S7: Posters S8/Q9: Posters	S9: Analytical Methods for Increased Understanding	S10: Modeling
T3: Interfaces & superlattices	T4: Interfaces & Thin Films	T5: Posters	T6: Thermo-electric Materials	T7: Electrons & Phonons		T8: Low-Dimensional Systems	T9: Low Conductivity Materials, Oxides, & Disorder
U5: Co-axial Electrospinning U6: Electrospinning Applications	U7: Electrospinning Mechanisms & Methods U8: Microfluidic Devices		U9: Electrowetting Mechanisms & Applications U10: Microfluidic Lab-on-Chip Applications	U11: DNA & Microfluidics			
V4: Synthesis & Applications I	V5: ZnO I	V6: Posters	V7: ZnO II	V8: Synthesis & Applications II	V9: Posters	V10: Sensors, Fuel, & Solar Cells	V11: Synthesis & Applications III
W4: Analysis I W5: Doping, Field Effect, & Devices	W6: Superconductivity		W7: Analysis II W8: Ferroelectrics & Devices	W9: Multiferroic & Magnetic Interactions			
	X2			X3			
Y4: Complex Structures by Assembly I	Y5: Complex Structures by Assembly II	Y6: Posters	Y7: Functional Nanostructure Fabrication	Y8: Crystal Growth & Phase Change		Y9: Composite Nanostructures	
Z3: Tubes, Wires, & Ribbons	Z4: Semiconductor Nanocrystals		Z5: Molecular Electronics Z6: Methods	Z7: Frontier of Electronics I Z8: Mesoscale Phenomena	Z9: Posters	Z10: Frontier of Electronics II	
AA4: Silicon Nanowire Electronic Devices	AA5: Silicon-Germanium Nanowire Growth & Doping	AA6: Posters	AA7: Catalyst Effects & Templated/ Directed Growth of Nanowires	AA8: Nanowire Growth Theory & Mechanisms	AA9: Posters	AA10: Nanowire Energy Conversion & Storage Devices	AA11: Nanowire Sensors
BB4: Biomolecule-Directed Assembly and Templating	BB5: Self Assembly of Colloids & Discrete Structures	BB6: Posters	BB7: Contact Lithography, Nano-imprinting, & Moulding BB8: Field- & Thermal-Gradient Driven Patterning	BB9: Particle- & Ink-Jet Direct Writing BB10: Scanning Nanoprobe Methods BB11: Surface-Tension, Evap., & Phase-Transition Driven Assembly			

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				a.m.	p.m.	eve.	a.m.	p.m.
CC	Nanoscale Functionalization & New Discoveries in Modern Superconductivity	Moscone Room 3012				CC1: New Superconductors	CC2: Wires	
DD	Ion Beams & Nano-Engineering	Room 3010				DD1: Beam Lithography DD2: Magnetic, Optical, & Semiconductor Applications	DD3: Fabrication of 3D Structures DD4: Beam-Induced Nanostructure Formation	
EE	Materials for Nanophotonics-Plasmonics, Metamaterials, & Light Localization	Room 2014				EE1: Synthesis & Optical Properties of Nanostructures EE2: Plasmonics in Biology	EE3: Spectroscopy & Fundamentals EE4: SPP Excitation, Guiding, & Concentration	
FF	Novel Materials & Devices for Spintronics	Room 3007				FF1: Dilute Magnetic Semiconductor & Oxides	FF2: Spin Dynamics FF3/H3: Magnetic Resistive RAM	
GG	Electron Crystallography for Materials Research	Room 2002		**Tutorial		GG1: Theory & Practice of Precession & Rotation Electron Diffraction GG2: In-Room Poster Session	GG3: Electron Crystallography by Complimentary Approaches	
HH	Quantitative Characterization of Nanostructured Materials	Room 3009				HH1: Spatially Resolved Techniques I	HH2: Spatially Resolved Techniques II	
II	Probing Mechanics at Nanoscale Dimensions	Room 3011				II1:	II2:	II3: Posters
JJ	Nanoscale Electromechanics & Piezoresponse Force Microscopy	Room 3000						
KK	Structure-Property Relationships in Biomineralized & Biomimetic Composites	Room 3024				KK1: Structure-Function Relationships in Biomineralized Tissues I	KK2: Structure-Function Relationships in Biomineralized Tissues II	
LL	Architected Multifunctional Materials	Room 3022				LL1: Opening Session LL2: Cellular & Fibrous Materials	LL3: Processing Challenges	LL4: Posters
MM	Synthesis of Bio-inspired Hierarchical Soft & Hybrid Materials	Room 3020				MM1: Bioinspired Synthesis & Assembly	MM2: Biopolymer Mediated Synthesis & Assembly	MM3: Posters
NN	Active Polymers	Room 3018				NN1: Shape Memory I	NN2: Hydrogel	NN3: Posters
OO	Materials & Strategies for Lab-on-a-Chip-Biological Analysis, Cell-Material Interfaces, & Fluidic Assembly of Nanostructures	Room 3016				OO1: Frontiers in Lab-on-a-Chip Research I	OO2: Frontiers in Lab-on-a-Chip Research II	OO3: Posters
PP	Materials & Devices for Flexible & Stretchable Electronics	Room 3014				PP1: From Flexible to Stretchable Electronic Circuits PP2: Dielectric Materials for TFTs	PP3: Low-Temperature Fabrication Process PP4: Device Performance	PP5, PP6: Posters

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a.m.	p.m.	eve.*	a.m.	p.m.	eve.*	a.m.	p.m.
CC3: Flux Pinning I	CC4: Flux Pinning II	CC5: Posters	CC6: Coated Conductors I—Fabrication	CC7: Coated Conductors II—Properties, Applications			
DD5: Ion-Solid Interactions DD6: Ripples & Self Assembly	DD7: Nanowires DD8: Biological & Biomedical Applications I		DD9: Biological & Biomedical Applications II DD10: Ion-Beam Patterning	DD11: Quantum Dots, Nanoparticles, Nanoclusters I DD12: Quantum Dots, Nanoparticles, Nanoclusters II	DD13: Posters	DD14: New Techniques & Instrumentation	
EE5: Nonlinear & Exotic Materials EE6: Detection & Emission	EE7: Emission Fundamentals EE8: Optical Imaging	EE9: Posters	EE10: Light Localization & Photonic Structures	EE11: Meta Materials & Superlenses EE12: Biophotonics	EE13: Posters	EE14: Meta-materials II	EE15: Meta-materials III EE16: Optical Nanoantennas & Decay Engineering
FF4: Spin Injection in Semiconductors & Si Spintronics	FF5: Single-Spin Dynamics/DMS I (III-V & Group IV)	FF6: Posters	FF7: MTJ & Dynamics FF8: Novel Spin Transport	FF9: Organic & Molecular Spintronics	FF10: Posters	FF11: Multiferroic Matls. & Oxides FF12: Multi-functional Matls. & Devices	
HH3: Local Structure	HH4: Nanoparticles I	HH5: Posters	HH6: Nanoparticles II HH7: Interfaces I	HH8: Interfaces II			
II4	II5	II6: Posters	II7	II8	II9: Posters	II10	II11
	**Tutorial		JJ1: Nanoscale Electromechanics JJ2: Electromechanics of Nanostructured Materials & Devices	JJ3: SPM Techniques in Nanoscale Electromechanics	JJ4: Posters	JJ5	JJ6: Bioelectromechanics JJ7: Nanoscale Switching Studies using PFM
KK3: Structure-Property Relationships in Biomimetic Composites I	KK4: Structure-Property Relationships in Biomimetic Composites II	KK5: Posters	KK6: Reversible Deformation & Fracture Mech. of Biol. Composites I	KK7: Reversible Deformation & Fracture Mech. of Biol. Composites II KK8: Structure-Property Relationships in Biomimetic Composites III		KK9: Biomaterials in Tissue Engineering	KK10: High-Resolution Imaging Techniques for Characterizing Organic-Inorganic Composites
LL5: Towards Structures	LL6: Multifunctional Materials I		LL7: Multifunctional Materials II LL8: Surface Functionalization & Bio-inspiration I	LL9: Surface Functionalization & Bio-inspiration II			
MM4: Inorganic-Organic Composites	MM5: Directed Assembly of Organic-Inorganic Hybrid I		MM6/NN7: Intelligent Polymers in Biological Systems MM7: Block Copolymer Directed Assembly	MM8: Functional Biomimetics—Fabrication, Optical, Sensing, Mechanical Behaviors		MM9: Functional Biomaterials & Biomimetics—Surface & Interfaces	
NN4: Shape Memory II NN5: Shape Memory III & Shape Changing I	NN6: Biomaterial I		NN7/MM6: Intelligent Polymers in Biological Systems NN8: Stimuli-Sensitive System	NN9: Shape Changing II NN10: Biomaterial II	NN11: Posters	NN12: Sensor & Modeling	
OO4: Materials Synthesis on Chip	OO5: Cell Manipulation & Biomimetics on Chip		OO6: Advances in Device Materials OO7: Novel Materials for Labs on a Chip	OO8: Advances in Integrating Device Components OO9: Porous Materials in Labs on a Chip		OO10: Sensing & Detection on Chip—Molecular Level OO11: Sensing & Detection on Chip—Cells & Particles	OO12: Sensing & Detection on Chip—DNA OO13: Materials Characterization using Micro- & Nanoscale Tools
PP7: Materials for Compliant Transducers PP8: Mechanical Sensing	PP9: Novel Materials for Flexible Electronics PP10: Reliability	PP11, PP12, PP13: Posters	PP14: Compliant Electrodes I PP15: Compliant Electrodes II	PP16: Neural Interfaces PP17: Conformable Biosensing Circuits			

WELCOME TO THE 2009 MRS SPRING EXHIBIT

The MRS Exhibit, held in conjunction with the 2009 MRS Spring Meeting, will feature more than 100 international exhibitors from all sectors of the materials science and engineering communities. Meeting attendees are invited to visit the exhibit to learn more about the latest techniques and advances in the swiftly evolving world of materials research directly from the manufacturers, suppliers and developers. Convenient to the technical session rooms and scheduled to complement the program, the MRS Spring Exhibit offers everything you need all under one roof.

Moscone West • Level 1 • April 14–16, 2009

EXHIBIT HOURS:

Tuesday, April 14 2:00 pm – 7:30 pm
Wednesday, April 15 11:00 am – 5:30 pm
Thursday, April 16 10:00 am – 1:30 pm

Poster session will be held in the Exhibit Hall on Tuesday from 5:30 pm to 7:30 pm

Refreshment breaks will be held in the Exhibit Hall on Tuesday and Wednesday afternoon

2009 MRS SPRING EXHIBITORS

(as of JANUARY 20, 2009)

ACCELRY'S, INC.

solutions@accelrys.com
www.accelrys.com

MRS
CORPORATE
AFFILIATE

Key Products: Materials Studio; Pipeline Pilot

Accelrys develops and commercializes scientific business intelligence software and solutions that help accelerate science for clients in the Life Sciences, Energy, Chemicals, Aerospace, and Consumer Packaged Goods industries. Our solutions are used by biologists, chemists, materials scientists, IT and business professionals to aggregate, analyze, simulate, and visualize scientific data. Our scientifically aware platform and predicative science tools help clients conduct experiments in-silico, make informed decisions, and reduce times for product development. Visit our website at <http://accelrys.com/>.

ADVANCED RESEARCH SYSTEMS, INC.

ars@arscryo.com
www.arscryo.com

Key Products: Closed and Open Cycle Cryogenic Systems; Probe Station

ARS manufactures integrated Pneumatically Driven CCR and Helitran Cryostats for material characterization. Cryostats are available for optical and non-optical (transport, XRD, Neutron Scattering, UHV) applications. The ARS (CCR) Cryocoolers have been redesigned for a temperature range of sub 1.5 to 300K or 3 to 800K. With the lowest vibrations at the sample, it is the cryocooler of choice for laboratory cryogenic applications such as Mossbauer, Optical and Microscopy setups. ARS is introducing a new probe station with up to 6 arms and 2 accessory ports, with a temperature range of 5 to 350K, sub micron vibration levels, and accommodates up to a 2-inch wafer. Also being introduced is the low cost 77K closed cycle cryostat for optical and non-optical experiments.

AGILENT TECHNOLOGIES

afm-info@agilent.com
www.agilent.com/find/afm

MRS
CORPORATE
AFFILIATE

Key Products: Atomic Force Microscopes, Scanning Probe Microscopes, Scanning Tunneling Microscopes, Particle Analyzers, Nanoindentation Systems, Nanoindenter, *In-situ* Mechanical Testing Systems

Agilent Technologies has strengthened its portfolio of instrumentation for imaging, characterization and quantitative nanomechanical material properties. Agilent now offers the G200 and G300 nanoindentation systems, the Nano UTM (Universal Testing Machine) system, and *in-situ* mechanical testing solutions. Agilent's nanomechanical measurement platforms are used to verify the structural integrity of semiconductor devices and to determine material properties of coatings and thin films. Agilent will also introduce two new high precision atomic force microscopes—the 5600 large stage and 5420 with the exclusive Scanning Microwave Microscopy for electromagnetic materials characterization. We invite you to stop by our booth for discussion of your research or to view a demonstration of these new instruments and techniques designed for material research.

AIXTRON AG

info@aixtron.com
www.aixtron.com

MRS
CORPORATE
AFFILIATE

Key Products: MOCVD and OVPD Equipment; ALD, AVD and CVD Equipment; Black Magic CVD and PECVD Equipment

AIXTRON is a leading provider of deposition equipment for the semiconductor industry. The company's technology solutions are used by a diverse range of customers worldwide to build advanced components for electronic and optoelectronic applications based on compound, silicon, or organic semiconductor materials. Such components are used in fiber optic communication systems, wireless and mobile telephony applications, optical and electronic storage devices, computing, signaling and lighting, as well as a range of other leading-edge technologies.

AJA INTERNATIONAL, INC.

topgun@ajaint.com
www.ajaint.com

Key Products: Magnetron Sputtering Systems; Magnetron Sputtering Sources; Substrate Holders/Heaters

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.

AMBIOS TECHNOLOGY, INC.

sales@ambiostech.com
www.ambiostech.com

MRS
CORPORATE
AFFILIATE

Key Products: Profilometers; Interferometers; AFM/SPM

Ambios Technology, Inc. manufactures high performance, state-of-the-art, surface metrology equipment. Our product line includes stylus profilometers, non-contact optical profilers, and AFM and SPM instruments. The Ambios line is designed for the researcher who is interested in getting fast repeatable data that is not encumbered by unneeded levels of complication.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS)

fellowships@aaas.org
www.fellowships.aaas.org

Spend a year working in Washington, DC—become an AAAS Science & Technology Policy Fellow! Since 1973 nearly 2,000 scientists and engineers have contributed their analytical and technical skills to federal policymaking. Fellowships are available in a variety of congressional offices and federal agencies for professionals of all career stages. Applicants must hold a PhD or a master's degree in engineering plus three years of post-MS degree professional experience. Visit <http://fellowships.aaas.org> for more details.

ANNEALSYS

info@annealsys.com
www.annealsys.com

Key Products: RTP; RTCVD; LPCVD; MOCVD

Annealsys manufactures Rapid Thermal Processing and Chemical Vapor Deposition equipment for research and development and production applications. RTP systems are available from 2- to 8-inch wafers for RTP and RTCVD processes. Cold wall chamber, lamp furnace, high temperature (1400°C) and high vacuum capability are the main features. MOCVD tools dedicated to oxide and metal deposition are available for 2-inch and 4-inch substrates. LPCVD batch furnace for 4-inch wafers. Annealsys provides worldwide sales and service support.

ASYLUM RESEARCH

sales@AsylumResearch.com
www.AsylumResearch.com

MRS
CORPORATE
AFFILIATE

Key Products: Atomic Force Microscopes; Scanning Probe Microscopes

The AFM/SPM technology leader introduces the Cypher™ AFM, the first new small sample AFM/SPM in over a decade for more capability, more control, more modularity, higher resolution and unprecedented ease of use. Cypher combines the accuracy and control of closed loop with the power of atomic resolution for the most accurate images and measurements possible today. Included are SpotOn™ automated laser alignment, interchangeable laser spot sizes down to 3µm for broad application/scan mode flexibility, and support for high-speed AC imaging with cantilevers as small as 5x10µm. The integrated system enclosure provides acoustic and vibration isolation, plus excellent thermal control for image and measurement stability. Also featured is the MFP-3D™ AFM and Piezo Force Module for high voltage, cross-talk free electromechanical measurements.

B&W TEK, INC.

info@bwtek.com
www.bwtek.com

Key Products: Portable Raman Spectrometers; UV/VIS/NIR Spectrometers; Solid-state Lasers

B&W Tek, Inc. provides high value solutions for photonics. A versatile product portfolio comprises an off-the-shelf selection of lasers, spectrometers and sampling accessories for the deep UV to the longwave NIR. B&W Tek OED and OEM services provide innovative solutions for the design, development and quality manufacturing to the most demanding requirements for analytical, industrial, medical, biophotonic and diagnostic applications. ISO 9001 and ISO 13485 certified.

BECKMAN COULTER, INC.

www.beckmancoulter.com

Key Products: LS13 320; Multisizer 4; Delsanano

Beckman Coulter offers a variety of analyzers for the characterization of particles, including particle sizing and counting, laser diffraction, zeta potential and submicron analysis, and an applications laboratory equipped to support the full range of particle characterization. Industries include pharmaceutical, environmental, energy, food and beverage.

BLUE WAVE SEMICONDUCTORS, INC.

info@bluewavesemi.com
www.bluewavesemi.com

Key Products: Substrate Heaters; Thin Film Coatings; PVD, CVD Deposition Systems

Blue Wave Semiconductors, Inc. is proud to present its line of substrate heating products for thin film and coating synthesis in R&D and device or coating manufacturing. These are available in 1- to 6-inch diameters for use in high vacuum (1x10⁻⁸ Torr) to 1 atm. and in various gaseous ambient. The maximum temperature can be up to 1100°C in high vacuum to 850°C in reactive atmospheres. We also provide power supplies with in-built temperature controller. Additional product lines include Hot Filament Chemical Vapor Deposition system, physical vapor deposition tools, thin film and coatings (metals, oxides, nitrides, carbides, diamond, diamond-like-carbon) services, and customized nanodevices.

BRUKER

info@bruker-axs.com
www.bruker-axs.com

Key Products: X-Ray Diffraction Instruments; Detectors; Microanalysis Instruments

Bruker AXS specializes in high-end X-ray diffraction solutions performing a wealth of applications in materials analysis. Our technology is used to investigate complex samples ranging from wafers, thin films, and powders to amorphous materials. We are the market leader in XRD, offering the largest, highest quality portfolio of cutting edge diffraction components and software. Our products include the D8 product line, Super Speed Solutions, NanoStar, Multex Area, Leptos, NanoFit and Topas.

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CEM CORPORATION

info@cem.com
www.cem.com

Key Products: Discover® Microwave Synthesizer; MARS™ Microwave Synthesizer; Explorer® Automated Microwave Synthesizer

CEM is a leading global provider of microwave synthesis systems that are used in a variety of applications, including nanomaterial and polymer synthesis. In both areas, CEM Systems have been proven to both reduce reaction times and generate a more uniform product. The Discover® platform offers unmatched flexibility with a wide variety of options including automation, gaseous reagent addition, pressurized or atmospheric reaction capability, low-temperature synthesis, and more, plus award-winning technical service and applications support.

CENTER FOR TRIBOLOGY, INC. (CETR, INC.)

sales@cetr.com
www.cetr.com

Key Products: Universal Nano+Micro+Macro Materials Testers

CETR is a world leading manufacturer of nano, micro and macro precision mechanical testers for coatings, thin films and bulk materials, with measurements of adhesion, delamination, scratch-resistance, nano- and micro- hardness, elastic modulus, friction, reciprocating and rotary wear, fatigue, elasticity, plasticity and other mechanical properties, including in controlled temperature (-25C to +1,000C), humidity or vacuum, for biomedical, microelectronics, data storage and other industries, as well as for basic materials research on nano and micro levels.

CHEMAT TECHNOLOGY, INC.

marketing@chemat.com
www.chemat.com

Key Products: Spin Coater; Coating Equipment; Chemical Precursors

Chemat Technology, Inc. is one of the leading worldwide resources for advanced materials processing. Chemical products offered, in research and bulk quantities, include: high purity of metal alkoxides, dialkylamides, organopolymers, high surface area powders, colloidal solutions and functional solutions for the sol-gel and/or CVD processes. As the manufacturer of the least expensive quality spincoater in the world, Chemat also designs and distributes thin film coating equipment, fiber drawing machine, rotary evaporators, microscopes and diverse laboratory instruments.

CRYSTALMAKER SOFTWARE LTD.

info@crystalmaker.com
www.crystalmaker.com

Key Products: CrystalMaker; SingleCrystal; CrystalDiffract

CrystalMaker Software Ltd. develops software for working with crystalline materials and their diffraction patterns, including the award-winning CrystalMaker® (interactive structures visualization) with its real-time photo-realistic graphics. This works seamlessly with our other products: CrystalDiffract™ (x-ray and neutron powder diffraction) and SingleCrystal™ (electron diffraction and stereographic projections). All products feature elegant, easy-to-use interfaces plus cross-platform compatibility for Windows XP/Vista and Mac OS X (PowerPC/Intel).

CSM INSTRUMENTS INC.
usinfo@csm-instruments.com
www.csm-instruments.com

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Key Products: Scratch Testers; Indentation Testers; Tribology

CSM Instruments is leader in the development of instruments for advanced materials testing for over thirty years. Our products include Hardness Testers, Scratch Testers, and Tribometers of varying load ranges. 3D-imaging options are available with the ConScan or AFM objective. CSM manufactures stand-alone instruments as well as testing modules that can be configured alone or combined together on a testing platform for a single instrument capable of multiple analysis modes. We also offer full contract testing services.

ECOPIA CORP.
sales@ecopia21.co.kr
www.ecopia21.co.kr

Key Products: Variable Temperature Hall Effect Measurement System; Probe Station; Heat Treatment System

Ecopia is a leading supplier of Hall Effect Measurement Systems which include the HMS-5000 with variable temperature from 80K to 350K. The magnet moves automatically using a software controlled motor for greater convenience. Measure temperature vs. resistivity, carrier density, mobility, hall coefficient, conductivity. P/N Typing. Check contacts with I-V and I-R curve capability. Economical HMS-3000 still available with new choices in Spring Clip sample mounting boards.

FISCHIONE INSTRUMENTS
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www.fischione.com

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Key Products: Electron Microscope Accessories; Plasma Cleaner; Ion Mill

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FIVEASH DATA MANAGEMENT, INC.
fdm@fdmspectra.com
www.fdmspectra.com

FTIR users are invited to stop by and discuss the FDM Very Large Bundle and recent updates including the FDM ATR Organics, FDM Forensic VPFTIR and the HiRes VPFTIR for Search. The FDM Very Large Bundle (27,000 spectra) is a superior combination of quality, quantity, variety and price. We are introducing four new Raman libraries: Polymers, Inorganics, Organics (including bio-fuels and flavors and fragrances), Essential Oils (and food oils). The new FDM Raman spectra were measured on a research grade instrument at high resolution with multiple excitation wavelengths making them equally applicable in research and field applications.

FUJIFILM DIMATIX, INC.
info@dimatix.com
www.dimatix.com

Key Products: Materials Deposition Printer; Materials Deposition Cartridge; Other Printheads and Systems

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GATAN, INC.
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Key Products: Analytical TEM Instruments; EM Specimen Preparation; TEM Digital Imaging

Gatan, Inc. designs and manufactures instruments and products for electron microscopes that enable and advance EM applications. Gatan is the recognized leader in the industry and our products set the industry standards. Our designers and engineers understand the application criteria of our customers and provide customers with the right solutions for their application needs. The applications addressed by Gatan users include metallurgy, ceramics, semiconductors, microelectronics, healthcare, food and pharmaceutical industries, nanomaterials research, and biotechnology.

HEATWAVE LABS INC.
techsales@cathode.com
www.cathode.com

Key Products: Substrate Heaters; Dispenser Cathodes; Vacuum Furnaces

HeatWave Labs is an engineering, design and manufacturing company that specializes in components and assemblies for the vacuum tube and vacuum equipment industries. Our expertise lies in the areas of thermionic cathodes and ion emitters and guns, ion sources and ionizers, ion pumps and controllers, vacuum tube design, processing and rebuilding, specialized high purity and refractory materials, UHV sample heating and filament products, temperature controllers and power supplies, ceramics and vacuum envelope assemblies and other related products.

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Key Products: X-Ray Cameras; Detectors

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HIELSCHER USA, INC.
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www.hielscher.com

Key Products: Ultrasonic Processor

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HUNTINGTON MECHANICAL LABORATORIES, INC.
vacman@huntvac.com
www.huntvac.com

Key Products: Vacuum Chambers; Manipulators; Feedthroughs; Positioning Devices; Valves; Flanges/Fittings

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HYSITRON, INC.
info@hysitron.com
www.hysitron.com

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Key Products: TI 950 NanoIndenter; PI 95 TEM PicoIndenter; TS 75 NanoIndenter

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JANIS RESEARCH COMPANY, INC.
sales@janis.com
www.janis.com

Key Products: Continuous Flow and Reservoir Cryostats; 4 K and 10 K Mechanical Closed-Cycle Refrigerators; Micro-Micromanipulated Probe Stations

Janis combines over 40 years of manufacturing experience with extensive engineering capabilities to provide cryogenic systems for all research applications. Application specific products include cryostats for optical microscopy, FTIR, and Mössbauer spectroscopy, continuous flow and Helium-3 cryostats, 4 K and 10 K closed-cycle refrigerators, dilution refrigerators, superconducting magnet systems, and micromanipulated probe stations. Our staff of physicists and engineers is on hand to tailor cryogenic systems to meet specific experimental requirements and budgets.

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JEOL USA, INC.
salesinfo@jeol.com
www.jeolusa.com

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Key Products: TEM; SEM; FIB; Sample Prep; AFM; E-beam; Ion Beam; FE-SEM; LV-SEM; FEG-SEM

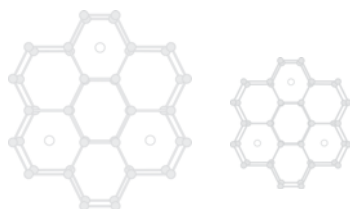
JEOL is a global provider of high performance electron microscopy, ion beam, e-beam lithography, and analytical instrumentation and technology for scientific and industrial R&D. Core markets include nanotechnology, materials science, biological science, and the semiconductor industry. Innovative, sub-angstrom developments enable customers to advance scientific research and manufacturing applications. Stop by for information on our full line of electron microscopes and precision tools for sample preparation. JEOL also sells NMR spectrometers and novel mass spectrometers.

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Key Products: UHV Instruments; UHV Chambers; Surface/Cryo Products

Johnsen Ultravac manufactures a complete line of vacuum products for R&D, production and light sources including: six axis manipulators featuring maximum ±4.00 inch XY motion; heating/cooling stages with 10 K to 1500 K temperature range; ultra-long stroke linear motion translators; UHV XYZ translators with 500 lbs. payload capacity; XYZ stages for *in situ* analysis; 5x10⁻¹¹ Torr UHV chambers; beam line components; monochromators; and a wide range of vacuum systems for surface analysis, semiconductor, optoelectronics and coating. We specialize in unique, one-of-a-kind projects.



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Key Products: Pure Targets and Materials; Vacuum Components; Deposition Systems; Atomic Layer Deposition

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LAKE SHORE CRYOTRONICS, INC.
sales@lakeshore.com
www.lakeshore.com

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Key Products: Hall Effect Measurement Systems; Probe Stations; Cryogenic Instruments and Sensors

Lake Shore manufactures cryogenic, closed cycle refrigerator-based, electro-magnet and superconducting magnet-based, high vacuum, and load lock probe stations, as well as Hall effect measurement systems (HMS). The probe stations can be used for DC, RF, microwave (up to 67 GHz), and magneto-transport measurements on devices and wafers. Features include temperatures from 1.5 K to 475 K, horizontal or vertical magnet fields, up to 6 micro-manipulated probe arms, vacuum to 10⁻⁷ torr, and up to 4-inch wafer probe capabilities. The HMS feature fields to 9 T, temperatures from 2 K to 800 K, up to 6-inch wafers or accommodation of 4 samples. Measurements including resistance, I-V curves, Hall coefficient, mobility, and carrier concentration can be made on compound semiconductors, semi-insulators, and heterostructures. Quantitative Mobility Spectrum Analysis (QMSA®) software resolves individual carrier mobilities and densities in multi-carrier devices such as quantum wells and HEMTs.

MDC VACUUM PRODUCTS, LLC
sales@mdcvacuum.com
www.mdcvacuum.com

Key Products: Flanges and Fittings; Valves; Viewports and Glass Components; Feedthroughs; Motion and Manipulation Instruments; Thin Film Deposition; Custom Engineering

MDC Vacuum Products, LLC stocks thousands of off-the-shelf vacuum components. The MDC product line consists of flanges, fittings, valves, roughing hardware, vacuum measurement and motion and manipulation instruments, thin film equipment and surface science chambers. MDC's electrical and optical division, Insulator Seal, features the industry's most comprehensive line of hermetically sealed electrical feedthroughs and optical components for even the most demanding Ceramic-to-Metal seal applications. MDC's SemiSystems division specializes in the manufacture of ultra-high purity gas and fluid delivery systems. Capabilities include welding of gas lines, vacuum weldments, tube bending and assembly. Visit our technically based Web sites: www.mdcvacuum.com, www.insulatorseal.com, and www.mdcsemisystems.com.

METROHM USA, INC.
info@metrohmusa.com
www.metrohmusa.com

Key Products: Electro Chemical Systems; Impedance Characterization; Sensors; EQCM

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MICROTRAC

www.microtrac.com

Key Products: Particle Analyzer; Particle Counter

Complete line of particle size and counting instrumentation. Highlighting our Nanotracs 150 & 250 and Ultra analyzer using dynamic light scatter for high concentration nanometer sizing from .0008 to 6.5 microns with zeta potential options, also our S3500 laser diffraction based analyzers, utilizing three solid state lasers for easy, accurate particle analysis from .02 to 3000 microns. Quick wet to dry conversions, Advanced Flex software, extremely user friendly. Advanced Turbotrac Dry Induction feeder will also be shown. New Bluewave blue laser light scatter now available.

MMR TECHNOLOGIES, INC.

sales@mmr.com

www.mmr.com

Key Products: Hall Effect Measurement Systems; Seebeck Effect Measurement Systems; Variable Temperature Microprobes

MMR Technologies manufactures temperature controlled systems—cryogenic cooling systems and wide temperature range thermal stages—which find application in materials research in chemistry, biology, electrical engineering, and physics. These systems operate over the temperature range of 10 K to 730 K. They are used for electrical resistivity, Hall effect, Seebeck effect, DLTS, MEMS, magneto-resistivity, and luminescence studies. They are also used in medical applications and the cooling and characterization of computer chips, electronic devices, laser diodes and thermal imaging devices as a function of temperature.

See ad in this issue

MTI CORPORATION

info@mtixtl.com

www.mtixtl.com

Key Products: Diamond Saw; High Temperature Furnace; Polishing Machine

MTI has been providing a total solution for materials research since 1995. We supply crystal substrates and nanopowders from A to Z, desktop laboratory equipment, including cutting, polishing and high temperature box/tube furnaces, as well as compact XRD/X-Ray orientation.

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NANOANDMORE USA INC.

usa@nanoandmore.com

www.nanoandmore.com

Key Products: AFM Probes; Nanoparticle Size Analyzer; Digital Holographic Microscope

NanoAndMore USA, Inc. is a nanotechnology distributor with products that include SPM probes and calibration standards from NanoWorld™, NANOSENSORS™ and Budget Sensors™, Image Metrology SPIP software, Minus K vibration isolation products and scientific instruments. The Digital Holographic Microscope from Lyncée tec captures 3D images in real time and does not require vibration isolation. The Reflection model competes with white light and laser interferometry while the Transmission model competes with Confocal systems. The NanoSight nano-particle size analyzer gives a full distribution of all particles suspended in solution by particle count and percentage. We have most AFM probes in stock and can ship overnight. Contact: 877-521-1108 (toll free) or usa@nanoandmore.com.

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NANOFACILITY INSTRUMENTS AB

info@nanofactory.com

www.nanofactory.com

Key Products: *In situ* TEM-AFM; *In situ* TEM Electrical Probing; *In situ* TEM-Force Measurements

Nanofactory Instruments is the world leader in providing specialized SPM systems (STM, AFM, NanoIndenter) designed to work in Transmission Electron Microscopes (TEM). These unique SPM-TEM instruments provide unprecedented opportunity to combine 3-dimensional nanomanipulation, STM-AFM imaging and *in situ* electrical and mechanical measurements with high resolution TEM imaging.

NANOINK, INC.

info@nanoink.net

www.nanoink.net

Key Products: DPN 5000™ System; NLP 2000™ System; 2D nano PrintArray™

NanoInk, Inc. is an emerging growth technology company specializing in nanometer-scale manufacturing and applications development for the life science and semiconductor industries. Using Dip Pen Nanolithography® (DPN®), a patented and proprietary nanofabrication technology, scientists are enabled to rapidly and easily create nanoscale structures from a wide variety of materials. This low cost, easy to use, and scalable technique brings sophisticated nanofabrication to the laboratory desktop. Located in the new Illinois Science + Technology Park, north of Chicago, NanoInk currently has over 140 patents and applications filed worldwide and has licensing agreements with Northwestern University, Stanford University, University of Strathclyde, University of Liverpool, California Institute of Technology and the University of Illinois at Urbana-Champaign. For more information on products and services offered by NanoInk, Inc., visit www.nanoink.net.

NANONICS IMAGING LTD.

info@nanonics.co.il

www.nanonics.co.il

Key Products: Multiprobe SPM/NSOM/Confocal; AFM/Raman; TERS; AFM/SEM/FIB; Cryogenic NSOM/AFM/Confocal Raman

Single and Multiprobe AFM/NSOM/SPM Systems hallmarked by transparent optical and electron/ion beam integration. Ideal for multiprobe plasmonics, electrical characterization, photonics, thermal diffusivity, chemical writing, etc. On-line Raman/TERS, confocal, SEMs, FIBs, 10°K operation. Capable of all modes of AFM/NSOM with silicon or transparent AFM probes. Deep trench and side wall imaging capabilities, glass insulated electrical probes, Nanoheater™ thermal conductivity, AFM-controlled gas/liquid nanochemical deposition, electrochemical probes, etc. Visit and see the first multiprobe SPM system! Up to 4 probes.

NATIONAL ELECTROSTATICS CORP.

nec@pelletron.com

www.pelletron.com

Key Products: Ion Beam Accelerator; RBS/PIXE/AMS; Beam Handling Components

National Electrostatics Corp. (NEC) is the manufacturer of MeV ion and electron beam systems including a new turnkey RBS system with Angstrom level resolution. This high resolution RBS system is also capable of standard RBS, channeling, PIXE, ERD and NRA. In addition, NEC manufactures a wide variety of ion beam systems including complete Accelerator Mass Spectrometry (AMS) systems for a wide variety of radioisotope measurements including all necessary hardware and software for low background, high precision and high throughput measurement. Applications for these systems include semiconductor research, carbon dating, pharmaceutical research and many others. Accelerator subsystems and components including ion sources are also available from NEC.

See ad in this issue

NEOCERA, LLC

sales@neocera.com

www.neocera.com

Key Products: Pulsed Laser Deposition; Pulsed Electron Deposition; Laser MBE with RHEED

Neocera creates, develops and promotes advanced thin film materials and deposition techniques. Founded in 1989 to commercialize technical expertise in cutting-edge materials, Neocera is a world leader in the manufacture of Pulsed Laser Deposition (PLD) and Pulsed Electron Deposition (PED) systems for research and production applications. Neocera's nanotechnology products include Laser MBE systems with RHEED, Combinatorial PLD/PED Systems, and Ion assisted-PLD Systems. Neocera offers complex oxide thin films on a foundry basis.

NETZSCH INSTRUMENTS INC.

NIB-Sales@netsch.com
www.e-thermal.com

Key Products: Thermal Analysis Instruments; Thermal Conducting; Calorimeters

Thermal analysis, thermal properties measurement, thermal conductivity, *in situ* dielectric analysis, and contract testing services; featuring a new STA (simultaneous TGA-DSC/DTA) w. 25 nanogram resolution and 5g sample load, DSC, TGA, DTA, coupling to MS & FTIR for evolved gas analysis, Dilatometers for CTE and sintering optimization, Laser Flash Thermal Diffusivity/Conductivity, TMA, DMA, DEA-Micromet-series cure monitoring by dielectric analysis in-process and lab-scale, Guarded Hot Plate and Heat Flow Meters for thermal conductivity acc. to ASTM standard methods.

NIST

www.nist.gov/srm

Key Products: Standard Reference Materials; Data and Calibration Services

NIST Standard Reference Materials supports accurate/compatible measurements by certifying and providing over 1100 SRMs with well-characterized composition or properties, or both. SRMs are used to perform instrument calibrations as part of quality assurance, accuracy of specific measurements and support new measurement methods. Standard Reference Data provides well-documented numeric data to scientists and engineers for use in technical problem-solving, research, and development. The Calibration Services are designed to help in achieving high levels of measurements.

NIST/CENTER FOR NANOSCALE SCIENCE AND TECHNOLOGY

www.cnst.nist.gov

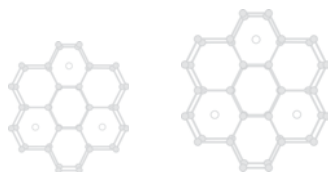
The Center for Nanoscale Science and Technology enables science and industry by providing essential measurement methods, instrumentation, and standards to support all phases of nanotechnology development, from discovery to production. Through a distinctive combination of measurement expertise, multidisciplinary research, specialized instruments and fabrication equipment, and partnerships, the CNST aims to provide a major technical boost to the nation's pursuit of an almost unlimited assortment of emerging or only-imagined nanotechnology products. The CNST's prime objective is to lay the technical groundwork necessary to translate nanotechnology's many anticipated offerings into practical realities—manufacturable, market-ready products. To accomplish this goal, the Center leverages and combines the diverse knowledge and capabilities of NIST, industry, academia, and other government agencies to support all phases of nanotechnology development, from discovery to production.

NOR-CAL PRODUCTS, INC.

ncsales@n-c.com
www.n-c.com

Key Products: Vacuum Chambers; Vacuum Components, Flanges and Fittings; Valves

Since 1962, Nor-Cal Products, Inc. has manufactured high and ultra-high vacuum components for many applications. Nor-Cal has earned a reputation worldwide for quality components, competitive prices and excellent customer service and is now ISO 9000-2001 registered. Standard products include: flanges; fittings, viewports, feedthroughs and flexible hoses; crystal monitors, manual and pneumatic valves; pressure control valves and controllers; heater jackets; foreline traps; and manipulators. Custom chambers, manifolds, feedthrough collars and baseplates can be manufactured from customer specifications, sketches or drawings. Entire systems can be supplied. Our extensive 3D Model Library is available on-line. Visit our website at www.n-c.com for more information.



OMICRON NANOTECHNOLOGY USA

info@omicronus.com
www.omicron-instruments.com

Key Products: UHV SPM; Surface Science Instrumentation; MBE

Omicron NanoTechnology is the premier supplier of UHV instruments for nanoscience and research. We invite you to visit our booth to see the latest results from the next generation Low Temperature (down to 5K) Atomic Force Microscope with enhanced LHe hold time. The Variable Temperature AFM/STM is now available with a non-optical QPlus force sensor. We will also be highlighting the ESCA+, NanoESCA, Nanoprobe, and NanoSAM surface science systems. From thin film development to characterization, Omicron can help.

PANALYTICAL INC.

amec.info@analytical.com
www.panalytical.com

Key Products: X-ray Spectrometers; X-ray Diffraction; X-ray Fluorescence

PANalytical Inc. is the leading world supplier of analytical X-ray instrumentation and software for elemental analysis, phase characterization and small angle scattering. PANalytical has been providing X-ray instrumentation for over 50 years to nanomaterial, pharmaceutical, and materials research and process control applications. Our X-ray diffraction products are designed and engineered to supply our customers with solutions to solve complex problems such as thin film characterization; e.g., epitaxial, reflectivity and diffuse scattering, and determination of bulk material properties using the most advanced software algorithms for data collection, phase and structure determination. Additionally, our X-ray spectrometry systems provide elemental analysis for semiconductor and process control applications. Finally, our commitment to providing a customer based solution is exemplified by the largest and most dedicated customer support group in the X-ray business.

PARK SYSTEMS INC.

info@parkafm.com
www.parkafm.com

Key Products: AFM Products; AFM Mode Options

Park Systems serves its customers by providing a complete range of SPM solutions including AFM systems, options, and software, along with global service and support. Park Systems is a leading nanotechnology solutions partner for the most demanding imaging and measurement needs in research and industry. The company has an established reputation in the field stemming from its beginnings at Stanford University over 20 years ago. The innovative XE-Technology, which eliminates background curvature associated with conventional AFMs, has been widely acknowledged by major research institutions around the world. The latest developments from Park Systems include the XE-NSOM for diverse optical applications including NSOM and Raman spectroscopy and the XE-Bio for life science research applications.

PHYSICAL ELECTRONICS

sales@phi.com
www.phi.com

Key Products: Scanning Auger; SIMS; XPS; ESCA; TOF-SIMS; Materials Analysis; Surface Analysis

Physical Electronics (PHI) is a subsidiary of ULVAC-PHI, the world's leading supplier of UHV surface analysis instrumentation used for research and development of advanced materials. The high technology fields of application include: nanotechnology, microelectronics, storage media, bio-medical, and basic materials such as metals, polymers, and coatings. PHI's innovative XPS, AES, and SIMS technologies provide our customers with unique tools to solve challenging materials problems and accelerate the development of new materials and products. A recent development is the use of C60 ion beams for sputter depth profiling and 3D imaging of polymer and organic materials. For more information visit our website at www.phi.com

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PLASMATERIALS, INC.
info@plasmaterials.com
www.plasmaterials.com

Key Products: Sputtering Targets; Backing Plates; Evaporation Materials

Plasmaterials, Inc. provides high purity Physical Vapor Deposition (PVD) materials in nearly every element, alloy, composition and component available on the periodic table. Products include sputtering targets, backing plates and other segments of the materials market including evaporation material, crucible liners and electron beam starter sources. In addition to backing plates, we also provide metallic bonding services. The bonding process utilizes a proprietary process for affixing the target directly to the backing plate using low vapor pressure materials. These bonding materials provide the necessary mechanical strength, thermal and electrical conductivity while allowing differential expansion between the target and the backing plate. Backing plates for nearly all commercial available systems are usually in stock for immediate delivery. Customer designed backing plates can usually be provided within a short period of time. A full service company, Plasmaterials, Inc. can provide all of your deposition materials needs.

RBD INSTRUMENTS, INC.
sales@rbdinstruments.com
www.rbdinstruments.com

Key Products: UVB-100 Bakeout; IG2 2kV Backfill Ion Source Package; PHI Replacements Parts

RBD Instruments provides innovative products and services to the materials science community. In addition to servicing and upgrading previous generation Physical Electronics (PHI, Perkin-Elmer, ULVAC) surface analysis instrumentation for nearly 20 years, we also now provide products such as our UV bakeout enhancement system, low cost 2kV sputter ion gun package, and compact Auger Analyzer package. RBD—Innovations for Surface Science.

RHK TECHNOLOGY, INC.
info@rhk-tech.com
www.rhk-tech.com

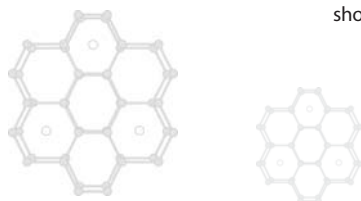
Key Products: SPM Universal Controls; UHV STM; UHV AFM/STM

Imaging the Future of Nanoscience: RHK is the chosen company for fundamental science at the atomic scale. Our UHV STM, AFM, 4-Probe systems, controllers, and electronics are engineered for the advanced researcher but comfortably systemized for the first-time buyer. To choose RHK means to experience peak performance, scalability, compatibility, and value. Celebrating 20 years of commitment to customer and quality, we partner with the researcher to support our products over a lifetime of experimental success.

RIGAKU AMERICAS CORPORATION
info@rigaku.com
www.rigaku.com

Key Products: X-ray Diffraction Systems; Small Angle X-ray Scattering Systems

Rigaku provides the world's most complete line of X-ray diffraction and X-ray fluorescence instruments and components, including benchtop XRD and XRF systems, X-ray optics and detectors, the Saturn and SCXmini CCD-based single crystal diffractometers for small molecule crystallography, the Ultima IV and SmartLab® multi-purpose diffractometers with SAXS and in-plane capabilities, and the ZSX Primus series of high-powered WDXRF spectrometers with mapping capabilities, in either tube-above or tube-below configurations.



SEKI TECHNOTRON CORPORATION
www.sekicvdsolutions.com

Key Products: Plasma CVD Systems; Hot-Filament CVD Systems; Microwave Plasma CVD Systems

Seki Technotron is the leading manufacturer of Microwave Plasma CVD Systems and the exclusive worldwide supplier of sp3 Diamond Technologies' Hot Filament CVD Systems. Our Microwave Plasma CVD systems are designed for high growth rate, high quality diamond films, single-crystal diamond, carbon nanotubes and advanced material research, for deposition areas up to 200 mm and power levels from 1.5 to 100 kW depending on required process and growth rates. The sp3 Hot filament CVD system provides highly uniform deposition over 14-sq. in. smooth ultra nanocrystalline and faceted diamond films for electronics, tools, and wear part coating applications. We work closely with our customers to select the CVD system and process solution most suited for the intended R&D and production applications. Please visit our website at www.sekicvdsolutions.com.

SOUTH BAY TECHNOLOGY, INC.
info@southbaytech.com
www.southbaytech.com

Key Products: Sample Preparation; Reactive Ion Etching/Plasma Processing; FIB Accessories

South Bay Technology, Inc. manufactures materials processing equipment for applications in electron microscopy, optical microscopy, metallography, microelectronics and single crystal processing. Featured products include: IBS/e with Low Energy Broad Beam Ion Source & Eucentric Stage; Plasma Trimming Tools for Eliminating Ion Damage from FIB-Prepared TEM Samples; Fortress Holders for FIB Sample Storage & Protection; Sample Saver Storage Container for Sample Preservation; UVO Cleaner Station for Cleaning & Storage of TEM Samples and Holders; and new accessories and consumables for our traditional line of cutting, polishing, crystal orientation and Electron Microscopy products will also be on display.

SPECS USA CORP.
sales@specsusa.com
www.specsinstruments.com

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Key Products: Electron Spectrometers; SPM; Deposition Equipment

SPECS manufactures cutting-edge systems and components for surface analysis in UHV, based on methods like XPS, UPS, AES, ISS, STM, LEEM/PEEM, LEED, SIMS, SNMS and HREELS. We offer a variety of sources for deposition, excitation and charge neutralization as well as analyzers, monochromators and research microscopes like LEEM and STM. A strong focus of our work is on customized systems combining thin film preparation (MBE) with spectroscopic and microscopic options.

SPI SUPPLIES
Division of Structure Probe, Inc.
info@2spi.com • www.2spi.com

Key Products: Electron Microscopy Supplies; Sputter Coaters; Plasma Etchers

SPI Supplies will be featuring its newest products including the OPC Osmium Plasma Coater for "zero grain size" coating, Plasma Prep™ X parallel plate (anisotropic) plasma etcher (for no undercutting), MACO® TEM film, and the Secador® automatically regenerating desiccant module for sample storage. Also on display will be the popular line of SPI Module™ SEM/EDS coaters and the Plasma Prep™ II plasma etcher. Visit www.2spi.com to learn more about these innovative new products or to place an order using the on-line shopping cart.

SPRINGER

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www.springer.com

Key Products: Books; Journals; Periodicals

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STAIB INSTRUMENTS, INC.

staib-us@staibinstruments.com
www.staibinstruments.com

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Key Products: RHEED; Spectrometer; Surface Analysis

STAIB designs and manufactures innovative, high performance, reliable instruments for *in-situ* material analysis including: a full range of Electron Guns for analytical surface studies (flood, microfocus, general purpose, low energy, nano-focus); RHEED systems (new in CVD-PLD-PVD environments) to study structure and quality of thin films; CMA energy spectrometers (Auger, SAM, XPS, and UPS) for analytical surface studies; SEM using our micro-focus guns; Photo-Electron Emission Microscopes (PEEM); ESCA; X-ray Sources; and Multi-Technique Surface Analysis Chambers.

SVT ASSOCIATES, INC.

info@svta.com
www.svta.com

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Key Products: Molecular Beam Epitaxy Equipment; Atomic Layer Deposition; Deposition Process Monitoring Tools

SVT Associates offers a full range of MBE, thin-film deposition, *in-situ* process monitoring, and related UHV equipment for advanced materials. Since 1993, we have designed and delivered tailored solutions for emerging materials through MBE, ALD, PLD, and UHV deposition equipment innovations. In addition, internally developed *in-situ* process monitoring tools provide the highest level of accuracy and precision for closed loop control of temperature, deposition rate, thickness, and stress. By having the industry's most advanced MBE and thin film applications lab, SVT ensures all products are well suited for each application and include material performance guarantees. Epiwafer and advanced device manufacturing services are also available for GaN and ZnO related materials. Please contact SVT for more information.

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www.technos-intl.com

Key Products: X-Ray Spectrometers; TXRF and VPD Instruments; X-Ray Fluorescence; X-Ray Reflectivity

Technos is a worldwide leader in trace metal contamination monitoring systems (TXRF and VPD) as well as X-ray based thin film metrology systems. The S-MAT series allows films measurement with X-ray Reflectivity, X-ray Fluorescence and X-ray Diffraction. These techniques can be combined in one tool to measure dielectrics and metal films on wafers from 100 mm to 300 mm. Thickness, density, composition, interface roughness, phase ID and crystal orientation can be measured.

TED PELLA, INC.

sales@tedpella.com
www.tedpella.com

Key Products: Vacuum Coaters; Calibration; Microscopy Sample Prep and Supplies/Accessories

Ted Pella, Inc. offers a full range of compact versatile bench top vacuum coaters for thin film research and electron microscopy applications which can be equipped with high resolution thickness monitors and multi-angle rotary stages. Also offers a full line of vacuum pumps and parts for research applications and small scale production. On display will also be a large selection of supplies, consumables, tools and sample preparation equipment for SEM, TEM, FIB AFM, and nanotechnology.

TRANSFER ENGINEERING & MANUFACTURING, INC.

team@transferengineering.com
www.transferengineering.com

Key Products: Wafer/Substrate Transfer Systems, HV/UHV Magnetic Transporters; Loadlocks

Transfer Engineering provides innovative products for OEM, production and R&D customers in semiconductor, media, sputter deposition and R&D markets. Core expertise is in handling, transporting, positioning, and manipulation of samples, semiconductor wafers, substrates, flat panels, and other materials in HV, UHV and other controlled environments. Product lines include transfer arms, sample transfer and loadlock systems including MASCOT, TEAM-Mate and CAROUSEL MESC-compatible wafer transport systems, heating/cooling assemblies and motion and placement systems.

ULVAC TECHNOLOGIES, INC.

sales@us.ulvac.com
www.ulvac.com

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Key Products: Seebeck Measuring Equipment; Annealing Furnace; Vacuum Systems; Pumps; Leak Detectors

ULVAC-RIKO specializes in thermo-physical property measurement systems. Products include high temperature IR gold reflector furnaces, a furnace hot-stage optical microscope, a programmable tabletop RTA furnace, Laser Flash unit for thermal conductivity, LaserPIT for in-plane thermal diffusivity of thin sheet or thin films, and a Seebeck coefficient and electrical resistance-measuring instrument. ULVAC-RIKO is a division of ULVAC, an international corporation that provides systems and components used in manufacturing and research applications requiring vacuum technology.

WITEC INSTRUMENTS CORP.

info@witec-instruments.com
www.witec-instruments.com

MRS
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Key Products: Confocal Raman Microscopy; Scanning Near-Field Microscopy; Atomic Force Microscopy

WITec is a manufacturer of high-resolution optical and scanning probe microscopy solutions for scientific and industrial applications. A modular product line allows the combination of different microscopy techniques such as Raman, NSOM or AFM in one single instrument for flexible analyses of optical, chemical and structural properties of a sample. WITec headquarters and production facilities are based in Ulm, Germany. WITec's US sales office, WITec Instruments Corp., is located in Savoy, IL.

WV NANO INITIATIVE/WEST VIRGINIA UNIVERSITY

wvnano@mail.wvu.edu
wvnano.wvu.edu

Key Products: Nanoscience Research; Workforce Development; Shared Facilities

West Virginia University's WVNano Initiative is the institution's focal point for discovery and innovation in nanoscale science, engineering and education (NSEE). Elevated to a state-wide initiative in 2006 through award of an NSF EPSCoR Research Infrastructure Improvement grant to the State of West Virginia, WVU's WVNano Initiative continues its leadership role, now in partnership with colleagues at partner state institutions. The WVNano Initiative at WVU has three primary objectives: 1) solidify and grow NSEE research, 2) advance supporting NSEE research infrastructure, and 3) build the NSEE culture.