

Preview: 2008 MRS Spring Meeting

Moscone West and San Francisco Marriott Hotel, San Francisco, Calif.
Meeting: March 24–28 • Exhibit: March 25–27
www.mrs.org

Meeting Chairs:

Jeffrey C. Gelpy
Mattson Technology

Robert J. Hamers
University of Wisconsin–Madison

Paul Muralt
Swiss Federal Institute of Technology

Christine A. Orme
Lawrence Livermore National Laboratory

The 2008 Materials Research Society Spring Meeting will be held March 24–28, 2008 in San Francisco, Calif. The technical meeting and exhibits will be located at the Moscone West Convention Center, and will include 41 symposia. To complement the scientific sessions, tutorials will provide a detailed introduction to particularly exciting areas of research, 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 Electronics, Magnetics, and Photonics (comprising Symposia A–N) will include presentations on the science and technology of amorphous and polycrystalline thin-film silicon; advances in GaN, GaAs, SiC, and related alloys on silicon substrates; silicon-carbides; and functional plasmonics and nanophotonics. With the continuation of evolutionary scaling of complementary metal-oxide semiconductor (CMOS) transistor devices, scaling becomes increasingly problematic owing to short channel effects and excessive power dissipation. Revolutionary device concepts—disruptive approaches—based on noncharge logic variables are therefore important for enabling “beyond CMOS” scaling in about 15–20 years from now. Symposium B will present a one-day symposium on materials and device technologies that can enable realization of novel information processing technologies of relevance in the time frame after 2019.

The cluster on Nanomaterials, Fundamentals, and Characterization (Symposia O–Z) features symposia on nanowires, carbon nanotubes, nanoscale tribology, and the mechanics of nanoscale materials as well as other topics. The cluster also

includes Symposium Z on Materials Structures—The Nabarro Legacy, a special one-day event focusing on the impact of Frank Nabarro’s work over the last 66 years, specifically on dislocation theory and its impact on a variety of materials and processes. Invited speakers include Gerhard Dehm (Austrian Academy of Sciences and University of Leoben, Austria), Yuichi Ikuhara (University of Tokyo, Japan), Doris Kuhlmann-Wilsdorf (Univ. of Virginia), Bill Nix (Stanford University), and Alexei Romanov (Ioffe Physico-Technical Institute, St. Petersburg, Russia); complementary contributions will be presented during a poster session.

The cluster on Polymers and Biomaterials (Symposia AA–GG) will feature a number of talks on the interface of biomaterials and biomedicine. Aging of biological tissues is traced to changes in mechanical properties of tissues. Malaria has a dramatic influence on cell stiffness. The performance and diseases of lungs are associated with the mechanical behavior of lung cells under cyclic loading. The dynamic bond strength between drugs and cancer cells critically affects the treatment efficiency. In tissue engineering, cells sense and respond to the stiffness of the substrate material, which in turn affects the cell adhesion structure and dynamics, cytoskeleton assembly, differentiation and proliferation, and subsequent cell-on-cell adhesion behavior. Significant achievements in these areas of research have initiated many applications in tissue engineering; disease/cancer detection and treatment; and dental, pharmacy, and other industries and Symposium GG will offer presentations and discussions to provide guidance for future studies and to exploit more applications. Symposium BB will focus on organic and inorganic host materials with built-in functionalities enabling the proper translation of signals between biology and photonics/electronics. Symposium CC presents an emerging discipline that addresses biomolecular interactions at surfaces, with a specific focus given to biomedical applications of biointerfaces in cell and tissue engineering, sensing, and diagnosis. Symposium DD: From Biological Materials to Biomimetic Material Synthesis offers a special session for student/post-doctoral talks for which abstracts will be selected on a competitive basis.

The cluster on Energy and Environ-

ment (Symposia HH–NN) will address the hydrogen economy, electrical energy storage, light management in photovoltaic devices, along with health and environmental impacts of nanoscale materials. In Symposium JJ, a special session will be held on the reports from the April 2007 U.S. Department of Energy’s Office of Science Workshop on Basic Research Needs for Electrical Energy Storage. Throughout the Spring Meeting, special emphasis will be given to the need for materials solutions to global energy concerns, problems, and challenges.

Symposia covering general interests will include Symposium X on Frontiers of Materials Research, which will feature topics at the forefront of materials science and engineering; Symposium OO, which will address educational and industrial interests worldwide on creating a workforce prepared to advance societal needs in nanotechnology; and Symposium PP addressing the specific topic on the business of nanotechnology. In particular, Symposium PP will target issues pertaining to market considerations, design innovation, usability, manufacturability, reliability, and intellectual property.

Poster sessions will be held at the Marriott Hotel on Tuesday 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.

MegaMONDAY!

MegaMONDAY (March 24) is filled with exciting and informative events, beginning with 12 tutorial sessions that cover a broad spectrum of topics, from Nanoplasmonics and Pulsed-Fiber Lasers, to Introducing Nanotechnology in Undergraduate and K–12 Education. Optional tutorial notes may be purchased for a nominal fee.

Also on Monday, the Energy Forum will give an overview of select materials research topics in the area of environmentally sustainable energy. It will complement the release of a special expanded issue of *MRS Bulletin* on Harnessing Materials for Energy. The forum consists of four seminars with discussion periods, beginning with **George M. Whitesides** of Harvard

University who will provide a balanced view of energy needs that materials advances can address. The other sessions address biofuels and biomass, presented by **Chris Somerville** of the University of California, Berkeley; catalysis, presented by **Daniel G. Nocera** of the Massachusetts Institute of Technology; and solar technology, presented by **Martin A. Green** of the University of New South Wales, Australia. For more details, see Web site www.mrs.org/energyforum.

During the Plenary Session held in the evening, **Michael Graetzel** of the Ecole Polytechnique Fédérale de Lausanne, continues the energy theme with a special address entitled "Power from the Sun—The Advent of Mesoscopic Solar Cells." Graetzel discovered a type of solar cell based on dye-sensitized mesoscopic oxide particles, and pioneered the use of nanomaterials in energy conversion devices.

Special Events

An awards ceremony will be held at which this year's Outstanding Young Investigator will be recognized and Gold

and Silver Graduate Student Awards will be presented to graduate students for symposium papers that exemplify significant and timely research.

In addition, various special events will be held, including a science-as-art contest in which artwork related to materials science and aesthetic scientific pieces of art, for example, micrographs, will be exhibited and judged for multiple first- and second-place awards. Presentations for the annual MRS Entrepreneurship Challenge, a competition designed to help MRS members develop the entrepreneurial skills that get ideas out of the laboratory and directly into the marketplace, will be held at the Spring Meeting.

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 7, 2008**. The MRS Web site can be accessed for updated information on confirmed talks and details on special events, visas, and pre-registration at www.mrs.org. 

Meeting Scene...

Register Today for this FREE electronic newsletter covering MRS and other special meetings from around the world. Coverage for 2008 includes summaries of technical presentations and events by on-the-spot reporters at:

- 2008 MRS Spring Meeting • *San Francisco, California, USA, March 24-28*
- American Conference on Neutron Scattering 2008 • *Santa Fe, New Mexico, USA, May 11-15*
- E-MRS 2008 Spring Meeting • *Strasbourg, France, May 26-30*
- MRS International Materials Research Conference • *Chongqing, China, June 9-12*
- MRS-Australia/ICEM • *Sydney, Australia, July 28-August 1*
- XVII International Materials Research Congress (IMRC 2008) • *Cancún, Mexico • August 17-21*
- 7th Brazilian MRS Meeting • *Guaruja, São Paulo, Brazil • September 28- October 2*
- 2008 MRS Fall Meeting • *Boston, Massachusetts, USA • December 1-5*
- IUMRS International Conference in Asia 2008 (IUMRS-ICA 2008) • *Nagoya, Japan • December 9-13*

Don't miss a minute of the action!

Register today at www.mrs.org/alerts and let MRS bring the world of materials to your Inbox!

2008 MRS SPRING MEETING REGISTRATION AND LODGING

Pre-registration deadline: March 7, 2008 • Hotel reservations deadline: February 29, 2008

REGISTRATION

Pre-Registration Rates

Valid through Friday, March 7, at 5:00 p.m. EST:

■ Member:	\$450
■ Student Member:	\$105
■ Nonmember:	\$525
■ Student Nonmember:	\$125
■ Retired:	\$125
■ Unemployed:	\$125

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

Online: www.mrs.org/s08_registration

On-Site Registration Rates

Valid AFTER 5:00 p.m. EST on Friday, March 7:

■ Member:	\$550
■ Student Member:	\$130
■ Nonmember:	\$625
■ Student Nonmember:	\$150
■ Retired:	\$150
■ Unemployed:	\$150

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 \$151 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: 1-415-896-1600
Fax: 1-415-486-8101

Online: www.mrs.org/s08_lodging

2008 MRS SPRING MEETING SYMPOSIUM TUTORIALS

MONDAY • MAY 24 • MOSCONE WEST CONVENTION CENTER

SYMPOSIUM STA

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

Monday, March 24, 9:00 am–5:00 pm; Room 2002, Moscone West

SYMPOSIUM STC

GaN, GaAs, SiC, and Related Alloys on Silicon Substrates

Monday, March 24, 1:30–5:00 pm; Room 2003, Moscone West

SYMPOSIUM STE

Trends, Challenges in Doping, and Characterization of Bulk and Thin Body Semiconductor Devices

Monday, March 24, 1:30–5:00 pm; Room 2005, Moscone West

SYMPOSIUM STF

Materials Science and Technology for Nonvolatile Memories

Monday, March 24, 8:30 am–5:15 pm; Room 2006, Moscone West

SYMPOSIUM STG

Phase-Change Materials—Science and Applications

Monday, March 24, 8:30 am–5:15 pm; Room 2007, Moscone West

SYMPOSIUM STH

High-*k* and Device Fabrication Properties on Ge and III-V Substrates

Monday, March 24, 1:00–5:00 pm; Room 2008, Moscone West

SYMPOSIUM STK

Pulsed Fiber Lasers—From Basics to Advanced Concepts

Monday, March 24, 1:30–5:00 pm; Room 2010, Moscone West

SYMPOSIUM STL

Nanoplasmonics

Monday, March 24, 1:30–5:00 pm; Room 2012, Moscone West

SYMPOSIUM STP

Synthesis, Characterization, and Applications of Carbon Nanotubes and Related One-Dimensional Nanostructures

Monday, March 24, 8:30 am–4:30 pm; Room 2009, Moscone West

SYMPOSIUM STW

Low-Energy Electron Microscopy (LEEM) and Photoemission Electron Microscopy (PEEM)

Monday, March 24, 9:00 am–12:30 pm; Room 2000, Moscone West

SYMPOSIUM STKK

Optical Modeling and Simulation of Thin-Film Photovoltaic Devices

Monday, March 24, 1:30–5:00 pm; Room 2018, Moscone West

SYMPOSIUM STOO

Introducing Nanotechnology in Undergraduate and K-12 Education

Monday, March 24, 1:30–5:00 pm; Room 2004, Moscone West

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

2008 MRS SPRING MEETING SYMPOSIUM SESSION LOCATOR

SYMP.	TITLE	LOCATION	MONDAY, MARCH 24			TUESDAY, MARCH 25		
			Moscone West	a.m.	p.m.	eve.	a.m.	p.m.
A	Amorphous & Polycrystalline Thin-Film Silicon Science & Technology	Room 2002	Tutorial**	Tutorial**		A1: Film Growth A2: Defects & Transport	A3: Solar Cells I A4: Characterization	A5, A6, A7: Posters
B	Materials & Devices for "Beyond CMOS" Scaling	Room 3000						
C	Advances in GaN, GaAs, SiC, & Related Alloys on Silicon Substrates	Room 2003		Tutorial**		C1: III-Vs on Si: Layer Transfer & Bonding Approaches	C2: III-V Epitaxy on Si	C3: Posters
D	Silicon Carbide—Materials, Processing, & Devices	Room 2004				D1: Bulk Growth D2: Defects & Characterization I	D3: Defects & Characterization II D4: Epitaxial Growth I	
E	Doping Engineering for Front-End Processing	Room 2005		Tutorial**		E1: Ultra-Shallow Junctions I	E2: Shallow Junction Contacting	E3: Posters
F	Materials Science & Technology for Nonvolatile Memories	Room 2006	Tutorial**	Tutorial**		F1: Ferroelectric/Ferromagnetic/Multiferroic	F2: Flash/Nanocrystals	F3: Posters
G	Phase-Change Materials for Reconfigurable Electronics & Memory Applications	Room 2007	Tutorial**	Tutorial**		G1: Theory of Phase-Change Materials	G2: Structure of Phase-Change Materials	G3: Posters
H	Materials Science of High- k Dielectric Stacks—From Fundamentals to Technology	Room 2008		Tutorial**		H1: Understanding the WF Control	H2: Practicalities of WF Control & Reliability	
I	Synthesis and Metrology of Nanoscale Oxides & Thin Films	Room 2001				I1: Nanostructures & Thin Films: Magnetic & Electrical Properties	I2: Ferroelectrics	I3: Posters
J	Passive & Electro-mechanical Materials & Integration	Room 2009				J1: Packages & LTCC	J2: Ferroelectrics	
K	Materials & Devices for Laser Remote Sensing & Optical Communication	Room 2010		Tutorial**		K1: Fiber Optics Lasers & Amplifiers K2: Photodetection Devices I	K3: Photo-detection Devices II	
L	Functional Plasmonics & Nanophotonics	Room 2012		Tutorial**		L1: Propagation & Modulation I L2: Antennae & Emitters	L3: Coupling & Focusing L4: Fabrication of Tunable Plasmonic Structures	
M	Materials & Technology for Flexible, Conformable, & Stretchable Sensors & Transistors	Room 2011				M1: Conformable Electronic Systems M2: Thin-Film Transistors on Flexible Substrates	M3: Technology for Conformable Electronic Systems M4: Materials for Conformable Electronics	M5: Posters
N	Materials & Processes for Advanced Interconnects for Microelectronics	Room 2024				N1: Low- k Dielectrics I	N2: Low- k Dielectrics II	

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WEDNESDAY, MARCH 26			THURSDAY, MARCH 27			FRIDAY, MARCH 28	
a.m.	p.m.	eve.	a.m.	p.m.	eve.*	a.m.	p.m.
A8: Novel Applications A9: Thin-Film Transistors I	A10: Alloys+A30Microcrystalline Silicon A11: Film Growth & Characterization I		A12: Crystallization Techniques A13: Thin-Film Transistors II	A14: Solar Cells II A15: Film Growth & Characterization II	A16, A17, A18: Posters	A19, A20: Sensors, Transistors & Active Matrix Arrays I & II	
			B1	B2	B3: Posters		
C4: GaN Electronic Devices & Sensors on Si	C5: GaN Optical Devices on Si		C6: GaN on Si: Growth & Characterization	C7: Group IV Epitaxy		C8: GaN Processing & Defects	
D5: Epitaxial Growth II D6: Deep-Level Defects & Carrier Lifetime	D7: Posters D8: Epitaxial Growth III D9: Processing		D10: Devices I D11: Devices & Applications I	D12: Devices & Applications II D13: MOS Interface			
E4: Ultra-Shallow Junctions II	E5: Solid-Phase Epitaxial Regrowth		E6: Modeling & Simulation				
F4: Emerging (Probe/Cross-point/Organic) I	F5: Posters F6: Resistance Change RAM		F7: Emerging (Probe/Cross-point/Organic) III	F8: Future Nanovolatile Memories	F9: Posters		
G4: Phase-Change Materials—Experiment I	G5: Phase-Change Materials—Experiment II		G6: Phase-Change Materials—Applications I	G7: Phase Change Materials—Applications II G8: New Phase-Change Materials			
H3: Higher- <i>k</i> Materials - Deposition & Optimization	H4: Posters H5: High- <i>k</i> Characterization		H6: High- <i>k</i> on Novel Substrate Materials	H7: High- <i>k</i> Novel Substrate Materials			
I4/I15: Nanoscale Structures/Oxides/Films—Characterization & Applications to Superconductivity	I5: Posters I6: Structure Effects Upon Magnetic, Electric, & Optic Properties		I7: ZnO Nanoparticles & Thin Films	I8: Surfaces, Interfaces, Junctions I I9: Nanoparticles, Structural, Electrical, & Optical Properties	I10: Posters	I11: I11: High- <i>k</i> Dielectrics I12: I12: Surfaces, Interfaces, & Junctions II	I13: Nanoporous Materials I14: Nanoparticles, Clusters, & Thin Films for Sensors & Photocells
J3: Embedded & Acoustic Wave System	J4: Flexible System		J5: MEMS I	J6: MEMS II	J7: Posters	J8: New Materials & Processing	
K4: Laser Remote Sensing Instruments	K5: Nanocrystal Materials & Ceramic Lasers K6: In-Room Posters		K7: Semiconductor Lasers & Pump Arrays I	K8: Semiconductor Lasers & Pump Arrays II K9: Photonic Structures & Quantum Dot Devices			
L5: Applications & Devices L6: Propagation & Modulation II	L7: Posters L8: Nanocavities L9: Nanostructures for Sensing I		L10: Nanostructures for Sensing II L11: Advanced Spectroscopy & Microscopy	L12: Nonlinearities & Gain L13: Metamaterials			
M6: Mechanics of Conformable Electronics M7: Mechanics of Conformable Electronics II	M8: Process		M9: Ultracompliant Sensors M10: Ultracompliant Transducers	M11: Sensing M12: Neural Interfaces	M13, M14, M15: Posters		
N3: Metallization I	N4: Metallization II		N5: Reliability & Packaging I	N6: Emerging Interconnect Technology I	N7, N8, N9, N10, N11: Posters		

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			Moscone West	a.m.	p.m.	eve.	a.m.	p.m.
O	Semiconductor Nanowires—Growth, Physics, Devices, & Applications	Room 3002				O1: Growth of III-V Nanowires	O2: Growth of Si, Ge Nanowires	O3, O4: Posters
P	Carbon Nanotubes & Related Low-Dimensional Materials	Room 3003	Tutorial**	Tutorial**		P1: Growth	P2: Hybrid & Membrane P3: Process & Assembly I	P4, P5: Posters
Q	Ionic Liquids in Materials Synthesis & Application	Room 3000				Q1: Ionic Liquids in the Processing of Biomaterials Q2: Polymer & Protein Assembly in Ionic Liquids	Q3: Nano-structures in Molecular Solvents Q4: Nano structures in Ionic Liquids	
R	Coupled Mechanical, Electrical, & Thermal Behaviors of Nanomaterials	Room 3004				R1: Functional Nanomaterials with Coupled Behavior	R2: Multiscale Characterization of Coupled Behavior	R3: Posters
S	Weak Interaction Phenomena—Modeling & Simulation from First Principles	Room 3008				S1: Theory	S2: Water & Biological Systems	S3: Posters
T	Nanoscale Tribology—Impact for Materials & Devices	Room 3006				T1: Interfacial Aging, Adhesion, & Friction T2: Nanotribology of Materials for Devices	T3: Nanotribology for Polymeric & Biomaterial Applications	
U	Mechanics of Nanoscale Materials	Room 3007				U1: Polymers & Composites	U2: Pillars & Wires	
V	Crystal-Shape Control & Shape-Dependent Properties—Methods, Mechanism, Theory, & Simulation	Room 3005				V1: Metallic Nanocrystals	V2: Predicting & Utilizing Crystal Shapes	V3: Posters
W	Advances & Applications of Surface Electron Microscopy	Room 3011	Tutorial**	W1: Organic Films/Biological Materials		W2: Thin-Film Growth, Magnetism, & Multiferroics	W3: Semiconductor & Device Physics	W4: Posters
X	Frontiers of Materials Research	Exhibit Hall					X1	
Y	Focused Ion Beams for Materials Characterization & Micromachining	Room 3011						
Z	Materials Structures—The Nabarro Legacy	Room 3010				Z1: Nanoscale Materials Z2: Dislocation Mechanics & Theoretical Considerations	Z3: Semiconductors, Ceramics, & Intermetallics Z4: Phase Transformations	Z5: Posters
AA	Conjugated Organic Materials—Synthesis, Structure, Device, & Applications	Room 3001	AA1: Conjugated Polymer Device & Patterning	AA2: Nano-electronic Devices, Self Assembly & Sensors		AA3: Organic Photovoltaic Devices I	AA4: Organic Photovoltaic Devices II	AA5: Posters

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a.m.	p.m.	eve.	a.m.	p.m.	eve.*	a.m.	p.m.
O5: Nanowire Growth O6: III-V Nanowire Devices	O7, O8: Posters O9: Transport O10: Si & Ge Nanowire FETs & Memory I		O11: Si & Ge Nanowire FETs & Memory II O12: Si & Ge: Fabrication & Devices	O13: Nanowires: Energy Conversion & Piezoresistive Properties I O14: Nanowires: Energy Conversion & Piezoresistive Properties II	O15, O16: Posters	O17: ZnO & Related Materials (Room 2004)	O18: Nanowire Sensors (Room 2004)
P6: Graphene	P7, P8: Posters P9: Applications: Overview P10: Bio-Interface & Sensing		P11: Conductive Thin Films P12: Wet Process & CNT Network	P13: Characterization of CNTs P14: Molecular & Chemical Sensors	P15, P16: Posters	P17: Process & Assembly II P18: Novel Properties—Electronic, Spin, & Photoconductivity (Room 2005)	
Q5: Ionic Liquids for Electronic, Optical & Sensing Applications Q6: Materials Processing in Ionic Liquids-I	Q7: Materials Processing in Ionic Liquids-II Q8: Materials Solubility in Ionic Liquids						
R4: Coupled Behavior In Thermal Transport	R5: Coupled Behavior in Electron Transport		R6: Nanomaterials with Coupled Behavior in Biology & Chemistry				
	S4: Hydrogen Storage		S5: Surfaces & Interfaces				
T4: Nanocontacts: From Atoms to Automobiles	T5: Posters T6: Novel Instrumentation for Coatings & Beyond		T7: Physical Origins of Friction Between Solids				
U3: Thin Films & Surfaces	U4: Multilayers		U5: New Findings in Nanoindentation	U6: Mechanics of Nanoporous Metals U7: Semiconductors & IC-Related Systems	U8: Posters	U9: Nanocrystalline Bulk Materials I (Room 2007)	U10: Nanocrystalline Bulk Materials II U11: Nanotubes (Room 2007)
V4: Studies on Metal & Metal Oxide Crystals	V5: Shape-Dependent Properties & Application		V6: New Methods to Grow & Study Crystals	V7: Semiconducting Nanocrystals	V8: Posters		
W5: Surface Processes				X2			
	Y1: Nanolithography & Nanostructuring with Focused Ion Beam (Optical Devices & Membranes) Y2: FIB Preparation of Small Samples for Analysis with TEM, Nanoindentation & Microtesting		Y3: Innovative Patterning, Nanofabrication & Beam Induced Deposition (Nanowires, Nanotubes & Semiconductors)	Y4: 3D/FIB-Tomography & Microstructure Analysis		Y5: Interactions Ion Beam-Materials—Simulation & Experiments/Applications with Soft Materials/Bio/Polymers	
AA6: Organic Photovoltaic Devices III	AA7: Posters AA8: Organic Thin-Film Devices		AA9: Organic Field Effect Transistors—New Materials	AA10: Organic Field Effect Transistors: Device Fabrication & Architectures	AA11: Posters	AA12: Organic Light-Emitting Diodes as White Light Sources	AA13: Organic Light-Emitting Diodes: Physics & Devices

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			a.m.	p.m.	eve.	a.m.	p.m.	eve.*
BB	Signal Transduction Across the Biology-Technology Interface	Moscone West Room 3010						
CC	Designer Biointerfaces	Room 3024				CC1: Biomolecules at Interfaces	CC2: Designer Particles	
DD	From Biological Materials to Biomimetic Material Synthesis	Room 3022				DD1: Structures & Properties of Biological Materials I	DD2: Structure & Properties of Biological Materials II	
EE	Responsive Biomaterials for Biomedical Applications	Room 3020				EE1	EE2	EE3: Posters
FF	Molecular Motors, Nanomachines, & Active Nanostructures	Room 3018				FF1: Synthetic Motors & Active Molecules	FF2: Biological Approaches in Nanoscale Motion	FF3: Posters
GG	Mechanical Behavior of Biological Materials & Biomaterials	Room 3009				GG1: Multiscale Mechanical Behavior of Bone & Tissues	GG2: Nanomechanical Behavior of Biological Materials	
HH	The Hydrogen Economy	Room 2022				HH1: Hydrogen Production from Renewable Resources	HH2: Hydrogen Storage Challenges & Potential Solutions	HH3: Posters
II	Heterostructures, Functionalization, & Nanoscale Optimization in Superconductivity	Room 2000				II1: YBCO-Coated Conductor Processing & Characterization	II2: YBCO-Coated Conductor Characterization & Applications II3: Advanced Templates for Second-Generation Coated Conductors	II4: Posters
JJ	Materials Research for Electrical Energy Storage	Room 2020				JJ1: Critical Issues & Approaches	JJ2: Battery Cathodes	
KK	Light Management in Photovoltaic Devices—Theory & Practice	Room 2018		Tutorial**		KK1: Modelling & Characterization KK2: Transparent Conducting Oxides – Applications	KK3: Plasmon Effects KK4: Light Trapping in Thin Si Photovoltaic Devices	KK5: Posters
LL	Energy Harvesting—From Fundamentals to Devices	Room 2016				LL1: Solar I	LL2: Thermoelectrics I	
MM	Health & Environmental Impacts of Nanoscale Materials—Safety by Design	Room 3016						
NN	Actinides IV—Basic Science, Applications, & Technology	Room 2014				NN1: Phase Transformation & Metallurgy	NN2: Electron Correlation & Structure	
OO	The Role of Lifelong Education in Nanoscience & Engineering	Room 3016		Tutorial**		OO1: How Nano Knowledge Implementation	OO2: Current & Development Informal Methods	
PP	The Business of Nanotechnology	Room 3014				PP1: Nanotech Energy Solutions & Business Models Across the Globe	PP2: Nanoelectronics & Nanotech Transition in Large & Small Companies	

*Poster Sessions: All Evening Poster Sessions Located on Salon Level, San Francisco Marriott Hotel **Refer to Tutorial Schedule

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a.m.	p.m.	eve.	a.m.	p.m.	eve.*	a.m.	p.m.
BB1: Materials & Methods for Improved Signal Transduction	BB2: Posters BB3: Sensor Materials & Technology		BB4: Electrodes & Probes to Sense & Actuate Systems in Biology	BB5: Devices & Circuits to Sense & Actuate Systems in Biology			
CC3: Nanostructured Biointerfaces	CC4: Posters CC5: Lipid Bilayers, Self-Assembled Monolayers, & Polymer		CC6: Sensors & Devices	CC7: Biointer-faces for Cell & Tissue Engineering			
DD3: Bioenabled Materials I	DD4: Bioenabled Materials II		DD5: Biomimetic Materials Synthesis	DD6: Special Student/Post-Doc Session	DD7, DD8: Posters	DD9: Materials for Biological Applications	
EE4	EE5		EE6	EE7	EE8: Posters		
FF4: Motors & Active Nanostructures from DNA, Proteins, & Cells	FF5: Fundamen-tal Mechanisms Of Nanoscale Motion						
GG3: Mechanics of Cells & Networks	GG4: Posters GG5: Mechanics & Deformation of Biomaterials		GG6: Dental Materials & Biomaterials	GG7: Deforma-tion & Microstructure of Biological Materials			
HH4: Hydrogen Storage via Sorption	HH5: Hydrogen Storage via Complex & Chemical Hydrides		HH6: Challenges for Hydrogen Fuel Cells	HH7: Solid-Oxide Fuel Cells HH8: Hydrogen Utilization			
I5/4: Nanoscale Structures/Oxides/ Films—Characterization & Applications to Superconductivity	I16: Fundamental & Applied Research on MgB2 & BSSCO Superconductors		I17: Flux Pinning & Current Transport in RE-123	I18: Flux Pinning II			
JJ3: Olivine Cathodes	JJ4: Posters JJ5: Battery Anodes		JJ6: Capacitors	JJ7: Electrolytes & Ion Transport			
KK6: General Topics in Light Management I KK7: General Topics in Light Management II	KK8: Advanced Light Management KK9: Organic & Sensitized Solar Cells		KK10: Nanostructures I KK11: Spectral Management	KK12: Nanostructures II KK13: Back Reflectors			
LL3: Mechanical/ Magnetic	LL4: Posters LL5: Thermoelectrics II		LL6: Energy Harvesting, All Topics II	LL7: Solar II			
			MM1: Character-ization of Nanomaterials for Environment, Health & Safety Studies	MM2: Biological Response to Engineered Nanomaterials			
NN3: Nuclear Fuel, Waste, & Storage	NN4: Actinide Chemistry I		NN5: Actinide Chemistry II	NN6: Spectros-copy & Microscopy to Actinides	NN7: Posters	NN8: Spectroscopy/ Microscopy & Atomistic Modeling	NN9: Supercon-ductivity & Complex Behavior
OO3: Current & Development University Methods	OO4: Global & Industry Integration of NanoEd						
PP3: Nanobiotech & GreenNanotech Challenges	PP4: Nanoman-ufacturing & Nanotech Transition from the Lab to Market		PP5: Nanotech Commercialization Challenges Forum: Growing a Successful Start-Up Co.	Forum: Growing a Successful Start-Up Company			

Shaded Blocks: No Session

WELCOME TO THE 2008 MRS SPRING EXHIBIT

The MRS Exhibit, held in conjunction with the 2008 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
March 25-27, 2008

EXHIBIT HOURS:

Tuesday, March 25 11:00 am – 5:30 pm
Wednesday, March 26 11:00 am – 5:30 pm
Thursday, March 27 10:00 am – 1:30 pm

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

2008 MRS SPRING EXHIBITORS

(as of JANUARY 29, 2008)

AAAS SCIENCE & TECHNOLOGY POLICY FELLOWSHIPS

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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.

ACCELRY'S, INC.

solutions@accelrys.com • www.accelrys.com

Key Products: Materials Studio; Pipeline Pilot

Accelrys has over twenty years of innovation and technology leadership in delivering software and service solutions that transform research and development. Accelrys' Materials Studio® provides software for multiscale materials modeling and simulation, from electronic to atomistic to mesoscale, via an easy-to-use desktop environment. Materials Studio enables users to solve a wide range of critical research problems in the areas of nanotechnology, catalysis, polymers, and crystallization. For more information about Accelrys, visit the website at <http://www.accelrys.com/>.

ADVANCED RESEARCH SYSTEMS, INC.

ars@arscryo.com • www.arscryo.com

Key Products: Closed and Open Cycle Cryogenic Systems

ARS offers integrated Displex and Helitran Cryostats for material characterization. Cryostats are available for optical and non-optical (transport, XRD, 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. Low vibrations systems available for Mossbauer, Optical and Microscopy applications. ARS is introducing the low cost 77K closed cycle cryostats for optical and non-optical experiments as well as the Cryogenic Probe Station with up to 4 probes. ARS manufactures the open and closed cycle cryocoolers with all custom hardware to provide a systems solution for material characterization and sample cooling.

AGILENT TECHNOLOGIES

afm-info@agilent.com • www.agilent.com

Key Products: Atomic Force Microscopes; Scanning Probe Microscopes; Automated Materials Test Systems

Agilent Technologies offers a wide range of high precision Atomic Force Microscope systems to meet your unique research needs. Agilent's industry-leading environmental/temperature options and fluid handling enable superior control for materials & life sciences including electrochemistry & polymer applications. Agilent delivers worldwide support, provided by experienced application scientists and technical service personnel.

AIXTRON AG

info@aixtron.com • www.aixtron.com

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

Key Products: Surface Profiler; Atomic Force Microscope; White Light Interferometer

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.

ANDEEN-HAGERLING, INC.

info@andeen-hagerling.com • www.andeen-hagerling.com

Key Products: Capacitance/Loss Bridges; Precision Reference Capacitors

Manufacturers of the most precise capacitance/loss bridges and capacitance standards available commercially. Bridges are fully automatic and can resolve measurements to sub-attofarad levels. Operation at fixed or variable frequencies (50 Hz to 20 KHz). Loss (dissipation factor) measured down to $1.5 \times 10^{-8} \tan \delta$. A-H bridges are ideal for many capacitance-based, precision sensor applications. AH capacitance standards available from 0.1 pF to 115 pF. Standards have stability < 0.3 ppm/year, temperature coefficient of .01 ppm/deg C, and are NIST traceable to an accuracy of 2 ppm.

ANNEALSYS

info@annealsys.com • www.annealsys.com

Key Products: RTP; 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 wafer capability for RTP and RTCVD processes. Cold wall chamber, lamp furnace, high temperature (1400°C) and high vacuum capability are the main features. R&D CVD systems: 2-inch RTP-MOCVD tool and 4-inch MOCVD tool dedicated to oxide and metal deposition and 4-inch LPCVD furnace are available. Worldwide sales and service support.

ASYLUM RESEARCH

sales@AsylumResearch.com • www.AsylumResearch.com

Key Products: Atomic Force Microscopes; Scanning Probe Microscopes

Asylum Research manufactures advanced Atomic Force Microscopes for nanoscale science. Featured is the MFP-3D AFM with unprecedented precision while maintaining

image clarity. The MFP-3D features the NPS™ Nanopositioning System for precision and accuracy with closed-loop operation in all three axes; a low noise, fully-digital controller; MicroAngelo built-in nanolithography and manipulation; IGOR Pro open software for customized experiments including advanced 3D rendering; ORCA for conductive AFM measurements, and advanced optical capabilities for simultaneous AFM and fluorescence imaging. Other capabilities include the NanoIndenter for quantitative mechanical properties measurements; ferroelectric imaging capabilities and environmental accessories. The new iDrive allows effortless cantilever tunes for fluid imaging.

ATOMATE CORPORATION

info@atomate.com • www.atomate.com

Key Products: CVD Systems for Research and Production; Process Control Modules; R&D and Commercial Nanomaterials Fabrication

Atomate Corporation develops robust systems, components, and materials optimized for the synthesis of nanowires and nanotubes using the chemical vapor deposition (CVD) method. Atomate has a solution for researchers who desire enhancements to existing systems and for those who want to build or buy a new system. Atomate's mission is to develop products that enable the customer to focus their efforts on the science, not on engineering of equipment.

AXIC, INC.

info@axic.com • www.axic.com

Key Products: Plasma Process Equipment; Rapid Thermal Process Systems; Metrology and CVD

AXIC, Inc. is the sole distributor in the USA for AnnealSys, Nano-View, Secon and Ultech. Combined we provide process equipment including: Plasma Etch, PECVD, LPCVD, MOCVD, Rapid Thermal Processing, Defect Density, Ellipsometry, Wafer Thinning and Metrology systems. AXIC, Inc. manufactures a line of Plasma Etchers (including ICP) and Plasma Deposition systems for 2" to 8" wafers. AnnealSys supplies Rapid Thermal Process and Rapid Thermal Annealing equipment for annealing, alloying, phase change, and deposition. Nano-View systems measure film thickness, index, adsorption applications as well as particle and defect surface analysis. Secon microwave systems are applicable for Etch, Deposition, and Texturization for Solar Cell applications. Sputtering Equipment, Evaporators, Ion Immersion, and Dry Etchers are provided by Ultech Co.

BRINKMANN INSTRUMENTS, INC.

info@brinkmann.com • www.brinkmann.com

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

Brinkmann Instruments offers the Metrohm and Eco Chemie Autolab family of electrochemistry systems for both dedicated and multifaceted material research. The modular PGSTAT 302N potentiostats and galvanostats used for electrochemical analysis and impedance characterization of sensor and material components also offer low current and high speed scanning options as well as integration with EQCM, SPR and other measuring systems. The Metrohm Computrace analysis systems are used for electrochemical determination of trace levels of material and sensor components.

BROOKHAVEN INSTRUMENTS CORPORATION

info@bic.com • www.bic.com

Key Products: Particle Size Analyzers; Zeta Potential Analyzers; Molecular Weight Analyzers

Characterize colloidal particles, polymers and proteins with Brookhaven's light scattering instruments: Nanoparticle size analyzers, Zeta Potential analyzers and Absolute Molecular Weight analyzers. INTRODUCING the BioDLS/NanoDLS with 2.5 uL cell volumes, batch, stop-flow and SEC mode for absolute size exclusion chromatography, ASEC. Use these instruments for research, quality control, dispersion stability, and formulation. Choose from dynamic light scattering, centrifugation, particle electrophoresis, and static light scattering with our expert help.

BRUKER AXS INC.

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.

CENTER FOR TRIBOLOGY, 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, organo-polymers, 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.

CRC PRESS-TAYLOR & FRANCIS GROUP LLC

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Key Products: Books; Journals; NetBase Products

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CRYSTMALMAKER SOFTWARE LTD.

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Key Products: CrystalMaker 8 for MAC; CrystalMaker 2 for Windows; SingleCrystal

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

Key Products: Scratch Testers; Indentation Testers; Tribology

CSM Instruments manufactures advanced indentation, scratch, and tribological testing tools for a wide range of loads. Our testing modules can be configured alone or combined together on a testing platform for a single instrument capable of multiple analysis modes. 3D-imaging options are available with the ConScan or AFM objective. CSM Instruments is proud to announce the launch of its new Table Top Nano Indentation Tester (TTX), a cost-effective solution which meets the ISO 14577 & ASTM E2546 standards.

DR. EBERL MBE-KOMPONENTEN GMBH

sales@mbe-components.com • www.mbe-components.com

Key Products: Effusion Cells; E-Beam Evaporators; Doping Sources

Dr. Eberl MBE-Komponenten is a leading manufacturer of thin film deposition equipment for molecular beam epitaxy, surface science and other UHV applications. Our range of products comprises amongst others effusion cells, electron beam evaporators, valved sources for phosphorus or arsenic, gas cracker cells for hydrogen or oxygen and a variety of sources for growth and doping applications used in semiconductor production, scientific research and nanotechnology.



ECOPIA CORP.

sales@ecopia21.co.kr • www.ecopia21.co.kr

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

Ecopia is one of the leading companies in measurement systems for semiconductors, offering the HMS-3000 Hall Effect Measurement System to measure electrical properties (Bulk/Sheet carrier concentration, mobility, hall coefficient, resistivity, magneto-resistance, etc.). Reasonably priced, a compact desk top design, powerful yet easy-to-use. Provides I-V and I-R curves. Measure at room temperature or 77K using LN₂. Permanent magnetic flux density (0.55 Tesla standard; 0.31T, 0.37T, and 1.0T optional).

EDAX INC.

info.edax@ametek.com • www.edax.com

Key Products: Energy Dispersive X-ray; EBSD; X-ray Detectors

EDAX raises the standard as the technical innovator with high performance and functionality that gives you "Confidence in Your Results." For many years EDAX has led the industry as the world's largest supplier of EDS, EBSD and WDS systems and as the technical and performance leader. EDAX-TSL integrated products provide a powerful and unique combination of elemental information from EDS and structural information from EBSD in the EDAX Pegasus, while the EDAX Trident combines the EDS and EBSD capabilities with WDS to provide a complete solution.

EVANS ANALYTICAL GROUP

marketing@eaglabs.com • www.eaglabs.com

Key Products: Analytical Services

Evans Analytical Group® (EAG) is the world's leading, fully integrated and independent materials characterization lab network delivering world class testing services and expertise in surface analysis, trace elemental analysis, electron microscopy, failure analysis and circuit edit. EAG offers a comprehensive suite of over 30 analytical techniques and services supported by a fleet of 150 major instruments via 15 EAG locations across Asia, Europe and the U.S. Techniques/Services include: SIMS, TOF-SIMS, XPS, AES, FTIR, GDMS, IGA, ICP-OES/MS, LA-ICP-MS, LEXES, TEM/STEM, SEM, EDS, Dual Beam FIB/SEM, XRF, XRD, XRR, TXRF, AFM/SPM, RBS, HFS, NRA, PIXE, Raman, GC/MS, Chip Decapsulation/Deprocessing, Electrical Localization (Photon Emission, OBIRCH, TVA, Liquid Crystal), RTX, SAM, FIB Circuit Edit, ESD & Latchup.

FISCHIONE INSTRUMENTS

info@fischione.com • www.fischione.com

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

Fischione Instruments features a full line of Electron Microscopy Instrumentation. TEM Specimen Preparation Instruments include the Twin-Jet Electropolisher, Dimpling Grinder, Ultrasonic Disk Cutter, Ion Mill, and the Plasma Cleaner which eliminates contamination in TEM and SEM applications. The NanoMill combines ultra-low ion energies and a concentrated beam for artifact-free preparation. The Automated Sample Prep (ASaP) System (Patent Pending) significantly enhances the image quality and analytical data derived from SEM specimens. Imaging Instruments include the high angle Annular Dark Field (ADF) detector for high resolution STEM imaging. The Model 2000 TEM Tomography Holder series includes specimen holders that allow high tilt and extended fields of view and are available in single-, dual- and on-axis versions.

FRONTIER SEMICONDUCTOR

fsm100@frontiersemi.com • www.frontiersemi.com

Key Products: Film Stress Measurement; Non-contact Sheet Resistance and Leakage Current Measurement; Substrate Thickness; Surface Roughness Measurement

Film Stress (Cryo, room and high temperatures up to 1100°C). Materials Characterization (low-k, Cu) for Stress Hysteresis, TDS, Film Shrinkage, and Quantitative Adhesion Testers. Ultrathin Wafer and Membrane Thickness, Surface Roughness and Warpage Measurements during/after background, chemical etch for bumped, patterned, bare wafers and MEMS. In line Gate Oxide Integrity (GOI) metrology and metal contamination (MC) for product wafers. Non-Contact Rs, leakage current for ultra shallow junctions (USJ). High spectral and high spatial resolution, production ready UV/VIS Raman Spectroscopy for Strain in Si, SOI, SiGe, STI and MEMS applications.

FUJIFILM DIMATIX, INC.

info@dimatix.com • www.dimatix.com

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

With the Dimatix Materials Printer (DMP), FUJIFILM Dimatix has advanced ink jetting to enable high-performance micro-precision deposition of a wide range of "inks"

tailor fit to specific applications. It is the industry's first low-cost, cartridge-based piezo ink jet printing system that enables direct deposition of fluids for proprietary research allowing faster and less expensive product development. The MEMS-based ink jet head coupled to a disposable cartridge allows researchers to deposit the materials they have synthesized today.

GATAN, INC.

info@gatan.com • www.gatan.com

Key Products: TEM and SEM Instruments; Nanotechnology Holders; Material Science EM Instruments

Gatan 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 engineers understand the application criteria of our customers and provide them with the right solutions. GATAN GETS IT!

HEATWAVE LABS INC.

techsales@cathode.com • www.cathode.com

Key Products: Substrate Heaters; Dispenser Cathodes; Ion Pumps and Controllers

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.

HITACHI HIGH TECHNOLOGIES AMERICA, INC.

emdwebsite@hitachi-hta.com • www.hitachi-hta.com/emd

Key Products: Scanning Electron Microscopes

Hitachi High Technologies America, a global leader serving the needs for material science and nanotechnology development, provides a wide array of advanced electron microscopes. Our product line-up includes Scanning Electron Microscopes (SEM), Transmission Electron Microscopes (TEM), Variable Pressure SEM (VP SEM), Field Emission SEM (FE SEM), Focused Ion Beam Systems (FIB) and the new TM-1000 Tabletop SEM (now available with EDS). Our customers can expect more experience, reliability and customer support when choosing Hitachi electron microscopes.

HORIBA JOBIN YVON, INC.

info@jobinyvon.com

www.molecularandmicroanalysis.com • www.JobinYvon.com

Key Products: Raman & EDXRF Spectrometers; Spectrofluorometers; Spectroscopic Ellipsometers; CCDs; End Point Detectors

HJY is a World Leading Manufacturer of high performance Spectroscopic Instrumentation for all techniques and applications from Research and Development to routine analysis. We manufacture Ellipsometers, End Point Detectors, Raman, EDXRF/XRF Spectrometers, Steady State and Lifetime Spectrofluorometers with both TCSPC and phase capability. We are proud leaders in important, increasingly demanding applications, and expanding techniques in biology, nanotechnology, pharmaceuticals, chemistry and semiconductors that require outstanding system performance. Systems are available for general laboratory research or customized to offer you Spectroscopic Solutions for your unique application. Our Applications Scientists are available to advise on any measurements—Ellipsometry for measuring film thickness and optical constants for all types of materials, End Point Detectors used for plasma analysis and trench depth monitoring, Steady-state and Lifetime Fluorescence, EDXRF (X-Ray Fluorescence Elemental Analysis), fast mapping, combined AFM/Raman, Raman/PL, Raman/FT-IR and process Raman, Photoluminescence, Cathodoluminescence and more.

HUNTINGTON MECHANICAL LABORATORIES, INC.

vacman@huntvac.com • www.huntvac.com

Key Products: Manipulations; Chambers; Positioning Devices

The industry's largest selection of vacuum valves, flanges, fittings, and feedthroughs is available when you need it at Huntington. Also available are a wide assortment of roughing components including flexible hoses, traps, thermocouple and ionization gauge tubes, sorption and jet roughing pumps. Standard, custom, or modified UHV positioning and motion devices can be provided to meet your special needs. Stainless steel custom chambers, tees, and crosses are supported by 35 years of

experience in vacuum chamber design and fabrication. Our electrical feedthrough product line has been dramatically increased. We also now offer a Pulse Laser Deposition System! See all of our products on our website at www.huntvac.com.

HVA, LLC

sales@highvac.com • www.highvac.com

Key Products: Gate Valves; Rectangular Valves; Pendulum Valves

HVA is the premier manufacturer of high and ultrahigh vacuum valves for the semiconductor, scientific, and high-technology industries. Gate valves and rectangular valves are constructed out of 304 Stainless Steel, vacuum furnace brazed at 1100°C at 10⁻⁶ for maximum joint integrity. Product line includes stainless-steel gate valves, 3-position valves, angle valves, complete throttle/isolation gate valve systems, stainless-steel/aluminum rectangular valves, pendulum valves, new rapid service lift valves for easy maintenance, and more.

HYSITRON, INC.

info@hysitron.com • www.hysitron.com



Key Products: TriboIndenter®, TS-Series TriboScope®, PI-Series TEM PicoIndenter®

As world leader in nanomechanical testing, Hysitron is dedicated to testing solutions for nanoscale mechanical characterization. Hysitron's instruments provide *in situ* SPM imaging in addition to mechanical property measurements including modulus, hardness, fracture toughness and wear resistance. Advanced techniques include nanoDMA® for viscoelastic materials and nanoECR™ enabling simultaneous current, voltage, force and displacement measurement. Stop by to view the new PI 95 PicoIndenter®, Hysitron's quantitative depth-sensing indenter capable of direct-observation testing in a TEM and let us show you that seeing is believing.

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; Micromanipulated Probe Systems

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, UHV-compatible systems, continuous-flow and Helium-3 cryostats, 4 K and 10 K closed-cycle refrigerators, dilution refrigerators, superconducting magnet systems and micro-manipulated probe stations. Our staff of physicists and engineers is on hand to tailor cryogenic systems to meet specific experimental requirements and budgets.

JASCO USA

sales@jascoinc.com • www.jascoinc.com

Key Products: Spectroscopy Instrumentation; Chromatography Instrumentation, Raman, RMP, FTIR Microscopy

2008 marks a major milestone for JASCO...50 years in business. JASCO specializes in analytical instrumentation in the areas of Spectroscopy and Chromatography and is experienced within the academic, pharmaceutical, biotechnology, and industrial markets worldwide; JASCO is an excellent choice for your laboratory needs. We offer a full line of reliable and robust instrumentation: Specializing in Raman including RMP, NFS 320 and 330, FT-IR Microscopy, FTIR, UV-Vis/NIR, Fluorescence, Circular Dichroism, Dissolution, FT-Raman, Polarimeters, SFE/SFC, HPLC, and X-LC (Extreme Pressure LC). JASCO is one of the few companies offering a single, cross platform software for our many different instruments.

JEOL USA, INC.

eod@jeol.com • www.jeolusa.com



Key Products: TEM; SEM; FIB; Sample Prep; AFM; E-beam; Ion Beam; FE-SEM; LV-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 novel mass spectrometers and NMR spectrometers.

KLA-TENCOR CORPORATION

info@kla-tencor.com • www.kla-tencor.com

Key Products: Surface Metrology, P-16 Profiler; Alpha Step IQ, HRP 340

At KLA-Tencor's SMD product group, our market segments span semiconductor and data storage manufacturing, MEMS, optoelectronics, material science and general scientific research—a range of industries that measure surface topography to control their process. SMD's products range from benchtop stylus profilers used in research environments to automated high resolution profilers for advanced IC production fabs.

KOBE STEEL LTD.

www.kobelco.co.jp/technobook/p238_e.htm

Key Products: Surface Analyzer System; Accelerator; Ion Beam Equipment

Kobe Steel Ltd. has been developing the ion beam technology for twenty years. Based on the compact ion beam accelerator technology, the High Resolution Rutherford Back Scattering Spectrometry system (HRBS-V500) is a 500 kV accelerating voltage-class surface-analyzing system which is brought to the market. Using the High Resolution RBS analyzing method, surface analyzing toll service can be available.

KSV INSTRUMENTS, INC.

info@ksvnc.com • www.ksvnc.com

Key Products: Langmuir Blodgett Instruments; Interfacial Shear Rheometer; Contact Angle Meters

KSV Instruments manufactures instruments for research and analysis of Contact Angle and Surface Tension as well as Langmuir Blodgett Instruments, a Quartz Crystal Microbalance, SPR, a PM-IRRAS, Interfacial Shear Rheometer and other LB characterization instruments. Surface Science and Nanotechnology application can benefit from the KSV extensive application experience and innovative instruments.

KURT J. LESKER COMPANY

sales@lesker.com • www.lesker.com

Key Products: Vacuum Components; Deposition Materials; Deposition Systems

Stop by our booth to discuss your materials research challenges. We offer systems, components and services for a wide variety of materials research related activities including: target bonding of ceramics, oxides and metals; magnetron sputtering; e-beam evaporation; organic materials evaporation; and Atomic Layer Deposition (ALD). Request a copy of our 900-page vacuum products catalog and reference guide.

LAKE SHORE CRYOTRONICS, INC.

info@lakeshore.com • www.lakeshore.com



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

Lake Shore manufactures cryogenic, closed cycle refrigerator-based, electromagnet 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 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.

LAMBDA AMERICAS

sales@lambda.com • www.lambda-hp.com

Key Products: Programmable AC/DC Power Supplies; Programmable High Voltage Capacitor Charging Power Supplies

Genesis™ programmable AC/DC power. 750 W to 15 kW, Outputs 7.5 to 600 VDC, current to 1000 A. Worldwide Inputs. RS-232/485 Standard. Common family controls. Now with LXI-C LAN Interface option. Flexible, reliable power for critical test and measurement systems. ALE systems division is the most experienced designer and manufacturer of high voltage capacitor charging power supplies. The wide range of output voltages (1–65 kV) and power levels (500 J/sec to 30 kJ/sec) available from a single supplier is unique.

MDC VACUUM PRODUCTS, LLC

sales@mdcvacuum.com • www.mdcvacuum.com

MDC and ISI stock thousands of off-the-shelf components and provide the widest product range of high and ultrahigh vacuum components in the industry. Both product lines are detailed in our catalogs and on our technically based websites. MDC products consist of flanges, fittings, valves, roughing hardware, vacuum gauge tubes, motion and manipulation instruments, thin film electron-beam evaporation systems, and surface science chambers. ISI products include Multi-pin, Low/high current power, Coaxial, liquid, Thermocouple and RF Feedthroughs, Optical viewports and Vacuum breaks and envelopes. MDC and ISI are ISO 9001:2000 registered companies.

MINUS K TECHNOLOGY

sales@minusk.com • www.minusk.com

Key Products: Vibration Isolation

Minus K Technology is the leader in high-performance vibration isolation. We guarantee 1/2 Hz natural frequencies vertical and horizontal. Our isolators perform 10 times better than top-performance air tables. They are also superior to higher priced active or electronic cancellation systems. By utilizing negative stiffness mechanisms, the need for an air supply is eliminated. The isolators are very compact and portable.

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, magnetoresistivity, 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.

MTI CORPORATION

info@mtixtl.com • www.mtixtl.com

Key Products: Single Crystal Substrates; Tube and Box Furnaces; Polisher and Diamond Saw

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.

MTS NANO INSTRUMENTS

nano@mts.com • www.mtsnano.com

Key Products: InSEM™ *In-situ* Nanomechanical Testing Tools; Nano Indenter Product Series; TestWorks 4 Software

MTS Nano Instruments is pleased to announce the InSEM™ series of *in-situ* nanomechanical testing tools for FEI Quanta™ scanning electron microscopes. Observing deformation as it occurs is now a possibility with the InSEM series of tools. Powered by our industry-leading TestWorks® software, InSEM tools offer a variety of experimental control options. We invite you to stop by our booth for discussion of your research or to view a demonstration of how our TestWorks software can support your initiatives in materials science. MTS Nano Instruments—tools for materials scientists developed by materials scientists.

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.

NANOINK, INC.

info@nanoink.net • www.nanoink.net

Key Products: NSCRIPTOR™ DPN® System; 2D nano PrintArray™; Just Add DNA™

NanoInk is an emerging growth technology company specializing in nanometer-scale manufacturing and application development for the life science and materials industries. With Dip Pen Nanolithography® (DPN®) technology and tools, NanoInk is able to offer customers innovative solutions for precision nanoscale deposition using a variety of materials to create nanoscale features on diverse surfaces. The NSCRIPTOR™ is a complete turnkey DPN system with optimized hardware, software, and enabling consumables.

NANONICS IMAGING LTD.

info@nanonics.co.il • www.nanonics.co.il

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

Ultimate resolution AFM/NSOM/SPM systems hallmarked by transparent optical and electron/ion beam integration. On-line microRaman, confocal, SEMs, TEMs, FIBs, 10°K operation. Optically transparent AFM probes surpassing nanotube profiling/deep trench capabilities, glass insulated electrical, Nanoheater™ thermal conductivity, electrochemical, AFM-controlled gas and liquid nanochemical deposition. Visit us and see the first multiprobe SPM system! Up to 4 probes.

NATIONAL ELECTROSTATICS CORP.

nec@pelletron.com • www.pelletron.com

Key Products: MeV Ion Beam Systems; High Resolution RBS; AMS; RBS; PIXE; NRA

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.

NEOCERA, LLC

sales@neocera.com • www.neocera.com

Key Products: Pulsed-Laser Deposition; Pulsed Electron Deposition

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 now a world leader in the manufacture, application, and support of Pulsed Laser Deposition (PLD) and Pulsed Electron Deposition (PED) systems for research and production applications. Neocera also offers complex oxide thin films on a foundry basis.

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.

NOR-CAL PRODUCTS, INC.

ncsales@n-c.com • www.n-c.com

Key Products: Custom Vacuum Chambers and Components; Valves and Traps; Flanges and Fittings

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.

OLYMPUS INDUSTRIAL AMERICA INC.

sales@olympusindustrial.com • www.olympusmicroimaging.com

Key Products: Inverted Metallographs; Upright Microscopes; Stereo Microscopes
Olympus Industrial America's Micro-Imaging division, based in Orangeburg, New York, is responsible for sales and service of the complete range of Olympus microscopy products for use in industrial applications from production and inspection to research and quality control. Complementing our line of materials analysis microscopes will be a range of digital cameras and Discover Series modular software packages. You will be impressed with the speed and accuracy of our software and cameras when archiving images, taking measurements/particle sizing or generating reports. Feel free to bring a sample to our booth to see the quality of Olympus Micro-Imaging products.

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.



OXFORD INSTRUMENTS

info@ma.oxinst.com • www.oxford-instruments.com

Key Products: Optical Spectroscopy; Materials Characterization; EBSD

Oxford Instruments, with over 40 years of experience, is the world's leader in research and analytical instrumentation. Visit our booth to see the latest in superconducting magnet, cryogenic/variable temperature control technologies and cryogenic high vacuum pumps. We offer a range of analytical accessories for electron microscopy, including a range of EDX, WDX and EBSD detectors and analyzers, plus micro-manipulators and high precision stages. Oxford Instruments Pro-Serve has a global distribution and support organization with an emphasis on exceptional customer support.

PACIFIC NANOTECHNOLOGY, INC.

sales@pacificnano.com • www.pacificnano.com

Key Products: Atomic Force Microscopes

Pacific Nanotechnology, Inc. provides products and services which facilitate advancements in Nanotechnology and Nanoscience. Our Atomic Force Microscope (AFM) products are optimized for research, product development and process control applications when visualization and measurement of nanometer-sized surface structure is critical. Pacific Nanotechnology offers high performance, easy to use, versatile AFM products. The new Nano-DST™ is the ultimate AFM research platform.

PANALYTICAL INC.

amec.info@panalytical.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: Scanning Probe Microscope; Atomic Probe Microscope

Park Systems (formerly PSIA) is a leading Atomic Force Microscope (AFM) manufacturer. Park Systems XE-series product innovation and reliability are derived from its rich history and long standing experience in the AFM industry. Our products are key enablers to the growing Nanotechnology industry. The XE-series AFM tools are routinely used to image and measure nanoscale features day-in and day-out at multiple institutions and companies around the globe. Park Systems is committed to grow with the markets needs as our mission is "to become the global leader of nanoscale measurements and systems through technology innovation."



TED PELLA, INC.

sales@tedpella.com • www.tedpella.com

Key Products: Vacuum Coaters; Calibration; Sample Preparation 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. New products are 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, AFM, Raman light microscopy and nanotechnology.

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 in a number of high technology fields including: 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. For additional information visit our website at www.phi.com.

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.

PVD PRODUCTS, INC.

sales@pvdproducts.com • www.pvdproducts.com

Key Products: Sputtering Systems and Sources; Pulsed Laser Deposition Systems; Evaporation Systems

PVD Products sells a complete line of thin film deposition tools including magnetron sputtering, pulsed laser deposition, thermal and electron beam evaporation systems for both R&D and prototype production applications. We manufacture custom components such as magnetron sputter sources, substrate heaters, target manipulators, and optical trains and unique components for coated-conductor applications. PVD also provides thin film deposition, SEM, and EDS services.

Q-SENSE, INC.

info@q-sense.com • www.q-sense.com

Key Products: E4 System; E1 System; Sensor Crystals

Q-Sense offers a new sensor technology—Quartz Crystal Microbalance with Dissipation monitoring (QCM-D), an *in situ*, real time technology for the study of mass and viscoelastic changes at the liquid/solid interface or in thin films. Processes that have been published include DNA hybridization, several aspects of protein/lipid/cell/bacterial adsorption/adhesion, protein-protein interactions, cross-linking and phage display. Water content information, substrate, flexibility and conformational information are major advantages with the QCM-D technology. For more information, please visit www.q-sense.com.

QUANTUMCLEAN

www.quantumclean.com

Key Products: Semiconductor; Nanotechnology; Solar

QuantumClean (Quantum Global Technologies, LLC) is the leading provider of outsourced parts cleaning, process tool part restoration, surface treatment and analytical engineering services for Semiconductor, Nanotechnology, Solar and other high-tech industries. The company operates technologically innovative cleaning centers in every major semiconductor market across the U.S. and Asia.

RAITH USA, INC.

ebeam@raithusa.com • www.raithusa.com

Key Products: Electron Beam Lithography; Ion Beam Lithography; Semiconductor Navigation Software

We supply and support lithography solutions for the world's leading nanotechnology facilities. The Raith catalog includes lithography attachments for SEMs or FIBs and complete turnkey systems with full wafer and mask handling capabilities. Our newest products are the *ionLINE* Ion Beam Lithography and *Raith 150^{TWO}* Electron Beam Lithography systems. Both models have a full complement of options for nano-engineering research.

RENISHAW INC.

usa@renishaw.com • www.renishaw.com

Renishaw Raman Microscopes provide chemical information at a spatial resolution of less than 1 micron. Renishaw's spectrometers perform from 244 nm to 830 nm, analyze to within 10 cm⁻¹ of the laser line and include direct 2-D Raman and photoluminescence imaging. Process and Forensic Raman Spectrometers interface options include optical, AFM and SEM microscopes.

RF VII INC.

rfvii@yahoo.com • www.rfvii.com

Key Products: RF Generators; Matching Networks; RF Accessories

RF VII Inc. manufactures quality RF equipment for use in Analytical, Medical, Induction Heating, Semiconductor, Annealing, and Coating processes. We offer RF Generator power levels to 2000 watts with frequency bands of 13.56, 27.12, and 40.68Mhz. Our Autotuners are direct coupling LC networks for maximum impedance range, whether capacitive or inductive. We offer repair on many different brands of existing RF Equipment with quick turnaround for our production environment customers. Our commitment is to the customer and their requirements in RF related concerns, offering phone and on-site assistance for RF service, coupling and control of their source process.

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.

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 of 100 mm to 300 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. of very 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.

SONO PLOT, INC.

info@sonoplot.com • www.sonoplot.com

Key Products: Picoliter Fluid Dispensers; Functionalized Substrates

SonoPlot designs and sells picoliter-scale ultrasonic fluid dispensing systems, ultrasonic surface height calibration sensors, and chemically functionalized substrates. SonoPlot's products are aimed at applications such as biological microarrays, polymer-based and printable electronics, embedded passive components, and semiconductor packaging.

SPECS SCIENTIFIC INSTRUMENTS, INC.

support@specs.com • www.specs.com

Key Products: Surface Analysis; AFM/STM; PEEM; LEEM

Bio and Nano Technology, NanoAnalysis, NanoManipulation, NanoSpectroscopy, NanoMotion, Digital Robotics, GC/MS LC/MS, Surface Analysis Instruments and Materials Deposition Equipment for XPS, STM, AFM, LT-STM, MBE, CVD, ALD, OLED, PLD, 3D Laser Atom Probe, LEED, EELS, UPS, Auger, ESCA, SIMS, SNMS, PEEM, LEEM, KELVIN-Probe, RHEED, E-Beam Evaporation, Effusion Cells, Plasma Atom/Ion Sources, Magnetron Sputter Deposition, Bio-Organic Injectors, Beamlines, Monochromators, and Synchrotron Equipment.

SPECS USA CORP.

sales@specsus.com • www.specsinstruments.com

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.

SPEX SAMPLEPREP LLC

sampleprep@spexcorp.com • www.spexcorp.com

Key Products: Mixer/Mills; Katanax Automated Electric Fluxers; Ball Mills

SPEX SamplePrep provides products for grinding and pulverizing even the toughest samples. These include high-energy ball mills, swing mills, and cryogenic mills. Over the past few decades, the SPEX SamplePrep Mixer/Mill, widely known as the "SPEX Mill," has become the industry standard for mechanical alloying applications. The high energy of the milling action, and the durability of the motor, allow running for extended periods. We're also known for our Freezer/Mill, the only "True Cryogenic Mill."

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

exhibits-ny@springer.com • www.springer.com

Key Products: Books; Journals; Periodicals

Springer is one of the world-leaders in Engineering book publishing, boasting a broad range of subject matter, and a history of working with the most prestigious scholars in the field. Additionally, Springer publishes an astute collection of Journals, with a track record of generating the latest sought after content. For additional information about all our engineering publications, please stop by our booth, or visit us at Springer.com.



ULVAC TECHNOLOGIES, INC.

sales@ulvac.com • www.ulvac.com

Key Products: IR Furnaces; Thermal Diffusivity; Thermal Conductivity Equipment

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.



STAIB INSTRUMENTS, INC.

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

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.

sales@svta.com • www.svta.com

Key Products: MBE, ALD, PLD, UHV Sputtering, RF Plasma, *In-Situ* Monitoring

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.

THE ROYAL SOCIETY

www.publishing.royalsociety.org

Key Products: Scientific Journals

The Royal Society publishes three journals of interest to materials scientists. All are available in print and online. *Philosophical Transactions A* publishes topical themed issues, each one dedicated to a specific area of the physical sciences (publishing.royalsociety.org/philttransa). *Proceedings A* publishes high quality research papers and reviews (publishing.royalsociety.org/proceedingsa). And *Interface* publishes high quality articles at the interface of the physical and life sciences (publishing.royalsociety.org/interface). Edited by Sir William Bonfield, CBE, FRS, it is particularly strong in biomaterials.

TRANSFER ENGINEERING & MANUFACTURING, INC.

team@transferengineering.com • www.transferengineering.com

Key Products: Wafer Transfer Systems, HV/UHV Magentic 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 MASCO, TEAM-Mate and CAROUSEL MESC-compatible wafer transport systems, heating/cooling assemblies and motion and placement systems.

VALQUA AMERICA, INC.

info@valqua-america.com • www.valqua-america.com

Key Products: High Performance Seals; Fluoropolymer Products; Metal Seals & Bellows

For over 70 years, VALQUA has been fulfilling the needs of leading edge applications for sealing technology. VALQUA seals offer "Yield Improvement" by enabling "High Performance" at "Low Cost" that is supported by its outstanding R&D capability which meets the advanced semiconductor manufacturing challenges. VALQUA ARMOR series of O-rings are very clean—no particle generation, plasma resistant, heat resistant, low outgassing, and low adhesion for your dynamic and static locations.

VARIAN, INC.

vtl.customer.service@varianinc.com • www.varianinc.com/vacuum

Key Products: Vacuum Pumps; Vacuum Instrumentation; Leak Detectors

Varian, Inc. is a world leader in providing total vacuum solutions. Product offerings include primary, high and ultra-high vacuum pumps, vacuum gauges, valves and fittings, and leak detectors for all applications. Varian offers unique expertise in applications, support, and system design to integrate these superior components into optimized vacuum solutions.



VEECO INSTRUMENTS INC.

info@veeco.com • www.veeco.com

Key Products: Atomic Force Microscopes; Optical Profilers; Stylus Profilers; Epitaxial Equipment

Veeco's complementary thin-film technologies, metrology tools, and world class probes facility make it the industry's most complete equipment supplier. Our scanning probe microscopes and optical/stylus profilometers are used in research facilities and industrial settings for materials sciences, polymer studies, thin films, MEMS/NEMS, biomaterials and life sciences. We are also the only company offering both MBE and MOCVD technologies for the research, development and production of compound semiconductor devices. Veeco's performance fuels our customers' success.



WITEC INSTRUMENTS CORP.

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

Key Products: Confocal Microscopy; Scanning Near-Field; Raman AFM

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.

