



April 4-8, 1994
San Francisco Marriott Hotel
San Francisco, California

Meeting Chairs:

James M.E. Harper, IBM T.J. Watson
Research Center

Alan J. Hurd, Sandia National Laboratories
James E. Mark, University of Cincinnati

The 1994 MRS Spring Meeting offers 23 topical symposia, packed with 2,500 oral and poster presentations. Amorphous Silicon and Better Ceramics through Chemistry are the largest symposia, each with over 200 abstracts. Symposia on Wide-Bandgap Semiconductors, Polycrystalline Thin Films, High Temperature Superconductors, Ultrafine/Nanostructured Materials, and Theory and Simulation will also offer a substantial number of presentations. Some smaller symposia introduce topics new to MRS meetings, such as Flat Panel Displays and Materials for Musical Instruments. Also, permeating the meeting across symposium lines are environmental and manufacturing themes. See the session matrix on the following pages for a list of all symposia and session titles.

Symposium W, Theory and Simulation of Time-Dependent Processes in Materials, brings the topics of modeling and simulation to bear on many materials issues, from surface diffusion to fracture. Simulation tools are now capable of doing useful computations on enough atoms to resemble real materials. This marks a watershed beyond which simulation may replace some experiments.

A new cluster of symposia (K, L, M, and P) addresses display-related topics, including Liquid Crystal Polymers, Electroluminescent Polymers, Flat Panel Display Materials, and Scintillator and Phosphor Materials. Related sessions in Symposium A include a review of tech-

nology on flat panel displays in Japan. On Wednesday, M. Hack (Xerox PARC) will address active-matrix liquid crystal displays in an authoritative review for non-specialists in Symposium X.

Materials manufacturing is woven into several symposia. Moving amorphous silicon R&D to manufacturing is the theme of session A1/M1. Session B1 addresses manufacturing challenges associated with interconnects—the key to continued size reduction of electronic circuits and higher speed computers. A panel will discuss temperature measurement in rapid thermal processing in session G1. Emerging technologies and technology transfer are the focus of the leading sessions of Symposium O on Microwave Processing.

The interplay of materials and the environment appears in several formats. Symposia I and J directly cover Environmental Protection and Environmental Sciences, respectively. Waste remediation is covered in Symposium O (using microwave processing) and in Symposium R (using ceramic membranes for high temperature separation of gases). Also a panel discussion (see Special Features) will focus on the impact of automotive materials on the environment.

A symposium with a new tune for MRS is Symposium Q, Materials for Musical Instruments. Manufacturing and environmental issues are particularly important for the music instrument industry as international competition increases and suitable replacements are sought for increasingly rare Sitka spruce (pianos), Brazilian rosewood (guitars), and African mpingo (clarinets). Symposium X speaker, Thomas D. Rossing from Northern Illinois University will introduce the role of physics and materials in musical instruments in his Symposium X overview talk on Wednesday, April 6.

Fullerenes, foams, diamond, and even interstellar dust will be covered in Symposium T, Novel Forms of Carbon. Presentations about one-dimensional carbon, ionic properties of hydrogenated and fluorinated fullerenes, and a process to enable rapid deposition of diamond on large substrates are all slated for this symposium.

A group of symposia—B (Advanced Metallization), C (Materials Reliability in Microelectronics), and H (Polycrystalline Thin Films)—brings together many contributions on the role of microstructure of metal thin films in electronics. Symposium B includes a session on chemical-mechanical polishing, an emerging process of importance to the microelectronics industry.

Other symposium topics include Rapid Thermal and Integrated Processing, Compound Semiconductor Epitaxy, Epitaxial Oxide Thin Films, and Inter-metallic Matrix Composites.

Special Features

The Outstanding Young Investigator (OYI) Award and the Graduate Student Awards will be presented Monday evening, April 4, followed by the plenary presentation by James F. Gibbons from Stanford University on "Lessons from the History of Silicon Valley: Start-Ups and Strategic Alliances." The recipient of the OYI Award will give a special talk on Monday at noon. The Turnbull Lecture (awarded at the 1993 Fall Meeting) will be given on Wednesday, April 6 by Morris Cohen from MIT on "Societal Issues in Materials Science and Technology."

On Tuesday, April 5 a noontime panel discussion will feature Environmental Impact of Automotive Materials. The session will begin with presentations by speakers from Ford Motor Company, General Motors Research Laboratories, and Exxon Research and Engineering Company. Issues surrounding automotive materials include life-cycle analysis, control of emissions, alternative propulsion (electric propulsion, fuel cells, batteries), recycling, weight reduction, safety, fuel efficiency, and federal programs relating to the "clean car" and the 80 mpg car.

A noontime forum will be held Thursday on the Changing Federal Initiatives for Materials Science Programs. It will focus on the ramifications of President Clinton's newly chartered National Science and Technology Council. The NSTC supersedes and expands the role of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET). FCCSET formulated interagency Presidential Initiatives; the ones most relevant to materials are the Advanced Materials and Processing Program (AMPP) and the Advanced Manufacturing Initiative (AMI).

The Spring Meeting will also offer short courses and tutorials related to symposium topics, authoritative lunchtime reviews for nonspecialists, an extensive equipment exhibit, a job placement bulletin board, three evening poster sessions, a student mixer, and other auxiliary events. For further details about the meeting see the 1994 MRS Spring Meeting Program, which will be mailed to all MRS members. If you need a program or would like to register, call or fax the MRS Meetings Department (412) 367-3003; fax (412) 367-4373.

MRS

MRS 1994 SPRING MEETING SESSION LOCATOR

Symposium	Location	Monday, April 4			Tuesday, April 5		
		a.m.	p.m.	eve.	a.m.	p.m.	eve.*
A. Amorphous Silicon Technology - 1994	Golden Gate C2				A1/M1: R&D Manufacturing A2/M2: Flat Panel Display Materials	A3: Plasmas and Films A4: Deposition Studies	
B. Advanced Metallization for Devices and Circuits	Golden Gate A1	B1: Manufacturability	B2: Chem-Mechanical Polishing		B3: Copper Interconnection Metallization	B4: Diffusion Barriers/Cu B5: Diffusion Barriers/Al	
C. Materials Reliability in Microelectronics IV	Golden Gate A3				C1: Stress in Semiconductors C2: Stress: Techniques	C3: Stress in Metals C4: Stress and Electromigration	
D: Wide-Bandgap Semiconductors	Sunset A/B		D1: Surfaces and Surface Preparations		D2: Devices and Device Processing	D3: Diamond Growth	Posters D4
E. Compound Semiconductor Epitaxy	Golden Gate C3	E1: Material Issues and Modeling	E2: Selective-Area and Pattern Growth E3: Nanoprobes		E4: Wide Bandgap II-VI - Based Heterostructures	E5: II-VI Compound Semiconductors	
F. Epitaxial Oxide Thin Films and Heterostructures	Golden Gate B1				F1: Epitaxial Oxides	F2: Dielectric Oxide Thin Films	
G. Rapid Thermal & Integrated Processing III	Golden Gate B3		G1: Temperature Measurement		G2: RTCVD I - SiGe G3: Novel Applications of RTP	G4: RTP for Metallization	
H. Polycrystalline Thin Films	Golden Gate A2	H1: Microstructural Evolution in Thin Films	H1: Microstructural Evolution in Thin Films		H2: Interphase Interfaces and Grain Boundary	H3: Polycrystalline Thin Films	
I. Environmental Protection	Sunset C				I1: Environmental Protection	I2: Environmental Protection	
J. Environmental Sciences	Sunset C	J1: CO ₂ Chemistry	J2: Exhaust Gas Conversion				
K. Liquid Crystal Polymers	Marina A	K1: Theory, Computation and Application	K2: Molecular Design and Synthesis		K3: Polymer Dispersed Liquid Crystals	K4: Characterization	
L. Electroluminescent Polymers	Marina C	L1: Electroluminescent Polymers	L1: Electroluminescent Polymers				
M. Flat Panel Display Materials	Golden Gate C2				M1/A1: R&D Manufacturing M2/A2: Flat Panel Display Materials	M3: Poly Si TFT Technology	
N. Better Ceramics Through Chemistry VI	Presidio	N1: Precursor Chemistry N2: Novel Chemical Routes for Oxide & Non-Oxides	N2: Novel Chemical Routes for Oxide & Non-Oxides		N3: Hybrid-Organic Inorganic Materials & Composites	N4: Design & Processing of Advanced Ceramics	Posters N5
O. Microwave Processing of Materials IV	Sunset E/F	O1: Emerging Technology	O2: Technology Transfer O3: Alternative Microwave Sources		O4: Microwave Nondestructive Testing	O5: Dielectric Properties Measurements	
P: Scintillator and Phosphor Materials	Marina A						
Q. Materials in Musical Instruments	Golden Gate C1						
R. Materials for Separation Technology	Sunset D	R1: Microporous Inorganic Membranes	R2: Polymeric Membranes		R3: Sol-Gel Derived Inorganic Membranes	R4: Dense-Microporous Inorganic Membranes	
S. High Temperature Superconductors	Golden Gate B2	S1: High Tc Wire Development	S2: High Tc Wire Development		S3: High Tc Bulk Research	S4: High Tc Bulk Research	Posters S5
T. Novel Forms of Carbon II	Nob Hill/Russian Hill	T1: Novel Allotropes/Exoatmospheric Carbon	T2: Fibers, Foams & Films		T3: Fullerenes and Nanotubes I	T4: Fullerenes and Nanotubes II	
U. Intermetallic Matrix Composites III	Golden Gate C1	U1: Overviews and Processing	U2: Fibers for IMCs		U3: Ti Aluminide and MoSi ₂ Composites	U4: NiAl Composites	
V. Nano-Structured Materials	Potrero Hill/Telegraph Hill		V1: Clusters, Metals and Structural Materials		V2: Electronic and Magnetic Materials	V3: Self-Assembly, Bio/Molecular Engineering	
W. Time-Dependent Processes in Materials	Marina D/E/F	W1: Diffusion and Surface Effects	W2: Composite Materials W3: Ceramics Materials		W4: Diffusion and Surface Effects	W5: Dislocations in Metals W6: Microscopic Links to Macroscopic Properties	Posters W7
X. Frontiers of Materials Research	Sunset A/B		X1				

*Evening posters in Presidio Room

Wednesday, April 6			Thursday, April 7			Friday, Apr. 8	
a.m.	p.m.	eve.*	a.m.	p.m.	eve.*	a.m.	p.m.
A5: Modified Bandgap Materials I A6: Modified Bandgap Materials II	A7: Characterization Approaches A8: Defect Metastability	Posters A9	A10: Thin Film Transistors A11: Hydrogen's Role	A12: Solar Cells A13: Electrical Transport	Posters A14	A15: Sensors, etc. A16: Defects and Doping	
B6: Contacts to GaAs	B7: Contacts to InP B8: Novel Schemes on Semiconductors		B9: Silicides	B10: Electro- and Stress-Migration B11: Refractory Metals	Posters B12	B13: Metal on Polymer Dielectrics/Glass/Ceramics B14: Characterization	
C5: Electromigration	C6: Realistic Interconnect Structures C7: Electromigration & Stress Migration		C8: Electromigration & Microstructure C9: Microstructure	C10: Polymers: Stress and Techniques	Posters C11	C12: Thin Polymers C13: Coatings	C14: Gate Oxidation
D5: BN and SiC Epitaxial Growth	D6: Nitride Epitaxial Growth		D7: Doping, Impurities and Properties	D8: Defects	Posters D9	D10: Contacts and Bulk Growth	
E6: Dopants and Traps E7: Chemical Beam Epitaxy/Metal-Organic MBS	E8: Processing and Novel Techniques		E9: Strained and Relaxed Structures E10: In Situ Production Issues	E11: Epitaxy for Devices			
F3: Optical Oxide Thin Films	F4/S7: Thin Films of High Tc Oxide	Posters F5/S8	F6: Ferroelectric Thin Films	F7: Titanate Thin Films			
G5: Dielectrics I	G6: RTCVD and Integrated Processing II G7: Rapid Thermal Annealing I		G8: Dielectrics II G9: Rapid Thermal Annealing II	G10: RTP Modeling and Equipment Issues			
H4: Thin Film Magnetic Media	H5: Magnetic Multilayers	Posters H6	H7: Polycrystalline Dielectric Thin Films	H8: Polycrystalline Metallization	Posters H9		
I3: Environmental Protection	I4: Environmental Protection		I5: Environmental Protection	I6: Environmental Protection			
M4: AMLCD Materials and Processes	M5: Emissive Displays	Posters M6					
N6: Sol-Gel Optics and Electronics	N7: Non-Oxides	Posters N8	N9: Porous Materials	N10: Nano-Scale Materials		N11: In Situ Studies of Structural	N12: Biological Perspectives
O6: Simulation and Modeling	O7: Waste Remediation O8: System Design O9: Microwave Interactions	O10: Microwave Processing Systems	O11: Microwave Processing of Materials	O12: Microwave Plasma Processing O13: Microwave Joining	Posters O14	O15: Microwave Processing of Polymers	
P1: Materials & Applications	P2: Cross Luminescence and Scintillation	Posters P3	P4: Scintillation Processes and Modeling	P5: Phosphors and Materials Preparation		P6: Plastics and Glasses	P7: Radiation Damage
Q1: Strings I	Q2: Strings II	Q3: Panel Discussion	Q4: Woodwinds Q5: Brass	Q6: Pianos Q7: Percussion			
R5: Adsorbents	R6: Inorganic Membranes						
S6: Metals, Superlattices, Multilayers & Diagnostics	S7/F4: Thin Films of High Tc Oxide	Posters S8/F5 S9	S10: TBCCO, MOCVD and Large Area Films	S11: Microwave, Field Effect and Hybrid Devices	Posters S12 S13	S14: Josephson Devices	
T5: Fullerenes and Nanotubes III	T6: Fullerenes and Nanotubes IV	Posters T7	T8: Diamond I	T9: Diamond II		T10: Diamond-Like Materials	
U5/W8: Intermetallic Materials							
V4: Self-Assembly, Bio/Molecular Engineering	V5: Sol-Gel and Polymer Materials	Posters V6	V7: Characterization and Modelling	V8: Vapor Deposition and Si Particles		V9: Synthesis and Properties VII	
W8/U5: Intermetallic Materials W9: Glass and Ionic Materials	W10: Deformation Processes in Metals	Posters W11	W12: Fracture	W13: Semiconductor Materials	Posters W14	W15: Dislocations in Semiconductor Materials W16: Polymeric Materials	
	X2						



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MRS 1994 SPRING MEETING GENERAL INFORMATION

Location/Lodging
San Francisco Marriott Hotel
55 Fourth Street
San Francisco, CA 94103
(800) 228-9290 Nationwide
(415) 896-1600 Direct
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For alternative housing information, you may also contact Giselle's Travel Bureau.

MRS meeting attendees receive the following travel benefits and services:

Lowest fares on any airline guaranteed • Free flight insurance of \$100,000 • Computerized driving instructions from major U.S. airports • Car rental savings • Vouchers for discounts on vacation packages

ONE MRS 1994 SPRING MEETING ATTENDEE WILL WIN TWO (2) FREE AIRLINE TICKETS TO ANYWHERE IN THE 48 CONTIGUOUS STATES. To be eligible: You, your travel agent, or your in-house travel department must make your reservations through Giselle's Travel Bureau.

**DEADLINE FOR HOTEL RESERVATIONS:
MARCH 4, 1994**

A block of rooms has been reserved for MRS meeting attendees at the San Francisco Marriott Hotel (30 minutes from the San Francisco International Airport). When making your reservations, mention the Materials Research Society to receive the special rates.

Travel Arrangements

The official travel management company for the Materials Research Society's 1994 Spring Meeting is **Giselle's Travel Bureau**. They will guarantee the lowest fares on any airline at time of booking.

Call 800-523-0100 and ask for MRS Group 001
Monday-Friday, 7:30 a.m.-5:30 p.m. PST
Fax (916) 565-0936 or 1-800-878-5329

Local Transportation

The San Francisco Airporter service between the airport and downtown San Francisco hotels is \$8 one way, or \$14 round trip. Cab fares are approximately \$28 each way.

Parking

Parking at the San Francisco Marriott is \$24 per day (valet only). Public parking is available within easy walking distance of the hotel at an average cost of \$11 for 24 hours.

MRS SHORT COURSE AND TUTORIAL PROGRAM

MRS will present its popular Short Course and Tutorial Program at the 1994 Spring Meeting, featuring a number of courses never before offered by MRS on the West Coast. The diverse array of short courses and tutorials includes:

Characterization of Materials

C-07 Amorphous Silicon Materials and Devices for Large Area Electronics

Instructors: Robert A. Street and Michael G. Hack

C-18 TEM Specimen Preparation in the Physical Sciences

Instructor: Ronald M. Anderson

C-28 IC Failure Analysis: Failure Mechanisms and Analytical Techniques

Instructors: Giorgio Riga and Alton D. Romig, Jr.

C-31 Super-Resolution Imaging and Spectroscopy with Near-Field Scanning Optical Microscopy (NSOM)

Instructors: Hans Hallen and Mehdi Vaez-Iravani

Preparation of Materials

P-14 Film Formation, Adhesion, Surface Preparation, and Characterization of Thin-Film Structures

Instructor: Donald M. Mattox

P-26 Metallization for Devices, Circuits, and Packaging and in Multilayer Schemes for VLSI and ULSI

Instructor: Shyam P. Murarka

Advanced Materials

M-17 Science and Technology of Nanostructured Materials

Instructor: Horst W. Hahn

M-18 Diamond Films: Growth and Properties

Instructors: Linda S. Plano, David L. Dreifus, and Robert J. Nemanich

M-19 Wide Bandgap II-VI Semiconductor Microstructures: Growth, Characterization, and Optical Devices

Instructor: Leslie A. Kolodziejski

Tutorial Program

MRS Tutorials are designed to inform individuals about subjects that are outside their immediate interest or to bring individuals "up to speed" in an area that they are newly entering.

TP-1 Transfer of Technology from R&D to Manufacturing

Instructors: Donald M. Mattox and Alton D. Romig, Jr.

TP-5 Light-Emitting Porous Silicon: Fabrication, Properties, and Device Applications

Instructor: Philippe M. Fauchet

TP-7 Electromigration

Instructor: James R. Lloyd

Registration Information

Call MRS Headquarters, (412) 367-3003, to request a copy of the short course brochure, information about student scholarships, and other special short course and meeting registration discounts.

Student Scholarship Program

Student scholarships are available for full-time graduate and undergraduate students. Application forms are available from MRS Headquarters. The application deadline is March 25, 1994.

On-Site Short Course Program

For detailed information about the MRS Short Course Program for presentation at your facility, contact: Short Course Office, Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15237-6006 Telephone (412) 367-3003 • Fax (412) 367-4373

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Please check category and enter amount in payment section below.

\$250 Member \$325 Nonmember

\$300 After March 25, 1994 \$375 After March 25, 1994

\$65 Student Member \$90 Student Nonmember

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Student registration will not be processed without proof of full-time student status (class schedule with student's name or signed letter from faculty advisor or registrar must be submitted at time of registration).

\$90 Unemployed/Retired (special application form available from MRS HQ to qualify)

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\$90 Short Course Attendee registered for at least two full course days

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Nonmember registration includes 12 months of complimentary MRS membership commencing July 1, 1994.

Symposium interest (please check all that apply):

A C E G I K M O Q S U W

B D F H J L N P R T V

Enter total here and in box below right. **TOTAL \$** _____

If you have already registered and paid and find that you are unable to attend, you must notify MRS IN WRITING of your request for a refund. **Refunds will be made upon receipt of written notice**, less a \$25 service charge. This service charge will be waived if you apply \$25 or more of this refund to any other MRS product or service. MRS will not honor requests made more than one calendar month after the close of the meeting.

B PROCEEDINGS (published after this meeting)

These rates apply only to meeting or short course attendees and MRS members. Nonmembers must contact MRS headquarters for prices.

	No. Copies	Total
A: Amorphous Silicon.....	\$54 x _____	= _____
B: Advanced Metallization.....	\$44 x _____	= _____
C: Materials Reliability in Microelectronics.....	\$44 x _____	= _____
D: Diamond, SiC, Nitride Wide-Bandgap Semicond..	\$37 x _____	= _____
E: Compound Semiconductor Epitaxy.....	\$44 x _____	= _____
F: Epitaxial Oxide Thin Films & Heterostructures.....	\$37 x _____	= _____
G: Rapid Thermal & Integrated Processing.....	\$38 x _____	= _____
H: Polycrystalline Thin Films.....	\$44 x _____	= _____
I: Environmental Protection.....	\$44 x _____	= _____
M: Flat Panel Display Materials.....	\$44 x _____	= _____
N: Better Ceramics Through Chemistry.....	\$45 x _____	= _____
O: Microwave Processing.....	\$37 x _____	= _____
P: Scintillator and Phosphor Materials.....	\$48 x _____	= _____
T: Novel Forms of Carbon.....	\$39 x _____	= _____
U: Intermetallic Matrix Composites.....	\$49 x _____	= _____
V: Ultrafine/Nanostructured Materials.....	\$48 x _____	= _____
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C JOURNAL OF MATERIALS RESEARCH 1994

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SHORT COURSES AND TUTORIALS

To preregister, check each short course/tutorial in which you wish to enroll. If you register for two or more short course days, you may attend the technical meeting for only \$90 (complete the Meeting Preregistration section at left).

After March 25, 1994, short course and tutorial registrations will be \$25 higher. Cancellations received by March 25, 1994, will be refunded less a service charge of \$25. There is no charge for transferring from one short course to another or from one tutorial to another.

D SHORT COURSES

Facilities registering three or more persons at the same time in one MRS Short Course receive a 20% discount for the third and all additional persons.

C-07 Amorphous Silicon Materials and Devices.....\$395

C-18 TEM Specimen Preparation.....\$495

C-28 IC Failure Analysis.....\$795

C-31 Near-Field Scanning Optical Microscopy.....\$395

P-14 Thin-Film Structures.....\$595

P-26 Metallization for Devices, Circuits, and Packaging/VLSI & ULSI....\$395

M-17 Nanostructured Materials.....\$395

M-18 Diamond Films: Growth and Properties.....\$395

M-19 Wide Bandgap II-VI SC Microstructures.....\$395

E TUTORIALS

TP-1 Transfer of Technology from R&D to Manufacturing.....\$125

TP-5 Light-Emitting Porous Silicon.....\$ 95

TP-7 Electromigration.....\$ 95

TOTAL SHORT COURSE/TUTORIAL TUITION \$ _____

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A Meeting Preregistration (from left) \$ _____

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C *Journal of Materials Research* (from above) \$ _____

D/E Short Courses/Tutorials (from above) \$ _____

TOTAL FEES PAID \$ _____

The Materials Research Society wishes to comply with the Americans with Disabilities Act by taking those steps necessary to ensure that no individual with a disability is excluded from participation in MRS meetings. If you have a disability requiring accommodation at the 1994 Spring Meeting, please attach a written description of your needs.

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San Francisco, California

MRS Exhibit

San Francisco Marriott Hotel Buena Vista & Sea Cliff Ballrooms Tuesday-Thursday, April 5-7, 1994

As part of the 1994 Spring Meeting, a major exhibit will be held to display analytical and processing equipment closely paralleling the nature of the technical symposia. The exhibit will be in the San Francisco Marriott Hotel. The technical program has been arranged to allow meeting participants ample opportunity to visit the exhibit.

Academic Press #614

525 B Street, Suite 1900
San Diego CA 92101
Contact: Karen Steele
Tel: 619-699-6774
FAX: 619-699-6580

New and classic titles include High Temperature Superconductors (Bourdillon), *Fundamentals of Ceramic Powder Processing* (Ring), *Molecular Nonlinear Optics* (Zyss), *Science and Technology of Rubber*, 2nd ed. (Mark et al.) and *Optical Characterization of Semiconductors* (Perkowitz). Sample copies of journals including the *Journal of X-Ray Science and Technology* are available in the booth. Discounts are offered on all books ordered at the meeting.

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Tel: 205-536-6576
FAX: 205-536-6590

CFDRC provides research and development services and advanced analysis software for: fluid flow, heat transfer, combustion, fluid-structure interaction, and scientific data visualization. We will be exhibiting the following computer codes: CFD-ACE (a general-purpose computational fluid dynamics code, CFD-VIEW (a 3D graphics and animation software, and CFD-FASTRAN (a CFD code for compressible viscous flows).

Chemagnetics #319

2555 Midpoint Drive
Fort Collins CO 80525
Contact: Richard Moore
Tel: 303-484-0428
FAX: 303-484-0487

Chemagnetics is a full line manufacturer of NMR spectrometer systems. The CMX line of systems features include solids, liquids and liquids microimaging capabilities. Chemagnetics also offers a complete selection of probes and magnets, with additional probes and magnets supplied by Nalorac™ and Oxford™.

CI Systems Inc. #216

5137 Clareton Drive
Suite 220
Agoura Hills CA 91301
Contact: Michael E. Adel
Tel: 818-865-0402
FAX: 818-865-0403

CI Systems develops and markets electro-optical measure-

Exhibit Hours

Tuesday noon-7:00 p.m.
Free Reception 5:00 p.m.-7:00 p.m.
Wednesday 9:30 a.m.-5:00 p.m.
Thursday 9:30 a.m.-2:00 p.m.

Coffee will be available during morning and afternoon breaks in the Exhibit area, Tuesday afternoon through Thursday morning.

Indicates MRS Corporate Affiliate Member

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ment systems for industrial, scientific markets worldwide.

CI System's NTM1 is a dual channel active/passive in situ noncontact temperature monitor for semiconductor wafers during processing. The active channel is an infrared reflection spectrometer, relying on absorption edge temperature sensing. The passive channel is an emissivity compensating pyrometer.

Commonwealth Scientific #104

500 Pendleton Street
Alexandria VA 22314
Contact: David Day
Tel: 703-548-0800
FAX: 703-548-7405

Crimatec #518

104 Route de Larchant, B.P. 521
77794 Nemours Cedex

FRANCE

Contact: Edouard Marienbach

Tel: 33 1 64 45 10 10

FAX: 33 1 64 45 10 01

Laser crystals: Ho, Tm, Cr;
YAG; Nd: YAG, Nd: YLF;
Crystals for non-linear optics:
KDP, POM, NPP, LTO, LNO;
Single crystal wafers of InP;
Garnet crystals and epitaxial
films: YAG, GGG, SGGG; YIG;
Crystals for x-ray spectrometry:
LiF, Beryl, TlAP, and PET;
Scintillation crystals: NaI(Tl),
CsI(Tl), CsI, BGO.

Cryomech, Inc. #516

1630 Erie Blvd. East
Syracuse NY 13210
Contact: Peter E. Gifford
Tel: 315-475-9692
FAX: 315-422-1202

Cryomech Inc. will exhibit the following new products: the DC01 Cryorefrigerator (2 watts <77 K for detector cooling), the portable LNP48 Liquid Nitrogen Plant (2 liters/hour), and the soon to be introduced Liquid Helium Plant (1 liter/hour). Cryomech will also exhibit standard cryostats and cryorefrigerators for temperatures down to 3 K.

DCA Instruments, Inc. #218

400 West Cummings Park
Suite 3900
Woburn MA 01801
Contact: Jari Vanhatalo
Tel: 617-937-6550
FAX: 617-935-2405

DCA Instruments specializes in the design and manufacture of UHV deposition systems. We offer standard systems for the following deposition techniques: III-V MBE, II-VI MBE, CMT-MBE, metal MBE, UHV sputtering, UHV laser ablation, Si/Ge epitaxy and UHV CVD.

We also offer a wide range of components including effusion cells and a wobble-free substrate manipulator.

Denton Vacuum, Inc. #316

1259 North Church Street
Moorestown NJ 08057
Contact: James L. Campbell
Tel: 609-439-9100
FAX: 609-439-9111

Denton Vacuum is a premier manufacturer of High Vacuum Thin Film Deposition Systems. For applications ranging from the preparation of samples for electron microscopy; semiconductor failure analysis and quality control; thin film research; and production size optical coating systems Denton Vacuum offers an appropriate system to meet a wide range of technical requirements. In addition to its system offerings, DVI also has a wide variety of accessory equipment such as Electron Beam Evaporation Guns and Power supplies, Ion sources, Optical Monitors, Sputter Cathodes, Feedthroughs, and Thermal Evaporation Supplies.

Duniway Stockroom

Corp. #110
1600 N. Shoreline Blvd.
Mountain View CA 94043
Contact: Ralph R. Duniway
Tel: 415-969-8811
FAX: 415-965-0764

Duniway Stockroom will be exhibiting NEW Variable Leak Vales, ion pumps, elements, cables, and replacement parts. Also 12-point bolts, copper gas-kets, Conflat & Quik flange hardware, DP & mechanical pump oil, vacuum hose and TSP cartridges. New 44 page catalog will be available.

Elsevier Science/Pergamon

#611, 613
655 Avenue of the Americas
New York, NY 10010
Contact: Marsha Levell
Tel: 212-633-3767
FAX: 212-633-3764

North Holland, Elsevier, and Pergamon are 3 of the outstanding imprints of Elsevier Science. We will be featuring a wide range of materials science and Solid State physics publications. The *Handbook of Semiconductors* and the *Handbook of Crystal Growth* will be on display with our many other fine publications. A FREE sample copy of our journals will be available for meeting attendees, especially Computational Materials Science. We will demonstrate CoDAS, a new direct alerting service. (see ad in this issue)

EMCORE Corporation #202

35 Elizabeth Avenue
Somerset NJ 08873
Contact: Peter Broskie
Tel: 908-271-9090
FAX: 908-271-9686

Manufacturer of TurboDisc Deposition systems producing highest quality thin film compound semiconductor wafers with uniformity of thickness, doping and composition, and interface abruptness required for modern electronic, microwave and optoelectronic devices. EMCORE's TurboDisc systems are further distinguished by throughput, capacity and process conditions and utilize major deposition technologies including MOCVD, ALE, and CVD depending on application requirements.

Charles Evans & Associates #206

301 Chesapeake Drive
Redwood City CA 94063
Contact: Rennie J. Harrington
Tel: 415-369-4567
FAX: 415-369-7921

Charles Evans & Associates is a complete analytical service laboratory specializing in surface, trace-level, and micro-analysis of materials. We have an outstanding analytical laboratory with SIMS, ESCA, Static SIMS, FTIR, SEM, AUGER, RBS, AFM, and many other techniques for surface analysis. Our capabilities include measurement of trace-level impurities and dopants, characterization of thin or thick films, particle analysis, and failure analysis. Stop by our booth to discuss your materials characterization requirements.

ETP-USA/Electron Detectors Inc. #209

1650 Holmes Street Building C
Livermore CA 94550
Contact: Robert Ruscica
Tel: 510-449-8534
FAX: 510-449-8996

ETP-USA will be exhibiting the Robinson Backscattered Electron Detector for SEMS. Outstanding resolution, TV imaging, and robust design puts the Robinson detector in a class by itself. We will also feature our new SEM ChamberView TV system.

Falex Corporation #504

2055 Comprehensive Drive
Aurora IL 60505
Contact: Michael Anderson
Tel: 708-851-7660
FAX: 708-898-7851

World's largest manufacturer of materials test equipment specializing in the measurement of friction, wear, abrasion and erosion. Complete test facilities. Design and manufacture of custom test equipment.

FEI Company #302

7451 NE Evergreen Parkway
Hillsboro OR 97124
Contact: Andree Kraker
Tel: 503-640-7500
FAX: 503-640-7509

FEI Company features a new, compact 2-lens liquid metal ion(LMI) focusing column. Superior milling and imaging performance, reliable UHV construction and a modular design philosophy are combined in this new component ion focusing column. Also featured are single-lens ion and electron field emission columns, LaB6/CeB6 electron sources, and FIB workstations.

E.A. Fischione Instruments, Inc. #308

9003 Corporate Circle
Export PA 15632
Contact: Paul E. Fischione
Tel: 412-325-5444
FAX: 412-325-5443

Features a full line of TEM Specimen Preparation devices. New product introductions include the Model 3000 Ion Mill and the Model 330 Ultrasonic Disk Cutter. Other devices on display are the Twin-Jet Electropolisher, the FIM/FEM Micro Polisher, and the Model 2000 Specimen Prep System (a state-of-the-art, microprocessor based, ultra-precision dimpling grinder). Also displayed are SEM and TEM Specimen Holders including the new Cryo-Prep Station/TEM Holder.

Fison Instruments #501, 503

55 Cherry Hill Drive
Beverly MA 01915
Contact: Marie Mello/Jacky Kieras
Tel: 508-524-1000
FAX: 508-524-1019

Displaying our comprehensive range of molecular beam epitaxy systems and fully integrated surface analysis instruments. And the KEVEX SIGMA, an energy dispersive X-ray micro-analysis system. Together with

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the unique SuperDry detector that requires no liquid nitrogen, the system combines dedicated real-time data acquisition with the convenience of a high performance Windows PC.

Gatan Inc. #509

6678 Owens Drive
Pleasanton CA 94588-3334
Contact: Christopher Byrne
Tel: 510-463-0200
FAX: 510-463-0204

Manufacturer of instrumentation for TEM & SEM including: TV-rate and Slow-Scan CCD imaging systems; DigitalMicrograph™ image acquisition and processing software; the Parallel-Detection electron energy loss spectrometer (PEELS™); specimen preparation equipment; DuoMill™ ion milling system and precision dimple grinder; GIF™ Gatan image filter; DigiScan™ for SEM image acquisition and processing; TEM straining holders (heating and cryo); Macintosh video processor; PIP- precision ion polishing system and high resolution ion beam coater.

Goodfellow Corp. #605

130 Lindenwood Drive
Suite 140
Malvern PA 19355-1758
Contact: Dolores L. McCabe
Tel: 800-821-2870
FAX: 800-283-2020

Goodfellow present their unique range of metals and materials for research and development. Metals, Alloys, Compounds, Ceramics, Polymers and Composites in many different forms - Foil, Wire, Powder, Tube and Rod. More than 3600 items available from stock. New 1993/94 catalog available at the booth.

Granville-Phillips Co. #208

5675 Arapahoe Avenue
Boulder CO 80303
Contact: Lisa Whitten
Tel: 303-443-7660
FAX: 303-443-2546

Granville-Phillips designs and manufactures instrumentation intended to help reduce processing costs associated with vacuum measurement. The new STABIL-1™ Vacuum Measurement System provides stability of calibration that is approximately ten times better than commonly used, older technology gauges. This stability results in more reliable process repeatability and replication.

High Voltage Engineering

Europa B.V. #214
PO Box 99
3800 AB Amersfoort
THE NETHERLANDS
Contact: Henri van Oosterhout
Tel: 31 33 619741
FAX: 31 33 615291

Particle accelerator systems for scientific, educational, and industrial research communities. (see ad in this issue)

Huntington Mechanical Laboratories #212

1040 L'Avenida
Mountain View CA 94043
Contact: Ken Kissane
Tel: 415-964-3323
FAX: 415-964-6153

Huntington Laboratories is an integrated supplier of UHV component hardware including valves, roughing components, and viewports as well as positioners, feedthroughs, and custom chambers. Huntington also offers prototype and high volume production support services for custom or standard UHV requirements including engineering design assistance. (see ad in this issue)

IBM Analytical Services #505

1580 Route 52
Hopewell Junction NY 12533
Contact: David Fouts
Tel: 914-892-2450
FAX: 914-892-2003

Offers a broad range of capabilities from failure analysis to chemical and electrical characterization, all performed by a highly experienced staff of experts in their specific fields. We offer high-quality work performed on state-of-the-art equipment in a timely and cost-competitive environment.

Institute for Scientific Information #603

3501 Market Street
Philadelphia PA 19104
Contact: Frank Spiecker
Tel: 215-386-0100
FAX: 215-386-6362

Demonstrating the Materials Science Citation Index with reduced pricing. This CD-ROM product covers the current journal and conference proceeding literature on metals, ceramics, composites and polymers, and their applications in electronics, optics, construction, dentistry and medicine; and energy products. Cited references, all bibliographic material and abstracts are indexed.

Institute of Physics Publishing #615

The Public Ledger Bldg.
Suite 1035
Philadelphia PA 19106
Contact: Barbara Aiona
Tel: 215-627-0880
FAX: 215-627-0879

Institute of Physics Publishing, a wholly owned subsidiary company of the Institute of Physics (the professional body and not-for-profit learned society for physicists in the UK) is responsible for all the Institute's publishing activities. These encompass over 30 research journals (including *Modelling & Simulation in Materials Science & Engineering*, *Superconductor Science & Technology*, *Nanotechnology*, *Journal of Hard Materials*, *High Performance Polymers*, and *Journal of Physics: Condensed Matter*), associated electronic products, professional magazines, reference works (including *Biographical Encyclopedia of Scientists*), and over 30 new books each year in physics and related disciplines.

Intevac MBE Equipment Division #201

3550 Bassett Street
Santa Clara CA 95054
Tel: 408-986-9888
FAX: 408-727-7350

Ion Tech Inc. #513

2330 East Prospect
Ft. Collins CO 80525
Contact: Gerald Isaacson
Tel: 303-221-1807
FAX: 303-493-1439

Manufacturer of DC & RF ion beam sources, power supplies, and systems for thin film deposition, etching, cleaning, and modification. Provides complete turnkey systems for production or R&D, standard or custom designed to accommodate various optical or other components.

JEOL USA #403

11 Dearborn Road
Peabody MA 01960
Contact: Charlie Nielsen or Mike Kersker
Tel: 508-536-2271
FAX: 508-536-2205

JEOL is a leading supplier of analytical electron-optical instrumentation which includes TEM, SEM, EPMA, and Auger. JEOL also markets a complete line of image archiving and automated metrology attachments.

Keithley Instruments #309

28775 Aurora Road
Solon OH 44139
Contact: Kristin Rice
Tel: 216-248-0400
FAX: 216-248-6168

Keithley is a leading manufacturer of sensitive test instruments for making accurate and reliable DC measurements in materials research applications. Keithley manufactures a full line of electrometers, DMMs, picoammeters, source-measure units and much more. Keithley products are found in universities, industrial research labs, and engineering development departments worldwide.

Kluwer Academic Publishers #612

101 Philip Drive
Norwell MA 02061
Contact: Annie Rollins
Tel: 617-871-6600
FAX: 617-871-6528

Kluwer Academic Publishers will again be attending the Spring MRS Meeting. Please stop by our booth - on display will be the latest research books and journals in materials science including information on polymers, ceramics, and microwave technologies. Pickup a free sample copy of one of our many esteemed journals in the area which includes *Interface Science* and the *Journal of Sol-Gel Science and Technology*.

Kratos Analytical Inc. #107

535 East Crescent Ave.
Ramsey NJ 07446
Contact: David Surman
Tel: 201-825-7500
FAX: 201-825-8659

Kratos Analytical will be featuring information on its range of Surface Analysis Instrumentation. The company specializes in X-ray Photoelectron Spectroscopy and Auger Electron Spectroscopy, with particular emphasis on small area analysis and imaging. Information on the VISION data system for spectral and image analysis will also be available.

Lake Shore Cryotronics #500

64 East Walnut Street
Westerville OH 43081
Contact: Kristina S. Cooper
Tel: 614-891-2243
FAX: 614-891-1392

Cryogenic temperature sensors including diodes, resistors, capacitance, rhodium-iron, magnetic field hall sensors and

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Cernox~ sensors with low magnetic field dependence; analog and autotuning temperature controllers, helium level monitors, temperature transmitters and current sources; gaussmeters for benchtop and handheld applications; AC Susceptometers/DC Magnetometers; Vibrating Sample Magnetometers; true, four-quadrant Magnet Power Supplies for electromagnets and superconducting magnets and laboratory electromagnets.

Lasertec USA Inc. #108

2001 Gateway Place
Suite 130

San Jose CA 95110

Contact: Tamotsu Chinone

Tel: 408-437-1441

FAX: 408-437-1430

Confocal Laser Scanning Microscope, featuring Real Time Image, Surface Profiling, Critical Dimension Measurement and 3D Surface Image.

Kurt J. Lesker Co. #301, 303

1515 Worthington Avenue
Clairton PA 15025

Contact: Joseph Wolfenberger

Tel: 412-233-4200

FAX: 412-233-4275

High precision, multi-axis UHV sample manipulators from Vacuum Generators. Rotary and linear motion feedthroughs from Vacuum Generators and Ferrofluidics. Flanges, gaskets, and components on all flange systems. Power, instrumentation, and thermocouple feedthroughs. Vacuum gauges from 1200 to 10^{-10} Torr. Torus sputter sources and pure materials. Full range of surface science components. (see ad in this issue)

Luxtron Corporation #101

2775 Northwestern Parkway
Santa Clara CA 95051-0903

Contact: William Kolbeck

Tel: 408-727-1600

FAX: 408-727-1677

Optical fiber temperature measurement and control instrumentation. Offers non-contact and contact temperature measurements from -200°C to 4000°C with resolution to 0.01°C .

MDC Vacuum Products

Corporation #306

23842 Cabot Boulevard
Hayward CA 94545

Contact: Phil Crane, Mike Weiss

Tel: 510-887-6100

FAX: 510-887-0626

Complete line of UHV compo-

nents including: flanges and fittings, valves, roughing components, instrumentation, electrical feedthroughs, XYZ manipulators, rotary and linear feedthroughs, fast entry load-lock systems, all-metal sealed right angle valves and M.E.S.A. compatible rectangular gate valves.

Featured products will be a complete line of electron beam evaporation sources in single pocket and multi-pocket configuration with matching 6 kW, 10 kW and 15 kW solid state switching power supplies. (see ad in this issue)

Micro Photonics Inc. #317

PO Box 3129

Allentown PA 18106

Contact: George Ferrio

Tel: 215-366-7103

FAX: 215-366-7105

Will be featuring mechanical properties testing instruments from Micro Materials, CSEM and BICERI for testing hardness, modulus, adhesion, friction and wear resistance of thin films and bulk materials. Also featured will be in-situ ellipsometers from Sofie Instruments for monitoring and controlling thin film deposition and etching.

MicroCal Software, Inc. #517

One Roundhouse Plaza
Northampton MA 01060

Contact: Ms. Gillian L. McGarvey

Tel: 413-586-2013

FAX: 413-585-0126

Origin, the first technical graphics and data analysis software for Windows, offers a complete data management solution for collecting, analyzing and presenting experimental data. Origin's Data Acquisition and User Interface Modules provide the unique capability to build and control real-time data acquisition from a wide variety of laboratory devices, all from your desk top.

Microwave Laboratories, Inc. #103

8917 Glenwood Avenue
Raleigh NC 27622

Contact: Arvid C. Johnson

Tel: 919-781-4260

FAX: 919-781-4187

Microwave Laboratories, Inc. (MLI), is a recognized leader in the design, development, and manufacture of high-power microwave amplifiers, sub-systems, and systems for industrial and military applications.

MLI's Variable Frequency Microwave Furnace makes use of patented technology to provide uniform microwave heating over large volumes for advanced materials processing. (see ad in this issue)

Modular Process

Technology Corp. #520

966 Shulman Ave.

Santa Clara CA 95050

Contact: Meiyong F. Forney

Tel: 408-988-7808

FAX: 408-988-7807

MACVD-6000 Advanced Microwave-Assisted CVD system for depositing high quality polycrystalline diamond thin films. This highly flexible system incorporates DC/RF substrate bias in addition to RTP/CVD capability.

CVD-6000 Advanced Process Modules/turnkey flexible single-wafer multiprocessing systems incorporating in-situ process monitoring.

RTP-600S Advanced RTP Systems/integrated PC, 6 MFC channels/vacuum/UV Ozone Cleaning capability.

Molecular Simulations

#406, 408

16 New England Executive Park
Burlington MA 01803

Contact: Mike Weitz

Tel: 617-229-9800

FAX: 617-229-9899

Come to our booth and step into the future of materials modeling where we will be presenting the next generation of Solutions through SimulationSM. See how applications from the whole range of materials science are integrated in a revolutionary and unrivaled new software environment.

National Electrostatics

Corp. #307

Graber Road

PO Box 620310

Middleton WI 53562-0310

Contact: Gregory A. Norton

Tel: 608-831-7600

FAX: 608-256-4103

National Electrostatics manufactures a wide range of ion beam systems from below 100 keV to the hundreds of MeV region. These systems include dedicated materials analysis instruments for RBS, PIXE, NRA, and other analysis procedures requiring MeV beams. NEC also manufactures electron beam and x-ray systems in the MeV region. (see ad in this issue)

NORAN Instruments, Inc. #217

2551 West Beltline Highway
Middleton WI 53562

Contact: Craig Eversoll

Tel: 608-831-5125

FAX: 608-836-7224

NORAN Instruments, Inc. is a premier manufacturer of energy-dispersive spectrometry microanalysis systems and confocal light microscopes. Preeminence in these fields has been achieved through extensive market research to determine which instrument features are needed most. This research establishes the basic guidelines used in product development at NORAN Instruments.

Nor-Cal Products, Inc. #418

1967 S. Oregon Street
PO Box 518

Yreka CA 96097

Contact: Tom Deany

Tel: 916-842-4457

FAX: 916-842-9130

Manufacturer of stainless steel vacuum components. Standard products include: NW, ISO, ASA, CF and Wire Seal Flanges; fittings, viewports, feedthroughs and flexible hoses; manual and pneumatically actuated valves; and liquid nitrogen, molecular sieve, water-cooled and particulate foreline traps. Custom chambers, manifolds, feedthrough collars and baseplates can be manufactured from customer specifications, sketches or drawings.

North Eastern Analytical #511

17 Sherman Road

PO Box 25

Millis MA 02054

Contact: Joan A. Flanagan

Tel: 508-376-4132

FAX: 508-376-8687

Displaying Bede Scientific High Resolution X-Ray Diffractometer Systems. Glancing Incidence Reflectometer Systems. "RADS" Rocking Curve and "REFS" Reflectivity Simulation Software. X-Ray Generators, X-Ray Tubes, and Radiation Enclosures.

Perkin Elmer #300

6509 Flying Cloud Drive

Eden Prairie MN 55344

Contact: Molly Whelan

Tel: 612-828-6156

FAX: 612-828-6322

Manufacturer of surface analysis equipment and analytical services will provide graphics and literature on their 670xi Scanning Auger Microprobe,

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5600ci Multi Technique and 7200 TOF-SIMS systems. Also, stop by and find out more on PHI's latest components, subsystems, XPS Research System and UHV equipment.

Philips Electronic Instruments Company #102

85 McKee Drive
Mahwah NJ 07430
Contact: Bob Sommerville
Tel: 201-529-3800
FAX: 201-529-5084

Philips Electronic Instruments, the leading manufacturer of X-Ray Fluorescence and X-Ray Diffraction equipment, has recently achieved ISO9001 certification. The most stringent of the three ISO classifications, it requires that an established, effective Quality System be in place.

Philips Semiconductors #600

Materials Analysis Group
MS 65

811 E Arques
Sunnyvale CA 94088
Contact: Alan E. Morgan
Tel: 408-991-4868
FAX: 408-991-4801

Materials Analysis Group is an analytical service laboratory for composition and structural characterization of surfaces, interfaces, thin films, and bulk materials. Techniques include dynamic and static SIMS, Auger, ESCA, RBS/ERD, XRF, TEM, SEM/EDX, AFM, XRD, acoustic microscopy, FTIR, GC/MS/IR, TGA/TMA/DSC, UV/Vis, ICP, AA, IC, and GPC. High precision TEM and field emission SEM cross-section images are guaranteed.

Publishers Display Group, Inc. #617

44 Bayview Avenue
Valleystream NY 11581
Contact: Debi Drayer
Tel: 516-872-3217
FAX: 516-561-9054

Publishers Display Group, Inc., will be displaying publications of interest to conference participants.

Pure Tech Inc. #215

Commerce Drive
PO Box 1319
Carmel NY 10512
Contact: Matthew T. Willson
Tel: 914-878-4499
FAX: 914-878-4272

PURE TECH is an American small business devoted to the quality manufacture of high purity materials for sputtering

and evaporation. Specialists in difficult or unusual materials for research & development or production orders. Our in-house capabilities include vacuum melting, hot pressing, metal & ceramic machining, custom designed backing plates and target bonding services.

Research and PVD Materials Corporation #415

PO Box 4796
Wayne NJ 07474
Contact: Melvin Hollander
Tel: 201-575-4245
FAX: 201-227-2530

Research and PVD Materials Corporation has established a unique SERVICENTER, manufacturing a comprehensive offering of highly characterized materials for the diverse and sophisticated requirements of the semiconductor, electronics, electro optic and related research communities.

Products from this single quality source include but are not limited to fabricated forms of specialty and exotic metals, alloys, ceramics and custom "one off" vacuum components.

SOPRA Inc. #204

33 Nagog Park
Acton MA 01720
Contact: Barry Glasgow
Tel: 508-263-2520
FAX: 508-263-2790

The GESP5 is the first commercially available instrument to combine spectroscopic ellipsometry with accurate measurement of light scattering, transmittance, and reflectance as a function of wavelength, incidence angle and polarization.

South Bay Technology Inc. #400

1120 Via Callejon
San Clemente CA 92673
Contact: David Henriks
Tel: 714-492-2600
FAX: 714-492-1499

South Bay Technology, Inc. will be displaying sample preparation equipment & supplies for the following applications: Lapping & Polishing, Crystal Orientation, TEM Sample Preparation, Damage Free Sample Preparation, Cutting & Sectioning. New products on display include Diamond Band Saw, Real Time Back Reflection Laue Camera, EZorient~Digitizing System for Laue Back Reflection, Lapping &

Polishing Machine, Metallographic Supplies. Applications engineers will be available to address specific sample preparation requirements. For additional information please call (800) SBT-2233 or FAX (714) 492-1499.

Spectrum Sciences, Inc. #507

3050 Oakmead Village Drive
Santa Clara CA 95051-0808
Contact: Don Weeks
Tel: 408-727-1567
FAX: 408-727-1322

Spectrum Sciences Inc. offers ion implantation systems for very large substrates (500x500mm) such as Flat Panel Displays or multiple wafer batches. The company is also developing an Ion Shower system for doping both amorphous Si and poly Si AMLCD's. For those organizations involved in surface modification, SSI has developed the Low Energy Ion Implantation Deposition (LEIID) system.

Also exhibiting in Booth #507
IICO and Arifov Institute of Electronics.

Stanford Research System #207

1290-D Reamwood Avenue
Sunnyvale CA 94089
Contact: David R. Ames
Tel: 408-744-9046
FAX: 408-744-9049

Featuring our full line of scientific and engineering test equipment including lock-in amplifiers, current amplifiers, optical choppers, low-noise preamplifiers, photon counters, boxcar integrators, synthesized function generators, spectrum analyzers and digital delay/pulse generators

Superior Vacuum Technology #515

7620 Executive Drive
Eden Prairie MN 55344
Contact: James E. Tolan
Tel: 612-934-1993
FAX: 612-934-2021

Superior Vacuum Technology (SVT) is a manufacturer of molecular beam epitaxy (MBE) and ultra-high vacuum (UHV) deposition equipment. SVT's continual research and development in the industry allows us to offer the highest performance on systems and components such as high temperature sample heaters, effusion cells, e-beam evaporators and manipulators.

Surface/Interface Inc. #609

110 Pioneer Way, Suite D
Mountain View CA 94041
Contact: Charles E. Bryson, III
Tel: 415-965-8205
FAX: 415-965-8207

- ESCA-Tools Software
- Reference Materials
- Spectrometer Systems
- Precision Angular Manipulators
- Precision Magnetic Manipulators
- BEES-Ballistic Electron Emission Spectroscopy
- Custom Chambers & Loadlocks
- Rotary Seals

Technical Instrument Company #113

348 Sixth Street
San Francisco CA 94103-4788
Contact: Francis E. Lundy
Tel: 415-431-8231
FAX: 415-431-6491

Confocal Scanning Optical Microscopes and attachments from the K-2 and K2-IND series for failure analysis, materials inspection and non-destructive testing. Atomic Force and Scanning Tunneling Microscopes for non-destructive testing and materials analysis. Technical Instrument Company specializes in advanced microscopical image enhancement systems and attachments for submicron observation in real time. Metrology systems are also available using these techniques.

Tencor Instruments #401

2400 Charleston Road
Mountain View CA 94043
Contact: Gail Nishimura
Tel: 415-988-4313
FAX: 415-969-6371

Automated surface profiling systems with ability to provide comprehensive surface analysis of even very soft films. Precise alignment, proven reliability, and guaranteed repeatability ensure highly accurate measurements. Large sample profiler for flat panel displays, printed circuit boards. Thin film stress measurement systems for analysis at temperatures from -65 to 900°C. Automated film stress measurement system with radial stress mapping.

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TFI Telemark #318

51 Whitney Place
Fremont CA 94539
Contact: Chris Johnson
Tel: 510-770-8700
FAX: 510-770-8879

Telemark manufactures PVD components, including Electron Beam Sources, E-Beam Power Supplies (switching and tube-type), DC Sputter Power Supplies, Sputter Cathodes, Optical Monitors, and related accessories. New products include low cost, 3kW E-Beam Sources (with inexpensive power supply) which are UHV compatible, and an inexpensive 1.5kW Sputter Power Supply.

Thermionics Laboratory Inc.

#506, 508
22815 Sutro Street
PO Box 3711
Hayward CA 94540
Contact: John Brooks
Tel: 510-538-3304
FAX: 510-538-2889

Thermionics features precision, UHV sample manipulation products; sample introduction, heating, cooling and transfer, differentially pumped rotary seals, linear and rotary feedthrus and precision gearboxes; UHV systems, ion pumps, UHV gate valves, HM2 e-guns and power supplies, MBE systems and R-HEED components.

TopoMetrix #404

5403 Betsy Ross Drive
Santa Clara CA 95054
Contact: Eddy Robinson
Tel: 408-982-9700
FAX: 408-982-9751

TopoMetrix manufactures and distributes worldwide a complete family of scanning probe microscope products. Featured in their exhibit will be the Aurora Scanning Near-field Optical Microscope, a unique SPM concept. Aurora offers conventional optical characterization and contrast mechanisms with resolution on the scale of SPM techniques.

Vacuum Engineering and Materials Co., Inc. #114

PO Box 4480
Santa Clara CA 95056-4480
Contact: Dick Gilman
Tel: 408-986-8900
FAX: 408-986-8980

High Purity P.V.D. Materials

- Sputtering Targets/Pellets
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- Metals, Alloys, Intermetallics
- Dielectrics, Cermets, Ceramics

- Refractories, Precious Metals Tungsten/Titanium, Oxides/Silicides Borides/Nitrides,
- Carbides/Flourides Purities from 98% to 99.9999%+
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VCR Group, Inc. #601

250 E. Grand Avenue, #31
So San Francisco CA 94080
Contact: Ron Douglass
Tel: 415-875-1000
FAX: 415-875-7111

See it! XLA/2000 Ion Mill, PC based: data set-up, record logging and scheduling... Larger electron transparent areas, one or two sided low angle milling (s^4), and adjustable ion beam striking position. DIMPLER®, D500i -Robotic, automatic, low angle dimpling. IBS/TM2005 - 8A Cr films without Cr X-ray peak! Unobservable ultra thin metal films: Ta, W, Ir, Pt and Carbon.

Veeco/Sloan Instruments, Inc. #604, 606

602 E. Montecito Street
Santa Barbara CA 93103
Contact: Wendy Robinson
Tel: 805-963-4431
FAX: 805-965-0522

The Dektak 16000 is an advanced stylus based surface profiler capable of precise film thickness and surface texture measurements on flat panels up to 450mm X 500mm for R&D applications. Optional robotic substrate handling with automatic alignment provides completely automated operation for in-line production testing.

Virginia Semiconductor, Inc. #608

1501 Powhatan Street
Fredericksburg VA 22401
Contact: N. Perry Cook
Tel: 703-373-2900
FAX: 703-371-0371

Featuring Ultrathin™ and Ultra-machining™ silicon wafers with flatness within s 3 μ , planarity of s 3 μ , and taper s 2.5 μ ; also offering back side polishing services, custom or research wafer and ingot preparations, and conventional small diameter single and double side polished Cz or Fz wafers.

For precisely engineered silicon wafers, "If we can't make it, you don't need it!" (see ad in this issue)

Voltaix, Inc. #409

197 Meister Avenue
Box 5357 North Branch NJ 08876
Contact: John P. de Neufville
Tel: 908-231-9060
FAX: 908-231-9063

State of the art CVD gases, custom filled and packaged to the customer's specifications. Products include silane, disilane, methylsilane, germane, digermane, diborane, phosphine, trimethylboron, their mixtures, and ion implant gases including boron trifluoride. Custom synthesis of selected gases such as deuterated diborane, trimethylboron, and silane. (see ad in this issue)

Waters, Extrel Mass Spectrometry #407

34 Maple Street
Milford MA 01757
Contact: Carolyn Norton
Tel: 508-478-2000 ext. 3641
FAX: 508-478-5839

Waters will exhibit Extrel® Mass Spectrometry Products including the Extrel 2001 series of Ultrahigh Resolution Fourier Transform Mass Spectrometers (FT/MS®) which features Lazer Probe Ionization, MS/MS and the Odyssey Data System with patented SWIFT™ Technology. Quadrupole Power Supplies, Quadrupole Mass Filters and Electron Impact Ionizers will also be exhibited.

Westlake Rare Earth Industries #109

A Division of Westlake Development Co., Inc.
520 El Camino Road, 9th Floor
San Mateo CA 94402
Contact: Dr. J.J. Lin
Tel: 415-579-1010
FAX: 415-340-8459

Westlake Rare Earth Industries, a manufacturer and distributor of rare-earth resources, exhibits

the production line of rare earth materials, including RE metal and oxides, RE alloys and inorganic compounds as well as RE related products such as phosphors powders for color TV and lamps, glass polishing powders, permanent magnets.

J.A. Woollam Co., Inc. #105

650 J Street, Suite 39
Lincoln NE 68508
Contact: Kevin Lilly
Tel: 402-477-7501
FAX: 402-477-8214

Non-Destructive multilayer and multiconstituent materials analysis by Spectroscopic Ellipsometry. Measure film thickness, optical constants, alloy fractions and surface and interfacial roughness. In situ and ex situ configurations for industrial and research applications, including semiconductors, magnetic materials, optical coatings and flat panel displays. New, fast, multiwavelength in situ ellipsometer supports process monitoring control.

Zygo Corporation #112

Laurel Brook Road
Middlefield CT 06455
Contact: Polly White
Tel: 203-347-8506
FAX: 203-347-8372

Zygo Corporation is a world leader in the manufacture of high-precision noncontact measuring instruments and optical components. Zygo has launched a line of interferometric microscopes for measuring and quantifying the shape and microroughness of surfaces. The NewView 100 microscope is capable of characterizing an amazing array of samples and is a true breakthrough in measurement.

Companies interested in exhibiting may contact:

Mary E. Kaufold
Advertising & Exhibit Manager
Materials Research Society
9800 McKnight Road
Pittsburgh PA 15237
Phone: (412) 367-3036
FAX: (412) 367-4373