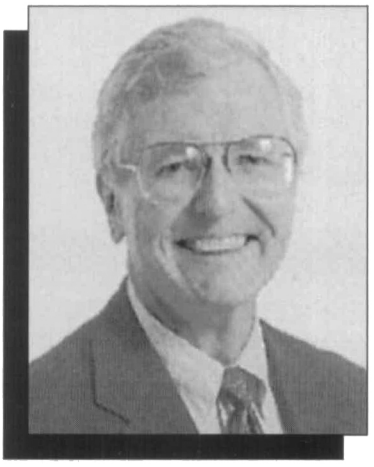
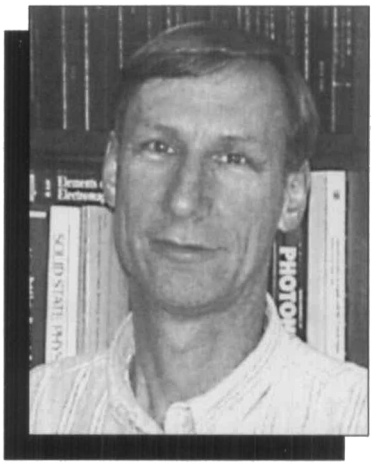
Craford, Forrest Named 1999 MRS Medalists

The Materials Research Society (MRS) has selected two scientists to receive the 1999 MRS Medal awards, which recognize a specific outstanding recent discovery or advancement that is expected to have a major impact on the progress of any materials-related field. M. George Craford of Hewlett Packard and Stephen Forrest of Princeton University will receive their medals at the 1999 MRS Fall Meeting during the Awards Ceremony on Wednesday, December 1, at 6:00 p.m. in Salon E of the Boston Marriott Hotel.



M. George Craford



Stephen Forrest

M. George Craford is named MRS Medalist "for pioneering contributions and leadership in the development of visible-spectrum light-emitting diode materials and devices." During the past 30 years of research, Craford, with his research groups, introduced the yellow light-emitting diode (LED) (GaAsP:N) and the transparent-substrate high brightness red-orange-yellow In(AlGa)P LEDs and lamps which exceed in performance the standard incandescent lamp.

Craford's numerous seminal contributions to LED research is leading the transition from conventional lighting sources to solid-state emitters. The commercial quality of LEDs that Craford has developed results from several risks and challenges that he had undertaken. Craford's research group introduced commercial yellow and orange LEDs based on research on the effects of N isoelectronic doping in GaAsP ternary alloys grown by hydride vapor-phase epitaxy (VPE). This work advanced understanding of the fundamental role of isoelectronic impurities in compound semiconductors.

Subsequently, Craford used the previously unproven technique of metalorganic chemical vapor deposition (MOCVD) crystal growth to produce high-efficiency LEDs from Al-containing III-V materials. He and his co-workers demonstrated the first high-brightness yellow AlGaInP LEDs that exhibited higher lm/W than unfiltered incandescent lamps. He and his group developed the wide bandgap process for the deposition of thick lattice-mismatched GaP cap layers on MOCVD-grown InAlGaP heterostructures grown on GaAs substrates.

More recently, Craford and his research team have implemented new techniques of compound semiconductor wafer bonding in order to produce orange-red spectrum devices whose efficiency (lm/W) exceed unfiltered incandescent sources along with several other conventional lighting sources such as halogen lamps. This technique involves development of a full, 2.0 in. diameter wafer bonding and epitaxial lift-off process that permits researchers to completely remove the GaAs absorbing substrate from an InAlGaP heterojunction LED wafer and to bond it to a transparent GaP wafer.

Since 1982, Craford has been the research and development manager of the HP Optoelectronics Division. Prior to joining HP in 1979, Craford worked for 12 years at Monsanto, advancing to technology director in the Monsanto Electronics Division in 1974. He received his MS (1963) and PhD (1967) degrees in physics at the University of Illinois. Among his several honors and memberships are the National Academy of Engineering, Institute of Electrical and Electronics Engineers (IEEE) Fellowship, and IEEE Morris N. Liebmann Memorial Award. He has over 50 publications, including a comprehensive reference text, *High Brightness Light-Emitting Diodes* (Academic Press, San Diego, 1997), and several patents.

Craford will deliver his Medalist talk in Symposium X on Wednesday, December 1, 12:45 p.m., in Room 208 of the Hynes Convention Center, on "Visible Light Emitting Diodes (LEDs): Past, Present, and Very Bright Future."

Stephen Forrest is named MRS Medalist "for pioneering contributions to the growth and optoelectronic applications of organic semiconductor thin films." He has set and continues to set the standard of growth and characterization in the emerging area of electrical properties and device structures based on ultrathin organic films.

With his research team, Forrest's studies led to the discovery and unraveling of many growth modes of van der Waals (vdW) bonded organic thin films onto a wide range of substrates. This has led to the development of models for understanding and predicting the structure these growth modes. This work also led to the first demonstration of the growth of organic multiple quantum well (MQW) structures, which exhibited quantum effects on the excitonic spectrum in close-packed vdW solids, then to the development of a quantitative model for quantum confinement of charge-transfer excitons in organic MQWs. Forrest's work has furthermore led to the development of novel organic/inorganic integrated devices for which he engineered a process where a molecular-beam-epitaxially grown III-V semiconductor is combined with an organic-molecular-beam-deposition-grown organic thin film in a single, ultrahigh vacuum environment.

Forrest's work has led to fundamental and applied advances in organic electroluminescent devices (OLEDs), and most recently in a 12-layer, 3-color stacked OLED (SOLED) which combines layers of crystalline and amorphous organics, conducting oxides and metals in a single stacked structure. Forrest and his colleagues were the first to identify fundamental current limiting mechanisms in molecular OLEDs, to demonstrate a fully transparent OLED, and to fabricate efficient OLEDs with the same metal oxide (indium-tin-oxide) used as both the anode and cathode.

Finally, Forrest and co-workers demonstrated lasing in semiconducting organic molecular thin films, opening the possibility for the eventual realization of all organic electrically pumped lasers.

Forrest's work has opened research in the areas of organic epitaxy and utilization of quantum effects in vdW solids and in

polymers; in fundamental physics and applications of these heterojunctions; and toward the design and fabrication of electrically pumped organic lasers.

After receiving his MS (1974) and PhD (1979) degrees in physics from the University of Michigan—Ann Arbor, Forrest worked for Bell Laboratories, the University of Southern California, and in 1992 joined Princeton University. He has over 230 publications, several patents, and has received numerous honors and is an IEEE Fellow.

Forrest will deliver his talk in Symposium X on Monday, November 29, 12:45 p.m., in Room 208 of the Hynes Convention Center, on "Science and Technology at the Nanometer Scale Using Vacuum-Deposited Organic Thin Film." MRS

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Symposium Session Locator

SYMPOSIUM	LOCATION	MONDAY, NOVEMBER 29			TUESDAY, NOVEMBER 30		
		a.m.	p.m.	eve.*	a.m.	p.m.	eve.*
A: Multiscale Phenom. in Matls.—Expmts. & Mod.	Room 208 (H)				A1: Plasticity at Small Length Scales & Continuum	A2: Nonlocal Plasticity Theory & Disloc. Phenom.	A3: Posters
B: Comp. Approaches to Predicting the Optical Properties of Matls.	Room 209 (H)				B1	B2	
C: Microstructural Modeling for Industrial Metals Processing	Room 209 (H)	C1: Casting and Solidification C2: Deformation & Texture I	C3: Deformation & Texture II C4: Powder & Special Processes		C5: Thermal Processes & Phase Transformations **ROOM 205**		
D: New Advances in Materials Prediction	Room 207 (H)					D1: Predictions in Advanced Materials	
E: Nucleation & Growth Processes in Materials	Room 210 (H)	E1: Phase Transformations I E2: Phase Transformations II	E3: Phase Transformations III E4: Phase Transformations IV	E5: Posters	E6: Liquid-Solid Transform. I E7: Liquid-Solid Transform. II	E8: Liq.-Solid Transform. III E9: Martensitic Transform.	E10: Posters
F: Nanophase & Nanocomposite Materials III	Salon F (M)	F1: Nanocomposites	F2: Nanophase Ceramics		F3: Sol-Gel & Organic/Inorganic Nanocomposites	F4: Nanophase Semiconductors	F5: Posters
G: Nonlithographic Approaches to Micro- & Nanoscale Organization	Salon E (M)	G1: Printing, Molding, Transfer, & Other Techniques I	G2: Nanoparticle Arrays		G3: Printing, Molding, Transfer, & Other Techniques II	G4: Biomolecular & Biomimetic Assembly	
H: Molecular Electronics	Cape Cod/ Hyannis (M)	H1 H2	H3 H4		H5 H6	H7 H8	
I: Self-Organized Proc. in Semiconductor Alloys	Wellesley (M)	I1: Quantum Dots I	I2: Spontaneous Ordering in Semiconductor Alloys		I3: Quantum Dots II	I4: Composition Modulation in Semiconductor Alloys	
J: Adv. Matls. & Techs. for Nanolithography *Sunday Tutorial Session***	Boston College (M)	J1: Advances in Photo & X-Ray Lithographies; Issues for Molecular Scale Electronics	J2: Advanced Resists & Characterization		J3: Advances in Electron Beam, Ion Beam, & Soft Lithographies	J4: New Concepts for Materials Design	
K: Thermal Spray—Materials Synthesis by Thermal Spraying	Room 309 (H)	K1: Spray Process Characterization by Modeling & Diagnostics	K2: Honorary Sess. for Prof. Herman—Spray Coating Formation & Evaluation	K3: Posters	K4: Synthesis of Powders & Nanostructured Materials **ROOM 308**	K5: New Proc. for Powder & Coating Formation & Eval. **ROOM 308**	
L: Fundamental Mechs. of Low-Energy-Beam-Mod. Surf. Growth & Proc.	Salon H/I (M)	*Tutorial Session***	L1: Beam-Induced Surface Growth & Modification		L2/O2/II4: Biaxially Textured Substrates for High-T_c Coated Conductors **ROOM 200**	L3: Polycrystalline Films—Microstructure & Texture	L4: Posters
M: Interfacial Engr. for Optimized Properties II	Salon C/D (M)						
N: Atomic Scale Meas. & Atomistic Models of Epitax. Growth & Lith.	Regis (M)				N1: Morphology, Defects, & Device Properties N2: *In-Situ* Observations	N3: GaAs Substrates N4: Atomistic Simulations	
O: Substrate Engineering—Paving the Way to Epitaxy	Harvard (M)		O1/W2: Lateral Epitaxial Overgrowth **ROOM 302**		O2/L2/II4: Biax. Textured Subs. for High-T_c Coated Conductors **ROOM 200**	O3: Surfaces for Oxide Epitaxy	
P: Optical Microstructural Charac. of Semicond.	Salon C/D (M)	P1: Near-Field Techniques I P2: Photoelec. & Reson. Tech.	P3: Luminescence I		P4: Luminescence II P5: Near-Field Techniques II	P6: Raman Spectroscopy P7: Optical Properties	P8: Posters
Q: Advances in Materials Problem Solving with Electron Microscope	Salon A/B (M)					Q1: Magnetic Materials & Low-Energy Electron Microscopy	
R: Applications of Synchrotron Radiation Tech. to Matls. Science	Suffolk (M)		R1: General		R2: Small-Angle X-Ray Scattering & Surface/Interface Scattering Techniques I R3: *(Cont'd.)* II	R4: Spectromicroscopy & Topography I R5: Spectromicroscopy & Topography II	
S: Nondestructive Methods for Materials Characterization	P'town/ Orleans (M)	S1: Proc. Cntrl. & Deformation Behavior via X-Ray Tech. S2: NDE for Frac. Fat. & Corr.	S3: Structure-Sensitive Properties for NDE Charac. S4: NDE for Concrete & Steel		S5: Linear & Nonlinear Ultrasonics S6: Electric & Optoelec. NDE	S7: NDE for Silicon Wafers & Interfaces S8: Novel Tech. & Application	S9: Posters
T: Struc. & Elec. Prop. of Ultrathin Dielec. Films on Si & Rel. Structures	Room 310 (H)	T1	T2	T3: Posters	T4	T5	
U: Amorphous & Nanostructured Carbon	Room 311 (H)	U1: Synthesis & Growth Mechanisms of Nanotubes	U2: Structure & Characterization of Nanotubes		U3: Electronic & Mechanical Properties of Nanotubes	U4: Electron Emission from Nanotubes & Amorphous Carbon	U5-U8: Posters
V: Thin Films—Stresses & Mechanical Properties VIII	Room 306 (H)		V1: Multilayered Films		V2: Metallic Thin Films	V3: Epitaxy, Deposition Parameters, Microstructure, & Stresses	V4: Posters
W: GaN & Related Alloys *Sunday Tutorial Session***	Room 302 (H)	W1: Optical Devices	W2/O1: Lateral Epitaxial Overgrowth	W3: Posters	W4: Electronic Transport & Devices	W5: Electronic & Structural Characterization	
X: Frontiers of Materials Research	Room 208 (H)		X1: **MEDAL AWARD TALK PRESENTATION**			X2	
Y: Ferroelectric Thin Films VIII *Sunday Tutorial Session***	Room 304 (H)	Y1: BST Thin Films & DRAM	Y2: Fundamental Properties of Thin-Film Ferroelectrics	Y3-Y6: Posters	Y7: Pb-Based Thin-Film Ferroelectrics	Y8: Bi-Based Thin-Film Ferroelectrics	
Z: Thin Films for Optical Waveguide Devices	Room 313 (H)						
AA: Matls. Sci. of Food—Processing-Structure-Property Relationships	P'town/ Orleans (M)						
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CC: Complex Fluids & Polymers	Salon J/K (M)	CC1	CC2		CC3	CC4	
DD: Mineralization in Natural & Synthetic Biomaterials	Vineyard (M)	DD1: Bone & Bonding of Synthetic Materials to Bone DD2: Cal. Phos. as Bone Sub.	DD3: Biomimetic Apatite Coat. DD4: Apatite Formation on Inorganic Surfaces I	DD5: Posters	DD6: Mineral Form. on Organic Self-Assembled Surfaces I DD7: Apatite Form. Inorg. Surf. II	DD8: Mineral Formation on Organic Self-Assembled Surfaces II	
EE: Materials Science of Phospholipid Assemblies	Salon A/B (M)	EE1: Lipid Monolayers, Bilayers, & Biomolecular Interactions	EE2: Supported Membranes		EE3: PEG-Containing Materials—Molecular & Biological Properties	EE4: Drug & Gene Delivery **VERMONT**	EE5: Posters

(H) = Hynes Convention Center
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*All Evening Poster Sessions Located in Exhibition Hall D (H)

** Check Tutorial Matrix in This Issue

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Symposium Session Locator

WEDNESDAY, DECEMBER 1			THURSDAY, DECEMBER 2			FRIDAY, DECEMBER 3	
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A4: Dislocation Dynamics—Experiments & Simulations	A5: Dislocation Core Properties & Effects	A6: Posters	A7: Fracture & Crack Propagation	A8: Dislocation-Interface Interactions	A9: Posters		
B3	B4	*B5: Posters*	*B6*	B7			
D2: New Predictive Descriptions of Materials	D3: Prediction of Mechanical Properties of Materials	D4: Posters	D5: Prediction of Electronic Properties of Materials	D6: Predictions over Large Length and Time Scales		D7: Prediction of Surface Phenomena	
E11: Particle Nucl. & Growth I E12: Particle Nucl. & Growth II	E13: *Particle Nucl. & Growth III* E14: Nanosystems						
F6: Applications & Properties of Nanophase & Nanocomposite Materials I	F7: Applications & Properties of Nanophase & Nanocomposite Materials II	F8: Posters	F9: Nanowires & Nanospheres	F10: Nanophase Metals *& Simulation Studies*			
G5: *Nanoscale Ordering* & Lithography via Polymer Self-Assembly	G6/H11: Nano- to Molec.-Scale Elec. of Organized Structures G7/CC6: Nonlith. Approaches **SALON J/K**	G8: Posters	G9: Surface-Induced Organization	G10: Field-Induced Order in Structures & Arrays		G11: 2D & 3D *Photonic Structures*	
H9 H10	H11/G6: Nano- to Molec.-Scale Elec. of Organized Structures **SALON E**		H12 H13				
I5: Quantum Dots III / 3-D Islanding	I6/N7: Atomic Scale Studies	I7: Posters	*I8/N9:* Real-Time *In-Situ* Studies on 3-D Islanding **DAVID TURNBULL AWARD LECTURE**				
J5: Nonconventional Lithographic Techniques							
L5: Energetic Beam Effects *on Film Growth I*	L6: Energetic Beam Effects on Film Growth II		L7: Surface Morphology Evolution with Energetic Beams				
M1: General Concepts & Modeling	M2: Reactions & Wetting	M3: Posters	M4: Interface Structure/ Composition/Character	M5: Mechanical Properties			
N5: Theory-Rate Equations *& Monte Carlo* N6: Si Substrates	N7/I6: Atomic Scale Studies **WELLESLEY**	N8: Posters	N9/I8: Real-Time *In-Situ* Studies on 3-D Islanding **WELLESLEY**	N10: *Ab-Initio* Methods N11: Substrates—Effects *& Characterization*			
O4: Wafer Bonding & Lift-Off	O5: Lattice Mismatch *Engineering I*	O6: Posters	O7: Lattice Mismatch Engineering II	O8: Solid-Phase Recrystallization & Epitaxy			
Q2: Crystallography & Defects	Q3: Microelectronic Materials	Q4, Q5: Posters	Q6: Partially Ordered & Nanophase Materials	Q7: Interfaces in Metals & Ceramics I	Q8, Q9: Posters	Q10: Interfaces in Metals & Ceramics II	
R6: X-Ray Diffraction	R7: Micro-Diffraction R8: Micro-Tomography/ Phase Contrast	R9: Posters	R10: Thermoelec. & Mag. Matls.: X-Ray Photoemission, Stand. *Waves, & Nuc. Res. Spec. I* R11: *(Cont'd.)* II	R12: X-Ray Absorption Spectroscopy of Magnetic *Materials & Nanoparticles I* R13:*(Cont'd.)* II		R14: X-Ray Absorption Spectroscopy	
T6							
U9: *Applications of Amorphous &* Nanostructured Carbon—Electrical, Chemical, & Mechanical	U10/V7: Mechanical Properties of Amorphous & Crystalline Carbon		U11: Structural Characterization of Amorphous Carbon	U12: Deposition & *Electrical Properties of* Amorphous Carbon			
V5/MM10: *Thin Films* for Applications in MEMS V6: Polymer Thin Films	V7/U10: Mechanical Properties of Amorphous & Crystalline Carbon **ROOM 311**		V8: Adhesion & Fracture	V9: Reliability in Microelectronics	V10: Posters	V11: Nanoindentation *& Advanced Testing* Techniques	
W6: Growth—MOCVD, HVPE, BULK	W7: Panel Discussion 1:30-3pm W8: Growth—MBE, Cubic GaN, GaAsN, Si Substrates		W9: *Theory, Doping*	W10: Contacts, Point Defects, Processing	W11: Posters	W12: Quantum Dots, Optical Characterization, Rare Earths	
X	X3: **MEDAL AWARD TALK PRESENTATION**			X4			
Y9: Integration & Electrodes	Y10/KK4: High-Frequency *Applications of Ferroelectrics*	Y11-Y14; Y15/KK5: Posters	Y16: Fundamental Properties *of Thin-Film* Ferroelectrics & Ferroelectric Gate Materials	Y17: Piezoelectric Thin Films & Thin-Film Capacitor Materials			
Z1: Luminescent Waveguide Materials & Devices	Z2: Planar Optics on Si *& Photonic Crystals*		Z3: Polymers—Material Property & Photonic Devices	Z4: Inorganic Films & Devices	Z5: Posters		
AA1	AA2 AA3: In-Room Posters **FALMOUTH**		AA4	AA5			
BB7/PP3: Two-Photon Absorption & Applications	BB8: Organic Photonics		BB9: Semiconducting Polymers	BB10: Light-Emitting Diodes	BB11: Posters	BB12/PP7: Organic Photorefractives	
CC5	CC6/G7: Nonlithographic *Approaches*		CC7	CC8	CC9: Posters	CC10	
DD9: Path. Mineral. & Prevention DD10: Calcium Carbonate Formation	DD11: Biomimetic Hydroxy-apatite-Polymer Composite DD12: *Biomol.-Mineral Interact.*						
EE6: Tubules, Templates, & Polymerization **VERMONT**							

Symposium Session Locator

SYMPOSIUM	LOCATION	MONDAY, NOVEMBER 29			TUESDAY, NOVEMBER 30		
		a.m.	p.m.	eve.*	a.m.	p.m.	eve.*
FF: Electroactive Polymers *Sunday Tutorial Session***	Simmons (M)	FF1	FF2	FF3: Posters	FF4	FF5	
GG: Transport Properties & Microstructure of Cement-Based Systems	Room 207 (H)	GG1: Microstructure	GG2: Transport I		GG3: Transport II	GG4/QQ6: Cement-Based Matls. & Waste Containment **ROOM 203**	
HH: Superplasticity—Current Status & Future Potential	Room 204 (H)	HH1: Superplasticity in Metals	HH2: Superplasticity in Industry		HH3: Superplasticity in Ceramics	HH4: Other Techniques Including Severe Plastic Deformation	
II: Superconduct. Matls.—Prop./Crys. Chem./Proc. *Sunday Tutorial Session***	Room 200 (H)	II1: Crystal Chemistry & New Materials I	II2: Crystal Chemistry & New Materials II	II3: Posters	II4/L2/O2: Biaxially Textured Substrates for High-T_c Coated Conductors	II5: Phase Equilibria, Thermodynamics, & Kinetics	
JJ: Magnetoresistive Oxides and Related Materials	Room 202 (H)	JJ1: Spin Polarization & Tunnelling in Magnetic Oxides	JJ2: Novel Magnetic Oxides	JJ3: Poster	JJ4: Transport & Optical Properties	JJ5: Charge & Orbital Ordering Effects	
KK: Materials Issues for Tunable RF & Microwave Devices	Room 201 (H)				KK1: Frequency Agile Materials for Electronics	KK2: Electric-Field Tuning	
LL: Smart Materials	Room 309 (H)				LL1: Piezoelectrics I	LL2: Piezoelectrics II	
MM: Matls. Science of Micro-electromechanical System (MEMS) Devices II *Sunday Tutorial Session***	Room 313 (H)	MM1: Deposition & Characterization of Silicon I MM2: Deposition & Characterization of Silicon II	MM3: New Materials & Processes for MEMS I MM4: New Materials & Processes for MEMS II	MM5: Posters	MM6: LIGA MM7: MEMS Tribology	MM8: New Characterization Techniques/MEMS Devices MM9: MEMS Packaging	
NN: Chemical Processing of Dielectrics, Insulators, & Electronic Ceramics	Room 312 (H)	NN1: Oxides	NN2: Dielectrics	NN3: Posters	NN4: Ferroelectrics	NN5: Batteries/Fuel Cells NN6: Solar Cells	NN7-NN9: Posters
OO: Infrared Applications of Semiconductors III	Room 206 (H)	OO1: Antimonide-Related Materials & Devices I	OO2: Antimonide-Related Materials & Devices II		OO3: Innovative Devices I	OO4: Innovative Devices II	OO5: Posters
PP: Materials for Optical Limiting III	Room 205 (H)					PP1: RSA & Multichromophore Materials	PP2: Posters
QQ: Scientific Basis for Nuclear Waste Management XXIII	Room 203 (H)	QQ1: Cladding & Spent Fuel	QQ2: Flow & Transport QQ3: Interfacial Processes & Interactions		QQ4: Ceramics—Corrosion QQ5: Ceramics—Structure & Characterization	QQ6/GG4: Cement-Based Materials & Waste Containment	QQ7-QQ15: Posters

(H) = Hynes Convention Center
(M) = Boston Marriott Hotel

*All Evening Poster Sessions Located in Exhibition Hall D (H) ** Check Tutorial Matrix Shaded Blocks: No Session

Symposium Tutorials

(Details available on the MRS Web site and in the Program Book)

SUNDAY • NOVEMBER 28

Symposium J

FTJ: Advanced Resists for Micro- and Nanolithography

2:00 – 5:00 p.m.
Room 204
Hynes Convention Center

Symposium W

FTW: Material Characteristics of the III-Nitrides

2:00 – 5:00 p.m.
Room 202
Hynes Convention Center

Symposium Y

FTY: Ferroelectric Thin Films

1:00 – 5:00 p.m.
Room 203
Hynes Convention Center

Symposium FF

FTf: Electroactive Polymers as Emerging Actuators for Devices and Robotic Applications

1:30 – 5:00 p.m.
Room 206
Hynes Convention Center

Symposium II

FTi: Fundamental Material Aspects of High-Temperature Superconductors

1:00 – 5:00 p.m.
Room 200
Hynes Convention Center

Symposium MM

FTm: Polycrystalline Silicon and Silicon Carbide as Materials for MEMS

9:00 a.m. – 4:00 p.m.
Room 201
Hynes Convention Center

MONDAY • NOVEMBER 29

Symposium L

FTL: Low-Energy Ion and Hyperthermal Neutral Beams for Semiconductor, Metal, and Ceramic Film Growth

8:30 a.m. – 12:00 p.m.
Salon H/I - Marriott

Tutorial attendance is open to all meeting registrants at no extra charge.

The 1999 Fall Meeting Program is available on the MRS Web site: www.mrs.org

Symposium Session Locator

WEDNESDAY, DECEMBER 1			THURSDAY, DECEMBER 2			FRIDAY, DECEMBER 3	
a.m.	p.m.	eve.*	a.m.	p.m.	eve.*	a.m.	p.m.
FF6	FF7						
HH5: Fundamental Aspects of Superplasticity	HH6: High-Strain-Rate Superplasticity						
II6: Critical Currents	II7: Coated Conductors		II8: HTS Film Growth	II9: BSCCO Processing & Properties	II10: Posters	II11: Bi-, Tl-, & Hg-Containing *Superconductors*—Processing & Properties	
JJ6: Two-Phase Coexistence in the Manganites	JJ7: Strain Effects in Manganite Thin Films	JJ8: Posters	JJ9: Magnetic Oxide Thin Films & Heterostructures	JJ10: Magnetic Oxide Heterostructures & Devices			
KK3: Magnetic-Field Tuning	KK4/Y10: High-Frequency Applications of Ferroelectrics **ROOM 304**	KK5/Y15, KK6: Posters	KK7: Fundamentals	KK8: Materials Characterizations			
LL3: Shape Memory	LL4: Actuator Materials	LL5: Posters	LL6: Magnetostrictive Materials	LL7: Sensor & Other Materials			
MM10/V5: Thin Films for Applications in MEMS **ROOM 306**							
NN10: Ceramics NN11: SiC & Diamonds NN12: Polymers							
OO6: Growth, Char., Inn. Tech. OO7: Infrared Photodetectors	OO8: Innovative Materials & Devices		OO9: Nonlinear Optical Materials	OO10: Interdiffusion *in Quantum Wells*			
PP3/BB7: Two-Photon Absorption & Applications **SALON G**	PP4: Two-Photon Absorbers & Spectroscopy of Optical Limiting		PP5: Theory & Modeling	PP6: Liquid Crystals, Nanotubes, & Photorefractives		PP7/BB12: Organic Photorefractives **SALON G**	
QQ16: Containers & Repository	QQ17: Use of Natural Analog Info. in Performance Assessment *QQ18: Microbial Processes* in Waste Management		QQ19: Glass—Processing & Characterization QQ20: Glass—Corrosion & Characterization	QQ21: Waste Processing			

1999 MRS Fall Meeting

Hotel Reservations

A block of rooms has been reserved for MRS meeting attendees at the Boston Marriott, Westin, Sheraton Boston, and Back Bay Hilton Hotels. When making your reservations, mention the Materials Research Society's meeting to receive the special rate. A hotel reservation form is available on the MRS Web site (www.mrs.org) and in the Program Book.

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This fall MRS is offering special, discounted airfares through a designated travel agency as a service to MRS Fall Meeting attendees. Refer to the MRS Web site (www.mrs.org) or the Program Book for the Discount Air Fare Form.

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Taxicabs are available around the clock. Fares range from $10-$15 to the Back Bay area hotels.

City Transportation Service, 617-321-2282, is located outside the baggage claim areas at the airport and stops at various Boston hotels. The fare is $7.50 per person one way. The shuttle departs every half hour, Sunday through Friday, 7:00 a.m.-10:00 p.m.; on Saturday, every hour, 8:00 a.m.-8:00 p.m.

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MRS 1999 Fall Exhibit The Hynes Convention Center • Second Level

Exhibit Hours:

Tuesday, November 30	11:30 am - 6:00 pm
Wednesday, December 1	9:00 am - 6:00 pm
Thursday, December 2	9:00 am - 2:00 pm

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Partial List of 1999 Fall Exhibitors (as of September 20, 1999) ◆ denotes MRS Corporate Affiliate

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Cambridge, MA 02139
Tel: 617-868-4330
Fax: 617-868-4026
E-mail: sales.digilab@biorad.com
www.biorad.com

Bio-Rad, Spectroscopy Division will be exhibiting their line of FT-IR spectrometers including the latest in fast infrared imaging technology. This includes micro-imaging, macro-imaging and surface imaging using attenuated total reflectance (ATR). Also on display will be latest in surface and thin film infrared spectroscopy systems which include grazing angle, IRRAS and micro-grazing angle.

Bioanalytical Systems, Inc. (BAS) #623

2701 Kent Avenue
West Lafayette, IN 47906-1382
Tel: 800-845-4246
Fax: 765-497-1102
E-mail: echem@bioanalytical.com
www.bioanalytical.com

BAS manufactures and distributes a comprehensive line of electrochemical equipment, including potentiostats, galvanostats, impedance analyzers, and electrodes. BAS will be exhibiting the BAS 100 B/W Electrochemical Workstation, the RDE-1 Rotating Disk Electrode, the BAS-Zahner IM6 Impedance Analyzer, and software for simulation of cyclic voltammetry (DigiSim®).

◆ Blake Industries, Inc. #911, 913

660 Jerusalem Road
Scotch Plains, NJ 07076
Tel: 908-233-7240
Fax: 908-233-1354
E-mail: blake4xray@worldnet.att.net

Blake Industries will be exhibiting Huber rotary tables, translation stages, goniometer heads, X-Y slits for synchrotron and rotating anode experiments. Blake monochromators, thin-film cameras, and Laue equipment will also be displayed.

BOC Edwards #610

301 Ballardvale Street
Wilmington, MA 01887
Tel: 800-848-9800
Fax: 978-658-7969
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◆ Bruker AXS, Inc. #505, 507

6300 Enterprise Lane
Madison, WI 53719
Tel: 608-276-3000
Toll Free: 800-234-XRAY
Fax: 608-276-3006
E-mail: info@bruker-axs.com
www.bruker-axs.com

Bruker specializes in x-ray diffraction and fluorescence instrumentation, including configurations for phase identification, wafer analysis, thin film analysis, quantitative analysis, and single-crystal molecular structure determination. Specialized equipment and software developments include high-resolution optics for analyzing epitaxial materials, two-dimensional detectors for texture and stress analysis, small angle scattering and micro-diffraction, and advanced optics to increase x-ray flux.

Buehler, Ltd. #724

41 Waukegan Road
Lake Bluff, IL 60044
Tel: 847-295-6500
Fax: 847-295-7929
www.buehlerltd.com

Buehler will be displaying the all new MPC 3000 Integrated Circuit Back-side Grinding System. This system is designed to accurately remove a pre-specified amount of material from a microelectronic sample without the need for operator intervention. The MPC 3000 is designed for precision (±2 micron) back-side grinding of semiconductor packages. A custom designed vacuum mounting system gives 5-micron parallelism across the chip.

Burleigh Instruments, Inc. #508

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7647 Main Street
Burleigh Park
Fishers, NY 14453-0755
Tel: 716-924-9355
Fax: 716-924-9072
E-mail: info@burleigh.com
www.burleigh.com

Burleigh Instruments designs and manufactures precision surface imaging and measurement products for use in industrial and academic research applications and for quality control. Visit Booth No. 508 to see the company's full line of scanning probe microscopes and optical profilers including VISTA™ and METRIS™ SPMs and the HORIZON™ non-contact optical profilometer.

Caburn-International, Inc. #1106

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Unit #612
Canyon Country, CA 91351
Tel: 661-298-3086
Fax: 661-298-4775
E-mail: alecmike@aol.com
www.caburn-kohzu.com

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◆ Cameca Instruments, Inc. #104

204 Spring Hill Road
Trumbull, CT 06611-1356
Tel: 203-459-0623
Fax: 203-261-5506
E-mail: sales@cameca.com
www.cameca.fr

Cameca Instruments will be highlighting their "NEW" SC ULTRA, SIMS for the most flexible support of wafer fabrication as well as its analytical instrument product line at this year's MRS Fall Exhibit. Please stop by the Cameca Booth No. 104 to learn more about the SC ULTRA, SIMS and the following products:

- IMS Wf, in-line wafer tool
- NanoSims 50, the SIMS with the highest lateral resolution and sensitivity
- IMS 6f, workhorse of semiconductor and geochemical research
- IMS 1270, high-performance analyzer for geochronology and geochemistry
- TOF SIMS IV and 300
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◆ Capovani Brothers Inc. #221

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ChemIcon Inc. is an innovative manufacturer of high performance materials characterization instruments. ChemIcon offers a broad range of instrumentation and chemical imaging services. ChemIcon manufactures the Falcon™ Raman Chemical Imaging Microscope that provides two-dimensional molecular images detailing materials morphology, composition and structure. Chemical imaging technology has successfully been applied by ChemIcon in many application market segments including polymers and coatings, semiconductors and pharmaceuticals.

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◆ EDAX Inc. #817

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EDAX Inc., established in 1962, is a leading innovator in the design and manufacture of energy dispersive x-ray analysis systems. On an international basis, EDAX supplies the microanalytical and x-ray spectrometry markets with PC-based systems for qualitative and quantitative elemental analysis. EDAX offers a full range of analytical systems including: the Phoenix which features the most advanced energy-dispersive x-ray analyzer system; the Eagle series featuring elemental analysis utilizing sophisticated capillary optics; and the Falcon which offers automatic peak identification and

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◆ EG&G Instruments, Inc. #310

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EOS-EyeOnScience #1206

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EOS, a division of Jigyasa, Inc., is a startup company developing multimedia-based informal science education software. Our products aim to present fundamental concepts and the scientific process underlying observed phenomena. Our product line, "Eye on Materials: An Interactive Multimedia Exposition," is designed to expose frontline issues in materials science with a view to attract undergraduate students towards research. At our exhibit, we will demonstrate a package on carbon that illustrates interesting structure-property interactions in carbon allotropes along with an overview of carbon as a material of current research. This endeavor is funded by a grant from the National Science Foundation. We are also developing a line of products based on allegorical science stories for children K-12.

◆ EPI MBE Products Group #705

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EXAKT Technologies, Inc. #323

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Oklahoma City, OK 73116-9066
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◆ Fischione Instruments #900, 902

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Fischione Instruments manufactures a full line of instrumentation for electron microscopy. The family of specimen preparation instruments includes the twin-jet electropolisher, the specimen punch, the dimpling grinder, the specimen grinder, the ultrasonic disk cutter, and the low-angle milling and polishing (LAMP) ion mill. This line also includes the plasma cleaner, an instrument for preventing and eliminating carbonaceous contamination in TEM, SEM, and surface science applications. The TEM specimen holders include single tilt-360° rotate holder, the single tilt holder for fine tip specimens, and the analytical double tilt holder. Cryogenic TEM specimen holders include the single tilt analytical cryo holder, the TEM cryotransfer system, and the TEM anti-contaminator. Imaging instruments include the high angle annular dark field (HAADF) STEM detector capable of single electron detection. In North America, Fischione Instruments markets the chemical microscope, a bench-top imaging SIMS system manufactured by Millbrook Instruments.

FRT of America #519

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Products include surface analysis instruments, MicroGlider®, MicroProf® and evaluation and control software (SPM [Mark III], LEED, AES). Services include surface analysis (damage analysis, quality assurance, processing optimization, development); in-line control (manufacture and integration); consultancy work (surfaces, new materials, new technology); and applied basic research. In addition, special services include scanning probe microscopy; examining nano hardness; and project work and studies.

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