

MATERIALS RESEARCH SOCIETY MEETS IN BOSTON

Nearly 4000 attendees from a variety of science and engineering disciplines will convene at the Marriott and Westin Hotels at Copley Place in Boston for the Materials Research Society's fall meeting, to be held this year from Sunday, 1 December, to Saturday, 7 December.

The multidisciplinary nature of materials science is reflected in the topics to be covered by the 26 symposiums and 21 short courses, which will touch on aspects of physics, chemistry, biology and engineering. Meeting planners will again offer familiar and popular symposiums such as those on semiconductors, optical materials, ceramics, complex materials and high-temperature superconductors. In addition, several new session titles emphasize emerging fields.

The MRS will hold its first formal symposium devoted to low-temperature GaAs and related materials, expanding on lively discussions that took place at the invitational workshop on the subject held in conjunction with the 1990 spring meeting of the MRS in San Francisco. Resistive layers of GaAs, which are grown by molecular-beam epitaxy on substrates at low temperatures, have a number of possible device and circuit applications.

In a symposium on the shape-memory effect, a complicated phenomenon found in certain ceramics, polymers and metallic and intermetallic alloys, speakers will discuss the design, fabrication, applications, structure and properties of shape-memory materials. Hierarchically structured materials are the subject of a symposium dedicated to the memory of Donald R. Ulrich. Here speakers will focus on the complex structural design of many naturally occurring materials, such as skin, bone and wood. These composites display unique properties at many length scales, from atomic to macroscopic dimensions. A symposium titled "Tissue-Inducing Biomaterials" will feature talks on the design of materials and devices that can guide the repair or regeneration of tissues and organs.

Recent reports that visible luminescence can be obtained at room temperature from highly porous silicon have prompted meeting organizers to schedule for Tuesday evening a special postdeadline symposium on the

subject. Symposium chair Subramanian Iyer hopes that the discussions will help clarify whether light emission from porous silicon is a quantum-confinement or a defect phenomenon. Other talks will concern possible applications of porous silicon, which might include lasers and LEDs that can be readily combined with integrated circuits.

The perennial "Symposium X," to be held each day at lunchtime and billed as a series of authoritative reviews for nonspecialists, features talks on fluorine-based polymers, nanofabrication, interaction of energetic ions with solids, biomaterials, shape-memory alloys, diamond films and more.

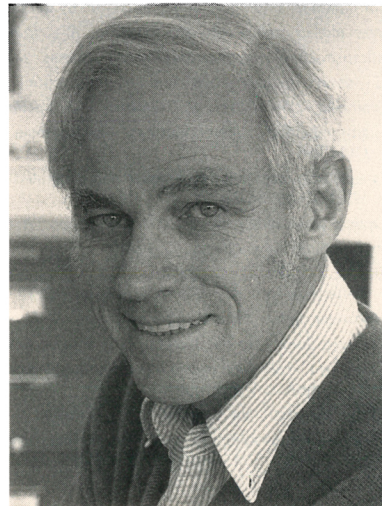
Presidential science adviser D. Allan Bromley will deliver the plenary address Monday evening at 6 pm.

The society's highest honor

On Wednesday evening at 6 pm MRS President James B. Roberto will present the Von Hippel Award, the society's highest honor, to Theodore H. Geballe of Stanford University for "a lifelong career of finding novel and important physical phenomena and for his example in carrying out effective multidisciplinary materials research." An experimenter known for his work on semiconductors and superconductors, Geballe has endorsed an integrated approach to materials research.

Geballe's early studies in the 1950s of transport in semiconductors contributed to the understanding of piezoresistance, phonon drag, and electrical, thermal and impurity-hopping conduction. He and Bernd T. Matthias, with Seymour Geller and Ernest Corenzwit, in their work on the A15 class of superconductors, broke the critical-temperature record in 1954 with their discovery of Nb_3Sn , which superconducts at 18 K. His achievements also include the development of layered-transition-metal dichalcogenide superconductors and the demonstration of enormous-critical-field anisotropy. Geballe's group at Stanford was among the first to produce thin films of the new high- T_c superconductors.

After receiving his BS and PhD in chemistry from the University of California, Berkeley, Geballe joined the staff of AT&T Bell Laboratories in 1952 to pursue studies of semiconduc-



Theodore H. Geballe

tors, superconductivity and the low-temperature properties of materials. In 1968 he joined the Stanford faculty, where he became chairman of the department of applied physics and director of the Center for Materials Research. Geballe held the Theodore and Sydney Rosenberg Chair in Applied Physics at Stanford from 1978 until 1990, when he became an emeritus professor.

The MRS fall meeting will once again feature an equipment exhibit, organized by the American Institute of Physics. The exhibit, which will display analytical and processing equipment related to the symposium topics, will be open Tuesday from noon to 7 pm, Wednesday from 9:30 am to 5 pm and Thursday from 9:30 am to 2 pm. There will be a reception Tuesday from 5 to 7 pm in the exhibit hall, on the third floor of the Marriott Hotel.

Tuesday through Thursday AIP will operate a job-placement center adjacent to the exhibit hall. Prospective employees can submit one-page resume forms to placement center staff, who will arrange on-site interviews with participating employers. Preregistration begins Sunday at 4 pm in the MRS registration area.

MRS will offer a comprehensive program of short courses to complement symposium topics. Courses will include instruction on the preparation, fabrication and characterization of materials as well as introductions to advanced materials. On-site registration for short courses begins on Sunday, 1 December, at 11:30 am.

Invited Papers

Monday, 2 December

morning

Formation of amorphous semiconductors by ion beams. *F. Saris, F. Spaepen*
Interfacial crystallography and structure. *R. C. Pond, A. P. Sutton*
Microstructural processes and intrinsic stresses. *S. D. Senturia, R. Abermann*
Gas-source epitaxial growth and characterization. *P. Demeester*
Diamond. *W. E. Pickett, R. J. Graham, V. S. Vavilov*
High-temperature superconductors: Fundamentals. *B. Batlogg, A. W. Sleight, J. R. Clem*
Optical characterization techniques and integrated sensors and detectors. *M. De Graef, M. Sayer*
Optical waveguide materials: Plenary session. *A. M. Glass*
Photoinduced phenomena. *G. Meltz*
Electrical, optical and magnetic properties of organic solid-state materials: Plenary session. *A. F. Garito, G. Wegner, D. O. Cowan*
Nonlinear optics: Second-order processes. *K. D. Singer, R. Lytel, Y. R. Shen*
Complex fluids: New architectures. *P. Pincus, E. W. Kaler, F. C. MacKintosh*
Synthesis I: Polymeric precursors for nonoxide ceramics, sol-gel chemistry. *D. Seyferth, L. V. Interrante*
Cluster chemistry and catalysis. *G. A. Somorjai*
History and foundations of multiple scattering theory. *J. Korringa, B. L. Gyorfgy, J. S. Faulkner, O. K. Andersen, H. Winter*

afternoon

Ion-beam modified semiconductors: Novel characterizations. *C. A. Volkert*
Growth kinetics. *J. W. Cahn, M. Enomoto, J. E. Taylor*
Interfacial defects and reactions. *R. Bonnet, J. M. Gibson*
Stresses and deformation processes. *F. Spaepen*
Implantation and annealing. *K. S. Jones, J. P. de Souza, J. H. Marsh*
Diamond. *R. W. Pryor, J. Narayan*
High-temperature superconductor materials: Properties and synthesis I. *D. C. Johnston, M. Takano*
Electrodes and electrical property characterization. *S. H. Rou, W. A. Geideman*
Fiber strength. *S. T. Gulati*
Infrared fibers. *T. Yamagishi*
Molecular superconductors and related phenomena. *H. H. Wang, G. Saito, P. M. Chaikin*
Gels, foams and emulsions. *J. Bastide, D. J. Durian, J. Bibette*
Synthesis II: Polymeric precursors for oxide ceramics and synthesis of powders (solution methods). *R. Roy*
Highly dispersed structures. *W. M. H. Sachtler*
Classical applications of multiple scattering theory. *J. R. Willis, V. V. Varadan*
Frontiers of materials research. *H. S. Eleuterio, J. H. Fendler*
Structures, properties and design rules in hierarchical materials in nature. *E. Baer, E. Evans, N. H. Mendelson*

Tuesday, 3 December

morning

Laser etching and ablation. *K. Gamo*
Instability and growth morphology. *G. S. Grest*
Interfacial kinetics and migration. *C. Rottman, W. Mader*
Mechanical testing techniques and mechanical properties. *H. G. Bohn*
Dry etch/deposition. *S. W. Pang, C. Constantine*
II-VI compounds. *J.-I. Nishizawa, R. D. Bringans*
High-temperature superconductor materials: Properties and synthesis II. *M. G. Smith, A. F. Hebard*
Physical and chemical vapor deposition techniques. *S. Hayashi, G. J. M. Dornans*
Active fibers I. *D. J. DiGiovanni*
Novel inorganic cements. *D. M. Roy*
Shape-memory materials and phenomena: Fundamentals. *C. M. Wayman, K. M. Ho, P. C. Clapp*
Conducting polymers. *A. J. Heeger, A. G. MacDiarmid, J. P. Pouget*

Colloids. *J. S. Huang, M. O. Robbins, B. J. Ackerson*
Dynamics and self-organization. *J. S. Langer, P. Bak, R. P. Behringer*
Processing science I: Dispersion and rheology. *R. G. Horn, M. Tirrell, F. F. Lange*
Gas pressure effects on materials processing and design: General papers. *M. Armor, K. Uematsu*
Zeolites and microporous materials. *R. J. Gorte*
Full-potential multiple-scattering theory. *R. K. Nesbet, A. Gonis, P. H. Dederichs*
Synthetic hierarchical structures and design rules. *C. P. Bosnyak, W. Brostow, L. C. Sawyer, S. H. Carr, B. Lotz, G. Olson*

afternoon

Phase formation by ion implantation: Silicides, ceramics and glasses. *J. M. E. Harper*
Laser deposition. *C. M. Friend*
Phase transition. *D. Turnbull, K. Kawasaki, R. Lipowsky, T.-M. Lu, P. Nielaba*
Interfaces and transformation. *G. J. Shiflet, R. Sinclair*
Indentation: Modeling and experiments. *G. M. Pharr*
III-V devices and contacts. *T. Sands, T. N. Jackson*
Theory of wide-band-gap semiconductors. *D. B. Laks, J. Bernholc, Y. Bar-Yam*
HTC thin films I: MBE and PLD. *J. R. Kwo, T. Kawai, A. Gupta*
Processing by spin pyrolysis and barium- and bismuth-based ferroelectrics. *D. Payne, S. Matsubara*
Nonlinear materials. *D. W. Hall*
Thin films. *R. Dorn*
Novel inorganic cements. *H. Igarashi*
Martensitic transformation and phase stability. *J. A. Krumhansl, L. E. Tanner, I. Müller, K. Shimizu*
Nonlinear optics. *G. C. Bjorklund, L.-T. Cheng, S. Etemad, J. LeMoigne*
Electrorheological and magnetic colloids. *T. C. Halsey, C. F. Zukoski, P. Fabre*
Dynamics and hydrodynamics. *Y. Couder, D. Jasnow, Y. Oono*
Processing science II: Forming processes and texture development. *L. A. Boatner*
Gas-pressure effects on materials processing and design: New applications. *D. J. Stephenson, T. Fujikawa*
Synthesis and reactivity of oxides I. *A. Corma*
Applications of multiple-scattering theory to alloys. *G. M. Stocks, P. E. A. Turchi, I. Mertig, D. M. Nicholson, D. D. Johnson*
Frontiers of materials research. *J. Ziegler, L. Katz*
Composite structures and mechanical properties. *G. Mayer, P. E. Klunzinger, L. Rebenfeld, A. Hiltner, F. J. McGarry*

evening

Fractals and multifractals in models and materials. *L. P. Kadanoff*

Wednesday, 4 December

morning

Irradiation-induced transformations. *C. W. Allen, J.-I. Koike*
Electron- and neutral-beam processing. *Y. Aoyagi*
Step flow and film growth. *A. Zangwill, J. M. Blakely, R. W. Collins*
Interfaces in thin films. *D. A. Smith, E. D. Williams*
Strain relaxation and misfit dislocations in heteroepitaxial thin films. *R. Hull*
Contacts and characterization. *A. Katz, C. W. Magee*
III-V nitrides. *I. Akasaki, W. A. Bryden, T. L. Tansley*
Toward HTC circuit technologies I: Devices, needs and processes. *T. Van Duzer, R. C. Dynes*
Pulsed laser ablation of thin-film ferroelectrics. *R. Ramesh, K. S. Grabowski*
Planar waveguides I. *M. P. DeMicheli*
Novel experimental approaches. *H. M. Jennings*
Shape-memory materials: Structure and properties. *R. D. James, A. L. Roytburd*
Molecular engineering. *M. Lahav, G. M. Whitesides, G. K. Wong, G. R. Möhlmann, S. R. Forrest, M. Hara, Y. Koike*

Interfaces: Patterns and forces. *F. Rondalez, J. Klein*
 Pattern formation. *H. Müller-Krumbhaar, J. Fineberg, J. Lee*
 Processing science III: Removal of processing aids and effects of processing on particle surfaces. *M. J. Cima*
 CVD of refractory metals and ceramics: Fundamentals/modeling. *C. Bernard, S. A. Gokoglu*
 Densification I. *S. E. Hsu*
 Synthesis and reactivity of oxides II. *H. Knözinger*
 Relativistic multiple-scattering theory. *J. B. Staunton, H. Ebert*
 Pattern formation in synthetic and natural composites. *A. Khachaturyan, R. W. Siegel, G. E. Welsch*

afternoon

Deposition with ion beams: ICB, IBAD. *I. Yamada*
 Plasma etching and ion-induced damage. *D. W. Hess, G. F. Doughty*
 Epitaxial growth. *R. M. Tromp, M. G. Lagally, P. M. Petroff*
 Segregation and deformation at interfaces. *I. M. Robertson, A. D. Marwick*
 Multilayers: Stresses and mechanical properties. *B. M. Clemens, I. K. Schuller*
 Novel growth and characterization. *A. R. Calawa, C. R. Abernathy, F. W. Smith, M. Stavola*
 Boron compounds. *K. Era, G. L. Doll*
 Toward HTC circuit technologies II: Junctions and circuit technologies. *W. Gallagher, L. P. Lee, H. Adachi*
 Lithium niobate, potassium niobate and late news. *S. L. Swartz*
 Cement-based materials for the infrastructure. *S. Diamond, L. J. Struble*
 Shape-memory effects. *Y. Yamada, T. Duerig*
 Ferromagnetism and related phenomena. *A. J. Epstein, H. Iwamura, T. Sugimoto, W. Haase*
 Friction fracture and adhesion. *J. Krim, C. A. Helm, P. A. Thompson, K. A. Mazich*
 Processing science IV: Densification and microstructure characterization. *M. Harmer, R. A. Page*
 In situ diagnostics. *R. Collins*
 Densification II. *A. Leriche, H. Palmour*
 Collagen-based scaffolds. *I. V. Yannas, E. Bell*
 Transient characterization methods. *W. N. Delgass*
 Application of MST to surfaces and extended defects. *R. Zeller, X.-G. Zhang*
 Frontiers of materials research. *C. M. Wayman*
 Electronic, optical and magnetic properties of hierarchically structured materials. *R. A. Farrell, P. N. Prasad, R. E. Newnham, P. Chaudhari, H. Demiryont*

evening

Chemical modification and applications of fullerenes. *F. Wudl, R. Smalley, R. C. Haddon, R. L. Whetten*

Thursday, 5 December

morning

Ion-assisted and plasma deposition. *J. Greene, H. F. Winters, N. Herbots*
 Self-assembled monolayers and growth at electrochemical interfaces. *G. Whitesides, B. M. Ocko*
 Interfaces: High-temperature and composite materials. *H. L. Fraser, M. J. Mills*
 Impurities and characterization. *H. C. Alt*
 Electrical properties of LT GaAs. *M. Kaminska, J. M. Woodall*
 Silicon carbide. *J. A. Powell, V. Heine*
 High-temperature superconductors: Microwave properties. *R. W. Ralston, V. Z. Kresin, D. E. Oates, T. Konaka*
 Nondestructive methods for characterizing pavements. *R. M. Pearson, C. E. Synolakis*
 Methods for evaluating performance properties of materials. *W. V. Chang*
 Materials processing, alloy design and industrial applications I. *L. M. Schetky, H. Otsuka, P. E. Thoma*
 Nonlinear optics: Second- and third-order processes. *Z. G. Soos, R. Silbey, N. Peyghambarian*
 Scattering and multiple scattering. *D. A. Weitz, P. Sheng, B. Duplantier*

Processing and synthesis: Synthesis and processing of composites, reaction bonding, solid-state reactions. *M. D. Sacks, J. S. Haggerty*
 Microstructure-process-property relationships. *M. A. Pickering*
 Electronic materials and glass. *H. Yamashita*
 Osteo-inductive materials II: Cell and tissue interactions. *R. Bizios, S. I. Stupp*
 Scaling and structural characterization in hierarchical natural and synthetic structures. *A. N. Berker, M. Senechal, P. M. Duxbury, E. A. DiMarzio, L. J. Gibson, R. Gronsky, M. Isaacson*

afternoon

Enhanced flux pinning. *Y. Matsui, L. Civale*
 Laser surface modification. *R. J. Baseman*
 Self-assembled monolayers. *M. L. Klein, C. E. D. Chidsey, C. M. Knobler*
 Interfaces in ceramics and electronic materials. *C. B. Carter*
 Electromigration and stress voiding in interconnect metals. *J. R. Lloyd*
 Defects, hydrogen and diffusion. *S. K. Estreicher, H. E. Jackson*
 Structural properties of LT GaAs. *Z. Liliental-Weber, M. R. Melloch*
 Amorphous and microcrystalline semiconductors. *Y. Hamakawa, S. Tsuda*
 New materials for infrastructure: General papers. *V. M. Castaño*
 Materials processing, alloy design and industrial applications II. *J. Van Humbeeck, Y. Suzuki, J. Stice*
 Conjugated polymers: Insulating forms. *M. Hanack, F. Wudl*
 Polymer interfaces and structure. *P. Auroy, K. I. Winey*
 Scattering and porous media. *P. Wong, S. K. Sinha, A. H. Thompson*
 Novel processing and synthesis: Biomimetic processes, composites, ceramic-polymer composites, molecular composites. *P. Calvert, I. Aksay, E. P. Giannelis, G. W. Scherer*
 Chemical vapor infiltration. *T. L. Starr*
 Superconductors. *J. Karpinski*
 Application of MST to LEED photoemission and spectroscopies. *P. M. Marcus, M. A. Van Hove, P. J. Durham, A. Bansil*
 Frontiers of materials research. *P. Bachmann*
 Processing of synthetic hierarchical structures. *J. H. Fendler, A. Bose, D. Christiansen, P. Calvert, I. A. Aksay, A. McCormick*

evening

Anomalous characteristics in low-temperature-grown III-V materials. *E. R. Weber*

Friday, 6 December

morning

Growth and characterization techniques I. *E. Vlieg, H. A. Atwater, P. H. Fuoss*
 Utilization of LT GaAs in FETs. *U. K. Mishra*
 Utilization of LT GaAs in optical devices. *G. Mourou*
 Chalcopyrites, oxides and halides. *K. J. Bachmann, K. Atsumi*
 High-temperature superconductor thin films II: Sputtering and CVD. *J. R. Gavalier, S. M. Garrison, R. Hiskes*
 Nonlinear processes and materials. *G. I. Stegeman, K. Sasaki, T. Kaino*
 Shear-induced effects. *P. K. Dixon, G. G. Fuller, P. Tong, C. R. Safinya*
 Phase transitions and networks. *D. G. Stroud, W. A. Curtin, G. F. Mazenko, M. H. W. Chan*
 Organometallic CVD. *L. V. Interrante*
 Materials for morphogen delivery. *R. Langer, E. A. Wang, M. Nugent, A. S. Rudolph*
 Molecular design of hierarchical structures. *R. H. Atalla, G. Zhang, D. W. Urry, E. T. Samulski, J. T. Staley, C. Furlong*

afternoon

Growth and characterization techniques II. *W. Lowe*
 Critical currents, wires and tapes. *A. P. Malozemoff, K. Kishio*
 Conjugated polymers, conducting forms. *C. C. Han, A. A. Ovchinnikov*
 Diamond films. *K. E. Spear*
 Specimen preparation for transmission electron microscopy of materials III. *A. Barna, D. P. Basile, V. L. Carlino, P. E. Fischione, R. Alani*