
# AVS Meets in Reno

The American Vacuum Society will hold its 31st National Symposium at the MGM Grand Hotel in Reno, Nevada from 3–7 December. The technical program, organized by chairman Galen B. Fisher and assistant chairman Steven J. Schmieg (both of General Motors Research), will be the largest in the history of the Society: 87 invited speakers and 384 contributed papers. The meeting will also feature a program of 22 short courses on vacuum physics and technology, an extensive equipment exhibit, the presentation of the 1984 AVS awards and business meetings of the Society's divisions. Howard G. Patton (Lawrence Livermore National Laboratory) is this year's chairman of the local arrangements committee.

Several of the divisions will offer symposia on topics relating to the burgeoning microelectronics industry. In addition to discussing semiconductor heterojunctions, the Electronic Materials and Processing division is cosponsoring a symposium with the Thin Film division on interconnects and microelectronics packaging. Other sessions sponsored by the Thin Film division will deal with *in situ* process monitoring and magnetic and optical recording materials. Topics of the Surface Science division will include recent research on the dynamic processes of surfaces and adsorbates; and the ASTM E-42 committee on surface analysis and AVS will cosponsor sessions on surface and interface characterization in materials science. For the first time in several years, the Vacuum Metallurgy division will present a program; it will focus on novel methods and applications of coating deposition and ion-implantation processes. In addition to discussing advances in pumping and leak detection, the Vacuum Technology division will offer two sessions with the Fusion Technology division on mutually interesting problems in pressure

## Invited papers

**TUESDAY**

**Morning**

Hard coatings. *J.-E. Sundgren*

High-speed electron devices using compound semiconductors and their heterojunctions. *L. F. Eastman*

Novel material properties of strained-layer superlattices. *G. C. Osbourn*

Characterization of heterojunction parameters by soft x-ray photoemission spectroscopy. *G. Margaritondo*

Measurements of semiconductor heterojunction band discontinuities by x-ray photoemission spectroscopy. *J. R. Waldrop, R. W. Grant, S. P. Kowalczyk, E. A. Kraut*

Interface and device properties of semiconductor heterojunctions. *R. S. Bauer, R. D. Burnham*

Surface vibrational properties. *R. F. Wallis*

Time-resolved electron energy-loss spectroscopy of surface kinetics. *W. Ho*

Surface measurements on nonhomogeneous material: the problems and the challenge. *M. T. Thomas*

Cryopumps in manufacturing today. *M. C. Bridwell, J. G. Rodes*

Reclamation of vacuum pump fluids—a realistic quality improvement and cost reduction program. *C. B. Whitman*

Characterization of laboratory plasmas with probes. *D. M. Manos*

Plasma-edge studies using carbon resistance probes. *W. R. Wampler*

**Afternoon**

Time-resolved optical diagnostics of rf plasma. *R. A. Gottscho, M. L. Mandich*

Glow discharge mass spectrometry for sputtering plasma diagnostics. *C. R. Aita*

End-point detection in plasma etching. *P. J. Marcoux*

The use of electrostatic probes for plasma diagnostics. *B. E. Cherrington*

Pulsed-laser and ion-beam melting and annealing of semiconductors. *M. O. Thompson, R. Fastow*

Naked clusters—molecular surfaces. *A. Kaldor, D. M. Cox, D. J. Trevor*

The bonding configuration and reactivity of ligand molecules on metal surfaces. *N. R. Avery*

Core-electron energy-loss spectroscopy of rare earths. *F. P. Netzer*

Surface magnetism: recent progress and opportunities. *M. Campagna*

Space shuttle molecular scattering and wake vacuum measurements. *R. J. Naumann, G. R. Carignan, E. R. Miller*

Development of large cryopumps: from space chambers to the fusion program. *C. B. Hood*

Errosion and deposition in tokamaks. *G. Staudenmaier*

Experimental studies for the development of high-heat-flux materials and components. *R. D. Watson, J. B. Whitley*

**WEDNESDAY**

**Morning**

Thin films for optical-data storage. *W. Y. Lee*

Thin films for magnetic-recording technology: a review. *J. K. Howard*

Chemical processes in etching reactions. *F. R. McFeely*

Impact-collision ion-scattering spectroscopy using noble gas and alkali ions for surface-structure analysis. *M. Aono, R. Souda, C. Oshima, S. Otani, Y. Ishizawa*

UHV high-resolution electron microscopy of reconstructed surface and adsorbed structures. *K. Takayanagi*

Chemical effects in electron energy-loss spectroscopy. *A. J. Bevolo*

TFCX design studies. *J. A. Schmidt*

Mirror Advanced Reactor Study (MARS). *B. G. Logan*

Next European Torus (NET). *R. Toschi*

The Advanced Toroidal Facility (ATF). *J. Sheffield*

**Afternoon**

Laser microchemical reactions for maskless device processing. *D. J. Ehrlich*

Status of TFTR with ohmic heating and neutral-beam injection. *D. J. Grove*

Joint European Torus (JET). *G. Duesing*

Plasma modeling of MFTF-B and the sensitivity to vacuum conditions. *G. D. Porter, M. Rensink*

The Doublet III Big Dee project. *L. G. Davis*

**THURSDAY**

**Morning**

Future trends in microelectronics packaging. *W. D. Grobman*



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measurement and vacuum system design. Fusion Technology will also feature three topical sessions; the first two will describe progress in magnetic fusion and breakeven devices, and the third will deal with inertial-fusion target development in other countries.

### Special sessions and awards

The Surface Science division will hold its annual post-deadline discoveries session on Thursday evening, 6 December. The session will begin with the presentation of the division's Morton M. Traum student award.

The American Vacuum Society will hold its awards luncheon on Wednesday, 5 December. William E. Spicer of Stanford University will receive the Medard W. Welch award for "his contributions to the development and application of photoelectron spectroscopy in the study of the electronic structure and chemical properties of solids and their surfaces and interfaces." Alfred Benninghoven of the University of Münster will be presented the Gaede–Langmuir award for his research on "static secondary ion mass spectrometry and the demonstration of its usefulness in manifold applications." The Peter Mark Memorial award for outstanding work by a young scientist will go to Barbara J. Garrison of Pennsylvania State University for "developing computer models of ion–solid interactions to obtain fundamental insights into the collision processes, and to obtain analytical, bonding, and structural information." The Society will also announce the winners of its 1984–85 scholarships and the winners of awards for the best Shop Notes published in the Journal of Vacuum Science and Technology.

The AVS plenary session will follow the awards luncheon and will feature lectures by Benninghoven and Spicer. Later that afternoon AVS will offer a seminar on new products. For the first time, the AVS President's Reception, scheduled for Wednesday evening, will be open to all Symposium attendees.

### Short courses

AVS will also offer a program of 22 short courses, ranging in length from one to five days, that are intended for anyone working with or interested in vacuum technology, including:

- ▶ Vacuum Technology
- ▶ Thin Film Deposition and Etching Process
- ▶ Applied Thin Film Optics
- ▶ Tritium Handling in Vacuum Systems
- ▶ Refractory Metals and Silicides for VSLI Technology
- ▶ Operation and Maintenance of Vacuum Pumping Systems
- ▶ Vacuum Equipment/Computer Interfacing
- ▶ Fundamentals of Surface Science
- ▶ Plasma and Vacuum Technology for Fusion Devices
- ▶ Sputter Deposition and Ion Beam Processes
- ▶ IC Processing
- ▶ Surface Analysis: Ion Spectroscopies (SIMS, ISS, RBS)
- ▶ Vacuum Leak Detection
- ▶ Clean Room Technology
- ▶ Pumping Hazardous Gases
- ▶ Plasma Etching and RIE
- ▶ Cryopumping
- ▶ Computer Operations for Vacuum Equipment Control
- ▶ Surface Analysis: Electron and Other Emerging Spectroscopies
- ▶ Spatially Resolved Analysis of Microelectronics
- ▶ Chemical Vapor Deposition for Electronics
- ▶ Adhesion of Polymeric and Metallic Thin Films

### Equipment and employment

The American Vacuum Society will sponsor an exhibit of state-of-the-art equipment for the production, control and analysis of films, surfaces, materials and vacua to run concurrently with the symposium. One-hundred thirty-six companies, institutions and organizations will participate in the display. The Society will also maintain an employment opportunities bulletin board throughout the Symposium. □

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Polymers as electronic materials. *C. B. Duke*

Chemical bonding and reaction at polymer surfaces and metal–polymer interfaces. *P. S. Ho, P. O. Hahn, G. W. Rubloff, F. K. LeGoues*

Ceramic microstructures and properties. *M. Rühle*

Room-temperature nickel silicide nucleation on Si(111) and Si(100). *F. Comin, J. E. Rowe, P. H. Citrin*

Theoretical considerations of energetics, dynamics, and structure of interfaces. *U. Landman, R. N. Barnett, C. L. Cleveland*

Clean and adsorbate-induced surface phase transitions on metal single crystals. *D. A. King*

Quantification and measurement by AES and XPS. *M. P. Seah*

Particulate contamination control. *R. F. Meeks*

Are robots really the key to making our "factories of the past," "factories with a future™" *V. E. Estes*

Plasma-assisted physical vapor-deposition processes—a review. *C. V. Deshpandey, R. F. Bunshah*

Reactively sputtered TiN, ZrN, and HfN. *W. D. Sproul*

A sputtering wind. *D. W. Hoffman*

Pellet fueling experiments in Alcator C. *M. Greenwald, J. Parker, C. Fiore, R. Gandy, C. Gomez, R. Parker, R. Granetz, P. Pribyl, E. S. Marmar, J. Rice, S. McCool, J. Terry, S. Milora, S. Wolfe, D. Pappas*

The US inertial fusion program. *R. L. Schriever*

**Afternoon**

High-performance packaging in microelectronics. *A. J. Blodgett, Jr*

Ceramic microstructure and adhesion. *D. H. Buckley*

Stress and thermal analysis for packaging. *W. H. Schroen, S. K. Groothuis*

An overview of surface-mount technology for hybrid microcircuit assembly. *J. M. Montante*

High-energy microbeam analysis of fusion reactor components. *B. L. Doyle*

The spinning rotor gauge. *J. K. Fremerey*

The development of variable-capacitance pressure transducers for vacuum applications. *J. J. Sullivan*

Principles and applications of ionized-cluster beam deposition. *P. R. Younger*

Effects of pressure, temperature and alloy composition on implantation-induced carburization of steels. *B. D. Sartwell, D. A. Baldwin, I. L. Singer*

Ion-beam modification of materials. *J. K. Hirvonen*

Plasma–surface interactions in the presence of strong rf fields during ICRF heating in PLT. *P. L. Colestock*

Vibrational relaxation in $H_2$ molecules by wall collision: applications to negative ion source processes. *A. M. Karo, J. R. Hiskes*

Target fabrication activities in the UK. *J. M. A. Reichelt*

Laser fusion target studies in the Centre D'Etudes de Limeil-Valenton. *X. Clement, A. Coudeville, P. Eyharts, J. P. Perrine, R. Rouillard*

Target fabrication activities in Japan. *Y. Izawa*

**FRIDAY**

**Morning**

Single-crystal silicide–silicon interfaces: structures and barrier heights. *R. T. Tung*

Raman scattering at buried semiconductor–metal interfaces. *J. C. Tsang*

State-selective studies of molecules from surfaces using laser-based techniques. *G. D. Kubiak, G. O. Sitz, A. C. Kummel, D. C. Jacobs, R. N. Zare*

The dynamics of energy flow at surfaces. *J. C. Tully*

The use of nonequilibrium plasma etching in metal–polymer interface analysis. *J. F. Evans, J. G. Gibson, J. G. Newman*

Computer-controlled residual-gas analysis. *D. J. Mitchell*

Management of vacuum leak-detection processes, standards and calibration. *N. G. Wilson*

Microfabrication research at the National Submicron Facility. *E. D. Wolf*

Glass microshell fabrication possibilities as viewed by a glass scientist. *R. H. Doremus*

**Afternoon**

Laser deposition of conductive films and microstructures. *S. D. Allen*

Surface preparation and characterization by spectroscopic ellipsometry. *D. E. Aspnes*

UV–ozone cleaning of surfaces. *J. R. Vig*

Surface cleaning, residual contamination and gate oxide–interface structure in MOS processing. *F. J. Grunthaner*

Adsorbate–surface and adsorbate–adsorbate interactions and their role in surface reactions. *J. K. Nørskov*

The roles of carbon, sulfur and alkali metals as promoters of catalyzed reactions on metal surfaces. *G. A. Somorjai*