

# Vacuum Society meets in Anaheim

**The 34th AVS National Symposium will feature a full technical program, a comprehensive exhibit of equipment, short courses and awards.**

The American Vacuum Society will hold its 34th National Symposium in Anaheim, California, 2-6 November. Located in the Anaheim Hilton Hotel and the Anaheim Convention Center, the symposium will feature a full technical program, a comprehensive exhibit of equipment, some 42 short courses, and awards. Registration will take place at the Hilton on Sunday, 1 November from 3 pm to 10 pm; on Monday, Tuesday and Wednesday, from 7 am to 5 pm; and on Thursday and Friday, from 7 am to 3 pm.

Several AVS divisions have organized symposia for the meeting. The Applied Surface Science, Electronic Materials, Thin Film and Vacuum Technology divisions have each organized eight symposia. Topics for Applied Surface Science include corrosion and depth profiling; for Electronic Materials, semiconductor interfaces and epitaxial growth; for Thin Films, processing and characterization, and diamond and diamond like carbon films; and for Vacuum Technology, pressure measurement and pump technology. The Surface Science Division will hold nine symposia on new microscopies and surface dynamics. The Plasma Science and Technology Division will sponsor three symposia on topics in inertial-confinement fusion target technology and pellet fueling. The Vacuum Metallurgy Division has organized symposia on ion-assisted deposition, and plasma polymerization and chemical-vapor deposition. A number of jointly sponsored symposia have also been scheduled, including plasma-surface interaction, new analytical techniques and novel semiconductor materials and heterostructures. In addition, AVS will sponsor a topical conference, "Deposition and growth: Limits for microelectronics," in conjunction with the meeting.

On Friday, the Plasma Science and

Technology Division will sponsor a workshop on pellet injector development for magnetic fusion and the Thin Film Division will sponsor a topical conference on high-temperature superconductors.

The popular AVS annual run will be held on Wednesday, 4 November at 6:30 am. All meeting participants are invited to join the competition. This year's race will include a corporate team division, with each team consisting of three or more employees of the sponsoring company. The society has also arranged a complete companion's program, which will feature tours to San Juan Capistrano and Laguna Beach, Universal Studios, the Huntington Museum, A Medieval (K)night, the Spruce Goose and the *R. M. S. Queen Mary*.

## Special sessions and awards

In addition to the technical programs and presentations that last throughout the week, the symposium will feature two plenary sessions. On Monday afternoon Heinrich Rohrer (IBM, Zurich), who received the 1986 Nobel Prize in Physics, will lecture on scanning tunneling microscopy. Yuan T. Lee (University of California, Berkeley), who received the 1986 Nobel Prize in Chemistry, will take the podium on Wednesday morning to speak on studies of reaction dynamics using crossed molecular-beams.

AVS will honor Mark J. Cardillo (Bell Laboratories, Murray Hill, New Jersey), Marsbed H. Hablanian (Varian Associates) and Raymond Tung (Bell Laboratories, Murray Hill), at its awards luncheon on Wednesday.

Cardillo, who is head of the chemical physics research department at Bell Laboratories, will receive the Medard W. Welch Award. Cardillo received his BS from Stevens Institute of Technolo-

gy in 1964 and a PhD in chemistry from Cornell University in 1970. Before joining Bell Labs, he was a research associate at Brown University (1969-71), a CNR visiting scientist at the Physics Institute of the University of Genoa (1971-72) and a research associate in the Mechanical Engineering Department of MIT (1972-75).

Cardillo has used molecular-beams techniques to study gas-surface interaction dynamics, including molecular dissociation at surfaces, helium diffraction as a probe of surface structures, and the role of steps and defects in thermal desorption; his current research is on the effect of surface chemistry on the electronic properties of semiconductors and on processes involved in gas-surface energy transfer.

Hablanian (Varian Associates) will receive the Albert Nerken Award. Hablanian received both his BS (1955) and MS (1957) in mechanical engineering at MIT. In 1957 he joined the vacuum division of the National Research Corporation where he has served as a research and development engineer, manager of research and development, and manager of engineering. (The vacuum division of National Research was purchased in the 1960s by the Norton Company and acquired by Varian in 1971.) Hablanian is currently manager of special research and development projects in Varian's Vacuum Products Division.

He has made substantial contributions to the art of vacuum components and system design, and was a principal contributor to three Air Force projects involving airborne diffusion pumps, cryogenic traps and epitaxial reactors. Hablanian and his team developed large pumps capable of maintaining a pressure of  $10^{-8}$  pascals, which were used in space simulation systems in the 1960s, as well as the vacuum gauges

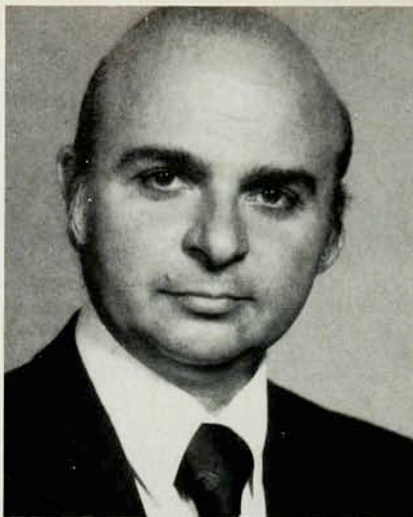


placed on the moon. Hablani also invented a wide-body diffusion pump that yielded a 50% improvement in pumping speed without a significant increase in size.

Tung will receive the Peter Mark Memorial Award, which is presented to young scientists for outstanding theoretical or experimental work published in part by the *Journal of Vacuum Science and Technology*. Tung received his BS in physics from National Taiwan University in 1973, and pursued his graduate studies at the University of Pennsylvania where he received his PhD in 1980.

Tung joined Bell Labs in 1980 and became a member of the technical staff in 1982. He has worked on the fabrication of epitaxial silicides under ultrahigh vacuum conditions and on Schottky barrier properties of single-crystal metal semiconductor junctions.

The Vacuum Technology Division will present the JVST Shop Note Award to J. P. St. Germain, G. Abel and B. L. Stansfield for their paper "A system for automatic ventilation of a turbomolecular pump." Prizes will also be presented to students who have excelled in sciences and technologies of interest to AVS, and the 1987 winner of



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the Russell and Sigurd Varian Fellowship, which is supported by Varian, will be announced.

#### Short courses

AVS will offer 42 short courses throughout the week, including the following:

Fundamentals of surface science  
Vacuum technology

Fundamentals of technology and ion plating  
Applied thin film optics  
Laser deposition and etching  
Pumping hazardous gases  
Structure property relations in thin films  
An elementary introduction to vacuum technology  
Operation and maintenance of vacuum pumping systems  
Vacuum equipment and computer interfacing  
Advanced vacuum system design and analysis  
Surface analysis: Electron and other emerging spectroscopies  
Overview of IC processing  
Partial pressure analyzers, analysis and applications  
Mechanical properties of thin films  
Vacuum system design  
Computer-aided techniques for optical thin films  
Principles of high-temperature superconductivity  
Sputter deposition and ion beam processes  
Scanning tunneling microscopy  
An introduction to the elements of cryopumping  
Monitoring and controlling techniques

## Invited papers and special sessions

### MONDAY

#### morning

Surface science: New surface microscopies. *E. Bauer, W. Teliaps, G. Turner, R. J. Celotta, J. Unguris, D. T. Pierce*

Applied surface science: Corrosion. *N. R. Armstrong*

Electronic materials: Epitaxial growth, heterostructures and superlattices. *L. Eastman*

Thin films: Microstructure and morphology. *D. A. Smith, D. J. Srolovitz, A. Mazar, B. G. Bukiet, P. S. Hagan*

Vacuum technology: Pressure measurement—Gauging and calibration. *C. R. Tifford*

Plasma science: Inertial-confinement fusion target technology. *T. M. Henderson*

#### afternoon

Surface science: Surface magnetism. *H. C. Siegmann, G. A. Prinz*

Applied surface science: Heterogeneous materials—Composites, ceramics and alloys. *S. H. Garofalini*

Electronic materials: Thin insulators and interfaces. *E. H. Poindexter, P. J. Caplan*

Thin films: Process—characterization—property relations. *K.-H. Müller, J. O. Carlsson*

Vacuum technology: System automation, motion in vacuum, and lubrication. *K. G. Roller*

Electronic materials and Thin films: Novel semiconductor materials and heterostructures. *M. W. Geis, R. Davis, H. J. Kim, H. Kong, J. A. Edmond, J. T. Glass, G. D. Davis*

Vacuum metallurgy: Plasma polymerization and plasma chemical-vapor deposition processes and applications. *J. Kieser*

### TUESDAY

#### morning

Surface science: Surface Structure. *S. M. Yalisove, W. R. Graham, H. L. Davis, J. R. Noonan*

Applied surface science: Characterization and properties of interfaces. *J. M. Cowley, R. Gronsky*

Electronic materials: Electronic and Atomic Structure of Semiconductor Interfaces. *C. B. Duke, I. K. Robinson*

Thin films: Process—characterization—property relations. *J. E. Sundgren, F. J. Cadieu*

Vacuum technology: Vacuum pumps, pumping effects and related topics. *M. H. Hablani*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Overview. *R. Rosenberg, A. Sinha, J. Gibbons, R. Y. Koyama*

Plasmas, Electronic materials, Thin films, and Vacuum technology: Chemical effects of plasmas. *R. Rief, P. L. Colestock*

#### afternoon

Surface science: Dynamics of ordering and phase transitions. *G. Comsa, J. D. Gunton*

Applied surface science: Quantitation and data handling. *D. M. Haaland, E. V. Thomas*

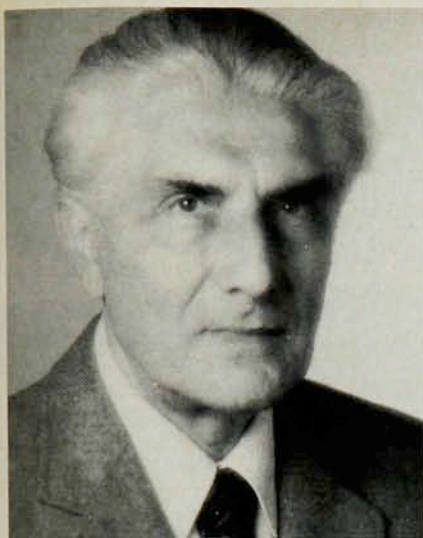
Electronic materials: Dry processing. *R. A. Gottscho, G. R. Scheller, T. Intrator, D. B. Graves*

Thin films: Metastable and multilayer coatings. *W. L. Johnson, E. Spiller, J. Bevk*

Vacuum technology: Vacuum pumps, pumping effects and related topics. *J. Henning*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Semiconductor growth. *B. S. Meyerson, P. Ho, M. E. Coltrin, W. G. Breiland, T. Asano, H. Ishiwara, S. Furukawa*





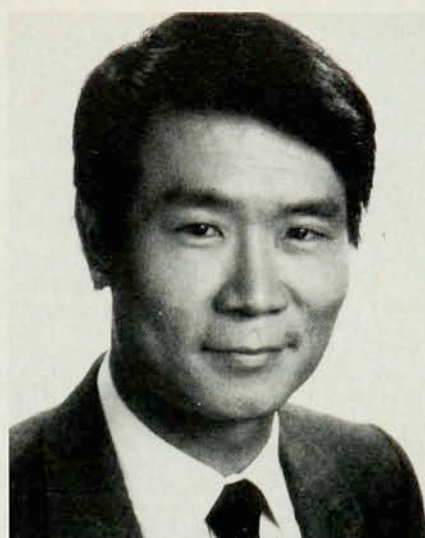
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for thin film deposition processes  
Rapid thermal annealing for semiconductor processing  
Process technology for packaging applications  
Electro-optical characterization of semiconductors and films  
An abbreviated course in surface spectroscopies  
Fundamentals of magnetic recording

Surface analysis: Ion spectroscopies (SIMS, ISS, RBS)  
UHV design and practices  
Vacuum sealing and joining techniques  
Plasma etching and RIE  
Depth profiling  
Handling hazardous materials in semiconductor processing  
An overview of thin film deposition and etching processes  
Dielectrics for microelectronics  
Scanning electron microscope techniques for materials analysis  
Characterization of films, coatings and surfaces  
Vacuum leak detection  
Chemical vapor deposition for electronics  
Clean room technology  
Adhesion of polymeric and metallic thin films

### Exhibit and services

The AVS equipment exhibit, located in the Convention Center, will be open on Tuesday, from noon to 7 pm, on Wednesday from 11 am to 6 pm and on Thursday from 10 am to 3 pm. Over 120 companies will display equipment and vacuum hardware for the production, control and analysis of films,



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surfaces and materials.

AVS will maintain an employment opportunities bulletin board throughout the meeting. The American Institute of Physics will operate a press room at the meeting for AVS; its hours will be 9 am to 5 pm Tuesday through Thursday.

—RICHARD HART

—MARGARET MARYNOWSKI

Surface science and Thin films: Growth and nucleation. *P. Barna; M. Grabow; J. Singh*

Vacuum metallurgy: Ion-assisted deposition processes and applications. *S. V. Krishnaswamy, M. H. Francombe*

Plasmas, Electronic materials, Thin films, and Vacuum technology: Plasma-surface interactions. *H. F. Winters; P. K. Mioduszewski, T. Uckan*

### WEDNESDAY

#### morning

Surface science: Surface chemistry. *J. M. White, S. Akhter*

Applied surface science: Depth profiling using sputtered neutral mass spectrometry. *W. Reuter*

Thin films: Diamond and diamondlike carbon films. *J. C. Angus; M. Kitabatake, K. Wasa*

Vacuum technology: Calibrated leaks, leak detection and flow measurement. *C. D. Ehrlich*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Insulator growth. *E. A. Irene; F. J. Feigl*

Plasmas, Thin films, Vacuum metallurgy, and Vacuum technology: Plasma physics and diagnostics. *G. S. Selwyn; J. C. Knights*

#### afternoon

Applied surface science and Thin films: Advances in depth profiling. *B. L. Doyle*

Electronic materials: Metal—III-V-semiconductor interfaces. *L. J. Brillson*

Thin films: Diamond and diamondlike carbon films. *W. L. Hsu; K. Kobashi, K. Nishimura, Y. Kawate, T. Horiuchi*

Vacuum technology: Handling of hazardous gases. *J. F. O'Hanlon, D. Fraser; D. O. Coffin*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Interconnections—Low-temperature metals and insulators. *A. S. Oberai; G. Lucovsky, D. V. Tsu; M. L. Green*

Plasmas, Thin films, Vacuum metallurgy, and Vacuum technology: Plasma physics and diagnostics. *K. M. Young; V. M. Donnelly; N. Hershkowitz; F. J. Zanner, R. L. Williamson, W. A. Hareland, L. A. Bertram*

### THURSDAY

#### morning

Surface science: Surface dynamics. *M. J. Cardillo; B. D. Kay, M. E. Coltrin, T. D. Raymond*

Applied surface science: Failure analysis and fracture. *C. R. Brundle; T. Michalske*

Thin films: Plasma deposition and etching. *S. M. Rossmagel; C. Horwitz*

Vacuum technology: Cleaning and surface treatment. *M. Grunze, O. Elshazly, H. Ruppender; H. F. Dylla*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Alternative growth techniques at the forefront. *A. Yamada; C. Schwebel, G. Gautherin; N. Herbots, T. S. Noggle, B. R. Appleton, R. A. Zhur*

Plasma science: Pellet fueling. *P. Kupschus; P. W. Fisher, S. K. Combs, C. A. Foster, C. R. Foust, M. J. Gouge, S. L. Milora, D. D. Schuresko*

Surface science, Applied surface science, and Electronic materials: New analytical techniques. *N. Amer; M. J. Pellin, C. E. Young, W. F. Calaway, B. Jergensen, E. L. Schweitzer, D. M. Gruen; R. J. Hamers, J. E. Demuth, F. Bozso, Ph. Avouris*

Applied surface science: Chemical effects. *F. J. Grunthaner*

#### afternoon

Surface science: Surface chemistry. *P. C. Stair*

Applied surface science: Applied catalysis. *C. T. Campbell*

Electronic materials: X-ray lithography with synchrotron radiation. *A. Wilson; H. Betz; F. Cerrina; K. Okada*

Thin films: Optical and magnetic recording media. *M. Chen; M. Mansuripur*

Vacuum technology and Electronic materials: Contamination control in vacuum processing applications. *R. J. Miller; C. R. Dickson*

Electronic materials and Thin films: Topical Conference on Deposition and Growth—Alternative growth techniques at the forefront. *P. Chatterjee, C. E. Chen; M. Grunze*

Electronic materials, Applied surface science, and Surface science: New analytical techniques. *P. K. Hansma, O. Marti, B. Drake; M. Terrell, S. Patel, Y.-L. Chen, G. Hadzioannou; A. E. M. J. Fischer*

Applied surface science, Thin films, and Vacuum metallurgy: Preparation and characterization of hard coatings. *A. J. Perry; D. T. Quinto*