

American Physical Society meets in Baltimore

APS will honor 13 physicists at its March meeting and will offer 48 invited symposia.

The March meeting of The American Physical Society will be held 25-29 March in Baltimore, Maryland, this year. The Hyatt Regency Baltimore will serve as the headquarters hotel while most of the technical sessions will take place at the Baltimore Convention Center. Both are located in the harbor area, which has recently undergone major renovation. Harborplace, the focal point of the restoration, is a mall with many different boutiques and eateries. The US frigate *Constellation*, the oldest existing US warship, is permanently assigned to the Chesapeake Bay; the National Aquarium and the Maryland Science Center are also located near Harborplace.

Registration will begin on Sunday afternoon, 24 March, at the Hyatt Regency and will continue for the duration of the meeting at the Convention Center. The majority of the sessions at the meeting have been organized by the Division of Condensed-Matter Physics, although invited symposia have also been arranged by the Divisions of Biological, Chemical, and Electron and Atomic Physics, Fluid Dynamics, Particles and Fields, the Forum on Physics and Society, the International Physics Group and the Committees on Applications of Physics and on the Status of Women in Physics. The Division of High-Polymer Physics organized its program independently of the general program.

Mildred Dresselhaus of MIT will deliver her retiring presidential address at the ceremonial session to be held on Tuesday, 26 March. At that session APS will also award many of its annual prizes.

Awards

Robert O. Pohl of Cornell University is the winner of the 1985 Oliver E. Buckley Condensed-Matter Physics Prize, endowed by Bell Laboratories, for his "pioneering work on low-energy excitations in amorphous materials and continued important contributions

to the understanding of thermal transport in solids." In 1971, Pohl and his student Robert C. Zeller published a seminal paper on the thermal properties of heavily disordered systems at very low temperatures. In it they demonstrated the universality of the linear temperature dependence of the specific heat and the T^2 dependence of the thermal conductivity of many non-crystalline solids. However, Pohl further postulated that the data indicated a new type of fundamental atomic motion, characteristic of virtually all noncrystalline solids. In addition, Pohl made some of the early observations and explanations of impurity modes in slightly disordered systems; identified a new class of tunneling modes in crystals that are caused by off-center atomic positions; and developed the heat-pulse techniques that ultimately allowed him to observe second sound in solids. Pohl received his PhD in 1957 from the University of Erlangen, where he remained as a member of the faculty and research staff until 1968. He then became a professor of physics at Cornell.

John Hopfield of Caltech and Bell Laboratories is the winner of the 1985 Biological Physics Prize for his "imaginative and predictive approach to theoretical physics, which is opening up new areas of biology." Hopfield, in collaboration with Robert G. Shulman, was among the first to develop a quantitative theory of cooperative behavior in hemoglobin molecules and relate it to kinetics and structure. In the mid-1970s Hopfield asked how cells are able to synthesize with great accuracy complicated molecules—such as proteins—composed of very many similar building units, given that only simple chemical reactions occur in the selection process. He hypothesized that the cell must possess a proofreading mechanism capable of discerning synthesis mistakes and that such a mechanism would be evidenced by a reduction in metabolic efficiency. Sev-

eral kinds of measurements have supported his theory, which is now widely accepted in molecular biology. More recently, he has been exploring the possibility that the nervous system may exhibit collective properties analogous to those of thermodynamic systems. He is developing a model of neuron function in conjunction with the work of his colleagues, Alan Gelprin and David Tank (Bell Laboratories). Gelprin is studying the ability of the common garden slug to learn tastes and smells through applications of Pavlovian stimuli; Hopfield ultimately hopes to relate physical processes within the animal's neurons to its behavior.

Hopfield received his PhD in 1958 from Cornell. He then worked in the theoretical physics group of Bell Labs until 1960, when he was a visiting research physicist at École Normale Supérieure in Paris. He held teaching positions at the University of California in Berkeley (1961-64) and Princeton University (1964-80) before becoming the Roscoe G. Dickinson Professor of Chemistry and Biology at Caltech. Concurrently, he has been a member of the technical staff of Bell Labs since 1973.

Richard Bersohn of Columbia University is the winner of the 1985 Herbert P. Broida Prize in Atomic and Molecular Spectroscopy or Chemical Physics for his "many outstanding contributions to the field of molecular spectroscopy, and especially for his pioneering studies on the dynamics of dissociating molecular states." In the 1950s, Bersohn did extensive research on the theory of rf and microwave spectroscopy, gaining wide recognition for his interpretation of quadrupole coupling constants of polyatomic molecules and nuclear hyperfine structure of aromatic free radicals. In the 1960s he began experimental work in chemical physics and biophysical chemistry. One of his most notable and elegant experiments, which involved the irradiation of cadmium dimethyl in a very

simple apparatus, demonstrated that molecules were anisotropically dissociated by polarized light, thus proving that dissociation could take place in a short time compared to the period of rotation. More recently, Bersohn and his colleagues have studied the photodissociation dynamics of linear triatomic molecules. In addition, using laser-induced fluorescence, they have stud-

ied nitrogen molecules and sulfur, carbon and iodine atoms, using two ultraviolet photons to make detection easier. Bersohn has also worked on micromolecules, proteins and other areas of biophysics.

After spending two years in the US Army working on the Manhattan project, Bersohn began graduate studies at Harvard University, receiving his MA

in 1947, and his PhD under J. H. Van Vleck in 1949. He worked at Cornell from 1951 until 1959, when he joined the faculty of Columbia, where he is a professor of chemistry.

J. Gregory Dash of the University of Washington is the winner of the 1985 Davison-Germer Prize, donated by Bell Laboratories, for his "pioneering studies of the structure and thermody-

Invited papers and special sessions—partial program

Speakers giving invited papers are listed

MONDAY

morning

- Symposium of the Division of Condensed Matter Physics: New surface techniques. *T. F. Heinz, J. Bokor, M. Pellin, M. Landolt, K. Lynn.*
- Symposium of the Division of Condensed Matter Physics: Instability and turbulence. *J. Maher, A. Libchaber, P. Kolodner, D. D. Awschalom.*
- Symposium of the Division of Electron and Atomic Physics: Clusters. *Miller, L. A. Bloomfield, Stein, W. Knight.*
- Symposium of the Division of Chemical Physics: Simulation of quantum systems. *B. J. Berne, M. Parrinello, D. Ceperley, P. Rossky.*
- Neutral-surface interactions. *K. H. Rieder.*
- Thin metallic films. *Ritter.*
- Fractals I. *E. Witten.*
- Silica and silicate glasses. *D. L. Price.*
- Diffusion. *Yu.*

afternoon

- Symposium of the Division of Condensed Matter Physics: Tunneling microscopy. *G. Binnig, J. A. Golovchenko, N. Garcia, C. Quate.*
- Symposium of the Division of Condensed Matter Physics: Granular metals and superconductors. *D. B. Tanner, D. Stroud.*
- Symposium of the Committee on Applications of Physics: Large facilities for materials research. *J. B. Cohen, G. H. Lander, R. Sinclair, J. S. Brooks.*
- Symposium of the Division of Chemical Physics: Computer simulation of quantum chromodynamics. *S. Otto, J. Polonyi, B. Svetitsky, R. Gupta.*
- Defects and diffusion in semiconductors. *S. Pantelides.*
- Fractals II. *Huang.*
- Spectroscopy. *Bovey.*
- Materials physics: Theory. *A. Carlsson.*
- Symposium of the Division of Condensed Matter Physics: Expanded metals near critical points. *W. W. Warren, F. Hensel.*

evening

- Symposium of the Division of Particles and Fields: Superconducting Super Collider. *M. Veltman, D. Jackson, R. Schwitters.*
- Symposium of the Instrumentation and Measurement Science Group. *B. Field, R. J. Higgins, W. T. Oosterhuis, C. Swenson.*

TUESDAY

morning

- Symposium of the Division of Condensed Matter Physics: Martensitic transformations. *C. M. Wayman, S. M. Shapiro, G. B. Olson, A. Zangwill, G. R. Barsch.*
- Symposium of the Division of Condensed Matter Physics: Dynamics, disorder, noise, and chaos in CDW systems. *A. Zettl, G. Mozurkewich, R. Cava, J. W. Brill, J. Stokes.*
- Symposium of the Committee on Applications of Physics: MBE and MOCVD of compositionally modulated structures. *J. E. Hilliard, J. F. Schetzina, R. Dupuis, R. People.*
- Symposium of the Division of Chemical Physics: Order and disorder in condensed systems. *Drickamer, D. Frenkel, M. Klein, F. Stillinger, A. C. Andersen.*
- Materials Physics: Ionic crystal defects I. *R. Friauf.*
- Three-dimensional metal-insulator transitions (experiment). *Y. Shapira.*
- Ford Prize symposium. *R. J. Kambour, E. J. Kramer, Doell, Argon, Brown, Takemori.*

afternoon

- Ceremonial Session. *M. Dresselhaus.*
- Symposium of the Division of Condensed Matter Physics: Intercalates. *S. J. G. Mochrie, D. P. DiVincenzo, J. E. Fischer, R. Clarke, M. Suzuki.*
- Symposium of the Division of Condensed Matter Physics: Polymers and surfaces. *M. Bloch, M. Klein.*

- Symposium of the International Physics Group: International facilities for condensed-matter research. *M. Blume, P. Eisenberger, C. P. Flynn, Frost.*
- Symposium of the Division of Chemical Physics: Biomolecules in physics interfaces. *L. Pratt, M. Karplus, J. Tully, F. Abraham.*

Superconductive tunneling II. *J. Marinis.*

Surface dynamics. *H. Ibach.*

Charge-density waves (theory). *S. Coppersmith.*

Biophysics—heme proteins. *W. E. Eaton.*

Dillon medal Symposium. *A. J. Lovinger, Lando, Pantelis, Taylor, Broadhurst, Cais, Frank.*

Symposium of the Division of Condensed Matter Physics: Molecular impurity vibrations and lasers. *L. Luty, A. J. Sievers, S. Rand.*

Invited Poster Session: National facilities of importance to condensed-matter physics.

evening

- Symposium of the Division of Condensed Matter Physics: Future needs of condensed-matter physics. *W. F. Brinkman, D. Eastman, D. Kleppner.*
- Symposium of the Forum on Physics and Society: The electromagnetic pulse from nuclear explosions: Generations and consequences. *C. L. Longmire, J. R. Mattox, J. M. Richardson, J. Miletta.*

WEDNESDAY

morning

- Symposium of the Division of Condensed Matter Physics: Holes and hydrogenic centers in quantum wells. *B. V. Shanabrook, Y. C. Chang, J. P. Eisenstein, L. J. Sham.*
- Symposium of the Division of Condensed Matter Physics: Flux quantization in normal metal arrays. *B. Pannetier, G. J. Dolan.*
- Symposium of the Committee on Applications of Physics: Physics of VLSI—silicon dioxide and interfaces. *J. DiMaria, M. V. Fischetti, F. J. Feigl, P. J. Grunthaler, E. H. Poindexter.*
- Symposium of the Division of Biological Physics: Interfaces between physics and biology. *J. J. Hopfield, T. Yamane, W. W. Parson, T. Poggio.*
- Optical properties of semiconductor superlattices and quantum wells: AlGaAs and CdMnTe systems. *R. C. Miller.*
- Materials physics: ionic crystal defects III. *R. Williams.*
- Amorphous metals I. *M. Clemens.*
- Transport in metals and alloys. *J. C. Hensel.*
- Symposium of the Division of Condensed Matter Physics: Magnetism and superconductivity in thin layers. *U. Gradmann, J. B. Ketterson, C. Uher.*

afternoon

- Symposium of the Division of Chemical Physics: Prizewinners symposium. *G. Herzberg, R. N. Zare, R. Bersohn.*
- Symposium of the Division of Condensed Matter Physics: Glassy behavior in crystals. *R. O. Pohl, G. Burns, G. P. Johari, A. C. Anderson.*
- Symposium of the Committee on Applications in Physics: Physics of VLSI—gallium arsenide. *T. F. Kuech, B. Streetman, S. S. Lau, D. Eastman, C. Liechti.*
- Symposium of the Division of Biological Physics: Physical probes of biomolecular structure. *N. Unwin, R. Huber, S. Opella, Matheis.*
- Symposium of the Division of Condensed Matter Physics: Inverse photoemission and image states. *N. V. Smith, J. D. Davenport, Reihl.*
- Phase transitions (experimental). *E. Adams.*
- Surface reactions and processes. *F. R. McFeely.*
- Materials physics: Nondestructive evaluations I. *R. Thomas.*
- Magnetism I. *D. Moncton.*
- Materials physics: Characterization I. *J. C. H. Spence.*
- Complex fluids, gels, microemulsions. *W. I. Goldburg, D. S. Cannell.*
- Symposium of the Division of Condensed Matter Physics: Structural properties of two-dimensional gases, liquids, solids. *J. G. Dash, P. W. Stephens.*

evening

- Symposium of the Forum on Physics and Society: Science, technology and war: Achieving strategic stability. *G. Yonas, S. Keeney.*

namic properties of two-dimensional gases, liquids and solids." His research on the effects of dimensionality on the physical properties of matter is enhancing our understanding of the phases and phase transitions of thin films as well as those of bulk materials. The work also has direct applications in practical aspects of surface science, such as adhesion, corrosion and the

production of thin-film electronic devices. Examples of the interplay between fundamental and applied aspects are the recent advances, stemming largely from Dash's work at the University of Washington and at the University of Marseilles, in the understanding of film growth: the way in which a film changes from 2- to 3-dimensional behavior as layers are

THURSDAY

morning

Symposium of the Division of Condensed Matter Physics: Novel heterostructures and superlattices. *R. L. Gunshor, D. Partin, J. Kakalios, Reed, Heilmann.*

Symposium of the Division of Condensed Matter Physics: Superconductivity. *J. Graybeal, J. C. Garland, C. Rossel, J. Floquet, D. Carlson.*

Symposium of the Committee on Applications of Physics: Recent advances in coal science. *G. R. Dyrkacz, H. Thomann, B. M. Lynch, L. Petrakis, L. J. Lynch.*

Symposium on the Division of Biological Physics: Applications of x-ray absorption to biological physics. *S. Doniach, S. M. Heald, G. Bunker, A. Lewis, D. Mendenhall.*

afternoon

Symposium of the Division of Condensed Matter Physics: Dynamic and nonequilibrium effects in heterostructures. *T. W. Hickmott, K. Kash, J. R. Hayes.*

Symposium of the Division of Condensed Matter Physics: Beyond the local density approximation. *M. Schluter, J. P. Perdew, C. S. Wang, S. Louie, P. Fulde.*

Symposium of the Committee on Applications: Physics of image capture. *J. Hamilton, R. P. Khosla, D. Barbe, J. Lowrance, R. Wagner.*

Symposium of the Division of Biological Physics: Low-frequency electromagnetic effects in living tissue. *E. Fukada, A. R. Liboff, W. S. Williams, A. J. Grodzinsky.*

Low-dimensional conductors. *S. A. Jackson.*

Monte Carlo and molecular dynamics techniques. *D. P. Landau.*

Theory of amorphous solids. *C. M. Soukoulis.*

Percolation. *R. B. Laibowitz.*

Materials physics: Nonstoichiometric compounds and ionic crystal defects. *L. Toth.*

Polymer structure and properties. *Baer.*

Symposium of the Division of Condensed Matter Physics: New materials prizewinners symposium. *L. Esaki, R. Tsu, L. L. Chang.*

evening

Symposium of the Committee on the Status of Women in Physics: Women in science: Factors in success. *J. Ostriker, Thompson, Cavanaugh, D. L. Price.*

FRIDAY

morning

Symposium of the Division of Condensed Matter Physics: Marginally conducting systems. *MacDonald, A. E. White, G. Timp, M. A. Dubson, J. Heremans.*

Symposium of the Division of Condensed Matter Physics: Structure and dynamics of glass: Theory. *D. R. Nelson, P. Steinhardt, D. L. Stein, J. Toner, S.-T. Chui.*

Symposium of the Committee on Applications of Physics: Physics and measurements of surface and film roughness. *J. M. Bennett, H. A. MacLeod, J. M. Elson, T. Vorburger.*

Symposium of the Division of Fluid Dynamics: Dynamic processes in liquid helium. *H. Haucke, J. Foster, W. C. Hsu.*

2-D phase transitions (theory). *S. Shenker.*

Materials Physics: cracks and dislocations I. *J. C. M. Lee.*

Metal hydrides and hydrogen in metals. *S. Moehlecke.*

afternoon

Symposium of the Division of Condensed Matter Physics: Spin glasses. *A. P. Young, A. T. Ogielski, G. Toulouse, H. Sompolinsky, A. P. Malozemoff.*

Symposium of the Division of Condensed Matter Physics: Smectic liquid crystals and related phases. *R. Pindak, L. Sorensen, T. Lubensky, C. R. Safinya.*

Symposium of the Committee on Applications of Physics: Physics of novel infrared detectors. *P. Richards, D. Coon, R. M. Westervelt, J. G. Broerman.*

Symposium of the Division of Fluid Dynamics: Thermal boundary resistance in liquid helium. *H. Maris, J. Sauls, D. Osheroff, J. P. Harrison.*

Polyacetylene and polydiacetylene—experimental. *A. Kapitulin.*

Magnetism II. *M. Huike.*

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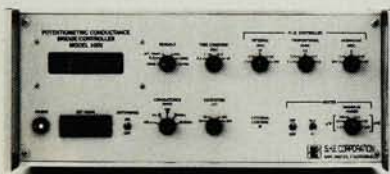
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added. For many materials the transition is abrupt, but for other materials one can see a gradual evolution through stages of intermediate dimensionality.

Dash obtained his PhD in physics in 1951 from Columbia. He then worked at Los Alamos until 1960, when he joined the faculty at the University of Washington. He became a full professor there in 1963.

Andrew J. Lovinger of Bell Laboratories has been named the 1985 John H. Dillon Medalist for his "outstanding investigations of the structure and properties of ferroelectric polymers." Lovinger has gained wide recognition for his work on polyvinylidene fluoride and its copolymers. He has explained the mechanism of phase transitions in PVF₂; established the form of the unit cell of its γ form; discovered its ϵ phase; and has made the first detailed studies of the Curie temperature of the PVF₂-PVF₃ copolymers.

Lovinger received his ScD in polymer science from Columbia in 1976. In 1977 he became a member of the technical staff of the organic materials research department and plastics research and development department of Bell Labs. Since 1982 he has concurrently held a faculty position in the department of chemical engineering and applied chemistry at Columbia. The Dillon Medal was established in 1984 to recognize "outstanding accomplishment and unusual promise in research on polymer physics."

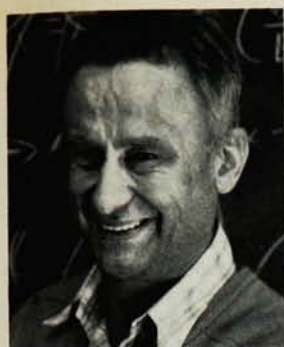
Edward J. Kramer of Cornell and Roger J. Kambour of General Electric are the winners of the 1985 High-Polymer Physics Prize, sponsored by the Ford Motor Company, for their "pioneering and outstanding contributions to the understanding of crazing in polymers." Crazes are microscopic defects and shear-deformation zones that form on the surface of polymer glasses prior to their fracture; an understanding of the structure and mechanical behavior of crazes is essential to the understanding of ductility and brittleness in polymer glasses. Kambour demonstrated that crazes are not cracks, as had been thought, but are filled with load-bearing fibrils that resist plane-strain crack growth in glassy thermoplastics. Using Kambour's work as a basis, Kramer and his colleagues used holographic interferometry, small-angle x-ray scattering and transmission electron microscopy to study the mechanisms by which they form and grow. (See illustration, page 72.) He established that the entanglement of long polymer molecules, which occurs during cooling processes, determines the elastic properties of the material: The higher the entanglement density, the lower the craze strain. In addition, he found that

higher density means higher stress for crazes, which favors higher rates of shear-deformation zone formation, until one reaches the densest entanglements, where only shear-deformation zones are found and the material is ductile.

Kambour received his PhD in chemistry from the University of New Hampshire in 1960. He then joined the staff of the research and development center of General Electric, becoming the manager of the polymer studies unit from 1970-74. Kramer received his PhD in metallurgy and materials from Carnegie-Mellon University in 1967. He then joined the faculty of Cornell, becoming a full professor in 1979.

Leroy L. Chang and Leo Esaki of the IBM Research Center and Raphael Tsu of the Instituto de Fisica E Quimica of the University of San Paolo are the winners of the 1985 International Prize for New Materials, sponsored by the International Business Machines Corporation, for their "conception of artificial semiconductor superlattices and their recognition that such structures were realized and would have novel electronic properties. Their sustained experimental and theoretical efforts have helped lead the way to versatile new materials and technologies."

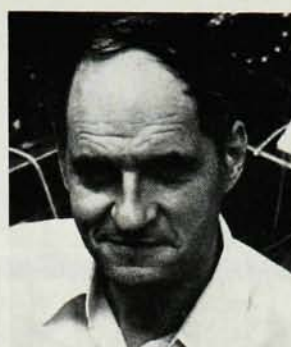
In 1969-70, Esaki and Tsu suggested one could produce a one-dimensional periodic potential, or "superlattice," by a periodically varying alloy composition or impurity density during epitaxial growth of a semiconductor crystal. In 1970, Esaki, Chang and Tsu reported their first experimental studies of GaAs-GaAsP superlattices, prepared by A. E. Blakeslee and C. F. Aliotta (IBM). When, in that same year, Alfred Y. Cho (BTL) and Jerry M. Woodall (IBM) demonstrated the feasibility of metallurgically producing superlattices by molecular-beam epitaxy and liquid-phase epitaxy, respectively, the stage was set for fabricating a host of manmade superlattice structures. In 1972, Chang, Esaki and their coworkers reported a negative resistance in the transport properties of a superlattice, which they interpreted on the basis of the predicted tunneling between the superlattice layers. Tsu and Esaki analyzed the transport properties in terms of the resonant transmission of electron waves through multiple tunneling barriers; in early 1974 they observed resonant tunneling in double barriers and, subsequently, Esaki and Chang measured electron transport via the allowed quantum states arising from the superlattice potential. Subsequent experiments demonstrated unequivocally the creation and consequence of discrete quantum states in both single and multiple wells. At the International Conference on Semicon-



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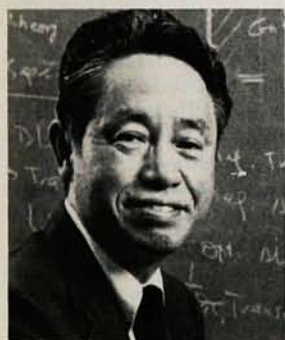
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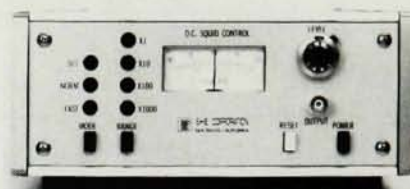
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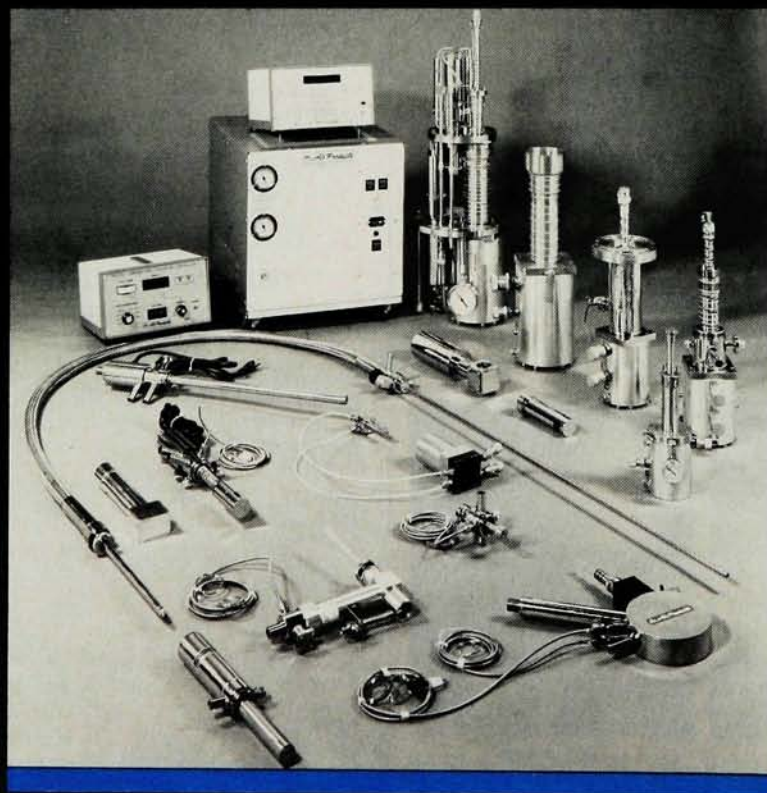
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ductor Physics, held in 1974 in Stuttgart, Chang, Esaki, A. Segmuller (IBM) and Tsu reported resonant electron transport in barrier structures, together with the result of small- and large-angle x-ray analyses to illustrate their metallurgical coherency. In 1977, G. A. Sai-Halasz (IBM), Esaki and Tsu proposed the type II superlattice, which differs from the earlier heterostructure in the relative location of the band edges of the two host semiconductors.

Chang earned his PhD in 1963 from Stanford University. With the exception of a year spent as an associate professor of electrical engineering at MIT (1968-69), he has been with IBM since 1963.

Esaki studied at the University of Tokyo, receiving his PhD in physics in 1959. From 1947 to 1956, he was a research member of the solid-state physics group of the Kobe Kogyo Corporation. He then joined the Sony Corporation as its chief physicist. In 1960 he joined IBM, where he has remained. For his experimental discovery of tunneling in semiconductors, Esaki shared the 1973 Nobel prize in physics.

Tsu earned his PhD in 1960 from Ohio State University. He joined the technical staff of Bell Labs in 1961, and from 1964-66, held jointly an academic position at Trinity University in San Antonio, Texas, and a research position at the Southwest Research Institute. In 1966 he joined the IBM Research Center, remaining there until 1980. He then joined Energy Conversion Devices Inc. In 1984, he joined the physics faculty of the University of San Paolo.

Richard N. Zare of Stanford University is the recipient of the 1985 Irving Langmuir Prize in Chemical Physics for his "seminal innovations in developing many experimental and theoretical methods for the study of molecular structure and collision processes." He has combined molecular-beam techniques, which allow one to study isolated molecules, with laser-spectroscopic techniques, which allow one both to prepare reagents in specific energy states and to identify products and determine their energy states. He and his group pioneered the development of laser-induced fluorescence, and used this technique, for example, in studies of the internal energy distribution of molecules scattered from metal surfaces. Zare has employed polarized light to determine how the geometry of reactive collisions affects the reaction outcome. In addition, he and his co-workers have developed a tunable source of coherent extreme vacuum uv radiation.

Zare obtained his PhD in chemical physics in 1964 from Harvard University. He held academic appointments at MIT (1964-65), the University of Colo-

rado (1965-69) and Columbia (1969-77). He is now at Stanford, where he has been the Shell Distinguished Professor of Chemistry since 1980.

J. Ross Macdonald of the University of North Carolina is the winner of the 1985 George E. Pake Prize, sponsored by Xerox Corporation, for his "innovations and creativity as reflected in more than 160 publications in more than 35 recognized journals to which he has contributed since 1951; his broad theoretical and experimental research interests in fundamental physics as well as the technology of a wide variety of subjects. He has revealed superior leadership capacity as a manager and as a research director at Texas Instruments Incorporated and in administrative roles in academia."

Macdonald received his DPhil in physics in 1950 from Oxford University; he was awarded a DSc by that institution in 1967 on the basis of his published papers. He worked at the Armour Research Foundation (1950-52) and Argonne National Laboratory (1952-53) before joining Texas Instruments. He has maintained a vigorous research program in a broad range of subjects. In 1965, Macdonald was issued a patent for a "semiconductor integrated circuit device using field-effect transistors," a contemporary work to Jack S. Kilby's 1958 invention of the integrated circuit (also at Texas Instruments). He was the first to measure the Hall effect in a photoconductor at room temperature, and he has done pioneering work on the reduction of nonlinear audio distortion by complementary distortion. His interest in data-analysis techniques led him to develop a generalized least-squares method. With C. A. Barlow, Macdonald has published a definitive series of theoretical papers on the effects of discreteness-of-charge in adsorption. Under his direction, the Texas Instruments Central Research Laboratories developed devices ranging from circuit elements based on gallium arsenide to photoconductor detectors and the germanium bolometer, which was developed by Frank Low and has led to major astronomical discoveries of infrared emissions from stars and planets. Concurrent with his work at Texas Instruments, Macdonald held an academic appointment at the University of Texas Southwestern Medical School in Dallas (1954-74). He retired from TI in 1978 and is now the William Rand Kenan Jr professor of physics at the University of North Carolina at Chapel Hill.

Gerhard Herzberg of the National Research Council of Canada is the recipient of the 1985 Earle K. Plyler Prize, sponsored by the George E. Crouch Foundation, for his "analysis of the Rydberg states of H_3 and NH_4 , ... [and for his service] as a role

model for all spectroscopists." Herzberg attempted in the late 1970s to observe the spectrum of the H_3^+ ion (later observed in 1980 by T. Oka in absorption) but instead found a spectrum of neutral H_3 in Rydberg states (the bound state is unstable). Looking for similar systems, he established by isotope studies that a spectrum observed in discharges through ammonia is a Rydberg spectrum of the NH_4 radical. Subsequently, the structure of ND_4 has been fully analyzed by J. K. G. Watson at NRC, Ottawa.

Herzberg studied at Darmstadt Technical University, receiving his DrIng in physics in 1928. He worked there as a Privatdozent and research assistant from 1930 to 1935. He then held academic appointments at the University of Saskatchewan (1935-45) and at Yerkes Observatory at the University of Chicago (1945-48) before joining the National Research Council of Canada in 1948. He was awarded the Nobel prize in chemistry in 1971 for his contributions to the knowledge of electronic structure and geometry of molecules, particularly free radicals. He has made extensive studies of dissociation and predissociation; in the course of his studies of forbidden transitions, he discovered, in 1931, what have become known as the Herzberg bands of O_2 . He and his colleagues at NRC obtained the spectra of many molecules and free radicals, several of which are of astrophysical importance. He was the first to determine the Lamb shift in the ground state of deuterium and has determined the Lamb shifts in the ground and first excited states of He and Li^+ . He has written the four-volume *Molecular Spectra and Molecular Structure*, the last volume with K. P. Huber.

Exhibit and other features

Organized by AIP's Advertising Division, this year's APS Show will be held at the Convention Center. This exhibit will feature research instrumentation, apparatus and materials, as well as scientific books and journals. Show hours will be 11 am to 6 pm on Tuesday, 10 am to 5 pm on Wednesday, and 10 am to 4 pm on Thursday. The American Institute of Physics will also sponsor a placement center during the meeting to arrange interviews between employers and prospective employees.

APS will also offer a short introductory course on the physics of polymeric solids on Saturday and Sunday, 23-24 March. The AIP Public Information Division will run a press room in the Convention Center, 8:30 am to 5:00 pm, Monday through Thursday (25-28 March). Popular versions of some of the papers will be available, and a number of press conferences will take place there.

—MM □

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