

HONORS AND APPOINTMENTS

A. Eisner, a staff physicist in the Space Research and Analysis Branch, was selected by the Parsons Fellowship Committee as the William S. Parsons Fellow for 1973-74.

The American College of Cardiology presented one of its three national scientific exhibit awards to the Applied Physics Laboratory for its exhibit that illustrates the history of the development of a rechargeable heart pacemaker. *R. E. Fischell* of APL and Dr. *K. B. Lewis* of The Johns Hopkins Hospital, co-developers of the pacemaker, received the award for APL.

S. N. Foner, Chairman of the Editorial Board, and *P. E. Clark*, Managing Editor, received an Award of Merit for the *APL Technical Digest*, Volume 10, Numbers 4/5 at the 20th International Technical Communications Conference at Houston, Texas. The conference was sponsored by the Society for Technical Communications, which had already given an Award of Excellence for this publication at a Washington, D.C. chapter meeting in 1972.

R. T. Kroll, an editor in the APL Technical Publications Group, received an Award of Excellence for a technical report entered in national competition at the same conference in Houston.

At the Annual Awards Dinner of the Washington, D.C. Chapter of the Society for Technical Communications in June 1973, *S. N. Foner* and *P. E. Clark* also received an Award of Merit for the *APL Technical Digest*, Volume 11, Number 3. *V. M. Root*, Supervisor of the APL Technical Publications Group, received an Honorable Mention Award as editor of a brochure, *Alfred Nobel and American Laureates in Physics*, *S. G. Smith*, Supervisor of the Illustration Project, designed the brochure, and its author was *Jeanne von Schulz*, then a member of the staff of APL's R. E. Gibson Library.

A. I. Mahan, a member of the staff of the Research Center, has been reappointed a member of the American Institute of Physics' Executive Committee, its Advisory Com-

mittee on Financial Charges for Society Services, and its Committee of Society Secretaries and Treasurers. Dr. Mahan has also been appointed by the National Academy of Sciences to membership on the visiting team to evaluate conditions for productive research at Kirkland Air Force Base, Albuquerque, New Mexico.

The Applied Physics Laboratory has been awarded its sixth I-R 100 Award, this time in collaboration with Stanford University, for development of a "drag-free satellite." The award was presented in Chicago by Industrial Research, Inc., which each year selects the top 100 inventions in the nation for this recognition. The drag-free TRIAD satellite has been in orbit since September 1972 and is capable of maintaining a constant orbit for much longer periods of time than do the satellites now in the navigation system. Thus, ships at sea that use the satellite navigation system are provided a highly predictable satellite orbit from which to determine their own positions.

APL COLLOQUIA

Jan. 12—"Control of Biological Development in a Simple Living Organism," by M. H. Cohen, University of Chicago.

Jan. 19—"Recent Developments in X-Ray Lasers at NRL," by R. C. Elton, Naval Research Laboratory.

Jan. 26—"Use of Atmospheric Electricity for Aircraft Stabilization," by M. L. Hill, Applied Physics Laboratory.

Feb. 2—"Survey of R & D in the Field of Walsh Functions," by H. F. Harmuth, The Catholic University of America.

Feb. 9—"Photocoagulation Procedures for the Treatment of Retinal Diseases," by Arnall Patz, The Johns Hopkins University.

Feb. 16—"Impact of Space Dis-

turbances on Man's Immediate Environment," by D. J. Williams, NOAA.

Feb. 23—"Sex Differences from the Physiological Point of View: Facts and Fiction," Estelle R. Ramey, Georgetown University.

Mar. 9—"The Gravitational Radiation Experiment," by J. Weber, University of Maryland.

Mar. 16—"Mathematically Precocious Youngsters," by J. C. Stanley, The Johns Hopkins University.

Mar. 23—"When Does Growth Become Too Expensive?" by S. F. Singer, University of Virginia.

Apr. 6—"The Solar Neutrino Puzzle," by P. D. Parker, Yale University.

Apr. 20—"Atmospheres of Mars, Venus, and Earth—A Problem in

Atmospheric Evolution," by S. I. Rasool, National Aeronautics and Space Administration.

Apr. 27—"How Many Engineers (or Scientists) Are Enough?" by Betty Vetter, Scientific Manpower Commission.

May 4—"Earth Resources from Satellites: ERTS and EROS," by W. A. Fisher, U.S. Geological Survey.

May 11—"Deciphering Babylonian Astronomy," by A. J. Sachs, Brown University.

May 18—"Gamma-Ray Astronomy from SAS-2," by C. E. Fichtel, Goddard Space Flight Center.

May 25—"A Rechargeable Heart Pacemaker: Evolution of a 'Better Mouse Trap,'" by R. E. Fischell, Applied Physics Laboratory.

PUBLICATIONS

Compilation of principal recently published books and technical articles written by APL staff members.

- S. M. Bose (Drexel Univ.), K. Moorjani (APL), T. Tanaka (Catholic Univ. of America), "Theory of Spin-Waves in a Disordered Heisenberg Ferromagnet," *Amorphous Magnetism*, 421-430, Plenum Publishing Corp.: New York, 1973.
- A. N. Jette, "A Convenient Method for Evaluating Two Center Integrals," *Internatl. J. Quantum Chem.* **7**, 1973, 131-132.
- F. W. Schenkel, "An Automatic Self Deployable High Attenuation Light Shade for Spaceborne Sensors," *J. British Interplanet. Soc.* **26**, 1973, 589-596.
- R. W. Flower, "An Inexpensive Dental Bite for Stabilizing Patients during Angiography," *Am. J. Ophthal.* **75**, No. 2, Feb. 1973, 322-323.
- G. D. Mitchell and C. Feldman (APL) and R. T. Foley (The American University), "The Piezoelectric Effect," *J. Electrochem. Soc.* **120**, No. 2, Feb. 1973, 236-241.
- J. R. Rowland, "Intensive Probing of a Clear Air Convective Field by Radar and Instrumented Drone Aircraft," *J. Appl. Meteorology* **12**, No. 1, Feb. 1973, 149-155.
- C. B. Barger, R. L. McCally, S. M. Cannon, and R. W. Hart, "Light-Beating Spectrum of Erythrocytes," *Phys. Rev. Letters* **30**, No. 6, Feb. 5, 1973, 205-206.
- G. Dailey, W. C. Caywood, and J. S. O'Connor, "A General Purpose Computer Program for the Dynamic Simulation of Vehicle-Guideway Interactions," *AIAA J.* **11**, No. 3, Mar. 1973, 278-282.
- T. O. Poehler and R. E. Walker, "Transverse Discharge Pulsed CO₂ Chemical Transfer Laser," *Appl. Phys. Letters* **22**, No. 6, Mar. 1973, 282-283.
- T. A. Potemra (APL), T. J. Rosenberg (Univ. of Maryland), "VLF Propagation Disturbances and Electron Precipitation at Mid-Latitudes," *J. Geophys. Res.* **78**, No. 10, Apr. 1, 1973, 1572-1580.
- J. C. Armstrong and A. J. Zmuda, "The Atmosphere Explorer Magnetometer Experiment," *Radio Sci.* **8**, No. 4, Apr. 1973, 401-405.
- J. N. Bramhall, "The First Fifty Years of Walsh Functions," *Proc. 1973 Symposium on the Applications of Walsh Functions*, NTIS Publication, Apr. 1973, 44-63.
- R. H. Cramer, "Earliest Classic Result for the Turbulent Hydraulic Wake Behind Body of Revolution," *J. Hydronautics* **7**, No. 2, Apr. 1973, 95-96.
- R. W. Flower, "A Technique for Fixation of Chronically Implanted Catheters in Unrestrained Primates," *J. Appl. Physiology* **34**, No. 4, Apr. 1973, 500-501.
- R. W. Flower and B. F. Hochheimer, "A Clinical Technique and Apparatus for Simultaneous Angiography of the Separate Retinal and Choroidal Circulations," *Investigative Ophthal.* **12**, No. 4, Apr. 1973, 248-261.
- H. E. Gilreath and R. T. Fretz, "Bubble Track Technique for Velocity Measurement in Stratified Liquids," *J. Hydronautics* **7**, No. 2, Apr. 1973, 93-94.
- J. B. Oakes and R. J. Johns, "The Role of Clinical Engineering in Health-Care Delivery," *IEEE Trans. Biomed. Eng.* **BME-20**, No. 3, May 1973, 225-227.
- M. H. Friedman, "Unsteady Aspects of Corneal Thickness Control," *Exp. Eye Res.* **15**, No. 5, May 10, 1973, 645-658.
- A. A. Westenberg and N. deHaas, "Rate of the Reaction OH + OH → H₂O + O," *J. Chem. Phys.* **58**, No. 10, May 15, 1973, 4066-4071.
- A. A. Westenberg and N. deHaas, "Rates of CO + OH and H₂ + OH over an Extended Temperature Range," *J. Chem. Phys.* **58**, No. 10, May 15, 1973, 4061-4065.
- Dianne C. Langlois and Jeanne V. Von Schulz, "Journal Usage Survey: Method and Application," *Special Libraries* **64**, No. 4/5, May/June 1973, 239-244.
- J. Bohandy, B. F. Kim, C. K. Jen, "Low Temperature Optical Absorption Spectra of Porphins," *J. Molec. Spectroscopy* **46**, No. 3, June 1973, 506-508.
- C. C. Kilgus, "Pseudonoise Code Acquisition Using Majority Logic Decoding," *IEEE Trans. Communications* **COM-21**, No. 6, June 1973, 772-774.
- P. Verzariu and S. M. Krimigis, "Directional Diffusion Coefficients of Solar Protons Inside and Outside the Bow Shock," *Planet. Space Sci.* **21**, No. 6, June 1973, 971-982.
- R. A. Farrell, R. L. McCally, and P. E. R. Tatham, "Wave-Length Dependencies of Light Scattering in Normal and Cold Swollen Rabbit Corneas and Their Structural Implications," *J. Physiol.* **233**, No. 3, 1973, 589-612.
- R. E. Hicks, "Thin-Film Electroplated Funnel Thru-Holes on Polyimide Resin and Laminated Boards," *Solid State Tech.* **16**, No. 7, Jul. 1973, 36-40.
- V. G. Sigillito and J. C. Pirkle, Jr., "A Priori Inequalities and Norm Error Bounds for Solutions of a Third Order Diffusion-Like Equation," *SIAM J. Appl. Math.* **25**, No. 1, Jul. 1973, 69-71.
- F. J. Adrian, E. L. Cochran, and V. A. Bowers, "ESR Spectra and Structures of NaSO₂ and NaO₂," *J. Chem. Phys.* **59**, No. 1, Jul. 1, 1973, 56-60.
- B. F. Kim, J. Bohandy, and C. K. Jen, "Low Temperature Optical Spectra of Zn Porphin in Triphenylene," *J. Chem. Phys.* **59**, No. 1, Jul. 1, 1973, 213-224.
- D. J. Benard, R. C. Benson, and R. E. Walker, "N₂O Pure Chemical cw Flame Laser," *Appl. Phys. Letters* **23**, No. 2, Jul. 15, 1973, 82-84.
- R. E. Walker, B. F. Hochheimer, T. Wang, and J. C. Creeden, "Vibrational Disequilibrium in a Low-Pressure Na-Catalyzed CO - N₂O Flame," *Chem. Phys. Letters* **20**, No. 6, Jul. 15, 1973, 528-533.

PUBLICATIONS (continued)

- C. Feldman (APL), F. G. Satkiewicz (GCA Tech. Division), "Mass Spectra Analyses of Impurities and Ion Clusters in Amorphous and Crystalline Silicon Films," *J. Electrochem. Soc.* **120**, No. 8, Aug. 1973, 1111-1116.
- R. E. Walker and J. E. Creeden, "The Reaction between Na Vapor and N₂O at Room Temperature," *Combustion and Flame* **21**, No. 1, Aug. 1973, 39-43.
- M. H. Friedman, "Unsteady Transport and Hydration Dynamics in the *In Vivo* Cornea," *Biophys. J.* **13**, No. 9, Sept. 1973, 890-910.
- V. L. Pisacane, J. M. Whisnant, "Attitude Stabilisation of the Geos-C Spacecraft," *Aeronautical J. Royal Aeronautical Soc.* **77**, No. 753, Sept. 1973, 465-470.
- P. J. Waltrup and F. S. Billig, "Prediction of Precombustion Wall Pressure Distributions in Scramjet Engines," *J. Spacecraft and Rockets* **10**, No. 9, Sept. 1973, 620-622.
- E. C. Roelof (Univ. of New Hampshire), S. M. Krimigis (APL), "Analysis and Synthesis of Coronal and Interplanetary Energetic Particle, Plasma, and Magnetic Field Observations over Three Solar Rotations," *J. Geophys. Res.* **78**, No. 25, Sept. 1, 1973, 5375-5410.
- A. J. Zmuda and T. A. Potemra, "HF Absorption Near the Polar Cap Edge during PCA Events," *J. Geophys. Res.* **78**, No. 25, Sept. 1, 1973, 5818-5821.
- D. M. Silver (APL), R. M. Stevens (Harvard Univ.), "Reaction Paths on the H₄ Potential Energy Surface," *J. Chem. Phys.* **59**, No. 6, Sept. 15, 1973, 3378-3394.

ADDRESSES

Principal recent addresses made by APL staff members to groups and organizations outside the Laboratory.

- R. W. Flower and B. F. Hochheimer, "A Clinical Technique for Simultaneous Angiography of the Separate Retinal and Choroidal Circulations," *Association for Research in Vision and Ophthalmology, Atlantic Session*, New York, October 26-27, 1972.
- D. D. Zimmerman, "Evaluation Study of Epoxy Materials for Use in Hybrid Assembly Processes," *1972 Microelectronics Symposium of the International Society for Hybrid Microelectronics*, Washington, D.C., October 30-November 1, 1972.
- A. Kossiakoff, "Functional Structure of Computer Programs," *IEEE, Washington Chapter, Applied Physics Laboratory*, November 1, 1972.
- E. J. Hinman, "Control Considerations for Automated Urban Transit Systems," *IEEE Northeast Electronics Research and Engineering Meeting*, Boston, November 1-3, 1972.
- R. M. Fristrom, "Flame Chemistry and Inhibition," *The Catholic University of America*, Washington, D.C., November 3, 1972.
- R. M. Fristrom, "Combustion Plasmas," *DuPont Experimental Station*, Wilmington, Delaware, November 10, 1972.
- R. Turner, "Density Measurement in an HCN Laser Using Faraday Mode Splitting Technique," *American Physical Society, Plasma Physics Meeting*, Monterey, California, November 13-16, 1972.
- D. W. Fox, "Lower Bounds to Eigenvalues for Schrodinger Operators of Atoms," *Mathematical Sciences Department, The Johns Hopkins University*, Baltimore, November 15, 1972.
- V. O'Brien, "Steady Non-Potential Flow Through Porous Media," *25th Annual Meeting of the Division of Fluid Dynamics, American Physical Society*, Boulder, Colorado, November 20-22, 1972.
- V. O'Brien, "Porous Flow Under a Magnifying Glass," *American Institute of Chemical Engineers*, New York, November 26-30, 1972.
- P. J. Waltrup, F. S. Billig, and J. M. Cameron, "Pre-Combustion Shock Structure in Scramjet Engines," *Eighth Propulsion Joint Specialists Conference*, New Orleans, November 29-December 1, 1972.
- M. H. Friedman, "Corneal Mechanics, Transport, and Hydration Control," *National Eye Institute, National Institutes of Health*, Bethesda, Maryland, December 6, 1972.
- J. W. Brubaker, "SAS-A Satellite," *Laurel Junior High School Career Day*, Laurel, Maryland, December 7, 1972.
- R. J. Danchick, "Navy Navigation Satellite System," *Baltimore Chapter, IEEE Communications Group*, Baltimore, December 7, 1972.

The following two papers were presented at *The Royal Society and the British Academy Meeting* on "The Place of Astronomy in the Ancient World," London, December 7-8, 1972:

- R. R. Newton, "Introduction to Some Basic Astronomical Concepts";
- R. R. Newton, "Two Uses of Ancient Astronomy."
- J. W. Brubaker, "Africa and the SAS-A Satellite," *High Point Senior High School*, Beltsville, Maryland, December 8, 1972.
- R. W. Flower, "Infrared Angiograph of the Ocular Fundus," *Ophthalmic Pathology Branch, Armed Forces Institute of Pathology*, Washington, D.C., December 18, 1972.
- B. F. Kim, J. Bohandy, and C. K. Jen, "Optical Fluorescence Spectra of the Free Base Porphin in Organic Hosts," *American Physical Society*, December 27-29, 1972.

ADDRESSES *(continued)*

J. T. Massey, "The Practice of Biomedical Engineering," *Franklin Square Auxiliary Meeting, Essex Community College*, Baltimore, January 12, 1973.

The following two addresses were presented at the *Eighth Mid-Atlantic Regional Meeting, American Chemical Society*, Washington, D. C., January 14-17, 1973:

L. Monchick, "Transport Properties of Ortho-Para Hydrogen";

R. E. Walker, B. F. Hochheimer, Tsei-Wang, and J. C. Creeden, "Vibrational Disequilibrium in a Low-Pressure Na-Catalyzed CO₂ Flame."

J. C. Murphy, "Magnetic Resonance," *Loyola College*, Baltimore, January 25, 1973.

T. Lee and T. P. Das (SUNY) and A. N. Jette (APL), "Many-Body Theory of the Zeeman Effect and HFS of the 2³P State of the Li⁺ Ion," *American Physical Society*, New York, January 29-February 1, 1973.

D. M. Silver, "Conservation of Symmetry in Concerted Reactions and the Woodward-Hoffman Rules," *The Johns Hopkins University, Theoretical Chemistry Seminar*, Baltimore, February 7, 1973.

A. A. Westenber, "Applications of ESR to Gas Phase Kinetics," *Washington ESR Group*, Georgetown University, Washington, D. C., February 26, 1973.

C. J. O'Brien, "Writing, Editing, and Distributing Newsletters," *State-Wide Seminar, Maryland Library Association*, University of Maryland Baltimore Campus, March 7, 1973.

H. E. Gilreath, "Flow Over Bodies in Stratified Fluids," *Virginia Polytechnic Institute, Department of Aerospace and Oceanographic Engineering*, Blacksburg, March 8, 1973.

V. L. Pisacane, B. B. Holland, and H. D. Black, "Recent (1973) Improvements in the Navy Navigation Satellite System," *1973 Meeting of the Institute of Navigation*, Washington, D. C., March 13-15, 1973.

The following four addresses were presented at the *American Physical Society Meeting*, San Diego, California, March 19-22, 1973:

F. J. Adrian, "Importance of Orbital Following of Molecular Distortion for Vibrationally Induced Transitions";

J. Bohandy, B. F. Kim, and C. K. Jen, "Polarized Optical Spectra of Cl Porphin and VO Porphin in Triphenylene";

E. L. Cochran, V. A. Bowers, and F. J. Adrian, "ESR Spectra and Structures of NaSO₂";

R. A. Farrell, "Padé Approximants and the Critical Point Exponents in the Ising Model."

J. B. Oakes and D. M. Bullis, "A Pulmonary Data Recording System for Bedside Use," *Eighth Annual Meeting and Exhibit Program, Association for the Advancement of Medical Instrumentation*, Washington, D. C., March 21, 1973.

M. H. Friedman, "Corneal Mechanics, Fluid Balance and Thickness Dynamics," *The Johns Hopkins University, Fluid Mechanics Seminar*, Baltimore, March 23, 1973.

E. P. Gray, "RF Plugging of Mirrors," *University of Maryland, Plasma Physics Seminar*, College Park, April 2, 1973.

R. G. King, A. J. Cote, and F. S. Gregorski, "Minicomputer Processing and Display for the San Francisco VTS," *IEEE Symposium on Minicomputers*, Gaithersburg, Maryland, April 4, 1973.

The following three addresses were presented at the *British Interplanetary Society Symposium on Earth Observation Satellites*, University College, London, April 10-12, 1973:

D. K. Anand and J. M. Whisnant, "Attitude Performance of Some Passively Stabilized Satellites";

A. Finkel and F. W. Schenkel, "Star Sensor for Attitude Determination";

F. W. Schenkel and A. Finkel, "Automatic Self-Deployable High Attenuation Light Shade for Spaceborn Sensors."

G. D. Mitchell, "A Study of the Piezoelectric Effect in Aqueous Electrolyte Systems," *Annual Convention of the National Institute of Science*, Philadelphia, April 13, 1973.

J. N. Bramhall, "The First Fifty Years of Walsh Functions—A Summary," *Symposium on the Application of Walsh Functions, NRL-IEEE-CU Meeting*, Catholic University, Washington, D.C., April 16-18, 1973.

The following three addresses were presented at the *American Geophysical Union*, Washington, D.C., April 16-20, 1973:

H. D. Black and S. M. Yionoulis, "A Two-Satellite Technique for Measuring the Deflection of the Vertical (The Dovimeter)";

A. D. Goldfinger, "A Satellite Radar Altimeter for a Geodetic Application";

H. S. Hopfield, "Tropospheric Effect on Electromagnetic Range Measurement at Oblique Angles."

C. J. O'Brien, "Newsletters," *University of Maryland Department of Journalism*, College Park, April 18, 1973.

R. L. McCally, "Light Beating Spectroscopic Studies of Lipoproteins," *Johns Hopkins Medical Institutions, Lipid Research Center*, Baltimore, April 26, 1973.

C. Feldman and R. Plachy, "Vacuum Deposited Silicon Devices on Fused Silica Substrates," *1973 Conference on Electron Device Techniques*, New York, May 1-3, 1973.

The following five addresses were presented at the *1973 International Conference on Personal Rapid Transit*, Minneapolis, Minnesota, May 2-4, 1973:

S. J. Brown, Jr., "Design Considerations for Point-Follower Type Vehicle State Control";

R. T. Cusick and E. E. Mooring, "PRT Test Program: A Review";

E. J. Hinman and G. L. Pitts, "Practical Safety Considerations

ADDRESSES *(continued)*

- for Short Headway Automated Transit Systems”;
- W. J. Roesler, M. B. Williams, B. M. Ford, and M. C. Waddell, “Comparisons of Synchronous and Asynchronous PRT Vehicle Management and Some Alternative Routing Algorithms”;
- M. C. Waddell, “Dual Mode PRT System Costs.”
- J. T. Massey, “Biomedical Engineering—Contributions of Technology in the Medical Field,” *Institute of Environmental Sciences — Chesapeake Chapter*, Laurel, Maryland, May 3, 1973.
- The following two addresses were presented at the 1973 Annual Meeting of the *Association for Research in Vision and Ophthalmology*, Sarasota, Florida, May 3–7, 1973:
- R. W. Flower, “Simultaneous Choroidal and Retinal Angiography Using a Multispectral Fundus Camera”;
- M. H. Friedman, “A Physical Description of Corneal Epithelial Edema.”
- M. H. Friedman (APL) and L. J. Krovetz and D. R. Pieroni (JHMI), “Johns Hopkins University Specialized Center of Research (SCOR) in Arteriosclerosis—Progress Report,” *Annual Meeting of SCOR, in Arteriosclerosis*, San Antonio, Texas, May 7, 1973.
- H. D. Black, “A Satellite Freed of All but Gravitational Forces: TRIAD I,” *First International Symposium on the Use of Artificial Satellites for Geodesy and Geodynamics*, Athens, Greece, May 14–21, 1973.
- E. A. Cadwallader, “Hydrazine Compatibility Survey,” *AIAA Positive Expulsion Working Group Meeting*, Los Angeles, May 16–17, 1973.
- G. L. Dugger (APL) and Ruth F. Burns and W. T. Morris, Jr. (AIAA, New York), “AIAA Experiments and Results on SDD, Synoptics, Miniprints, and Related Topics,” *IEEE Conference on the Future of Scientific and Technical Journals*, New York, May 17–18, 1973.
- N. C. Nicholas, “The Propagation of Sound in the Deep Ocean,” *Office of Naval Research, Workshop on Ocean Acoustics Propagation Theory*, Washington, D.C., May 22–25, 1973.
- T. A. Potemra, “The Use of vLF Propagation Measurements for Studies of Magnetospheric and Meteorological Influences in the Structure of the Lower Ionosphere,” *16th Plenary Meeting of the Committee on Space Research*, Constance, West Germany, May 23, 1973.
- C. H. Hoshall, “Synthetically Powered Prosthesis Development,” *Greenbelt Lion Belles*, Greenbelt, Maryland, May 29, 1973.
- P. F. Bohn, “Modeling and Simulation in Vehicle Handling Research,” *Vehicle Safety Research Integration Symposium*, Research Institute’s Offices of Operating Systems Research and Vehicle Structures Research, Washington, D.C., May 30–31, 1973.
- S. J. Brown, Jr., “Vehicle State Control in PRT Networks,” *Ground Transportation Symposium, University of Santa Clara*, Santa Clara, California, May 31–June 1, 1973.
- The following two addresses were presented at the *International Conference on Transportation Research*, Brugges, Belgium, June 18–21, 1973:
- W. H. Avery, and R. W. Blevins, “Accelerating Walkway”;
- R. A. Makofski, R. T. Cusick, and E. E. Mooring, “Results of the Testing of the Dulles Prototype Systems.”
- A. G. Schulz, “Environmental Site Evaluation for Power Plants,” *Rotary Club of Baltimore*, Baltimore, June 19, 1973.
- R. E. Kemelhor, “Techniques Used for Conducting a True Operational Test and Evaluation of a Deployed Missile System,” *31st Military Operations Research Symposium*, U. S. Naval Academy, Annapolis, June 20, 1973.
- D. E. Buchholz, “Practical Considerations in Converting an Analog to a Digital Data Acquisition System,” *Seminar on Analog vs. Digital Data Acquisition Systems*, Institute of Technological Assessments, Alexandria, Virginia, June 24–27, 1973.
- M. H. Friedman and K. Green, “Anteroposterior Variation of Rabbit Stromal Swelling Pressure,” *Eighth Annual Corneal Research Conference*, Boston, June 29–30, 1973.
- R. C. Rand, “Traffic Relief for Inner Suburbs,” *Greenbelt Lions Club*, Laurel, Maryland, July 9, 1973.
- R. E. Lohfield (Fairchild Industries) and D. K. Anand and J. M. Whisnant (APL), “Gravity Gradient Stabilization of Satellites in Highly Eccentric Orbits,” *AAA/AIAA Astrodynamics Conference*, Vail, Colorado, July 16–18, 1973.
- L. Monchick, “Multiple Interactions and Macroscopic Differences of Ortho and Para Hydrogen,” *8th International Conference on the Physics of Electronic and Atomic Collisions*, Belgrade, Yugoslavia, July 19, 1973.
- J. C. Armstrong, “Field Aligned Currents in the Magnetosphere,” *Summer Advanced Institute on Earth’s Particles and Fields*, Sheffield, England, August 17, 1973.
- The following three addresses were presented at the *13th International Cosmic Ray Conference*, Denver, August 17–30, 1973:
- S. M. Krimigis and J. W. Kohl (APL) and T. P. Armstrong (U. of Kansas), “Measurements of the Quiet-Time Low Energy Proton, Alpha, and M-Nuclei Component in Cosmic Rays”;
- S. M. Krimigis (APL) and T. P. Armstrong (U. of Kansas), “Measurements of the Relative Abundances of Fe-Group H and M-Nuclei During the October 29, 1972 Solar Particle Event”;

ADDRESSES *(continued)*

T. P. Armstrong (U. of Kansas) and S. M. Krimigis (APL), "Time Variations and Angular Distributions of Alpha Particles and Medium Nuclei for the October 29, 1972 Solar Particle Event."

B. M. Ford, "Simulation Studies of Vehicle Management Strategies for Personal Rapid Transit Systems," *International Symposium on Applications of Computers and Operations Research to Problems of World Concern*, Washington, D.C., August 21-22, 1973.

The following four addresses were presented at the *International IEEE/G-AP Symposium and USNC/URSI Meeting*, Denver, August 21-24, 1973:

Ella B. Dobson, "Some Characteristics of Clear Air Convective Field Motions as Measured by Doppler Radar";

T. G. Konrad, "Clear Air Convection as Seen by High Power, Narrow Beam Radar";

T. G. Konrad, "Fine Scale Probing of Rain Showers Using Narrow Beam Radars";

J. R. Rowland, "Convective Cell

Structure Revealed by Radar and In Situ Measurements."

D. M. Silver, "Hierarchy of Symmetry Conservation Rules Governing Chemical Reaction Systems," *American Chemical Society*, Chicago, August 26-31, 1973.

I. H. Schroeder, C. T. Holliday, and G. B. Bush, "Optical Alignment of an 0.5-Meter Ultraviolet Spectrometer for Apollo 17," *17th Annual Meeting of the Society of Photo-Optical Instrumentation Engineers*, San Diego, August 28, 1973.

K. Moorjani, N. A. Blum, and C. Feldman, "Comments on the Determination and Analysis of Optical Constants of Thin Silicon Films," *Fifth International Conference on Disordered Metallic Systems*, Garmish-Partenkirchen, W. Germany, September 3-8, 1973.

S. M. Krimigis, "Light Ion Releases in the Solar Wind and the Distant Magnetotail," *International Association of Geomagnetism and Aeronomy, General Scientific*

Assembly, Kyoto, Japan, September 9-21, 1973.

K. Moorjani, T. Tanaka, M. M. Sokolski, and S. M. Bose, "Numerical Aspects of the Two-Sites Coherent Potential Approximation," *International Conference on Disordered Metallic Systems*, Strasbourg, France, September 10-15, 1973.

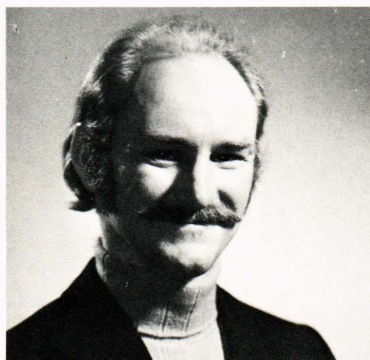
K. Moorjani, "Disordered Solids," *Laboratorio di Electronica, Istituto di Fisica dell' Universita*, Modena, Italy, September 19, 1973.

C. J. O'Brien, "Newsletters," *Communications Conference, Public Relations Society of America*, Washington, D.C., September 22, 1973.

R. Tolmei, "Analysis of Fault Tolerant Computer Hardware Systems," *Second Intersociety Conference on Transportation*, Denver, September 23-27, 1973.

R. E. Walker and R. C. Benson, "Vibrational Relaxation of Alkali Metals," *Naval Research Laboratory, Chemical Branch*, White Oak, Maryland, September 24, 1973.

WITH THE AUTHOR



R. C. Orth, author of "Gas Chromatography for Combustion Gas Analysis," was born in Mineola, N. Y. He received the B. S. degree in mechanical engineering from Princeton and the M. S., also in mechanical engineering, from Columbia University. He joined APL in 1965, and has been a member of the Hypersonic Propulsion Group since completion of the Associate Staff Training Program in 1966. Promoted to the rank of Engineer in 1968, Mr. Orth is a specialist in

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ADDRESSES (continued)

T. P. Armstrong (U. of Kansas) and S. M. Krimigis (APL), "Time Variations and Angular Distributions of Alpha Particles and Medium Nuclei for the October 29, 1972 Solar Particle Event."

B. M. Ford, "Simulation Studies of Vehicle Management Strategies for Personal Rapid Transit Systems," *International Symposium on Applications of Computers and Operations Research to Problems of World Concern*, Washington, D.C., August 21-22, 1973.

The following four addresses were presented at the *International IEEE/G-AP Symposium and USNC/URSI Meeting*, Denver, August 21-24, 1973:

Ella B. Dobson, "Some Characteristics of Clear Air Convective Field Motions as Measured by Doppler Radar";

T. G. Konrad, "Clear Air Convection as Seen by High Power, Narrow Beam Radar";

T. G. Konrad, "Fine Scale Probing of Rain Showers Using Narrow Beam Radars";

J. R. Rowland, "Convective Cell

Structure Revealed by Radar and In Situ Measurements."

D. M. Silver, "Hierarchy of Symmetry Conservation Rules Governing Chemical Reaction Systems," *American Chemical Society*, Chicago, August 26-31, 1973.

I. H. Schroeder, C. T. Holliday, and G. B. Bush, "Optical Alignment of an 0.5-Meter Ultraviolet Spectrometer for Apollo 17," *17th Annual Meeting of the Society of Photo-Optical Instrumentation Engineers*, San Diego, August 28, 1973.

K. Moorjani, N. A. Blum, and C. Feldman, "Comments on the Determination and Analysis of Optical Constants of Thin Silicon Films," *Fifth International Conference on Disordered Metallic Systems*, Garmish-Partenkirchen, W. Germany, September 3-8, 1973.

S. M. Krimigis, "Light Ion Releases in the Solar Wind and the Distant Magnetotail," *International Association of Geomagnetism and Aeronomy, General Scientific*

Assembly, Kyoto, Japan, September 9-21, 1973.

K. Moorjani, T. Tanaka, M. M. Sokolski, and S. M. Bose, "Numerical Aspects of the Two-Sites Coherent Potential Approximation," *International Conference on Disordered Metallic Systems*, Strasbourg, France, September 10-15, 1973.

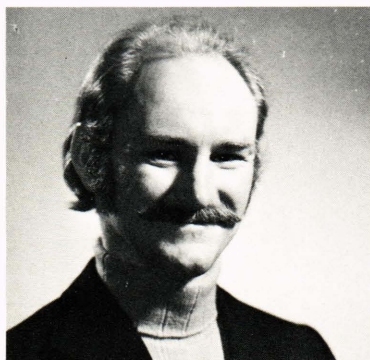
K. Moorjani, "Disordered Solids," *Laboratorio di Electronica, Istituto di Fisica dell' Universita*, Modena, Italy, September 19, 1973.

C. J. O'Brien, "Newsletters," *Communications Conference, Public Relations Society of America*, Washington, D.C., September 22, 1973.

R. Tolmei, "Analysis of Fault Tolerant Computer Hardware Systems," *Second Intersociety Conference on Transportation*, Denver, September 23-27, 1973.

R. E. Walker and R. C. Benson, "Vibrational Relaxation of Alkali Metals," *Naval Research Laboratory, Chemical Branch*, White Oak, Maryland, September 24, 1973.

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