

## PUBLICATIONS

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

- M. C. Waddell, "Use and Control of Trains in Personal Rapid Transit Systems," *Proc. 1972 Joint Automatic Control Conf. of American Automatic Control Council, Stanford Univ.*, AIAA Paper 4-4, 58-62.
- J. L. Abita, "On Sputtered Thin-Films of Chrome, Nitrided Chrome and Nickel-Chromium," *Microelec. and Reliability* **12**, 1973, 111-117.
- B. L. Gotwols, "Pulsating Type IV Solar Radio Bursts," *Solar Phys.* **33**, 1973, 475-482.
- R. W. Flower, "Injection Technique for Indocyanine Green and Sodium Fluorescein Dye Angiography of the Eye," *Investigative Ophthalm.* **12**, No. 12, Dec. 1973, 881-895.
- S. J. Brown, Jr., "Design of Car-Follower Type Control Systems with Finite Bandwidth Plants," *Proc. 7th Annual Princeton Conf. on Information Sciences and Systems*, 1973, 57-62.
- L. W. Ehrlich, "Point and Clock SOR Applied to a Coupled Set of Difference Equations," *Computing* **12**, 1974, 181-194.
- R. R. Newton, "The Application of Ancient Astronomy to the Study of Time," *Endeavour* **33**, No. 118, Jan. 1974, 34-39.
- W. R. Powell, "Evaluation of Non-isothermal Semi-Infinite Cylinder with Specularly Reflecting Walls as a Blackbody Source," *Appl. Optics* **13**, No. 3, Mar. 1974, 593-594.
- J. C. Murphy, L. C. Aamodt, and C. K. Jen, "Energy Transport in Ruby via Microwave-Optical Experiments," *Phys. Rev. B* **9**, No. 5, Mar. 1, 1974, 2009-2022.
- C. B. Barger, "Analysis of Intensity Correlation Spectra of Mixtures of Polystyrene Latex Spheres: A Comparison of Direct Least Squares Fitting with the Method of Cumulants," *J. Chem. Phys.* **60**, No. 6, Mar. 15, 1974, 2516-2519.
- K. Moorjani (APL), T. Tanaka (The Catholic Univ. of America), M. M. Sokoloski (Harry Diamond Lab.), and S. M. Bose (Drexel Univ.), "Coherent Potential Theory of a Random Binary Alloy: Effects of Scattering from Two-Sites Clusters and Off-Diagonal Randomness," *J. Phys. C.: Solid State Phys.* **7**, No. 6, Mar. 21, 1974, 1098-1116.
- W. R. Powell, "Transmission Characteristics of Specularly Reflecting Light Pipes Uniformly Irradiated by Obliquely Inclined Rays," *Appl. Optics* **13**, No. 4, Apr. 1974, 952-954.
- J. Goldhirsh and I. Katz, "Estimation of Raindrop Size Distribution Using Multiple Wavelength Radar Systems," *Radio Sci.* **9**, No. 4, Apr. 1974, 439-446.
- R. Turner, "Electron Density Measurement in the HCN Laser Using Faraday Mode Splitting Technique," *Appl. Optics* **13**, No. 4, Apr. 1974, 968-973.
- E. C. Roelof, "On the Measurement of Energetic Particle Flux Anisotropies with a Class of Spinning Detectors," *J. Geophys. Res.* **79**, No. 10, Apr. 1, 1974, 1535-1538.
- N. J. Brown, "Classical Dynamics: The Study of Vibrational and Rotational Excitation in  $\text{Li}^+$ ,  $\text{H}_2$ ," *J. Chem. Phys.* **60**, No. 8, Apr. 15, 1974, 2958-2965.
- F. J. Adrian and A. N. Jette, "Theoretical Investigation of the Polarization and Band Intensities of the Optical Transitions of the  $V_K$  Center Using a Valence-Bond Wave Function for the Halogen-Molecule Anion," *Phys. Rev. B* **9**, No. 8, Apr. 15, 1974, 3587-3596.
- A. N. Jette, "Fine-Structure of the Metastable,  $c^3\pi\mu$  (1s, 2p), State of Molecular Hydrogen," *Chem. Phys. Letters* **25**, No. 4, Apr. 15, 1974, 590-592.
- V. L. Pisacane and M. M. Feen, "Propagation at Radio Frequencies on Satellite Navigation Systems," *AIAA 5th Communications Satellite Systems Conference*, Los Angeles, Apr. 22-24, 1974, AIAA Paper No. 74-429.
- C. Feldman and R. Plachy, "Vacuum Deposited Silicon Devices on Fused Silica Substrates," *J. Electrochem. Soc.* **121**, No. 5, May 1974, 685-688.
- A. I. Mahan and C. V. Bitterli, "Absorbing and Radiating Cylinders as Boundary-Value Problems," *J. Opt. Soc. Am.* **64**, No. 5, May 1974, 619-630.

## HONORS AND AWARDS

P. J. Waltrup was honored on April 18, 1974 by being named the winner of the first Young Engineer-Scientist award of the National Capital Section of the American Institute of Aeronautics and Astronautics in Washington, D. C. A specialist in high-speed aerodynam-

ics and airbreathing propulsion systems, Dr. Waltrup is Supervisor of the Supersonic Combustion Section of the APL Propulsion Group.

Mary M. Schaefer, Editor in the

Space Development Department, has been named an Associate Fellow of the Society for Technical Communications. Miss Schaefer, who is a Past National President of the organization, received the award on May 16, 1974 at the 21st National Conference.

## ADDRESSES

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

T. P. Sleight, "Use of Graphics in Software Design, Development, and Documentation," *AFCET/IRIA Journées Graphiques*, Paris, December 7, 1973.

H. B. Land, R. C. Orth, and C. L. Yates, "Sampling and Precision Gas Chromatographic Analysis of Aerosols and Light Gases," *XXVth Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy*, Cleveland Convention Center, Ohio, March 4-8, 1974.

W. H. Avery, Participated in a Round-Table on "Energy Conservation in Transportation," Sponsored by *Scientific American Magazine* and held at the *American Institute of Architects*, Washington, D. C., March 17-18, 1974.

W. H. Avery, "Practical Requirements for Advanced Urban Transportation Systems," *Princeton University*, March 20, 1974.

The following two addresses were presented at the *International Conference on Tetrahedrally Bonded Amorphous Semiconductors*, Yorktown Heights, New York, March 20-24, 1974:

K. Moorjani, N. A. Blum, and C. Feldman, "Effects of Substrate Temperature During Deposition on the Optical Constants of Silicon Films";

H. K. Charles, Jr. and C. Feldman, "Switching Dynamics in Amorphous Silicon Thin Films."

The following four addresses were presented at the *American Physical Society*, Philadelphia, March 25-28, 1974:

C. B. Barger, "Measurement of a Continuous Distribution of Spherical Particles by Intensity Correlation Spectroscopy: Analysis by Cumulants";

C. Feldman and H. K. Charles, Jr., "A Model for Switching in Amorphous Boron and Silicon Thin Films";

H. K. Charles, Jr. and C. Feldman, "Switching Dynamics in Amorphous Boron and Silicon Thin Films";

N. A. Blum and C. Feldman, "Mossbauer Study of Amorphous and Crystalline Tellurium."

D. V. Kalbaugh and W. S. Levine, "Some Results Concerning Optimal Search Trajectories," *Princeton Conference on Information Sciences and Systems*, March 28-29, 1974.

D. G. Bodnar (G.I.T.) and C. C. Kilgus (APL), "An Antenna and Radome for a 95 GHz Arctic Surface Effect Vehicle Radar," *Naval Electronics Laboratory*, San Diego, March 1974.

C. B. Barger, "Measurement of a Continuous Distribution of Spherical Particles by Intensity Correlation Spectroscopy: Analysis by Cumulants," *MIT Program In Health Sciences and Technology*, Cambridge, Massachusetts, April 1, 1974.

D. Denzler, "A Low Cost Automatic Satellite Navigation System," *Radio Technical Commission for Marine Services Assembly Meeting*, St. Petersburg, Florida, April 1-3, 1974.

A. J. Zmuda and J. C. Armstrong, "Field-Aligned Currents and Flow Direction," *American Geophysical Union*, Washington, D. C., April 8, 1974.

Helen S. Hopfield, "Atmospheric Correction for Radar Altimeter Data Over the Oceans," *National Meeting, American Geophysical Union*, Washington, D. C., April 8-12, 1974.

T. A. Potemra (Lecture), "Ionizing Radiation Affecting the Lower Ionosphere," *NATO Advanced Study Institute on ELF-VLF Radio Wave Propagation*, Spatind Mountain, Norway, April 17-27, 1974.

V. L. Pisacane and M. M. Feen, "Propagation Effects at Radio Frequencies on Satellite Naviga-

tion Systems," *AIAA 5th Communications Satellite Systems Conference*, Los Angeles, April 22-24, 1974.

The following two addresses were presented at the *Spring Meeting of the Association for Research in Vision and Ophthalmology*, Sarasota, Florida, April 24-29, 1974:

R. W. Flower, "Infrared Angiography of the Choroid—Its Clinical Potential and Limitations";

L. J. Viernstein (APL) and I. P. Pollack (JHU, School of Medicine), "Precision of Constant Pressure Tonography."

N. Jette, "Fine Structure of the Metastable,  $c^3\pi_u$  (1s, 2p), State of Molecular Hydrogen," *Washington Meeting of the American Physical Society*, Washington, D. C., April 25, 1974.

R. P. Rich, "Ethics in the Computer Age," *1974 Annual Forum of Maryland Conference of Social Concern*, Civic Center, Baltimore, April 25, 1974.

W. E. Frain, H. W. Wong, and J. F. Burns, "A Comparison of Swept-Sinusoidal Versus Shock Spectrum Testing of the SAS-C Spacecraft," *1974 Annual Meeting of the Institute of Environmental Sciences*, Washington, D. C., April 29, 1974.

L. W. Hunter, "Some New Experimental Studies on Polymer Flammability," *Second National Flame Retardancy of Plastics Conference*, New York City, April 29-30, 1974.

V. O'Brien, "Blood Flow Dynamics," *Bioengineering Science Seminar*, The Johns Hopkins University, Baltimore, April 1974.

R. Beal, "SHP Requirements for R. F. Modules," *Navy Standard Hardware Program Government/Industry Conference*, National Bureau of Standards, Gaithersburg, Maryland, May 2-3, 1974.

D. E. Olsen, "Applications of Simul-

## ADDRESSES (continued)

- taneous Prediction Intervals," *Logistics Research Conference, Office of Naval Research and George Washington Univ.*, May 8-10, 1974.
- F. G. Satkiewicz, "Polyatomic Positive Ion Mass Spectra of Oxides," *22nd Annual Conference on Mass Spectrometry and Allied Topics, American Society for Mass Spectrometry*, Philadelphia, May 19-24, 1974.
- H. J. Binck and J. H. Zouck, "Use of a Microprocessor in a Supervisory Control Application," *National Aerospace Instrumentation Symposium*, Albuquerque, New Mexico, May 21-23, 1974.
- W. E. Buchanan and E. F. Kiley, "Integrated Universal Pilot Warning/Collision Avoidance Display," *1974 International Symposium and Exhibition, Society for Information Display*, San Diego, May 21-23, 1974.
- R. F. Gasparovic, G. H. Emmons, and L. D. Tubbs, "Two Wavelength Measurements of the Ocean Surface Radiometric Clutter," *22nd National Infrared Information Symposium*, Wright-Patterson Air Force Base, Ohio, May 21-23, 1974.
- J. A. Schetz and F. S. Billig, "Approximate Analysis of Base Burning in Supersonic Flow," *Workshop on Aerodynamics of Base Combustion*, Purdue University, Lafayette, Indiana, May 29-30, 1974.
- The following two addresses were presented at the *28th Annual Frequency Control Symposium*, Atlantic City, New Jersey, May 29-30, 1974:
- R. J. Taylor, "Satellite to Ground Timing Experiments";
- L. J. Rueger and A. G. Bates, "Frequency Synthesizer for Normalizing the Frequency and Time Scales of Crystal Clocks on Orbiting Satellites."
- E. F. Hart, "User-Transparent Automatic Terminal Identification," *Association for Computing Machinery*, San Diego, May 1974.

## APL COLLOQUIA

- Apr. 12*—"Recording and Reproduction of Music," by A. G. Bose, MIT and Bose Corp.
- Apr. 19*—"Nonlinear Transfer Equations," by N. G. Van Kampen, Univ. of Utrecht and Univ. of Texas.
- Apr. 26*—"Exploration of Mars," by H. Masursky, U. S. Geological Survey.
- May 3*—"Electron-Hole Condensation in Semiconductors," by R. N. Silver, California Inst. of Tech.
- May 10*—"A Computer-Assisted Tomographic X-Ray Scanner," by R. S. Ledley, Georgetown Univ.
- May 31*—"Mass Spectrometry of Solids," by F. G. Satkiewicz, Applied Physics Laboratory.
- June 21*—"Progress Toward Controlled Thermonuclear Fusion," by A. W. Trivelpiece, U. S. Atomic Energy Commission.

## WITH THE AUTHORS



C. K. Jen, the author of "Excitation Energy Transfer in Solids," was born in Chin-Yuang District, Shansi, China. He received a B. S. in electrical engineering from the Massachusetts Institute of Technology, an M. S. in radio communication from the University of Pennsylvania, and a Ph. D. in physics from Harvard University. Before coming to APL in 1950, Dr. Jen was Instructor of physics at Harvard; Professor of Physics and Electrical Engineering at the National Tsing Hua University, Peiping, China; Professor of Physics and Electrical Engineering at the National Southwest Associ-

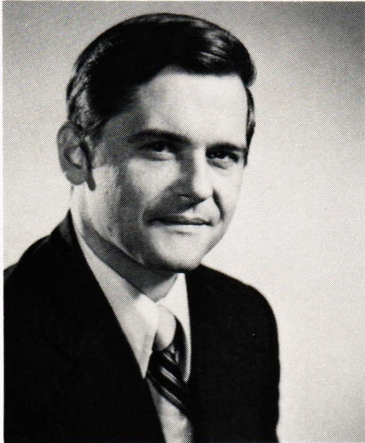
ated University, Kunming, China; and Research Lecturer in electronics at Harvard. At APL, Dr. Jen has collaborated in pioneering research on the electron spin resonance of free radicals trapped in inert matrices at liquid helium temperature, has studied the microwave spectra of molecules, and most recently has been involved in the study of triplet state molecules by simultaneous excitation by optical and microwave radiations. Since 1953 Dr. Jen has been Supervisor of the Microwave Physics Group and in 1958 he was appointed Vice-Chairman of the APL Research Center. He was the

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## WITH THE AUTHORS *(continued)*

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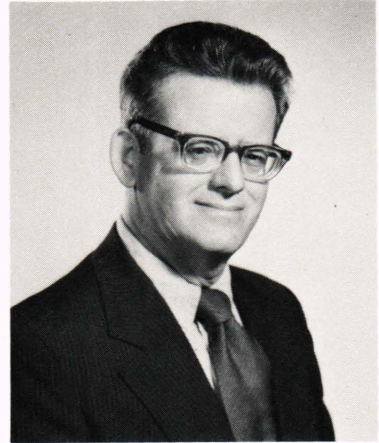
first William S. Parsons Visiting Professor at the Johns Hopkins University in 1966-1967. He is a Fellow of the American Physical Society, a Fellow of the Washington Academy of Sciences, a member of the Philosophical Society of Washington, and an elected Fellow of the Academia Sinica (Taiwan).



*E. F. Prozeller*, coauthor of "The TRIAD PRN Navigation Experiments," is a native of Buffalo, N.Y. He received the B. E. E. degree from the University of Detroit and the M. S. E. E. from the University of Illinois. A specialist in analog

and digital signal processing, radio navigation systems and carrier and modulation tracking receivers, Mr. Prozeller was employed by APL in 1965. His first assignment was in the Space Radio Frequency Systems Group of the Space Development Department where he contributed to the design of the Geceiver satellite navigation receiver. His latter assignments have included participation in the development of a hybrid OMEGA/Transit navigation system for aircraft and the study of modulation methods for use in advanced navigation satellites. In 1971 he was appointed SDO Project Scientist responsible for the technical development, coordination, and evaluation of the TRIAD PRN experiment. Mr. Prozeller is presently a section supervisor in the Space System Applications Group and is a member of the Institute of Electrical and Electronics Engineers.

*Verne Schwab*, coauthor of "The TRIAD PRN Navigation Experiments," is a native of northwestern Pennsylvania. He received the B.A. degree from St. John's College in Annapolis, Maryland. Mr. Schwab joined the APL staff in 1946 as a physicist in the Bumblebee Launching Group and performed studies of



stabilization and control of launching test vehicles. From 1950 to 1965, as a member of the Bumblebee Dynamic Analysis Group, he participated in design and performance studies of missile propulsion and guidance systems, radar search techniques and ICBM interception systems. In 1961 he was a member of the APL team that performed the first integral doppler navigation experiments with a Transit satellite. Since 1965 he has been a member of the Space Development Department and engaged in the design and analysis of satellite navigation systems. He is a member of the American Mathematical Society.