

PUBLICATIONS

Principal books and technical articles published by APL staff members during April-June 1977

- R. C. Benson, "Sodium Chemiluminescence in the $\text{Na}+\text{N}_2\text{O}$ and Nacatalyzed $\text{N}_2\text{O}+\text{CO}$ Reactions," *J. Chem. Phys.* **66**, No. 9, 3879.
- B. I. Blum and K. E. Richeson, "Inexpensive Computer Assisted Software Engineering for Moderate Sized Programs," *Proc. IEEE COMPCON 77*, San Francisco, 202.
- N. A. Blum, C. Feldman, and F. G. Satkiewicz, "Infrared Absorption of Amorphous Boron Films Containing Carbon and Hydrogen," *Phys. Status Solidi* **41**, 481.
- J. Bohandy and B. F. Kim, "An Electron Spin Resonance Study of Copper Porphin," *J. Magn. Reson.* **26**, 341.
- C. Feldman, F. G. Satkiewicz, and H. K. Charles, Jr., "Evaluation of Vacuum Deposited Silicon Films and Junctions for Solar Cell Applications," *Proc. National Workshop on Low-Cost Polycrystalline Silicon Solar Cells*, Dallas, 267.
- R. W. Flower, "Simple adaptors for fast conversion of a fundus camera for rapid-sequence ICG fluorescence choroidal angiography," *J. Biol. Photogr. Assoc.* **45**, No. 2, 43.
- R. W. Flower (APL) and P. Speros and K. R. Kenyon (JHMI), "Electroretinographic Changes and Choroidal Defects in a Case of Central Retinal Artery Occlusion," *Am. J. Ophthalmol.* **83**, No. 4, 451.
- J. W. Follin, Jr. and K. Yu, "Use of ELF Measurements to Supplement VLF and Magneto Telluric Signals in Electromagnetic Prospecting," *Trans. Geotherm. Resour. Coun.* **1**, 97.
- D. W. Fox and J. T. Stadter, "An Eigenvalue Estimation Method of Weinberger and Weinstein's Intermediate Problems," *Siam J. Math. Anal.* **8**, No. 3, 491.
- E. J. Francis (APL) and J. Seelinger (U.S. Maritime Admin.), "Forecast Markets, Economics and Shipbuilding Program for OTEC Industrial Plant-Ships in Tropical Oceans," *Proc. International Solar Energy Society Meeting*, Orlando, FL.
- E. P. Gray, R. W. Hart, and R. A. Farrell, "A New Variational Approach to Scattering by Random Media or Rough Surfaces," *Proc. Open Colloq., Commission F, URSI*, La Baule, France, 111.
- B. F. Hochheimer (APL) and J. L. Calkins (JHMI), "The Integrated Radiance of Flashbulbs," *Opt. Eng.* **16**, No. 2, 212.
- E. P. Irzinski, "The input admittance and near-field coupling of a TEM-driven concentric annular slot array," *Radio Sci.* **12**, No. 2, 213.
- C. J. Johns (JHMI), D. W. Simborg (Univ. of California, San Francisco), B. I. Blum (APL), and B. H. Starfield (JHMI), "A Mini-record: An Aid to Continuity of Care," *Johns Hopkins Med. J.* **140**, 277.
- B. F. Kim and J. Bohandy, "Single Site Spectra of Zn Porphin in Triphenylene," *J. Mol. Spectrosc.* **65**, 90.
- E. Kirsch and S. M. Krimigis (APL), E. T. Sarris (Max-Planck Institute), R. P. Lepping (NASA/Goddard), and T. P. Armstrong (Univ. of Kansas), "Possible Evidence for Large, Transient Electric Fields in the Magnetotail from Oppositely Directed Anisotropies of Energetic Protons and Electrons," *Geophys. Res. Lett.* **4**, No. 4, 137.
- H. A. Kues and C. E. Teague, "Thin-layer chromatography of some cyanine dyes," *J. Chromatogr.* **135**, 221.
- T. R. Larsen (Norwegian Defence Research Establishment), T. A. Potemra (APL), and W. L. Imhof and J. B. Reagan (Lockheed Palo Alto Research Laboratory), "Energetic Electron Precipitation and VLF Phase Disturbances at Middle Latitudes Following the Magnetic Storm of December 16, 1971," *J. Geophys. Res.* **82**, No. 10, 1519.
- C. S. Leffel, Jr. and C. A. Wingate (APL) and C. Balas (Philips Laboratories), "Performance of a Stirling Cycle Cryogenic Refrigerator for Spacecraft," *Proc. 25th National IRIS*, San Francisco.
- R. L. McCally and R. A. Farrell, "Effect of transcorneal pressure on small-angle light scattering from rabbit cornea," *Polymer* **18**, 444.
- L. Monchick (APL) and S. Green (NASA Institute of Space Studies), "Validity of Approximate Methods in Molecular Scattering. III. Effective Potential and Coupled States Approximations for Differential and Gas Kinetic Cross Sections," *J. Chem. Phys.* **66**, 3085.
- L. Monchick and L. W. Hunter, "A kinetic theory of quantum state diffusion," *J. Chem. Phys.* **66**, No. 9, 4141.
- K. Moorjani (APL) and S. K. Ghatak (Freie Universität Berlin), "Critical behaviour of a structurally and chemically disordered ferromagnet," *J. Phys. C. Solid State Phys.* **10**, 1027.
- B. H. Nall, "Use of a hot wire anemometer as a particle velocity detector in standing sound waves," *Rev. Sci. Instrum.* **48**, No. 4, 449.
- J. T. Nolte and A. S. Krieger (American Science and Engineering) and E. C. Roelof and R. E. Gold (APL), "High Coronal Structure of High Velocity Solar Wind Stream Sources," *Sol. Phys.* **51**, 459.
- J. T. Nolte (American Science and Engineering) and E. C. Roelof (APL), "Solar Wind, Energetic Particles, and Coronal Magnetic Structure: The First Year of Solar Cycle 20," *J. Geophys. Res.* **82**, No. 16, 2175.
- J. B. Oakes, "Training Engineers to Work in the Clinical Setting," *Proc. 23rd Annual IES Meeting*, Los Angeles.
- V. O'Brien and L. W. Ehrlich, "Pulsatile Flow Through Stenosed Arteries," *Proc. ASME-AMD 1977 Biomechanics Symp.* **23**, 113.
- D. E. Olsen, "Estimating Reliability Growth," *IEEE Trans. Reliab. R-26*, No. 1, 50.

PUBLICATIONS (continued)

- A. J. Pue, "A State Constrained Approach to Vehicle Follower Control for Short Headway Automated Transit Systems," *Proc. 1977 Joint Automatic Control Conf.*, San Francisco, 401.
- J. T. Stadter and R. O. Weiss, "A New Method for Analyzing Structural Contact Problems," *Proc. Sixth Canadian Congress of Applied Mechanics*, Vancouver, 1017.
- R. J. Taylor and W. J. Toth, "Ammonia Absorption Geothermal District Heating and Air-Conditioning System," *Trans. Geotherm. Resour. Coun.* **1**, 287.
- R. Turner, "Plasma effects in the HCN laser," *Appl. Opt.* **16**, No. 5, 1197.
- A. A. Westenberg and N. deHaas, "A flash photolysis-resonance fluorescence study of the $O+C_2H_2$ and $O+C_2H_3Cl$ reactions," *J. Chem. Phys.* **66**, No. 11, 4900.
- S. Wilson and D. M. Silver (APL) and R. J. Bartlett (Battelle Memorial Institute), "Many-body effects in the $X^1\Sigma^+$ states of the hydrogen fluoride, lithium fluoride and boron fluoride molecules," *Mol. Phys.* **33**, No. 4, 1177.
- S. Wilson and D. M. Silver, "Diagrammatic perturbation theory: many-body effects in the $X^1\Sigma^+$ states of first-row and second-row diatomic hydrides," *J. Chem. Phys.* **66**, No. 12, 5400.

ADDRESSES

Principal addresses presented by APL staff members to groups and organizations outside the Laboratory during April–June 1977

- F. J. Adrian, "Basic Diffusion Processes," NATO Advanced Study Inst. on Chemically Induced Magnetic Polarization, Urbino, Italy, April 17–30.
- F. J. Adrian, "Electron Polarization and CIDNP," NATO Advanced Study Inst. on Chemically Induced Magnetic Polarization, Urbino, Italy, April 17–30.
- F. J. Adrian, "Radical Pairs Concepts: Qualitative Aspects," NATO Advanced Study Inst. on Chemically Induced Magnetic Polarization, Urbino, Italy, April 17–30.
- F. J. Adrian, "Radical Pairs Concepts: Quantitative Theory," NATO Advanced Study Inst. on Chemically Induced Magnetic Polarization, Urbino, Italy, April 17–30.
- F. J. Adrian and A. N. Jette, "Hyperfine Interactions and Structure of the Noble Gas Monohalides," VI International Symp. on Magnetic Resonance, Banff, Canada, May 21–27.
- T. P. Armstrong and G. Chen (Univ. of Kansas), E. T. Sarris (Max-Planck Institute), and S. M. Krimigis (APL), "Acceleration and Modulation of Electrons and Ions by Propagating Interplanetary Shocks," XXth COSPAR Meeting, Tel Aviv, June 7–18.
- E. R. Bernheisel, "The Writing Process as a Design Tool," 24th International Technical Communication Conf., Chicago, May 11–14.
- B. I. Blum, "Low-Cost Mixed-Media Picture Data Retrieval," Workshop on Picture Data Description and Management, Chicago, April 20–22.
- J. Bohandy, "ERP of Iron Porphin in Triphenylene," VI International Symp. on Magnetic Resonance, Banff, Canada, May 21–27.
- S. E. Brown, "Thermal Expansion of Optical Materials from 25°C to 250°C," 34th Annual Meeting, National Inst. of Science and Beta Kappa Chi Scientific Honor Society, Nashville, April 6–9.
- D. W. Fox, "Bounds for Perturbation Eigenvalues of Relative Matrix Problems," American Mathematics Society, Evanston, IL, April 15.
- D. W. Fox, "Rayleigh-Ritz Bounds for Eigenvalues on the Wrong Side," Math-Sciences Department Seminar, The Johns Hopkins Univ., April 28.
- M. H. Friedman, "Analysis of Ion Transport Across and Electrical Properties of Rabbit Corneal Epithelium," Assoc. for Research in Vision and Ophthalmology, Sarasota, April 25–29.
- A. N. Jette and J. G. Parker, "Earth Surface Displacement Generated by Propagation of Acoustic Plane Waves Within Gas-Filled Buried Pipe (Theoretical)," Acoustic Society of America, State College, PA, June 6–8.
- R. J. Keenan and P. F. Bohn, "Hybrid Computer Handling Program — Prediction of Vehicle Dynamics," Mini-Conf. on Transportation, Univ. of Michigan, April 20–22.
- R. E. Lenhard, Jr. (JHMI) and B. I. Blum (APL), "A Comprehensive Clinical Data System for an Oncology Center," American Society for Clinical Oncology, Denver, May 18–21.
- R. L. McCally (APL), J. L. Cox (JHMI), and R. A. Farrell (APL), "The Effect of Intraocular Pressure on Stromal Structure," Assoc. for Research in Vision and Ophthalmology, Sarasota, April 25–29.
- J. C. Murphy, "Active Acoustic Detection of Leaks in Underground Natural Gas Distribution Lines (Theoretical)," Hazard Prevention Symp., Inst. of Gas Technology, Chicago, June 28.
- J. C. Murphy, "Photoacoustic Spectroscopy," Wake Forest Univ. Seminar, Winston-Salem, April 14.
- V. O'Brien, "Pulsatile Flow Through Stenosed Arteries," ASME Summer Meeting, New Haven, June 15–17.

ADDRESSES *(continued)*

- J. G. Parker, "Active Acoustic Detection of Leaks in Underground Natural Gas Distribution Lines (Experimental)," Hazard Prevention Symp., Inst. of Gas Technology, Chicago, June 28.
- W. K. Peterson and J. P. Doering (JHU) and T. A. Potemra and C. O. Bostrom (APL), "Characteristics of 1-500 eV Electrons Observed in the Earth's Thermosphere From the Photoelectron Spectrometer Experiment on the Atmosphere Explorer Satellites," NATO Advanced Study Inst. on Dynamical and Chemical Coupling of Neutral and Ionized Atmosphere, Norway, April 12-22.
- T. A. Potemra, "Large-Scale Characteristics of Field-Aligned Currents Determined from the Triad Magnetometer Experiment," NATO Advanced Study Inst. on Dynamical and Chemical Coupling of Neutral and Ionized Atmosphere, Norway, April 12-22.
- S. Qureshi, H. N. Wagner, Jr., and P. O. Alderson (JHMI), M. G. Lotter (Univ. of Orange Free State, South Africa), K. H. Douglass (JHMI), and L. G. Knowles (APL), "Characteristics of Left Ventricular Time-Activity Curves in Patients with Heart Disease," 24th Annual Meeting, Soc. of Nuclear Medicine, Chicago, June 21-24.
- E. C. Roelof and S. M. Krimigis, "Solar Energetic Particles Below 10 MeV," XXth COSPAR Meeting, Tel Aviv, June 7-18.
- F. G. Satkiewicz, "Relative Yields of Positive Ions Sputtered from Several Glasses," ASME 25th Annual Conf. on Mass Spectrometry and Allied Topics, Washington, DC May 30-June 1.
- V. G. Sigillito, "Bounds for Eigenvalues of Elliptic Applications," Applied Mathematics Colloq., Cornell Univ., Ithaca, April 1.
- D. M. Silver, "Interaction Potentials Between Closed-Shell Atoms and Molecules," Sixth Canadian Symposium on Theoretical Chemistry, New Brunswick, June 19-25.
- B. E. Tossman, "A Time Optimal Geomagnetic Maneuvering Technique for Orbit Correction Thrust Vectoring," 12th International Symp. on Space Technology and Science, Tokyo, May 17.
- H. N. Wagner, Jr. (JHMI), M. G. Lotter (Univ. of Orange Free State, South Africa), L. G. Knowles (APL), and T. K. Natarajan and K. H. Douglass (JHMI), "Computer-Assisted Cinematic Displays in Nuclear Medicine," Informatek European Users Group Meeting, Clermont-Ferrand, France, May 19-21. Also presented at 24th Annual Meeting, Society of Nuclear Medicine, Chicago, June 21-24.

APL COLLOQUIA

April-June 1977

- April 1*—"The Role of Active Oxygen in Biological Oxidations," by I. B. C. Matheson, Univ. of Georgia.
- April 8*—"Energy Options for Developing Countries," by I. H. Usmani, United Nations Environmental Program.
- April 15*—"Brain Mechanisms for Visual Attention," by V. B. Mountcastle, The Johns Hopkins University.
- April 29*—"Optical Fibre Guides for Lightwave Communication," by J. R. Carruthers, Bell Telephone Laboratories.
- May 6*—"Exploration of Mid-Ocean Ridges by Submersibles," by J. R. Heirtzler, Woods Hole Oceanographic Institute.
- May 13*—"Orbital Theory of the Ice Ages," by J. Imbrie, Brown University.
- May 20*—"Some New Uses of Ultrasound in Cardiology," by J. L. Weiss, The Johns Hopkins University.
- May 27*—"Tracking Down Legionnaire's Disease," by M. J. Goldberger, Maryland Department of Health and Mental Hygiene.

PATENTS

- J. W. Chubbuck—*Intracranial Pressure Monitor*, No. 4,026,276.
- J. M. DuBrul—*Simplified Time Code Reader with Digital PDM Decoder*, No. 4,025,917.
- R. W. Fowler—*Fractional Binary to Decimal Converter*, No. 4,016,560.
- E. J. McDevitt—*X-Y to Range-Bearing Converter*, No. 4,019,032.
- D. W. Rabenhorst—*Filament Connected Rim Rotor*, No. 4,020,714.
- D. W. Rabenhorst—*Filament Rotor Having Elastic Sheaths Covering the Filamentary Elements of the Structure*, No. 4,023,437.

WITH THE AUTHORS

R. R. Newton was born in Chattanooga in 1918. He obtained the B.S. in 1940 from the University of Tennessee and the M.S. and Ph.D. degrees in physics from Ohio State University in 1942 and 1946. During 1946-48, he was a member of the technical staff of the Bell Telephone Laboratories. He became associate professor of physics at the University of Tennessee in 1948 and was professor of physics at Tulane University during 1955-57. In 1957, Dr. Newton joined APL, where he has engaged in research in celestial mechanics, satellite tracking, and stabilization of space vehicles, and recently made a detailed study of the causes of the acceleration of the earth's ro-



rotation. In this connection, he has made an exhaustive study of ancient and medieval records that would enable him to determine the time when such astronomical events as eclipses took place. This research led to his discovery of Ptolemy's fraud. Dr. Newton is the author of many publications including a number of books: *The Mathematical Theory of Rocket Flight* (with J. B. Rosser), McGraw-Hill (1947); and *Ancient Astronomical Observations of the Earth and Moon* (1970), *Medieval Chronicles and the Rotation of the Earth* (1972), *Ancient Planetary Observations and the Validity of Ephemeris Time* (1976), and *The Crime of Claudius Ptolemy* (1977), published by The Johns Hopkins

University Press. He is presently supervisor of the Space Research and Analysis Branch of APL.

L. G. Knowles is a native of Pottsville, PA. He received the B.S. and M.S. degrees in electrical engineering from Pennsylvania State University (1961) and the University of Illinois (1963), respectively. Mr. Knowles is a specialist in digital systems simulation, evaluation of human visual responses to photon-limited images,



and generalized digital instrumentation techniques. Since joining APL in 1961, he has helped design portions of several missile systems; designed and developed a prototype digital storage and display system and conducted simulation studies, both involving the use of medicine radioisotopes; and investigated the effect of spatial filtering on the detectability of tactical targets at low light levels. He is presently engaged in conducting simulation studies in nuclear medicine. In addition to his APL responsibilities, since 1974 Mr. Knowles has been assistant professor in the Department of Radiology of The Johns Hopkins University School of Medicine and in the Department of Environmental Health of the University's School of Hygiene and Public Health. He is an elected member of the Howard County (Maryland) Council and currently chairs that legislative body.

H. N. Wagner, Jr., born in Baltimore, is professor of medicine, radiology, and environmental health sciences in The Johns Hopkins University School of Medicine and School of Hygiene and Public Health. He is also a member of the Principal Professional Staff of APL. He is president of the World Federation of Nuclear Medicine and Biology and past president of the Society of Nuclear Medicine and of the American Federation for Clinical Research. Except for two years at the National Institutes of Health and one year at the Hammersmith Hospital in London, England, all of Dr. Wagner's professional career has been at The Johns Hopkins Univer-



sity, where he received his A.B. degree in 1948 and his M.D. in 1952. After completing his residency on the Osler service at Johns Hopkins Hospital in 1958, he was co-founder of the Division of Nuclear Medicine and has been its director since 1965. Author or editor of many scientific articles and books, Dr. Wagner is best known as an innovator of many diagnostic techniques using radioactive tracers, including specific tests designed to evaluate the lungs, heart, spleen, and kidneys. He was the originator of an automated method of detecting bacterial growth in blood and recently developed a device called the "nuclear stethoscope" for monitoring heart function.