

PUBLICATIONS

Principal books and technical articles published by APL staff members
during January–March 1977

- L. C. Aamodt, J. C. Murphy, and J. G. Parker, "Size Considerations in the Design of Cells for Photoacoustic Spectroscopy," *J. Appl. Phys.* **48**, No. 3, 927–933.
- R. C. Adams (APL), and J. M. Cohen (Univ. of Pennsylvania), "Analytic Supernova Models and Black Holes," *Int. J. Theoret. Phys.* **16**, No. 1, 35–52.
- B. I. Blum (APL) and R. E. Lenhard, Jr. (JHMI), "A Prototype Clinical Patient Management System," *Proc. Washington ACM Technical Symp.*
- C. A. Boyles, "Theory of the spherical, compliant-tube Luneburg lens," *J. Acoust. Soc. Am.* **61**, No. 2, 338–352.
- T. D. Craddock (Ontario Cancer Foundation, Victoria Hospital) and L. G. Knowles (APL), "Computers in Nuclear Medicine," *Nuclear Medicine Physics, Instrumentation and Agents* (ed. F. D. Rollo), C. V. Mosby Co., St. Louis.
- G. L. Dugger, H. L. Olsen, P. P. Pandolfini, and W. H. Avery, "Experiments on and Design of Low-Cost Aluminum Heat Exchangers for OTEC Plant Ships," *Proc. Fourth Annual Conference on Ocean Thermal Energy Conversion VI*, 111–123.
- C. R. Edwards, R. C. Moore, and G. E. Baer, *St. Marys River COGLAD Navigation System Final Report*, APL/JHU CP 053.
- L. W. Ehrlich and M. H. Friedman, "Steady Convective Diffusion in a Bifurcation," *IEEE Trans. Biomed. Eng.* **BME24**, No. 1, 12–18.
- L. F. Fehlner, T. W. Jerardi, T. A. McCarty, and R. G. Roll, *Experimental Research on the Propagation of Loran-C Signals, Vol. A: Summary Report*, APL/JHU TG 1298A; also *Vol. D: Data and Analysis*, APL/JHU TG 1298D.
- E. J. Francis (APL) and J. Seelinger (U.S. Maritime Administration), "Market Definition, Commercial Development Plan, and OTEC Financing: A Summary of 1976 APL Work for the U.S. Maritime Administration," *Proc. Fourth Annual Conference on Ocean Thermal Energy Conversion III*, 58–66.
- S. Green (NASA Inst. of Space Studies), L. Monchick (APL), and R. Goldflam and F. Kouri (Univ. of Houston), "Configurational Tests of Angular Momentum Decoupling Approximation for Pressure Broadening Cross Sections," *J. Chem. Phys.* **66**, No. 4, 1409.
- B. F. Hochheimer (APL) and J. L. Calkins (JHMI), "The Integrated Radiance of Flashbulbs," *Opt. Eng.* **16**, No. 2, 212–213.
- L. W. Hunter, H. Schacke, C. Grunfelder, and R. M. Fristrom, "Surface Temperature Measurements in the Moving Wire Technique," *Combust. Sci. Tech.* **15**, 41–48.
- E. P. Irzinski, "The input admittance and near-field coupling of a TEM-driven concentric annular slot array," *Radio Sci.* **12**, No. 2, 213–222.
- W. C. Klingensmith III (Johns Hopkins School of Medicine), M. G. Lotter (Univ. of Orange Free State, Republic of South Africa), L. G. Knowles (APL), and A. Motazedi and H. N. Wagner, Jr. (Johns Hopkins School of Medicine) "Physiological Interpretation of Time-Activity Curves from Cerebral Flow Studies," *Proc. Symp. Computer-Assisted Data Processing in Nuclear Medicine*, ERDA Conf. 770101.
- L. G. Knowles, "Book Review of *Holography in Medicine*," *J. Nucl. Med.* **18**, 502.
- M. G. Lotter (Univ. of Orange Free State, Republic of South Africa), K. H. Douglass (Johns Hopkins School of Medicine), L. G. Knowles (APL), and E. L. Nickloff and H. N. Wagner, Jr. (Johns Hopkins School of Medicine), "A Technique for the Evaluation of Global and Regional Ventricular Function," *Proc. Symp. Computer-Assisted Data Processing in Nuclear Medicine*, ERDA Conf. 770101.
- J. H. Manley, "Management Discipline, An Essential Ingredient for Reliable Software," *Proc. NSIA Conf., Software Quality-Reliability*.
- R. R. Newton, *A Canon of Lunar Eclipses for the Years –1500 to –1000*, APL/JHU CP 054.
- R. B. North (APL), T. A. Fischell (Cornell Univ.), R. E. Fischell (APL), and D. M. Long (Johns Hopkins Hospital), *A Clinical Study of Spinal Epidural Stimulation for the Treatment of Intractable Pain*, APL/JHU CP 052.
- V. O'Brien, "Steady and Unsteady Flow in Noncircular Straight Ducts," *J. Appl. Mech.* **44**, No. 1, 1–6.
- W. K. Peterson and J. P. Doering (The Johns Hopkins Univ.), and T. A. Potemra, R. W. McEntire, and C. O. Bostrom (APL), "Conjugate Photoelectron Fluxes Observed on Atmosphere Explorer C," *Geophys. Res. Lett.* **4**, No. 3, 109.
- W. K. Peterson and J. P. Doering (The Johns Hopkins Univ.), and T. A. Potemra, R. W. McEntire, and C. O. Bostrom (APL), R. A. Hoffman and R. W. Janetzke (NASA Goddard), and J. L. Burch (NASA Marshall), "Observations of 10-eV to 25-keV Electrons in Steady Diffuse Aurora From Atmosphere Explorer C and D," *J. Geophys. Res.* **82**, No. 1, 43.
- T. O. Poehler (APL) and A. N. Bloch, D. O. Cowan, and T. Caruthers (The Johns Hopkins Univ.), "The Organic Metallic State: Some Physical Aspects and Chemical Trends," *Proc. NATO Conference on Physics and Chemistry of One-Dimensional Metals* (ed. H. J. Keller), Plenum Press, New York.
- T. O. Poehler (APL) and A. N. Bloch, D. O. Cowan, and T. Caruthers (The Johns Hopkins Univ.), "The Organic Metallic State: Chemical Aspects," *Proc.*

PUBLICATIONS (continued)

- NATO Conference on Physics and Chemistry of One-Dimensional Metals* (ed. H. J. Keller), Plenum Press, New York.
- T. A. Potemra, "Aurora borealis, the greatest light show on Earth, may help explain climatic changes, the ozone shield," *Smithsonian* **7**, No. 11, 64-73.
- R. C. Rand and W. Avery, "Applications of New Systems to Urban Transportation," *Traffic Q.*, 97-117.
- W. D. Stanbro, "The Chemistry of Amino Acids and Peptides in Power Plant Cooling Towers," *Chesapeake Sci.* **18**, No. 1, 126-128.
- A. C. Stucki, "What Goes Up Must Come Down," *Build. Oper. Manage.*, Mar 16.
- I. Sugai, "Partial Differentiations of Vis-Viva and Lambert Equations," *J. Astronaut. Sci.* **XXV**, No. 1, 63-74.
- I. Sugai, "Problem 76-4, Geometric Probability," *SIAM Rev.* **19**, No. 1, 152-154.

ADDRESSES

Principal addresses presented by APL staff members to groups and organizations outside the Laboratory during January-March 1977

- F. J. Adrian, "Chemically Induced Magnetic Polarization: A Semi-permanent Record of a Rapid Free Radical Reaction," *Argonne National Laboratory Chemistry Division Seminar*, Argonne, IL, Mar 17; *Univ. of Chicago Chemistry Department Seminar*, Chicago, Mar 18.
- B. I. Blum and K. E. Richeson, "Inexpensive Computer Assisted Software Engineering for Moderate Sized Programs," *Spring COMP-CON 77*, San Francisco, Mar 1-3.
- M. G. Lotter (Univ. of Orange Free State, Republic of South Africa), H. N. Wagner, Jr. (Johns Hopkins School of Medicine), L. G. Knowles (APL), and K. H. Douglass and E. L. Nickoloff (Johns Hopkins School of Medicine), "Cardiac Function Evaluation with Radionuclides," *Annual Congress, South African Association of Physicists in Medicine and Biology*, Capetown, Mar 7-10.
- M. G. Lotter (Univ. of Orange Free State, Republic of South Africa), H. N. Wagner, Jr. (Johns Hopkins School of Medicine), L. G. Knowles (APL), and K. H. Douglass and E. L. Nickoloff (Johns Hopkins School of Medicine), "Computers in Nuclear Medicine," *Annual Congress, South African Association of Physicists in Medicine and Biology*, Capetown, Mar 7-10.
- R. L. McCally and C. B. Barger, "Intensity Correlation Spectroscopy: Application to Measurement of Continuous Distributions of Spherical Particles," *American Physical Society*, San Diego, Mar 21-24.
- R. L. McCally, and R. A. Farrell, "Changes in Small Angle Light Scattering from Rabbit Cornea with Transcorneal Pressure," *American Physical Society*, San Diego, Mar 21-24.
- R. L. McCally and R. A. Farrell, "The Effect of Intraocular Pressure on Small-Angle Light Scattering from Rabbit Cornea," *Cleveland Symposium on Macromolecules, Structure and Properties of Biopolymers*, Case Western Reserve Univ., Cleveland, Oct 11-15; *Johns Hopkins Medical Association*, Baltimore, Feb 25.
- K. Moorjani, "Effective Field Theories in Disordered Magnetic Systems," *Catholic University Colloquium on Properties of Amorphous Magnetic Materials*, Washington, DC, Jan 13.
- J. B. Oakes (APL) and J. C. Aller (National Science Foundation), "Present Status and Future Prospects of Accreditation, Certification and Licensing in Clinical Engineering," *AAMI Twelfth Annual Meeting*, San Francisco, Mar 13-17.
- F. G. Satkiewicz, "Sputter Ion Source Mass Spectrometry of Several Glasses," *National Bureau of Standards Meeting*, Gaithersburg, MD, Mar 9.
- S. Wilson (Daresbury Laboratories, Warrington, England) and D. M. Silver and R. A. Farrell (APL), "Special Invariance Properties of the $[N + 1/N]$ Approximants in Rayleigh-Schrödinger Perturbation Theory," *American Physical Society*, San Diego, Mar 21-24.

PATENTS

- W. Schneider—*Digital Method of Pulse Width Modulation*, No. 4,001,728
- D. W. Rabenhorst—*Woven Filament Rotor Structure*, No. 4,000,665
- D. L. Sharp, E. A. Frekko—*Universal Binary Code Converter*, No. 4,011,559
- A. Kossiakoff, J. R. Austin—*Automated Radar Data Processing System*, No. 4,005,415
- J. F. Gulick—*Phase Modulated Monopulse System*, No. 4,011,564

APL COLLOQUIA

January—March 1977

Jan. 7—"Superconductive Naval Propulsion Systems," William J. Levedahl, Naval Ship Research and Development Center.

Jan. 14—"What Is The World Made Of? A Progress Report on the Problem of Thales," Joseph Suher, University of Maryland.

Jan. 21—"An Overview of Sailing Yacht Propulsion," J. Otto Scherer, Hydronautics, Inc.

Jan. 28—"The U.S. Mineral Position," John D. Morgan, U.S. Bureau of Mines.

Feb. 4—"Molecular Motion in Liquids," Robert Zwanzig, University of Maryland.

Feb. 11—"Tendon Structure and Aging," Eric Baer, Case-Western Reserve University.

Feb. 18—"Solid Waste Disposal," Abel Wolman, The Johns Hopkins University.

Feb. 25—"Simple Ecological Models with Very Complicated Dynamics," Robert M. May, Princeton University.

Mar. 4—"Structure and Function of Immunoglobulins," Roberto J. Poljak, The Johns Hopkins University.

Mar. 11—"Future Microcomputers and Technologies: A Perspective," Colin Crook, Motorola Semiconductor Products, Inc.

Mar. 18—"The Quest for the Absolute Zero of Temperature," E. G. D. Cohen, Rockefeller University.

Mar. 25—"Chaos Starting from $F = ma$," Alex J. Dragt, University of Maryland.

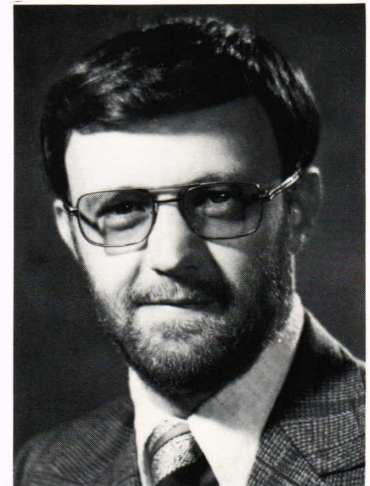
WITH THE AUTHORS



F. S. Billig, published previously in the Digest (December 1968) as co-author of "External Burning in Supersonic Streams." Born in Pittsburgh, he joined the Applied Physics Laboratory in 1955 after receiving a B.S.M.E. from The Johns Hopkins University. Under the Laboratory's part-time study program, he obtained M.S. and Ph.D. degrees in mechanical engineering from the University of Maryland. Shortly after coming to APL, Dr. Billig, in collaboration with Dr. Gordon Dugger, developed many of the fundamental concepts of external burning and supersonic combustion ramjets. As a result of these efforts, he was named in 1966 a Dis-

tinguished Young Scientist of the Maryland Academy of Sciences and received the Silver Medal from the Combustion Institute in 1970. In 1973, he became supervisor of the Submarine Physics Group and Program Manager of Applied Hydrodynamics under the SSBN Security Program. In 1977, Dr. Billig returned to the Aeronautics Division as Assistant Division Supervisor. He is a member of the Graduate Faculty at the University of Maryland and is an Associate Fellow and currently a member of the Board of Directors of the American Institute of Aeronautics and Astronautics. The co-holder of several patents, he has published more than 65 papers.

L. J. Crawford, born in Painesville, Ohio, received the B.Sc. degree in physics from Case Western Reserve University in 1964 and the M.Sc.E. in space science and the Ph.D. degree in fluid mechanics from Catholic University of America in 1969 and 1972, respectively. After Dr. Crawford joined APL in 1964, he participated in the analysis and evaluation of the Polaris and Pershing strategic weapon systems with particular emphasis on fire control subsystem performance. Since rejoining APL in 1972 after completing his advanced



degrees, he has worked in the areas of ship hydrodynamics and physical oceanography as applied to Navy needs. As supervisor of an at-sea measurements program effort from 1972-1975, he coordinated the acquisition of oceanographic measurements from APL's research vessels. In 1975 Dr. Crawford was appointed Section Supervisor of Fluid Mechanics. In 1978 he was appointed Group Supervisor of an ocean-related hydrodynamics program. He is a member of Sigma Xi, the American Geophysical Union, and the Fluid Dynamics Technical Committee of the American Institute of Aeronautics.

WITH THE AUTHORS *(continued)*



C. J. Gundersdorf, a native Baltimorean, received the B.E.S. in 1962 and the Ph.D. in electrical engineering in 1971, both from The Johns Hopkins University. From 1964 to 1971 he worked on the research staff of the Carlyle Barton Laboratory studying statistical aspects of optical communication. He joined APL in 1971 as a member of the SSBN Security Division. A specialist in optical communication and communication theory, Dr. Gundersdorf is now an engineer associated with the APL hydrodynamics program. He has worked on several projects involving the application of at-sea measurements to studies of the ocean's dy-

namic properties. These projects include high-frequency sonar and, for the last few years, the APL thermistor-fluorometer chain, for which he has been the project scientist in formulation, development, data analysis, and data interpretation efforts. He is a member of Tau Beta Pi.