PUBLICATIONS

Principal books and technical articles published by APL staff members during October–December 1976

F. J. Adrian and V. A. Bowers, "ESR Spectrum of XeCl in Argon at 4.2 K," *J. Chem. Phys.* **65,** No. 10, 4316–4318.

A. Arnold, "A Lapse Rate Depiction for Clear-Air Convection," *J. Appl. Meteorol.* **15,** No. 11, 1189–1192.

A. Arnold, "Observations of the Development of Individual Clear Air Convective Cells," *Preprint Volume, AMS 17th Conference on Radar Meteorology,* 338–341.

A. Arnold and J. R. Rowland, "Fine Scale Observations of Free Convection in the Atmospheric Boundary Layer," *Preprint Volume, AMS Third Symposium on Atmospheric Turbulence, Diffusion and Air Quality,* 1–8.

R. J. Bartlett (Batelle Memorial Inst.) and D. M. Silver (APL), "Numerical Infinite-Order Perturbation Theory," *Quantum Science (1976)* (ed. J.-L. Calais, O. Goscinski, J. Linderberg, and Y. Öhrn), Plenum Press, New York, 393–408.

E. B. Dobson (APL) and J. E. Kalshoven, Jr. (NASA/GSFC), "The Evaluation of Satellite-Borne Weather Radar System Designs Using Real Ground-Based Radar Data," *Preprint Volume, AMS Seventh Conference on Aerospace and Aeronautical Meteorology and Symposium on Remote Sensing from Satellites,* 253–259.

J. P. Doering and W. K. Peterson (The Johns Hopkins Univ.), and T. A. Potemra and C. O. Bostrom (APL), "Characteristic Energy Spectra of 1- to 500-eV Electrons Observed in the High-Latitude Ionosphere From Atmosphere Explorer C," *J. Geophys. Res.* **81,** No. 31, 5507–5516.

A. Elcrat (Wichita State Univ.) and V. G. Sigillito (APL), "An Explicit a priori Estimate for Parabolic Equations with Applications to Semilinear Equations," *SIAM J. Math. Anal.* **7,** No. 5, 746–753.

C. Feldman, H. K. Charles, Jr., and F. G. Satkiewicz, "p–n Junctions in Vacuum Deposited Polycrystalline Silicon Thin Films," *Technical Digest, 1976 International Electron Devices Meeting,* 71.

C. Feldman, F. G. Satkiewicz, and H. K. Charles, Jr., "Evaluation of Vacuum Deposited Silicon Films and Junctions for Solar Cell Applications," *Proceedings, National Workshop on Low-Cost Polycrystalline Silicon Solar Cell,* 267.

R. W. Flower, "A System for in vivo Measurement of Oxygen in Intraocular Tissue," *Oxygen Transport to Tissue—II,* (ed. J. Grote, D. Reneau, and G. Thews), Plenum Press, New York, 417.

J. Goldhirsh, "Attenuation of Propagation Through Rain for an Earth—Satellite Path Correlated with Predicted Values Using Radar," *IEEE Trans. Antennas Propag.* **AP-24,** No. 6, 800–806.

J. Goldhirsh, "Path Attenuation Statistics Influenced by Orientation of Rain Cells," *IEEE Trans. Antennas Propag.* **AP-24,** No. 6, 792–799.

P. L. Hazan, "March of the Microprocessors," *Johns Hopkins Magazine,* November, 9–15.

T. Iijima and T. A. Potemra, "Field-Aligned Currents in the Dayside Cusp Observed by Triad," *J. Geophys. Res.* **81,** No. 34, 5971–5979.

A. N. Jette, "The ab initio Calculation of the Spin-Rotational Coupling in the Metastable $c^3\Pi_u(1s.2p.)$ State of Molecular Hydrogen," *J. Chem. Phys* **65,** No. 10, 4325–4327.

A. N. Jette and F. J. Adrian, "Theoretical Investigation of the Hyperfine-Structure Constants of the V_K and $(XY)^-$ Centers Using a Valence-Bond Wave Function for the Halogen-Molecule Anions," *Phys. Rev. B.* **14,** No. 8, 3672–3681.

R. I. Joseph (The Johns Hopkins Univ.) and R. A. Farrell (APL), "High-Temperature Series for the Spin-One Ising Model for Arbitrary Biquadratic Exchange, Field, and Anisotropy," *Phys. Rev. B.* **14,** No. 11, 5121–5124.

I. Katz, "A Rain Cell Model," *Preprint Volume, AMS 17th Conference on Radar Meteorology,* 442–447.

E. F. Lucero, "Subsonic Stability and Control Characteristics of Configurations Incorporating Wrap-Around Surfaces," *J. Spacecr. Rockets* **13,** No. 12, 740–745.

J. H. Manley, *Encyclopedia of Computer Science and Technology* (ed. J. Belzer, A. G. Holzman, and A. Kent), Vol. 5, Marcel Dekker, Inc., New York, 174–186.

D. G. Mitchell (Univ. of New Hampshire) and E. C. Roelof (APL), "A Mathematical Analysis of the Theory of Interplanetary Scintillation in the Weak Scattering Approximation," *J. Geophys. Res.* **81,** No. 28, 5071–5082.

L. Monchick (APL), and L. A. Viehland, E. A. Mason, and T. H. Stevens (Brown Univ.), "Test of the H_2^+ + HE Interaction Potential, Comparison of the Interactions of HE with H^+, H_2^+ and H_3^+," *Chem. Phys. Lett.* **44,** 360–362.

J. M. Ross, "Sea Spider: An Ocean-Floor Oil Wellhead Monitoring and Maintenance System," *MTS J.* **10,** No. 8, 26–31.

J. R. Rowland, "Comparison of Two Different Raindrop Disdrometers," *Preprint Volume, AMS 17th Conference on Radar Meteorology,* 398–405.

S. Wilson and D. M. Silver, "Algebraic Approximation in Many-Body Perturbation Theory," *Phys. Rev. A* **14,** No. 6, 1949–1960.

ADDRESSES

Principal addresses presented by APL staff members to groups and organizations outside the Laboratory during October–December 1976

R. A. Farrell, "Collagen Organization in Corneal Transparency," *Macromolecular Science Colloquium,* Case Western Reserve Univ., Oct 22.

C. Feldman, "Polycrystalline Silicon Solar Cells," *Indian Institute of Technology Meeting,* Kanpur, India, Nov 8–9

D. W. Fox, "An Error Estimate for Definite Relative Eigenvalue Problems," *Math-Sciences Department Seminar,* The Johns Hopkins Univ., Nov 18.

D. W. Fox, "The Convexity of the Graph of Three Hermitian Forms and the Numerical of Sesquilinear Forms," *Math-Sciences Department Seminar,* The Johns Hopkins Univ., Dec 9.

E. P. Gray, "Scattering of a Surface Wave by a Submerged Sphere," *APS Fluid Dynamics Meeting,* Eugene, OR, Nov 22–24.

C. J. Johns and B. I. Blum (APL) and D. W. Simborg (The Johns Hokpins Univ.), "The Minirecord Approach to Continuity of Care for a Large Population of Ambulatory Patients," *Third Illinois Conference on Medical Information Systems,* Nov 4–5.

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., Oct 11–15.

L. Monchick, "Kinetic Theory of Quantum State Diffusion," *Third Washington-Area Statistical Physics Symposium,* Washington, DC, Nov 23.

V. O'Brien, "Convective Field Theory to Predict Dialysis Efficiency," *29th ACEMB,* Boston, Nov 6–10.

V. O'Brien, "Convective Transport in Non-Circular Ducts," *APS Fluid Dynamics Meeting,* Eugene, OR, Nov 22–24.

D. P. Peletier, S. A. Gary, and A. F. Hogrefe, "Mariner-Jupiter-Saturn Low Energy Charged Particle Experiment," *1976 Nuclear Science Symposium,* New Orleans, Oct 20–22.

D. Rabenhorst, "Modern Flywheel Technology," *Graduate Seminar,* Howard Univ., Washington, DC, Oct 15.

D. M. Silver, "Electronic Structure of Molecules Using Many-Body Perturbation Theory," *Chemistry Seminar,* Univ. of Maryland, College Park, Nov 3.

D. W. Stowe, "An Electronically Steered Parametric Transducer with Variable Frequency," *92nd Acoustical Society Meeting,* San Diego, Nov 15–19.

The following papers were presented at the *American Geophysical Union Meeting,* San Francisco, Dec 6–10:

F. T. Erskine (Univ. of Maryland), W. M. Cronyn and S. D. Shawhan (Univ. of Iowa), and E. C. Roelof and B. L. Gotwols (APL), "Interplanetary Scintillation at Large Elongation Angles: Response to Solar Wind Density Structure;"

R. E. Gold, B. L. Gotwols, S. M. Krimigis, and E. C. Roelof, "Propagation of Relativistic Jovian Electrons to Earth and to Pioneer 10;"

B. L. Gotwols, D. G. Mitchell, and E. C. Roelof (APL) and W. M. Cronyn (Univ. of Iowa), "Power Spectra of Interplanetary Radio Scintillations Observed at 34.3 MHz;"

E. P. Keath, S. M. Krimigis, and E. C. Roelof, "Statistical Analysis of Magnetospheric Emission of > 0.3 MeV Protons Observed by IMP–7 and IMP–8;"

E. Keppler and E. T. Sarris (Max-Planck Inst.) and S. M. Krimigis (APL), "The Interplanetary Shock Wave Event of Nov. 1975 Observed by Helios–A and IMP–7,8;"

E. Kirsch and E. T. Sarris (Max-Planck Inst.), S. M. Krimigis (APL), R. P. Lepping (NASA/GSFC), and T. P. Armstrong (Univ. of Kansas), "Evidence for a DC Electric Field in the Magnetotail from Observations of Oppositely Directed Anisotropies of Energetic Protons and Electrons;"

J. W. Kohl and S. M. Krimigis (APL), E. T. Sarris (Max-Planck Inst.), and T. P. Armstrong (Univ. of Kansas), "On the Occurrence of High-Energy Proton ($E_p \geq 1.85$ MeV) and Electron ($E_e \geq 500$ keV) Bursts in the Magnetotail;"

S. M. Krimigis and E. C. Roelof (APL), E. T. Sarris (Max-Planck Inst.), and T. P. Armstrong (Univ. of Kansas), "The Unusual Solar Particle Event of April 29, 1973;"

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;"

R. Reinhard (ESTEC, Noordwijk, Holland), and R. E. Gold, E. P. Keath, and E. C. Roelof (APL), "Coronal Control of Plasma and Energetic Particle Emission from the April 10, 1969 Solar Flare;"

E. C. Roelof and E. P. Keath (APL) and R. P. Lepping (NASA/GSFC), "Magnetic Signature of Large Proton Bursts Observed by IMP–7 Near the Plasma Sheet at 35 R_e;"

N. A. Saflekos and T. A. Potemra, "Small-Scale Transverse Magnetic Variations in the Polar Regions from TRIAD;"

E. T. Sarris and D. J. Williams (Max-Planck Inst.), S. M. Krimigis (APL), and L. A. Frank (Univ. of Iowa), "Correlative Studies of Energetic Particles and Hot Plasmas During Magnetospheric Particle Bursts;"

D. J. Williams (NOAA/Boulder) and R. E. Gold and E. C. Roelof (APL), "Intense Fluxes of > 50 keV Magnetospheric Protons Observed in Interplanetary Space Following an SSC."

APL COLLOQUIA

October–December 1976

Oct. 1—"Pain Relief by Electrostimulation," R. E. Fischell, Applied Physics Laboratory.

Oct. 8—"Photoelectrolysis of Water," J. G. Mavroides, Lincoln Laboratory.

Oct. 15—"Circulations and Salt Distributions in Estuaries," R. R. Long, The Johns Hopkins University.

Oct. 22—"Technology, Economics and Public Policy," J. D. Lewis, National Bureau of Standards.

Oct. 29—"Atmospheric Measurements of Trace Gases Via Aircraft," D. D. Davis, Georgia Institute of Technology.

Nov. 5—"Transition to Turbulence in a Rotating Fluid," H. L. Swinney, City University of New York.

Nov. 12—"The Scientific and Social Issues Raised by Recombinant DNA Research," M. F. Singer, National Institutes of Health.

Dec. 3—"Novem Magnetic Structures in Amorphous Solids," J. D. M. Coey, IBM and University of Grenoble.

Dec. 10—"The Coming of Age of Erwin Schroedinger: His Quantum Statistics of Ideal Gases," P. A. Hanle, National Air and Space Museum, Smithsonian Institution.

Dec. 17—"Catastrophe Theory and Some Potential Applications," E. H. Blum, Energy Research and Development Agency.

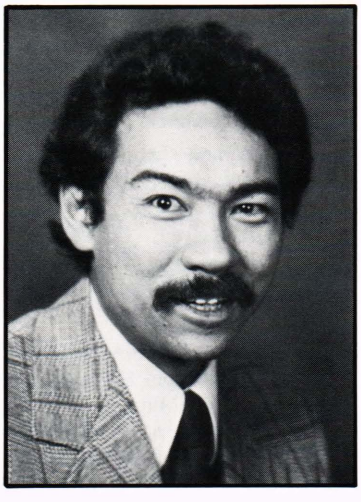
PATENTS

J. L. Abita—*Method for Making a Mask Having a Sloped Relief,* No. 3,986,876

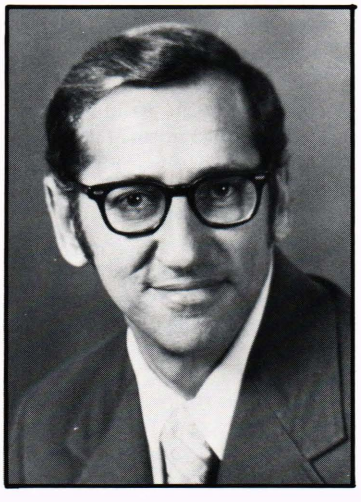
J. A. Perschy—*Real Time Control for Digital Computer Utilizing Real Time Clock Resident in the Central Processor,* No. 3,999,169

WITH THE AUTHORS

B. F. Kim, born in Georgia, received the B.E.S. in 1960, and the Ph.D. in physics in 1967, both from The Johns Hopkins University. He served at the Armed Forces Radiobiology Research Institute from 1967 to 1969, during which time he conducted research in high-energy radiation dosimetry. Dr. Kim joined APL in 1969 as a member of the Microwave Physics Group of the Research Center, where he studies the structure of molecules by means of optical spectroscopy and electron spin resonance. In this connection, he developed spectroscopic techniques that use a dye laser designed by him and built at APL. He is a member of Tau Beta Pi, Sigma Xi, and the American Physical Society.



J. Bohandy, a native of Ohio, received the B.S., M.S., and Ph.D. degrees in physics from Ohio State University. He came directly to APL in April 1965. Since that time, he has been a member of the Microwave Physics Group of the Research Center. A specialist in magnetic resonance and optical spectroscopy, Dr. Bohandy has worked on various problems in solid-state and chemical physics. Most recently, he has been involved in the application of these techniques to the study of molecules having charge-transfer capabilities. He is a member of the American Physical Society.



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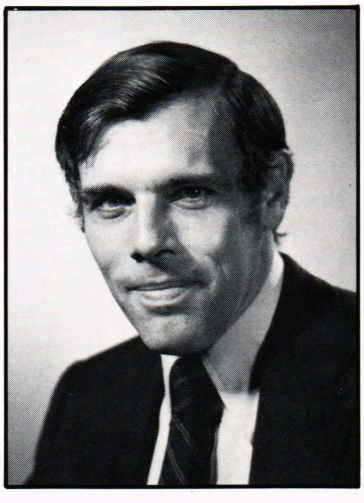

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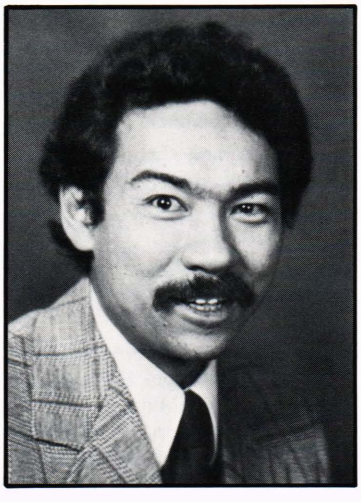

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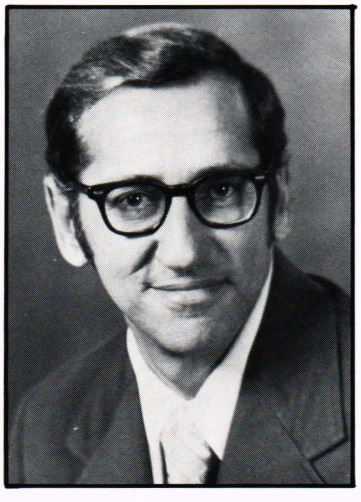

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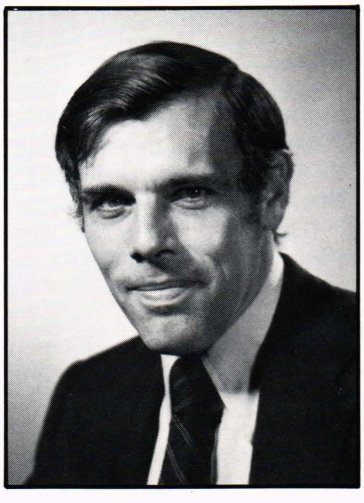
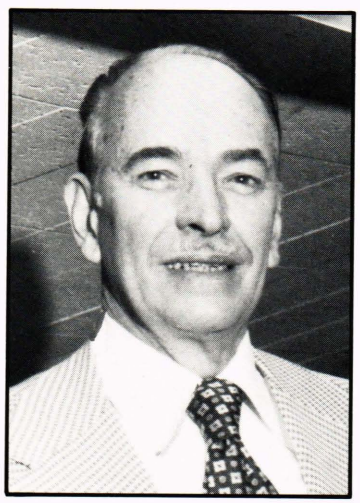


"Cyclotron Resonance in Solid-State Plasma" (May–June 1970) and of "Chemical Lasers" (March–April 1972). A native of Baltimore, he received the B.S., M.S., and Ph.D. degrees in electrical engineering from The Johns Hopkins University. From 1958 to 1962, he was a member of the research staff of The Johns Hopkins Institute of Cooperative Research. A specialist in solid-state physics and optical lasers, Dr. Poehler joined APL in 1963 as an engineer in the Microelectronics Group. He was appointed a physicist in the Microwave Physics Group of the Research Center in 1965, and Assistant Group Supervisor of the Plasma Dynamics Research Group in 1971. Since 1973, he has been Supervisor of the Research Center's Quantum Electronics Group where he works on compound semiconductors, organic conductors, photoelectrolysis, and chemical and infrared lasers. He received the National Capital Award for engineering in 1971 and is a member of the American Physical Society, the Institute of Electrical and Electronics Engineers, and the American Association for the Advancement of Science.

Art Director Retires



Beverley G. Fonda, Art Editor of the APL *Technical Digest* since its first issue was published in 1961, has retired. He was responsible for the Digest's high artistic quality and frequently designed the cover art. His successor is Stephen G. Smith.

A native of Chicago, Mr. Fonda was a special draftsman for Commonwealth Edison of Chicago from 1929 to 1943. During that period, he attended the Art Institute of Chicago and the American Academy of Art. After a varied career that included positions as artist, patent draftsman, and assistant art editor, he joined APL in 1950 as Supervisor of the Illustrations Section, Technical Publications Group. In 1968, he became Assistant Group Supervisor for Graphics.

A specialist in layout, design, and illustration, and in preparing art and copy for printing, Mr. Fonda introduced many technological developments and was instrumental in adapting new graphics techniques to many Laboratory projects. He designed a wide variety of distinctive insignia, documents, and awards for the Laboratory.

Mr. Fonda is a member of the American Institute of Graphic Arts, the Art Directors Club of Metropolitan Washington, and the National Society of Communicating Arts.