

PUBLICATIONS

The following list is a compilation of recently published books and technical articles written by APL staff members.

- A. J. Zmuda, "Currents in the Outer Van Allen Belt," *Geomagnetica*, Commemorative Issue, Fiftieth Anniversary of the Observatório Magnético de S. Miguel, Açores, Lisbon, Portugal, 1962, 75-79.
- J. F. Bird, F. T. McClure, and R. W. Hart, "Acoustic Instability in the Transverse Modes of Solid Propellant Rockets," *Proc. of the Twelfth International Astronautical Congress, I*, Academic Press, New York, 1963, 459-473.
- W. G. Berl, "Introduction," *Proc. of the Ninth Symposium (International) on Combustion*, Academic Press, New York, 1963, xxiii-xxvi.
- R. M. Fristrom, "Radical Concentrations and Reactions in a Methane-Oxygen Flame," *Proc. of the Ninth Symposium (International) on Combustion*, Academic Press, New York, 1963, 560-575.
- R. W. Hart and J. F. Bird, "Scaling Problem Associated with Unstable Burning in Solid Propellant Rockets," *Proc. of the Ninth Symposium (International) on Combustion*, Academic Press, New York, 1963, 993-1004.
- L. Monchick (APL) and E. A. Mason (University of Maryland), "Theory of Transport Properties of Gases," *Proc. of the Ninth Symposium (International) on Combustion*, Academic Press, New York, 1963, 713-724.
- A. A. Westenberg and S. Favin, "Complex Chemical Kinetics in Supersonic Nozzle Flow," *Proc. of the Ninth Symposium (International) on Combustion*, Academic Press, New York, 1963, 785-798.
- G. J. Veth, "High-Density Micro-electronic System Realization," *Proc. of the 1963 Winter Convention of Military Electronics*, Los Angeles, Jan. 1963, 10-9 to 10-18.
- L. Monchick, (APL), and K. S. Yun and E. A. Mason (University of Maryland), "Relaxation Effects in the Transport Properties of a Gas of Rough Spheres," *J. Chem. Phys.*, **38**, Mar. 1963, 1282-1287.
- J. O. Artman and J. C. Murphy, "Symmetry Considerations in the Spectrum of Ruby," *J. Chem. Phys.*, **38**, Apr. 1963, 1544-1547.
- R. G. Bartlett, Jr. (APL) and Rita A. Hertz (U. S. Naval School of Aviation Medicine), "Oxygen Cost of Breathing of a Hospital Population Measured with a Simplified Technique," *Aerospace Med.*, **34**, Apr. 1963, 299-301.
- R. G. Bartlett, Jr. (APL) and N. E. Phillips and G. Wolski (U. S. Naval School of Aviation Medicine), "Maximum Voluntary Ventilation Prediction from the Velocity-Volume Loop," *Diseases of Chest*, **43**, Apr. 1963, 382-392.
- D. G. Grant, "A Technique for Obtaining Single, High Peak Power Pulses from a Ruby Laser," *Proc. I.E.E.E.*, **51**, Apr. 1963, 604.
- J. P. Redmond, "Kinetics of the Low Pressure Nitrous Oxide Decomposition on a Platinum Filament," *J. Phys. Chem.*, **67**, Apr. 1963, 788-793.
- R. M. Fristrom, "Scavenger Probe Sampling: A Method for Studying Gaseous Free Radicals," *Science*, **140**, Apr. 19, 1963, 297-300.
- A. I. Mahan and L. P. Bone, "Far-Field Diffraction and Polarization Properties of a Three-Dimensional, Hollow, Homogeneous, Isotropic Cone," *J. Opt. Soc. Am.*, **53**, May 1963, 533-544.
- R. H. Cantrell, F. T. McClure, and R. W. Hart, "Acoustic Damping in Cavities with Mean Velocity and Thermal Boundary Layers," *J. Acoust. Soc. Am.*, **35**, Apr. 1963, 500-509.
- T. K. Sen (The Johns Hopkins University) and G. H. Mowbray (APL), "The Influence of Size and Brightness Parameters on the Differential Sensitivity of the Central Retina to Photic Flicker," *J. Opt. Soc. Am.*, **53**, June 1963, 750-754.
- R. A. Makofski, "A Two-Parameter Method for Shock Wave-Laminar Boundary Layer Interaction and Flow Separation," *Proc. of the 1963 Heat Transfer and Fluid Mechanics Institute*, Stanford University Press 1963, 112-127.
- G. J. Veth, "Optical Soldering Promotes Automated Packaging," *Electronics*, **36**, Mar. 22, 1963, 90-92-94.

APL COLLOQUIA

May 3—"A New Look at the Teaching of College Physics," by N. H. Frank, Massachusetts Institute of Technology.

May 14—"Recent Developments in Seismology," by F. Press, California Institute of Technology.

May 17—"The Mathematics of Map-Coloring," by H. S. M. Coxeter, University of Toronto.

May 24—"Evaluation of Surface-to-Air Missile Systems," by C. F. Meyer, The Johns Hopkins University, Applied Physics Laboratory.

ADDRESSES

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

- L. M. McClung, "A Disc-Oriented IBM-7094 System—A Summary," *Informatics, Inc. Disc File Symposium*, Los Angeles, Mar. 5, 1963.
- T. M. Rankin, "On the Generation of the Secondary Motions in the Field of a Vortex," *Midwestern Mechanics Conference*, Cleveland, Apr. 1, 1963.
- G. J. Veth, "High-Density Micro-electronic System Realization," *Electrochemical Society*, Pittsburgh, Apr. 15-18, 1963.
- L. J. Vierenstein (APL) and G. F. Poggio (The Johns Hopkins University), "Stochastic Properties of Single Unit Discharges in Ventrobasal Thalamic Neurons," *Federation of American Societies for Experimental Biology*, Atlantic City, Apr. 16, 1963.
- R. A. Freiberg, "Magnetic Amplifier Trends for Sophisticated Control Systems," *International Conference on Nonlinear Magnetics*, Washington, D. C., Apr. 17-19, 1963.
- A. J. Zmuda, B. W. Shaw, and C. R. Haave, "VLF Disturbances Caused by the Nuclear Detonation of October 26, 1962," *American Geophysical Union*, Washington, D. C., Apr. 17-20, 1963.
- J. O. Artman and J. C. Murphy, "Lattice Sum Calculations in
(continued)

ADDRESSES

(continued)

- Ruby and Cr_2O_3 ," *American Physical Society*, Washington, D. C., Apr. 22-25, 1963.
- E. A. Bunt and H. L. Olsen, "Development of Hypersonic Propulsion Tunnels Using DC Plasma Arc Heating," *A.I.A.A.-A.S.M.E. Hypersonic Ramjet Conference*, Naval Ordnance Laboratory, Apr. 23, 1963.
- G. C. Weiffenbach, "Memory and Timing Systems for the ANNA Geodetic Satellite," *Society of Photographic Scientists and Engineers*, Atlantic City, Apr. 29-May 3, 1963.
- A. J. Zmuda, B. W. Shaw, and C. R. Haave, "VLF Disturbances and Trapped Beta Rays from High-Altitude Nuclear Explosions," *International Scientific Radio Union*, Washington, D. C., Apr. 29-May 2, 1963.
- D. W. Fox, "On Lower Bounds for Eigenvalues of Self-Adjoint Operators," *Georgetown University*, Department of Mathematics Seminar, May 3, 1963.
- J. O. Artman, "The Conundrum of Chromium in Corundum," *Naval Research Laboratory*, Washington, D. C., May 14; and *The Johns Hopkins University*, Department of Electrical Engineering, May 15, 1963.
- D. W. Fox, Three-lecture Seminar, "Applications of Functional Analysis to the Estimation of Eigenvalues": (1) "Fundamental Ideas from the Theory of Unbounded Operators," May 14; (2) "Development of Methods for Classical Mechanics, and Examples," May 15; (3) "Development of Methods for Quantum Mechanics," May 16, 1963, *University of Texas*, Department of Engineering Mechanics.
- R. H. Cantrell, R. W. Hart, and F. T. McClure, "Acoustic Energy Losses in Rocket Engine Cavities," *Acoustical Society of America*, New York, May 15-18, 1963.

WITH THE AUTHORS

R. A. Makofski, author of "The Helium Hypersonic Wind Tunnel," is a native of Newport Township, Pennsylvania. He received his B.S. degree in aeronautical engineering from Pennsylvania State University, and his M.S. degree in aeronautical engineering from the University of Virginia in 1956, and pursued advanced studies at the California Institute of Technology. He is continuing his studies, leading to a Ph.D. degree, at The Johns Hopkins University.



Mr. Makofski came to APL in 1957, as a specialist in internal fluid mechanics, viscous fluids, rarefied gas dynamics, and hypersonic flow. He is a member of the Fluid Mechanics Project of the Research Center, conducting studies of the flow of fluids at hypersonic speeds, and the design of a low-density hypersonic wind tunnel. He is a member of the American

Physical Society and the Albertus Magnus Guild.

R. J. Hunt, author of "Availability Model for Shipboard Equipment," was born in Baltimore and received his B.S. degree in mathematics from Loyola College, Baltimore, in 1955. He was employed at APL in 1956 as a specialist in operations research, probability and statistics, and digital computer programming. He has conducted studies in fleet air defense and continental defense and in the doctrine of weapon assignment in fleet



air defense. Mr. Hunt is supervisor of the FSO-2 Project, Fleet Systems Division, with responsibility for defining availability and effectiveness models for missile systems. He is a member of the Operations Research Society.

R. J. Vicars, a native of Pontiac, Illinois, is the author of "Survival in Metropolitan-Area Nuclear Attacks." He received his B.S. degree in aeronautical engineering from the University of Notre Dame in 1942. Before coming to APL in 1945, Mr. Vicars was employed as a stress engineer at the Fisher Aircraft Division of the General Motors Corp., and as a structural design and stress analysis engineer at the Hudson Motor Car Co. and the Stinson Division of the



Consolidated-Vultee Aircraft Corp. At APL he has been active in various phases of missile technology, including warhead studies, structural design, handling equipment, and nuclear weapons effects. Mr. Vicars has served in several civic organizations concerned with civil defense matters related to local schools and public shelters.

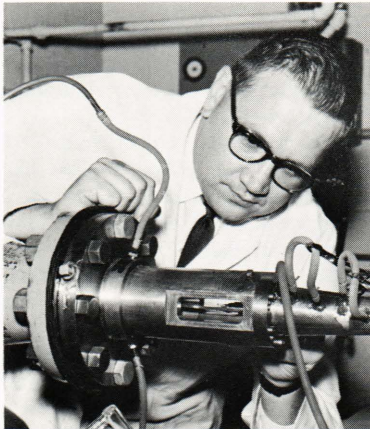
ADDRESSES

(continued)

- Ruby and Cr_2O_3 ," *American Physical Society*, Washington, D. C., Apr. 22-25, 1963.
- E. A. Bunt and H. L. Olsen, "Development of Hypersonic Propulsion Tunnels Using DC Plasma Arc Heating," *A.I.A.A.-A.S.M.E. Hypersonic Ramjet Conference*, Naval Ordnance Laboratory, Apr. 23, 1963.
- G. C. Weiffenbach, "Memory and Timing Systems for the ANNA Geodetic Satellite," *Society of Photographic Scientists and Engineers*, Atlantic City, Apr. 29-May 3, 1963.
- A. J. Zmuda, B. W. Shaw, and C. R. Haave, "VLF Disturbances and Trapped Beta Rays from High-Altitude Nuclear Explosions," *International Scientific Radio Union*, Washington, D. C., Apr. 29-May 2, 1963.
- D. W. Fox, "On Lower Bounds for Eigenvalues of Self-Adjoint Operators," *Georgetown University*, Department of Mathematics Seminar, May 3, 1963.
- J. O. Artman, "The Conundrum of Chromium in Corundum," *Naval Research Laboratory*, Washington, D. C., May 14; and *The Johns Hopkins University*, Department of Electrical Engineering, May 15, 1963.
- D. W. Fox, Three-lecture Seminar, "Applications of Functional Analysis to the Estimation of Eigenvalues": (1) "Fundamental Ideas from the Theory of Unbounded Operators," May 14; (2) "Development of Methods for Classical Mechanics, and Examples," May 15; (3) "Development of Methods for Quantum Mechanics," May 16, 1963, *University of Texas*, Department of Engineering Mechanics.
- R. H. Cantrell, R. W. Hart, and F. T. McClure, "Acoustic Energy Losses in Rocket Engine Cavities," *Acoustical Society of America*, New York, May 15-18, 1963.

WITH THE AUTHORS

R. A. Makofski, author of "The Helium Hypersonic Wind Tunnel," is a native of Newport Township, Pennsylvania. He received his B.S. degree in aeronautical engineering from Pennsylvania State University, and his M.S. degree in aeronautical engineering from the University of Virginia in 1956, and pursued advanced studies at the California Institute of Technology. He is continuing his studies, leading to a Ph.D. degree, at The Johns Hopkins University.



Mr. Makofski came to APL in 1957, as a specialist in internal fluid mechanics, viscous fluids, rarefied gas dynamics, and hypersonic flow. He is a member of the Fluid Mechanics Project of the Research Center, conducting studies of the flow of fluids at hypersonic speeds, and the design of a low-density hypersonic wind tunnel. He is a member of the American

Physical Society and the Albertus Magnus Guild.

R. J. Hunt, author of "Availability Model for Shipboard Equipment," was born in Baltimore and received his B.S. degree in mathematics from Loyola College, Baltimore, in 1955. He was employed at APL in 1956 as a specialist in operations research, probability and statistics, and digital computer programming. He has conducted studies in fleet air defense and continental defense and in the doctrine of weapon assignment in fleet



air defense. Mr. Hunt is supervisor of the FSO-2 Project, Fleet Systems Division, with responsibility for defining availability and effectiveness models for missile systems. He is a member of the Operations Research Society.

R. J. Vicars, a native of Pontiac, Illinois, is the author of "Survival in Metropolitan-Area Nuclear Attacks." He received his B.S. degree in aeronautical engineering from the University of Notre Dame in 1942. Before coming to APL in 1945, Mr. Vicars was employed as a stress engineer at the Fisher Aircraft Division of the General Motors Corp., and as a structural design and stress analysis engineer at the Hudson Motor Car Co. and the Stinson Division of the



Consolidated-Vultee Aircraft Corp. At APL he has been active in various phases of missile technology, including warhead studies, structural design, handling equipment, and nuclear weapons effects. Mr. Vicars has served in several civic organizations concerned with civil defense matters related to local schools and public shelters.