

ADDRESSES

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

- S. E. Anderson, "Computer Graphics in the 70's," *Association for Computing Machinery*, New York, September 2, 1970.
- R. Turner and T. O. Poehler, "Relaxation Effects in HCN Laser Emission," *VIIth International Quantum Electronics Conference*, Kyoto, Japan, September 7-10, 1970.
- The two following papers were presented at the *IEEE Group on Antennas and Propagation International Symposium*, Ohio State University, Columbus, September 14-16, 1970:
- T. C. Cheston, E. V. Byron, and G. J. Laughlin, "Very Wide-Band Phased Arrays;"
- J. Frank, H. Grady, J. H. Kuck, and C. Shipley, "A 256-Element Phased Array Development."
- P. G. Fuechsel, P. M. Bainum, and P. J. Grunberger, "Simulation of the Effects of Earth Environment on the Attitude of a Dual-Spin Spacecraft with Nutation Damping," *ASTM/AIAA/IES Fifth Space Simulation Conference*, Gaithersburg, Maryland, September 14-16, 1970.
- T. G. Konrad and J. H. Meyer, "Characteristics of False Radar Targets Over the Sea During Anomalous Propagation Conditions," *U.R.S.I. Fall Meeting*, September 15-17, 1970.
- S. E. Anderson, "Computer Animation at APL," *University of Maryland Adult Education Center*, College Park, September 16, 1970.
- S. E. Anderson, "Computer Animation at APL," *Washington Chapter of SIGGRAPH, Association for Computing Machinery*, Applied Physics Laboratory, September 29, 1970.
- S. E. Anderson, "VECTOR—A Translation Subroutine for Converting CalComp Programs Into SD 4020 Tapes," *Users of Automatic Information Display Equipment (UAIDE) Conference*, Miami Beach, October 19-22, 1970.
- R. M. Fristrom, "Kinetics and Mechanisms of Flames and Flame Suppression," *University of California, Berkeley*, October 23; and *4th Materials Research Conference on Mechanisms of Pyrolysis, Oxidation, and Burning*, NBS, Washington, D.C., October 27, 1970.
- J. F. Bird, "Physics and Vision," *Chesapeake Section, American Association of Physics Teachers*, Washington College, Chestertown, Maryland, October 31, 1970.
- The following three papers were presented at the *American Physical Society Plasma Physics Division Meeting*, Washington, D.C., November 4-7, 1970;
- E. P. Gray, "The Guiding Center in Inhomogeneous Fields";
- T. O. Poehler and J. R. Apel, "Electron-Ion Scattering in Low-Temperature Magnetized Quantum Plasma";
- W. R. Powell, "A Mirror Reactor Model."
- R. W. Flower (APL) and A. Patz (Johns Hopkins Hospital), "Oxygen Studies in Retrolental Fibroplasia. IX. The Effects of Elevated Arterial Oxygen Tension on Retinal Vascular Dynamics in the Kitten," *Association for Research in Ophthalmology Atlantic Section Meeting*, Philadelphia, November 6, 1970.
- W. H. Guier (APL) and G. C. Friesinger, D. D. Goulden, and E. Estey (JHMI), "Stroke Volume from Aortic Pulse Pressure," *American Heart Association 43rd Scientific Sessions*, Atlantic City, November 12-15, 1970.
- R. L. Konigsberg, "Electromyographic Sensor Design for Use with an Externally-Powered Prosthetic Arm," *Annual Conference on Engineering in Medicine and Biology*, Washington, D.C., November 15-19, 1970.
- L. J. Viernstein, "Dynamic Properties of First Order Afferents Responsive to Skin Indentation," *Annual Conference on Engineering in Medicine and Biology*, Washington, D.C., November 15-19, 1970.
- S. Favin and G. A. Smoot, "Large Computer Aid to Small Digital Data Acquisition System," *Systems Engineering Laboratories (SEL) User's Group Fall Meeting*, Houston, November 16, 1970.
- C. S. Morris and R. F. Plachy, "The Hybrid Hybrid—a New Packaging Concept," *1970 Hybrid Microelectronic Symposium*, Beverly Hills, California, November 16-18, 1970.
- The following two papers were presented at the *Fall Joint Computer Conference*, Houston, November 17-19, 1970:
- M. Lasky and M. L. Lasky, "How CPS Puts the 'Interaction' into Interactive Computing";
- B. E. Tossman, C. E. Williams, and N. K. Brown, "SIMCON: An Advancement in the Simulation of Physical Systems."
- The following five papers were presented at the *14th Weather Radar Conference*, Tuscon, Arizona, November 17-20, 1970:
- J. H. Meyer, "Radar Observations of Land Breeze Fronts at Wallops Island, Virginia";
- E. B. Dobson, "Doppler Radar Measurements of Mean Wind Variations in the Clear Atmosphere";
- T. G. Konrad, "The Dynamics of the Convective Process in the Clear Air as Seen by Radar";
- R. A. Kropfli, "Simultaneous Radar and Instrumented Aircraft Observations in a Clear Air Turbulent Layer";
- I. Katz, "A Comparison of Remote

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and In-Situ Measurements in Convection."

- R. A. Makofski, "New Systems for Urban Transportation," *Society for the Preservation of Federal Hill, Montgomery Street, and Fels Point*, Baltimore, November 18, 1970.

The following two presentations of "Magnetic Hyperfine and Zeeman Interactions in the c^3 State of H_2 " were made by A. N. Jette:

- Department of Physics, University of British Columbia*, Vancouver, B. C., November 19, 1970;
APS Electron and Atomic Physics Division Meeting, Seattle, November 23, 1970.

- J. Bohandy, "ESR and Optical Fluorescence of the $(Al_xCr_{1-x})_2O_3$ System," *American Physical Society Fall Meeting*, New Orleans, November 23-25, 1970.

- M. H. Friedman, "Fluid Dynamics in the Cornea," *Bioengineering Division Seminar, Polytechnic Institute of Brooklyn*, New York, November 24, 1970.

- D. W. Rabenhorst, "The Flywheel," *Kiwanis Club*, Silver Spring, Maryland, November 24, 1970.

- M. H. Friedman (APL) and K. Green (JHMI), "Free Swelling Rate of Bare Corneal Stroma," *American Institute of Chemical Engineers 63rd Annual Meeting*, Chicago, December 1, 1970.

- J. H. Kuck, "A Television Reader for the Visually Handicapped," *Washington Hospital Center Saturday Morning Lecture Series*, Washington, D. C., December 5, 1970.

- F. J. Adrian, "Theory of Anomalous Electron Spin Resonance Spectra of Free Radicals in Solution. Role of Diffusion Controlled Separation and Re-encounter of Radical Pairs," *American Chemical Society Division of Physical Chemistry 2nd Symposium on Electron Spin Resonance*, Athens, Georgia, December 8, 1970.

- D. W. Rabenhorst, "The Super Flywheel," *University of Maryland*

Mechanical Engineering Department Seminar, College Park, December 9, 1970.

- M. H. Friedman, "Irreversible Thermodynamics and Mass Transfer in the Cornea," *University of Pennsylvania Graduate - Faculty Seminar*, Philadelphia, December 14, 1970.

Two papers were presented by R. M. Fristrom at the *4th Indian National Symposium on Combustion, IIT, Kanpur, India*, December 14-16, 1970:

- "Flame Chemistry—1970";
 "Combustion and Air Pollution—Contrasts between American and Indian Problems."

The following two papers were presented at the *Computer Designer's Conference and Exhibition*, Anaheim, California, January 19-21, 1971:

- J. A. Perschy, "A General Purpose Computer for Satellite Applications;"
 G. D. Wagner and R. C. Moore, "The Ballad Computer."

- P. G. Fuechsel, P. M. Bainum, and P. J. Grunberger, "The Attitude Motion of a Nutationally Damped Dual-Spin Spacecraft in the Presence of Near-Earth Environment," *AIAA 9th Aerospace Sciences Meeting*, New York City, January 25-27, 1971.

- T. Tanaka (Catholic University of America), K. Moorjani (APL), and S. M. Bose (Catholic University of America), "Coherent Potential Theory of Off-Diagonal Randomness," *Annual Meeting of the American Physical Society*, New York City, February 1-4, 1971.

- R. M. Fristrom, "Flame Chemistry," *Trenton Section, American Chemical Society*, Trenton, New Jersey, February 9, 1971.

- R. M. Fristrom, "Fire Research and Flame Chemistry," *Naval Research Laboratory Seminar*, Washington, D. C., February 11, 1971.

The following two papers were presented at the *15th Annual Meeting of the Biophysical Society*, New Orleans, Louisiana, February 16, 1971:

- M. H. Friedman (APL) and K. Green (The Johns Hopkins Medical Institutions), "Ion Binding and Donnan Equilibria in Rabbit Corneal Stroma;"

- K. Green (The Johns Hopkins Medical Institutions) and M. H. Friedman (APL), "Potassium and Calcium Effects on Sodium Binding in Corneal Stroma."

- R. M. Fristrom, "Fire Research," *Princeton University, Department of Chemical Engineering Colloquium*, Princeton, New Jersey, February 22, 1971.

- R. G. King, "Mini-Computers and Their Applications," *Joint Meeting, The Society for Applied Spectroscopy and Instrument Society of America*, Laurel, Maryland, February 23, 1971.

- H. T. Henline, "Kenya SAS-A Launch," *Patapsco Middle School*, Ellicott City, Maryland, February 25, 1971.

APL COLLOQUIA

- Jan. 8* - "Galactic Confinement of Cosmic Rays," by M. M. Shapiro, Naval Research Laboratory.

- Jan. 15* - "Feedback and Dynamic Control of Plasma Instabilities," by Tsu-Kai Chu, Princeton University.

- Jan. 22* - "The Mössbauer Effect in High Magnetic Fields," by N. A. Blum, Applied Physics Laboratory.

- Jan. 29* - "Energy Exchange with the Environment of Plants and Animals," by D.M. Gates, Washington University.

- Feb. 5* - "The Gravitational Radiation Experiment," by J. Weber, University of Maryland.

- Feb. 12* - "To Insure Domestic Tranquility," by M. S. Eisenhower, The Johns Hopkins University.

- Feb. 19* - "Light Waves in Thin Films and Integrated Microoptics," by P. K. Tien, Bell Telephone Laboratories.

PUBLICATIONS

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

- R. B. Krakau, "Professionals as Summer Employees," *Personnel (AMA)* **7**, No. 6, Nov.-Dec. 1970, 18-23.
- B. E. Tossman, C. E. Williams, N. K. Brown, "SIMCON—An Advancement in the Simulation of Physical Systems," *AFIPS Conference Proceedings, 1970 Fall Joint Computer Conference* **37**, 1970, 399-405.
- J. R. Kuttler, "Upper and Lower Bounds for Eigenvalues of Torsion and Bending Problems by Finite Difference Methods," *Z. angew. Math. u. Phys.* **21**, No. 3, Nov. 25, 1970, 326-342.
- J. L. Cox (Johns Hopkins Hospital), R. A. Farrell, R. W. Hart, and M. E. Langham (Johns Hopkins Hospital), "The Transparency of the Mammalian Cornea," *J. Physiology* **210**, No. 3, 1970, 601-620.
- V. G. Sigillito, "On the Spatial Decay of Solutions of Parabolic Equations," *J. App. Math. and Phys. (ZAMP)* **21**, No. 6, 1970, 1078-1081.
- Vivian O'Brien, "The New Stokes Paradox," *Phys. Fluids* **14**, No. 1, Jan. 1971, 179-181.
- M. H. Friedman, "General Theory of Tissue Swelling, with Application to the Corneal Stroma," *J. Theoret. Biol.* **30**, No. 1, Jan. 1971, 93-109.

- S. M. Krimigis and P. Verzariu, "Implications on Particle Storage at the Sun from Observations of Solar-Flare Proton Spectrums," *J. Geophys. Res.* **76**, No. 4, Feb. 1, 1971, 792-807.
- R. W. Flower and A. Patz (Johns Hopkins Hospital), "Oxygen Studies in Retrolental Fibroplasia. IX. The Effects of Elevated Arterial Oxygen Tension on Retinal Vascular Dynamics in the Kitten," *Arch. Ophthalmol.* **85**, No. 2, Feb. 1971, 1971-203.

HONORS AND AWARDS

M. L. Hill, Supervisor of the High Temperature Materials Project, set a new world altitude record for radio-controlled model airplanes on 6 September 1970. The flight, at Dahlgren, Virginia, reached an altitude of 29,920 feet.

W. H. Avery, Supervisor of the Aeronautics Division, has been appointed a member of the Department of Commerce Technical Advisory Board Panel on SST Environmental Research. The appointment was made by the Office of the Assistant Secretary of Commerce for Science and Technology.

L. L. Cronvich, Supervisor of the Aerodynamics Group, has been appointed a member of the Publications Committee of the American Institute of Aeronautics and Astronautics.

A. I. Mahan, a member of the Research Center, has served as a member of the Evaluation Panel of the National Academy of Sciences that selected recipients of Federal Postdoctoral grants to be awarded during fiscal year 1972.

T. O. Poehler, a member of the Microwave Physics and Plasma Physics Groups, has been presented the National Capital Award as the outstanding young engineer in the Washington metropolitan area. The award is sponsored by the D.C. Council of Engineering and Architectural Societies.

A. M. Stone, Assistant to the Director, has been appointed to the Editorial Board of the *Journal of Defense Research, Series B: Tactical Warfare*, published by the Institute for Defense Analysis for the Advanced Research Projects Agency of the Department of Defense.

PATENTS

- W. Seamone—Unitized Control Module for Hydraulic Actuation Apparatus*, Patent No. 3,543,642.
- V. Uzunoglu—Multifunction Circuit*, Patent No. 3,544,809.
- F. F. Hiltz—Neuronal Event Recognizer*, Patent No. 3,546,601.
- I. H. Schroader, C. J. Swet, T. Wyatt, G. B. Bush—Television Satellite System*, Patent No. 3,560,642.
- E. J. Hoffman—Method for Redundant Time Measurement*, Patent No. 3,562,649.

WITH THE AUTHORS

A. G. Schulz, a native of California, holds the A.B. and Ph.D. degrees in physics from the University of California at Berkeley. He was originally employed at APL from 1945 to 1947 assigned to flight test telemetering of supersonic ramjet development vehicles. He left to go back to school and after receiving the Ph.D. in 1952 he returned to APL as Supervisor of the Missile Test Group. He has held several other supervisory positions including the following: From 1954 to 1956 he was Supervisor of the Transistor Circuit Development Group; from 1956 to 1958, Supervisor of the Missile Guidance Counter-Countermeasures Group; from 1958 to 1960, Supervisor of the Typhon Radar and Fire Control System Division; and from 1960 to 1962, Supervisor of the Typhon Missile Guidance Division. Since 1962 he has been Co-Supervisor of Excitation Mechanism Research in the Research Center. Dr. Schulz has been a member of the *Digest* Editorial Board since 1963. Having engaged in research in nuclear medicine for several years under the auspices of The Johns Hopkins Medical Institutions, Dr. Schulz holds appointments as Associate Professor in the department of Radiological Science in The Johns Hopkins University School of Hygiene and Public Health and in the department of Radiology in the School of Medicine. He is a member of the American Physical Society, the Philosophical Society of Washington, the Society of Nuclear Medicine, and the American Association for the Advancement of Science.



L. C. Kohlenstein, a native Marylander, received the B. S. degree in electrical engineering from The Johns Hopkins University in 1962. Employed at APL in 1963, he first studied the effects of quantization and limiting in analog-to-digital con-



The authors of the paper on "Simulation Studies of Nuclear Medicine Instrumentation" are shown above. They are Dr. A. G. Schulz (seated), L. C. Kohlenstein, and L. G. Knowles.

version in a radar system and assisted in the design of the analog portion of the circuitry. Since 1965 he has been interested principally in radioisotope scanning system research, including developing a digital computer simulation of the scanning process, conducting visual perception experiments, modeling the human observer in a scan viewing situation, and evaluating the effect of image processing. Recently, he has been interested in modeling large environmental and social systems and is involved in a study of the Chesapeake Bay region.



L. G. Knowles was co-author of an earlier paper in the *Digest* on "The Flexicon—A Medical Display

Unit for Digital Data," in the January-February 1968 issue. A native of Pennsylvania, he holds the B. S. and M. S. degrees in electrical engineering; the former was received from the Pennsylvania State University and the latter from the University of Illinois in 1963. Employed at APL in 1961, Mr. Knowles is a specialist in digital systems engineering, applications of digital processors to weapon control systems, and generalized digital instrumentation techniques. Since 1966 he has been concerned principally with the design and development of a digital simulation and display system for studying medical radioisotope scanners used in the detection of lesions in soft organs. He is a member of the Society of Nuclear Medicine.



The authors of the paper titled "Modular Externally-Powered System for Limb Prostheses," shown above examining some of their equipment, are (left to right): Dr. G. Schmeisser, C. H. Hoshall, and W. Seamone.

Dr. Gerhard Schmeisser, who is a native of Baltimore, received the A. B. degree from Princeton University, and the M. D. degree from The Johns Hopkins University School of Medicine in 1953. After completing his resident training in Orthopedics at The Johns Hopkins Hospital, he entered private practice. In 1959 he returned to Hopkins to accept full-time hospital and university appointments in order to pursue his interests in research and medical education. Dr. Schmeisser is Chief of Orthopedic Surgery at the Baltimore City Hospitals and Associate Professor of Orthopedic Surgery at both The Johns Hopkins University School of Medicine and the University of Maryland Medical School. Since 1966 he has directed the Limb Prosthesis Clinic at The Johns Hopkins Hospital and he has been working with Messrs. Seamone and Hoshall on externally-powered upper limb prosthetic devices since 1969. Dr. Schmeisser is a Fellow of the American Academy of Orthopedic Surgeons.

C. H. Hoshall is a native of Maryland and received the B. S. degree in electrical engineering from the University of Maryland in 1949. The same year he was employed as an electronics engineer at the National Security Agency, Washington, D. C. After leaving NSA in 1955, he worked in electronics at the ACF Industries and the Minneapolis-Honeywell Regulator Co., joining the Applied Physics Laboratory in 1962. At APL he was first an engineer in the Space Department and the Life Sciences Group; in 1967 he joined the Controls Group in the Missile Systems Division. The major portion of Mr. Hoshall's time in the recent past has been devoted to the development of myoelectrically-controlled upper extremity prostheses.



W. Seamone contributed a paper to the November-December 1964 issue of the *Digest* on "Feedback Technique Improves Efficiency of Hydraulic Servos" and was co-author of a paper titled "A Servo-Controlled Pulsatile Heart Pump" which appeared in the November-December 1969 issue. He is a native of West Virginia and received the B. S. degree in aeronautical engineering from The Catholic University of America in 1950. Before coming to APL in 1953, he was employed by Bell Aircraft Corp. where he was a specialist in hydraulic servomechanisms. At APL Mr. Seamone has been involved in the development of a variety of automatic flight control systems. In the last few years he has become interested in biomedical engineering projects and has done research on an artificial heart pump and upper limb prosthetics. Since 1966 he has been Supervisor of the Controls Group in the Missile Systems Division.