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- M. W. Burgan, "Editorial Consistency," Annual Meeting, Council of Biology Editors, Airlie, Va. (29 Apr-2 May 1984).
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- A. F. Cheng, "Magnetosphere, Rings, and Moons of Uranus," 164th Meeting, American Astronomical Soc., Baltimore (11-13 Jun 1984).
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- F. J. Adrian, J. Bohandy, and B. Kim, "Magnetophotoselective Photolysis of

- J. P. Darling, "A Hardware Model for Comparative Quantification of the Propagation Delay from an Inner-Product Step Processor," 15th Annual Pittsburgh Modeling and Simulation Conf., Univ. Pittsburgh (19-20 Apr 1984).
- Q. E. Dolecek, "Mainframe Graphics Using the Texas Instruments Professional," Texas Instruments Minicomputer International Users Group Symp., Nashville (25-28 Mar 1984).
- Q. E. Dolecek and D. B. Strake, "VHSIC System Design Methodology," DoD VHSIC Workshop Series, San Diego (19-21 Mar 1984).
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- R. E. Fischell, "From Space Technology: Implantable Micro Computer Devices to Treat Cardiovascular Diseases," American Heart Association's Advanced Topics in Cardiovascular Nursing 1984, St. Joseph Hospital, Towson, Md. (14 Jun 1984).
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- J. D. Franson, "Optical Interferometer Data in Support of Local Theories," Conf. on Fundamental Questions in Quantum Mechanics, State Univ. of New York, Albany (12-14 Apr 1984).
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- J. R. Gersh, "Rule-Based Automation of Command Action in Naval Combat Systems," 7th MIT/ONR Workshop on C³ Systems, San Diego (11-15 Jun 1984).
- J. Goldhirsh, "Rain Attenuation Program: Measurements and Prediction of Rain Attenuation at Frequencies above 10 GHz, August 1983 through June 1984," NASA Program Experimenter's Meeting VII, Hanover, N.H. (29 Jun 1984).
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- M. E. Greenspan (APL), D. H. Fairfield (NASA/Goddard), and C.-I. Meng (APL), "Simultaneous Polar Cap and Magnetotail Observations of Intense Polar Rain," AGU Chapman Conf. on the Magnetospheric Polar Caps, Fairbanks (6-9 Aug 1984).
- R. E. Greenwald, "Initial Results from the Goose Bay HF Radar," National Radio Science Meeting, Univ. Colorado, Boulder (11-13 Jan 1984).
- T. C. Guo, "Transient Dielectric Responses in Nonsteady State Regimes," Colloq., George Washington Univ., Washington, D.C. (16 Jul 1984).
- W. W. Guo, "Microwaves for Medical Imagery and Therapy," Colloq., George Washington Univ., Washington, D.C. (16 Jul 1984).
- G. D. Halushynsky, "An Architecture for the Year 2000 Navy Command and Control," Joint National Meeting, Institute of Management Sciences and Operations Research Soc., San Francisco (14-16 May 1984).
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- M. L. Hill, "Electrical Disturbances near Thunderstorms Observed by Means of Small Remotely Piloted Aircraft Stabilized with Respect to the Local Field Vector," 7th International Conf. on Atmospheric Electricity, Albany, N.Y. (3-8 Jun 1984).
- T. J. Kistenmacher, "Conformational Properties of Purine and Pyrimidine Complexes of cis-[(NH₃)₂PtCl₂]; Effects of Intermolecular and Intramolecular Forces," Dept. Chemistry, Towson State Univ., Baltimore (3 Apr 1984).
- T. J. Kistenmacher, "Structure-Physical Property Relationships for Tetramethyltetraselenafulvalenium Salts, (TMTSF)₂X," American Crystallographic Assoc. Meeting, Lexington, Ky. (21-25 May 1984).
- T. J. Kistenmacher, "Structure-Physical Property Relationships in the Family of Organic Superconductors, (TMTSF)₂X," Chemistry Dept., Morgan State Univ., Baltimore (10 Feb 1984).
- S. M. Krimigis and J. Dassoulas, "Active Experiments in the Distant Magnetosphere: The AMPTE Program," AIAA 22nd Aerospace Sciences Meeting, Reno (9-12 Jan 1984).
- S. D. Landersman, "Rainbow Reef Exercise and the Near Term Prepositioned Force," Military Sealift Command, Washington (26 Mar 1984); also Staff, Chief of Naval Operations, Washington (9 Apr 1984); also Master Mariners Readiness Training Course, U.S. Merchant Marine Academy, Kings Point, N.Y. (8 May 1984); also Naval Sea Systems Command, Washington, D.C. (23 May 1984).
- E. F. Lucero, "Empirical Curves for Predicting Supersonic Aerodynamics of Very Low Aspect Ratio Lifting Surfaces," AIAA 22nd Aerospace Sciences Meeting, Reno (9-12 Jan 1984).
- W. F. Mehlman, "Role of Aegis in AAW," Meeting, Assoc. of Senior Naval Engineers, Long Beach (8 Jun 1984).
- C.-I. Meng, "Dynamic Variations of the Auroral Precipitation and the Polar Cap," International Conf. on Results of ARCAD 3, Toulouse, France (22-25 May 1984).
- C.-I. Meng, "Imaging Aurora under Full Sunlight by Vacuum Ultraviolet Observation," International Conf. on Results of ARCAD 3, Toulouse, France (22-25 May 1984).
- G. E. Mitzel and P. G. Barnett, "Positional Surface Target Discrimination Using Pattern Recognition," 7th MIT/ONR Workshop on C³ Systems, San Diego (11-15 Jun 1984).
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- J. C. Murphy, "Thermal Wave Imaging in Non-Destructive Evaluation," Non-Destructive Evaluation of Materials Seminar, Rutgers Univ., New Brunswick, N.J. (15 Jun 1984).
- V. O'Brien, "Pulsatile Blood Flow in a Constricted Artery," Seminar, Univ. Sydney, (20 Jun 1984).
- D. K. Pace, "The Potential Impact of Third World Military Systems on Future Ship Designs," 52nd Symp., Military Operations Research Soc., Ft. Leavenworth, Kans. (5-7 Jun 1984).
- J. G. Parker, "Optical Determination of O₂ (¹W_g) Quenching Rates and Relative Emission Intensities in High Pressure Oxygen Gas Using Pulsed Laser Radiation at 10640 Å," Conf. on Singlet Molecular Oxygen, Clearwater Beach, Fla. (4-7 Jan 1984).
- J. G. Parker and W. D. Stanbro, "Optical Determination of the Rates of Formation and Decay of O₂ (¹W_g) in H₂O, D₂O, and Other Solvents," Conf. on Singlet Molecular Oxygen, Clearwater Beach, Fla. (4-7 Jan 1984).
- K. Peacock, "The Optical Variability of the Ocean from CZCS Imagery," SPIE Ocean Optics VII, Monterey, Calif. (25-28 Jun 1984).
- R. S. Potember, "Erasable Optical Switching," Colloq., E. I. DuPont de Nemours & Co., Inc., (6 Feb 1984).
- R. S. Potember, T. O. Poehler, R. C. Hoffman, and R. C. Benson, "Erasable Optical Switching in Organic Charge Transfer Complexes," International Conf. on Physics and Chemistry of Low-Dimensional Synthetic Metals, Albano Terme, Italy (20 Jun 1984).
- W. R. Powell, "A Missile Scheduling Simulation," 16th Summer Computer Simulation Conf., Boston (23-25 Jul 1984).
- J. P. Reilly and W. D. Larkin, "Growth of Sensation with Suprathreshold Current Transients," 6th Annual Bioelectromagnetics Soc. Meeting, Atlanta (15-19 Jul 1984).
- C. L. Rowland, "ALDOT Program," Underwater Systems Group, Range Commanders Council, Bay St. Louis, Miss. (27

- Feb-2 Mar 1984).
- D. M. Rust (APL) and B. V. Somov (P. N. Lebedev Physics Inst., USSR), "Flare Loops Heated by Thermal Conduction," 164th Meeting of American Astronomical Soc., Baltimore (10-13 Jun 1984).
- D. M. Silver, "Chemical Bonds and Other Electron Pairs," Seminar, Chemistry Dept., Georgetown Univ., Washington, D.C. (25 Jan 1984).
- D. M. Silver, "Complex Orbital Transformations for Molecular Structure," Kyoto Univ. (31 May 1984); Inst. for Molecular Science, Okazaki (8 Jun 1984); Tohoku Univ. (15 Jun 1984); Hokkaido Univ., Japan (18 Jun 1984).
- J. H. Smart, "Diurnal Variability of Fine-structure Shear Temperature in the Mixed Layer," AGU Ocean Science Meeting, New Orleans (23-28 Jan 1984).
- J. C. Spall, M. I. Koch, and J. L. Maryak, "On Detecting Sources of Parameter Errors in Invalid Linear Dynamic Models," American Statistical Assoc., Joint National Meeting, Philadelphia (13-16 Aug 1984).
- W. J. Tropf, A. N. Vavreck, B. P. Sandford, J. H. Schummers, and J. Schroeder, "Infrared Cloud Backgrounds and Sensor Performance," 2nd Annual Tri-Service Cloud Modeling Workshop, Naval Surface Weapons Center, White Oak, Md. (26-28 Jun 1984).
- A. C. Williamson, "Influence of Low Grazing Angle Sea Clutter on Detection," 6th DARPA Cruise Missile Survivability Workshop, Lincoln Laboratory, Lexington, Mass. (1-3 May 1984).

The following papers were presented at the JANNAF Propulsion Meeting, New Orleans (7-9 Feb 1984):

- P. P. Pandolfini, P. J. Waltrup, G. A. Sullins, and C. E. Stevens, "Dual-Combustion Ramjet Low Mach Number, High Altitude Connected-Pipe Tests;"
- J. R. Stevens, J. L. Keirse, M. E. White, and D. M. Van Wie, "Multiple Inward-Turning Scoop Investigation for a Hypersonic Dual-Combustor Ramjet Engine;"
- M. E. White (APL) and A. Kumar (NASA/Langley), "Viscous Analysis of Supersonic Inlets for the Hypersonic Dual-Combustion Ramjet."

The following papers were presented at the Annual American Physical Society Meeting, Detroit (26-30 Mar 1984):

- F. J. Adrian, B. F. Kim, and J. Bohandy, "Magnetophotoselective Photolysis of the Formyl Radical in Quartz;"
- K. Moorjani (APL) and D. J. Webb and S. M. Bhagat (Univ. Maryland), "Magnetic Phase Diagrams of Amorphous Fe_xB_{100-x} ;"
- T. O. Poehler, R. S. Potember, R. C. Benson, and R. C. Hoffman, "The Electronic and Vibrational Spectra of Electric Field-Induced Phase Transitions in Metal-TCNQ Complexes;"
- R. S. Potember, T. O. Poehler, R. C. Hoffman, and R. C. Benson, "Laser-Induced Optical Changes in Organometallic Thin Films."

The following papers were presented at the Symp. on the Effect of the Ionosphere on C³I Systems, Alexandria, Va. (1-3 May 1984):

- R. A. Greenwald, K. B. Baker, and R. A. Hutchins (APL) and C. Hanuise (Univ. Toulon), "A New HF Radar for Studying High Latitude F-Region Irregularities;"
- R. E. Huffman, J. C. Larrabee, and F. J. Leblanc (Air Force Geophysics Lab.) and C.-I. Meng (APL), "Ultraviolet Remote Sensing of the Aurora and Ionosphere;"
- T. A. Potemra, L. J. Zanetti, and P. F. Bythrow, "Global Patterns of Ionospheric and Field-Aligned Birkeland Currents."

The following papers were presented at the NATO Advanced Research Workshop on the Morphology and Dynamics of the Polar Cusp, Lillehammer, Norway (6-12 May 1984):

- R. A. Greenwald, "Coherent Scatter Radar Observations of the Cusp;"
- C. Hanuise (Univ. Toulon), and R. A. Greenwald and K. B. Baker (APL), "Problems in the Determination of Cusp-Related Convection Patterns from Single Radar Observations;"
- C.-I. Meng, "First Imagery of Aurora in Daylight;"
- C.-I. Meng, "The Large Scale Dynamic Motion of the Polar Cusp;"
- T. A. Potemra, "Characteristics of Birkeland Currents in the Polar Cap and Cusp."

The following papers were presented at the Spring Meeting, Assoc. for Research in Vision and Ophthalmology, Sarasota (30 Apr-4 May 1984):

- C. L. Aner, L. W. Hirst, H. Abbey, and J. Cohn (JHMI), and H. A. Kues (APL), "Quantitative Analysis of Wide-Field Specular Micrographs;"
- R. A. Farrell and R. L. McCally, "Light Scattered from the Cornea at Specular and Other Angles;"
- L. W. Hirst (JHMI), H. A. Kues (APL), W. R. Green and S. A. D'Anna (JHMI), and G. Dunkelberger (APL), "Microwave-Induced Corneal Endothelial Changes in Monkeys;"
- R. L. McCally and C. B. Barger (APL), W. R. Green (JHMI), and R. A. Farrell (APL), "Beam Diameter Dependence and Healing Processes in CO₂ Laser Damaged Corneas;"
- E. Young and M. Farazdaghi (JHMI), H. A. Kues (APL), and R. Prendergast (JHMI), "Improved Model of Corneal Allograft Rejection."

The following papers were presented at the COSPAR Meeting, Graz, Austria (25 Jun-7 Jul 1984):

- R. A. Greenwald, rapporteur, "IMS Results on Electric Fields in the Ionosphere and Magnetosphere;"
- A. T. Y. Lui, "Streaming Reversal of Energetic Particles in the Magnetotail during a Substorm in the IMS Period;"
- C.-I. Meng, "Imaging Aurorae under Full Sunlight;"

C.-I. Meng, "Simultaneous Observation of the Conjugate Polar Cusp Regions;"

- T. A. Potemra, "Current Systems in the Magnetosphere and Ionosphere and Their Effects;"
- D. M. Rust, "Energy Transfer in Solar Flares."

The following papers were presented at the American Geophysical Union Spring Meeting, Cincinnati (14-18 May 1984):

- K. B. Baker and R. A. Greenwald, "Early Results from the Goose Bay Ionospheric Radar;"

P. F. Bythrow, T. A. Potemra, and C.-I. Meng (APL) and R. E. Huffman, F. J. Rich, and D. A. Hardy (Air Force Geophysics Lab.), "An Intense Earthward-Directed Birkeland Current: Its Relationship to Energetic Electrons and Plasma Drifts;"

M. E. Greenspan (APL), D. H. Fairfield (NASA/Goddard), and C.-I. Meng (APL), "Simultaneous Polar Cap and Magnetotail Lobe Observations of Hard, Intense Polar Rain;"

A. T. Y. Lui (APL) and A. Hasegawa (Bell Labs.), "Implications of a Steady-State Magnetospheric Convection;"

B. H. Mauk, "Low Energy Particle Measurements within ULF Wave Environments;"

D. G. Mitchell and D. J. Williams (APL) and T. E. Eastman and L. A. Frank (Univ. Iowa), "Magnetospheric Low-Latitude Boundary Layer Convection Investigated in Energetic Particle (MEPI) and Plasma (LEPEDEA) Data;"

M. T. Paonessa and A. F. Cheng, "Energetic Ion Losses in Saturn's Magnetosphere;"

T. A. Potemra, L. J. Zanetti, P. F. Bythrow, and A. T. Y. Lui (APL) and T. Iijima (Univ. Tokyo), "B_y-Dependent Patterns of High-Latitude Phenomena during Periods of Northward IMF;"

E. C. Roelof, D. G. Mitchell, and D. J. Williams, "Energetic Neutral Atoms (E > 24 keV) from the Ring Current: Observations from ISEE-1 during a Magnetic Storm;"

L. J. Zanetti and T. A. Potemra (APL), T. Iijima (Univ. Tokyo), W. Baumjohann (Max-Planck Inst. Extraterrestrial Phys.), and P. F. Bythrow (APL), "Ionospheric and Birkeland Current Distributions for Northward Interplanetary Magnetic Field; Inferred Polar Convection."

COLLOQUIA

Apr 20, 1984 — "Gravitational Lenses," J. R. Gott III, Princeton University.

Apr 27 — "The Trouble with Fusion," L. M. Lidsky, M.I.T.

May 4 — "The America's Cup Race — Lessons Learned," N. Salveson, Science Applications, Inc.

May 11 — "Global Options for Curbing the Growth of Atmospheric CO₂ Concentration," D. J. Rose, Massachusetts Inst. of Technology.

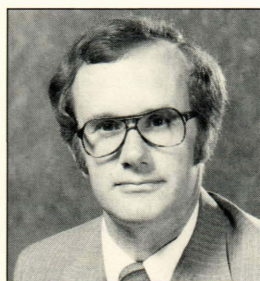
May 18 — "Free Fractional Charge: The Evidence and the Consequences," W. P. Trower, Virginia Polytechnic Inst. & State Univ.

May 25 — "Particle Injection Experiments in Space: The AMPTE Program," S. Krimigis, APL.

Jun 1 — "The Computer Challenge," B. R. Inman, Microelectronics and Computer Technology Corp.

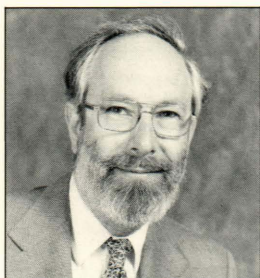
Jun 8 — "The Physics of Biological Memory," J. J. Hopfield, California Inst. of Technology.

THE AUTHORS



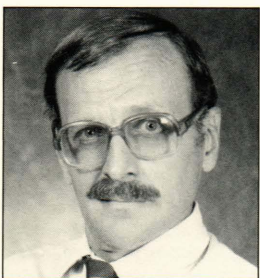
THOMAS P. SLEIGHT received his Ph.D. from the State University of New York at Buffalo in 1969. Before joining APL, he spent a year as a postdoctoral fellow at Leicester University, England. At APL, Dr. Sleight has applied computers to scientific defense problems. He has served as computer systems technical advisor to the Assistant Secretary of the Navy (R&D) and on the Ballistic Missile Defense Advanced Technology Center's

Specification Evaluation Techniques Panel. He has participated in the *DoD Weapon Systems Software Management Study*, which led to the DoD directive on embedded computer software management. Dr. Sleight served as supervisor of the Advanced Systems Design Group from 1977-82 in support of the Aegis Program and the AN/UYS-43 Navy shipboard mainframe computer development and test program. Since 1982, he has served in the Director's Office, where he is responsible for computing and information systems.



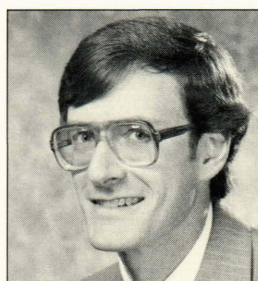
BRUCE I. BLUM was born in New York City. He holds M.A. degrees in history (Columbia University, 1955) and mathematics (University of Maryland, 1964). In 1962, he joined APL, where he worked as a programmer in the Computer Center. During 1967-74, he worked in private industry, returning to APL in 1974. Mr. Blum has special interests in information systems, applications of computers to patient care, and software engineering.

From 1975-83, he served as director of the Clinical Information Systems Division, Department of Biomedical Engineering, The Johns Hopkins University.



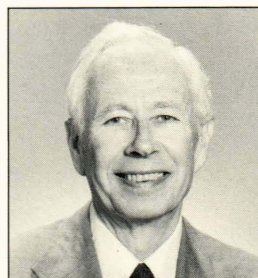
ROBERT E. JENKINS was born in Baltimore in 1938 and received an M.S. in physics from the University of Maryland in 1965. He joined APL in 1961, and is currently assistant supervisor of the Space Analysis and Computation Group, a member of APL's Program Review Board, and a member of APL's committee for VLSI. During Mr. Jenkins' Space Department tenure, he helped develop the world's first drag-free spacecraft,

and made the world's first observation of the relativistic Doppler effect using an earth satellite. Recently, he completed development of a biomedical robot vision system and led the development of one of APL's first full custom-designed LSI chips. During 1978, he was visiting scientist at the Defense Mapping Agency. This year he was awarded the Dunning Professorship at the Homewood campus, where he will be researching artificial intelligence techniques in Computer-Aided Design tools.



MARK E. SCHMID was born in Rochester, N.Y., in 1956, and received a B.S.E.E. from the University of Rochester in 1978. He is currently fulfilling requirements for an M.S. degree in electrical engineering at the University of Maryland. Mr. Schmid joined APL in 1978, and has worked in fault tolerant computing, distributed computing, computer architecture, and microprocessor system design. He is a member of the Advanced Systems

Design Group of the Fleet Systems Department.



ALEXANDER KOSSIAKOFF obtained his Ph.D. in chemistry from The Johns Hopkins University in 1938. He joined APL in 1946, became Assistant Director for Technical Operations in 1948, and served as Director from 1969-80. For his contributions during this period, he was awarded the Navy Distinguished Public Service Award and the Department of Defense Medal for Distinguished Public Service. Since retiring as Director, he has continued as Chief Scientist of the Laboratory and Chairman of the G.W.C. Whiting School of Engineering Part-Time Program in Technical Management.

Dr. Kossiakoff's interest in software technology is of long standing, starting with research on diagrammatic programming languages. He also was co-inventor and one of the principal designers of an automatic detection and tracking software system for Navy ships, which is being produced and deployed in the Fleet. His interest in computer-based systems to aid the handicapped stems from his participation in the First National Search for Personal Computing to Aid the Handicapped.



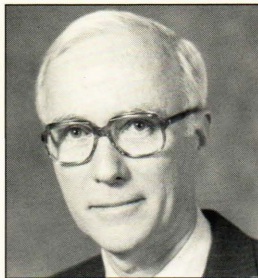
PAUL L. HAZAN is Assistant to the Director for Advanced Computer Technology at APL. He received his B.Sc. in electrical engineering from the Royal College of Science and Technology in the United Kingdom and did graduate work in computer science at the University of Maryland. Prior to joining APL in 1975, he was technical director of the Singer Company, Link Division, in Maryland.

Mr. Hazan is co-chairman of the APL VLSI task team and heads APL's participation in the VHSIC sponsored program aimed at stimulating the insertion of VHSIC/VLSI technology into advanced systems. He heads the JHU/APL interdisciplinary project on microcomputer software for handicapped children sponsored by the U.S. Department of Education. Mr. Hazan developed and taught a graduate level course in microcomputer technology and applications in the JHU evening college. He is chairman of the IEEE Technical Committee on Personal Computers.



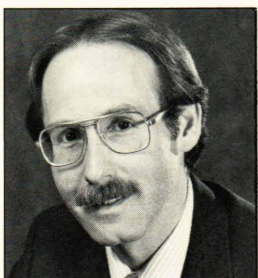
MARION V. PANYAN was born in Louisville in 1943, and received a Ph.D. in developmental and child psychology from the University of Kansas in 1975. She is currently associate professor of education at The Johns Hopkins University. She formerly served as assistant professor of psychology at Winthrop College, S.C.; director of psychology at Lubbock State School, Tex.; and project director at the State Home and Training

School, Wheatridge, Colo., where she developed and disseminated strategies to further the independence of handicapped students. Dr. Panyan's most recent work is in the application of microcomputers and related technology to the needs of handicapped students.



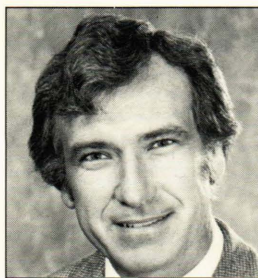
WILLIAM E. BUCHANAN is supervisor of the External Relations Group and serves as project engineer of APL's multisensory authoring computer system development, which is funded by the U.S. Department of Education. A native West Virginian, Mr. Buchanan joined APL in 1955 as the professional-staff recruiter. After working in several areas of personnel management, he was appointed to the external relations post in 1961. His

duties have included public and community information and audiovisual productions. He earned an M. Ed. degree in communicative disorders at Johns Hopkins in 1978 and recently served as an M. A. Tuve Fellow, pursuing work in computer-aided instruction.



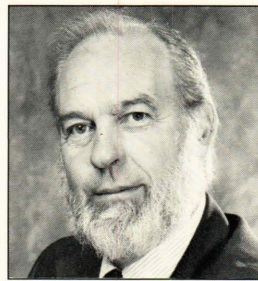
DANIEL F. STERNE was born in East Lansing, Mich., in 1950, and received an M.S. degree in computer science from the University of North Carolina at Chapel Hill in 1978. Prior to completing his degree, he worked at the University of Washington, developing software to analyze oceanographic data. Since joining APL's Fleet Systems Department in 1978, he has participated in the development of a distributed system of microprocessors and experimental applications of computer-generated speech. He currently serves as the technical leader of the Advanced Systems Design Group's Ada research efforts. His interests include programming languages, software engineering, computer architecture, and real-time systems.

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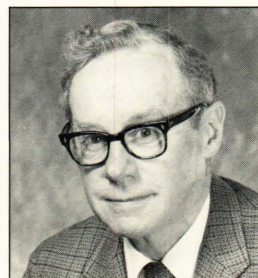
DANIEL P. PELETIER was born in Jersey City in 1941, and received an M.S. degree in electrical engineering in 1967 from the University of Maryland. Since joining APL in 1963, he has been involved in the development of electronic and computer systems for use with space physics experiments and underwater oceanographic research. Mr. Peletier's early work involved the design and development of satellite-based particle physics instruments. He was project manager for the APL Voyager Low-Energy Charged Particle instrument. Since 1978, he has established the Data Acquisition Processing and Analysis Center and has supervised the Instrumentation Group of the Submarine Technology Department. More recently, he has been APL's representative to the DoD VHSIC Program.

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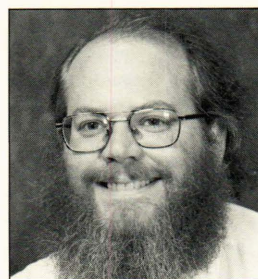
BRUCE B. HOLLAND was born in Westernport, Md., in 1933. He joined APL in 1957, and worked on the editing staff of the *Handbook of Supersonic Aerodynamics* prior to obtaining his B.A. in mathematics from American University in 1960. He joined the Space Analysis and Computations Group in 1961, where he has worked on the system and orbit analyses aspects of the Transit and other space missions. Most recently, he

managed the definitive orbit determination for MAGSAT. Mr. Holland is involved in GEOSAT-A mission analyses and is manager of the AMPTE Charge Composition Explorer Science Data Systems.



ROBERT P. RICH was born in Lowville, N.Y., in 1919. After receiving a Ph.D. in mathematics from The Johns Hopkins University in 1950, he joined APL as an operations researcher. In 1956, he became the first supervisor of APL's first computing center, which he continues to head as supervisor of the Data Processing Branch of the Technical Services Department. Dr. Rich is also associate professor of biomedical engineering at the Johns

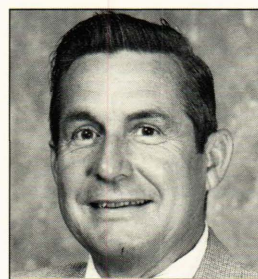
Hopkins Medical School and program chairman for Computer Science and Numerical science in the part-time engineering program of Hopkins' G.W.C. Whiting School of Engineering.



DANIEL BROCKLEBANK was born in Brooklyn in 1947. He received a B.S. from Lafayette College, Easton, Pa., in 1969, and joined APL in that same year.

Mr. Brocklebank is currently on the staff of the Laboratory's F.T. McClure Computing Center. His principal interests are programming languages, large-scale computing systems, database technology, and software craftsmanship. He has contributed actively to the development of APL programming language systems, as well as to many other services of the McClure Center.

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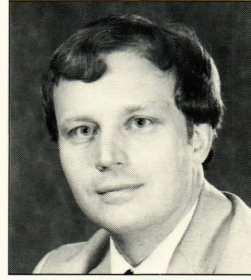


H. DAVID PIXLER was born in Morgantown, W. Va., in 1931. He joined APL in 1953 following service in the Navy. He studied mathematics and physics at Montgomery College and The Johns Hopkins University. Mr. Pixler's first assignment dealt with one of APL's first computer systems, and his continued work in this area includes the procurement, installation, development, and use of computer systems. He is a section supervisor in the Technical Services Department's Computer Engineering Group, and is past president of the EAI Computer User's Group.

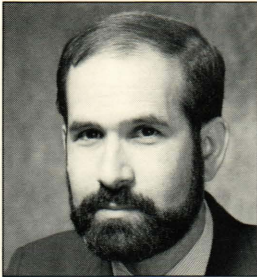
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JANET K. MARKHAM was born in Lancaster, Pa., and received a B.S. in biology in 1977 from Virginia Polytechnic Institute and State University. Prior to joining APL in 1981, she was employed as a graphics specialist. At APL, Ms. Markham has provided computer graphics training and system support as a part of the F.T. McClure Computing Center staff. She chairs a task force that is investigating new and highly interactive graphics tools for use in future APL programs.

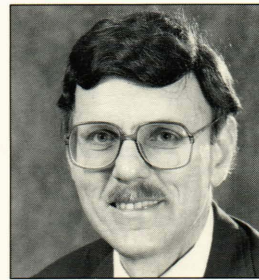


JAMES D. FRANSON was born in Lafayette, Ind. in 1947, and earned a Ph.D. in physics in 1977 at the California Institute of Technology, where he held a National Science Foundation Graduate Fellowship and the IBM Watson Postdoctoral Fellowship. He is a member of the Strategic Systems Department, where he is involved in the development of methods for estimating the accuracy of the Trident II weapon system under untested conditions. Dr. Franson's research activities have included studies of quantum interference effects in superconductors at microwave frequencies.



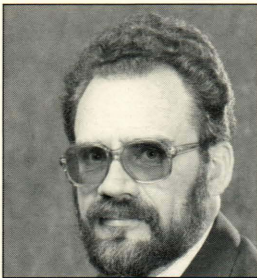
ARNOLD L. NEWMAN was born in New York City in 1951. He received a B.S.E.E. from the State University of New York at Buffalo (1979), and completed the course requirements for a Ph.D. in physiology at the State University of New York at Buffalo. He has done field work in biology and did cancer research at the Sloan-Kettering Institute in New York City. Prior to joining APL in 1982, he was employed for three years at Sierra Research Corp. in Buffalo, where he was involved in electronic design of avionics and radar systems. At APL, Mr. Newman has worked on several medical electronics programs as well as satellites. At present, he is the program manager of the Self-Injurious Behavior Inhibiting System.

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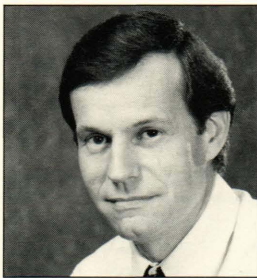
KENNETH A. POTOCKI was born in Chicago in 1940. He received his Ph.D. in physics in 1968 from Indiana University. Since joining APL in 1970, he has conducted oceanographic tests using acoustic and infrared technologies for the Submarine Technology Division and has managed the Navigation Group for the Strategic Systems Department. As a member of the Space Department, Dr. Potocki was program manager for the HILAT satellite. He is now supervisor of the Engineering Technology Branch in the Technical Services Department and engineering manager of the Hopkins Ultraviolet Telescope Program with the Physics Department at The Johns Hopkins University. Dr. Potocki is an instructor in the JHU Evening College at APL and a past member of the APL Advisory Board.

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J. PATRICK REILLY received an M.S.E. from The George Washington University in 1967. After joining APL in 1962, he worked on a variety of theoretical and experimental projects associated with radar and sonar systems, with emphasis on signal processing, system studies, and reflections from targets and the natural environment. In recent years, he has supervised the Electromagnetics and Acoustics Section of the Environmental Assessment Group, where he has been responsible for studies on electromagnetic and acoustic interactions with environmental and biological systems. As part of this group's activities, he has been principal investigator of the Human Reactions to Transient Electric Currents project.

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WILLARD D. LARKIN is a sensory psychologist on the faculty of the University of Maryland at College Park. He received his Ph.D. in experimental psychology from the University of Illinois in 1967. Except for a brief period at the Institute for Perception Research in the Netherlands, he has been at College Park since completing his graduate work. Prior to his collaboration with J. P. Reilly at APL, Dr. Larkin's research dealt principally with mathematical models of human decision-making and signal detection behavior, and with mechanisms of frequency analysis in auditory perception. He teaches courses in measurement theory, sensory and cognitive psychology, statistics, and the history of psychology.

principally with mathematical models of human decision-making and signal detection behavior, and with mechanisms of frequency analysis in auditory perception. He teaches courses in measurement theory, sensory and cognitive psychology, statistics, and the history of psychology.



JAMES E. COLVARD was born in Robbinsville, N.C., in 1932 and received the Ph.D. in public administration from the University of Southern California in 1982. During 1958-69, he was employed as a physicist at the Naval Ordnance Test Station, China Lake, and at APL, later returning to China Lake and holding management positions at the Naval Weapons Center. In 1969, Dr. Colvard moved to the Naval Weapons Laboratory, Dahlgren, Va., where he was appointed technical director in 1973. The following year, he became technical director of the newly formed Naval Surface Weapons Center. In 1980, he became Deputy Chief of Naval Material.

where he was appointed technical director in 1973. The following year, he became technical director of the newly formed Naval Surface Weapons Center. In 1980, he became Deputy Chief of Naval Material.

Dr. Colvard's awards include the Michelson Laboratory Fellowship Award for Management, the Navy Distinguished Civilian Service Award, and the Department of Defense Distinguished Civilian Service Award. He received the rank of Distinguished Executive in the Senior Executive Service in 1980.