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- J. G. Parker, "Energy Transfer Processes Accompanying Laser Excitation of Hematoporphyrin in Various Solvents," Chemistry Dept. Colloq., Howard Univ. (16 Apr 1982).
- The following papers were presented at the 48th Symp. of the Military Operations Research Society, Monterey (1-3 Dec 1981):
- D. K. Pace, "Data Link Support for Battle Group Anti-Air Warfare Coordination (BGAAWC);"
- D. K. Pace, "An Overview of Naval AAW;"
- J. Wang, "Naval AAW Analysis Procedures."
- The following papers were presented at The Army Research Office Workshop on Wave Propagation in Random Media, North Carolina State Univ., Raleigh (8 Mar 1982):
- R. H. Andreo, "Discrete Methods and Schwinger Variational Principles for Random Scattering;"
- R. A. Farrell and J. A. Krill, "Trial Functions in Variational Calculations;"
- R. A. Farrell, R. L. McCally, and R. H. Andreo, "Calculated Corneal SALS Patterns."
- The following papers were presented at The Meeting, American Physical Society, Dallas (8-12 Mar 1982):
- R. A. Farrell, R. L. McCally, and R. H. Andreo, "Calculated Corneal SALS Patterns;"
- A. N. Jette, F. J. Adrian, and J. M. Spaeth, "Contributions of Hydrogen Zero-Point Vibration to Fluorine Transferred Hyperfine Constants Nearest Neighbor to Trapped Interstitial Hydrogen Atoms in CaF₂;"
- B. H. Nall, C. B. Barger, and A. N. Jette, "Diffraction Patterns in the Specimen Current Images of a Single Crystal for Low-Energy Electrons."

PRESENTATIONS

- C. B. Barger, A. N. Jette, and B. H. Nall, "Diffraction Patterns in the Specimen Current Images of Single Crystals for Low-Energy Electrons," Milton S.

APL COLLOQUIA

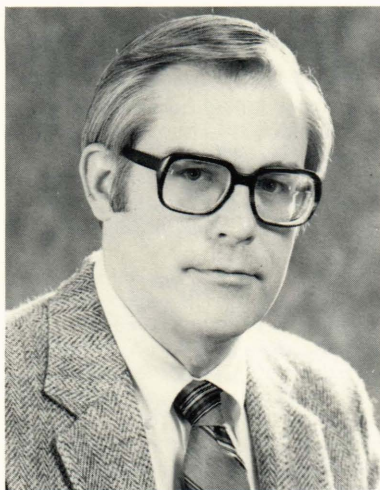
- Feb. 5, 1982 - "Structure and Function of the Nuclear Matrix in Biomedical Information Transfer," D. S. Coffey, The Johns Hopkins Univ.
- Feb 12 - "Solitons and Pirates in the Sulu Sea," J. R. Apel, APL.
- Feb 19 - "The Gyrotron," V. L. Granatstein, Naval Research Lab.
- Feb 26 - "Heat Transfer in Magma Generation," H. S. Yoder, Carnegie Inst.
- Mar 5 - "The Future of World Oil," S. F. Singer, Univ. Virginia.
- Mar 12 - "Strange Attractors," E. Ott, Univ. Maryland.
- Mar 19 - "New Insight into the Structure and Instabilities of the Ionosphere," T. P. Coffey, Naval Research Lab.
- Mar 26 - "Optics at the Other Place," P. Franken, Univ. Arizona.
- Apr 9 - "Recent Advances in Reproductive Endocrinology," W. F. Crowley, Harvard Univ.
- Apr 16 - "Conflicting Objectives in Regulating the Automobile," L. B. Lave, The Brookings Inst.
- Apr 23 - "The Transmission of Optical Solitons in Glass Fiber," A. Hasegawa, Bell Labs.
- Apr 30 - "The Punctuational Model of Evolution" S. M. Stanley, The Johns Hopkins Univ.
- May 7 - "Supercomputers," R. D. Levine, Technology Development of California.
- May 14 - "Technology of Interactive Cable TV," J. Lucas, TeleStrategies.
- May 21 - "Applications of Laser Radiation Pressure," A. Ashkin, Bell Labs.
- May 28 - "A New Theory of the Formation and Evolution of the Solar System," J. W. Follin, Jr., APL.

THE AUTHORS

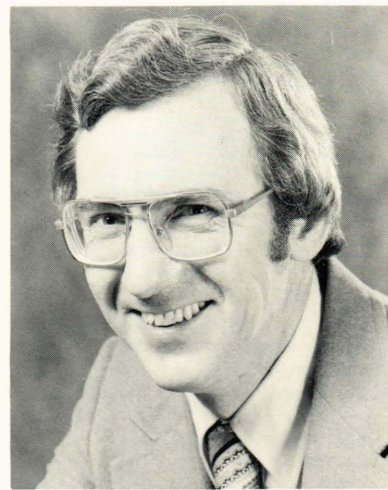


GARY L. SMITH was born in South Dakota in 1935. He received the B.S., M.S. and Ph.D. (nuclear physics, 1969) degrees from the University of California at Davis. In 1969 and 1970, he was a National Research Council postdoctoral research associate at the Naval Research Laboratory.

Dr. Smith joined APL in 1970. In 1975, he was appointed assistant supervisor of the Systems Group of the Submarine Technology Branch, where, beginning in 1976, he held various appointments in the SSBN Security Technology Program. Since 1979, he has been assistant supervisor of the Submarine Technology Division. Dr. Smith was named manager of the SSBN Security Technology Program at APL in 1981. Currently, he is a member of the APL Program Review Board.



RICHARD F. GASPAROVIC was born in Endicott, N.Y., in 1941. He received a B.S. degree from Fordham University in 1963 and graduate degrees in physics from the University of Pennsylvania (M.S., 1964) and Rutgers (Ph.D., 1969). He was employed by RCA for a brief period before joining APL in 1971. Since then, he has been associated with several research efforts involving remote sensing of the ocean surface, including management of the Infrared Project of the SSBN Security Technology Program and development of the APL/Bendix Airborne Infrared Radiometer. In 1978, Dr. Gasparovic became supervisor of the Remote Sensing Group in the Submarine Technology Division.



KEITH PEACOCK was born in Hull, England, in 1940. He received the B.S. degree in physics from Durham University (1961), the M.S. degree in radioactivity from Birmingham University (1962), and the Ph.D. degree in astronomy from Manchester University (1967). In 1966, he joined Bendix Aerospace Systems Division in Ann Arbor, Mich. where he worked on the Apollo Lunar Surface Experiments Package, designed instruments for the Space Telescope, and designed and used a series of multispectral scanners, including the APL/Bendix Airborne Infrared Radiometer.

After two years at the Los Alamos Scientific Laboratory, where he worked on laser fusion, Dr. Peacock joined the Surface Effects Group of APL in 1979. His work has centered on collecting and analyzing sea surface temperature data using the infrared radiometer. Currently, he analyzes atmospheric effects on satellite measurements of the ocean temperature.

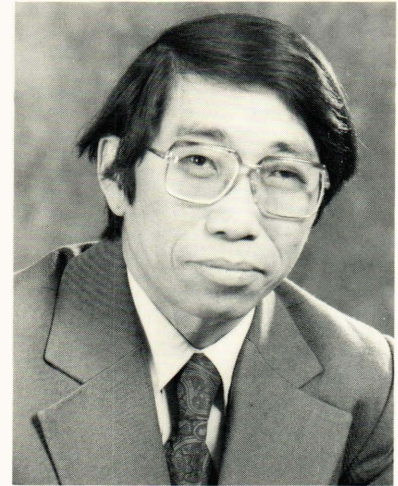


LLOYD D. TUBBS was born in Kansas in 1941. He received his B.S. (1966) and Ph.D. (1972) degrees in physics from Kansas State University. After joining APL in 1973, he participated in the development and use of instruments for remotely estimating sea surface temperature by measuring emitted infrared radiation from both surface vessels and aircraft. Dr. Tubbs is currently studying the errors in sea surface temperature estimates made from satellites. Concurrent satellite and aircraft measurements are being compared to test the usefulness of algorithms that apply atmospheric corrections to the satellite measurements.

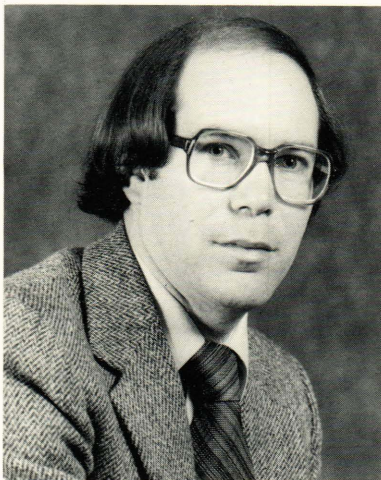


H.-P. PAO was born in China in 1935. He received his B.S.C.E. degree (1956) from National Taiwan University and the Ph.D. degree in fluid mechanics (1963) from The Johns Hopkins University. After a brief stay as a research associate at Johns Hopkins, he joined the faculty of The Catholic University of America. During 1964-80, he was successively assistant, associate, and full professor in the Department of Space Science and Applied Physics and, later, professor of civil engineering.

In 1980, Dr. Pao joined APL, where he has been engaged in studies of late wake eddies in a stratified fluid. His most recent research includes development of a four-electrode high-frequency conductivity probe for oceanic use. Since 1980, he has been vice chairman of the Fluids Committee of the American Society of Civil Engineers.



ROBERT Y. LAI was born in Keelung, Taiwan, in 1940. He received the B.S. degree in civil engineering from National Taiwan University in 1962, and M.S. and Ph.D. degrees in fluid mechanics from Northwestern University (1967, 1969). He was a postdoctoral fellow at the State University of New York at Buffalo. Dr. Lai joined the faculty of the University of Wisconsin-Milwaukee in 1970. There, as associate professor, he was the principal investigator for research projects in water resources engineering, hydrodynamics, and geophysical fluid dynamics until 1980, when he joined the APL Wake Physics Group. He served as the technical manager of the International Water Resources Association (1972-76).

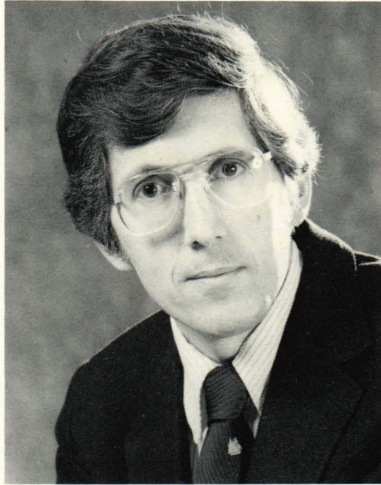


CHARLES E. SCHEMM was born in Baltimore in 1947. He received his B.S. degree in physics at Loyola College in 1969 and the Ph.D. degree in geophysical fluid dynamics from Princeton University in 1974. He then served (1974-77) as a research associate at what is now the Institute for Physical Sciences and Technology of the University of Maryland, where he subsequently was visiting lecturer in the Meteorology Department (1977-1981).

After joining APL in 1977, Dr. Schemm has been the project manager for two studies related to the evolution of wake turbulence in an ocean environment. His research interests include at-sea experimentation and numerical modeling of small-scale processes. He is currently assistant supervisor of the Applied Research Section in the Wake Physics Group.

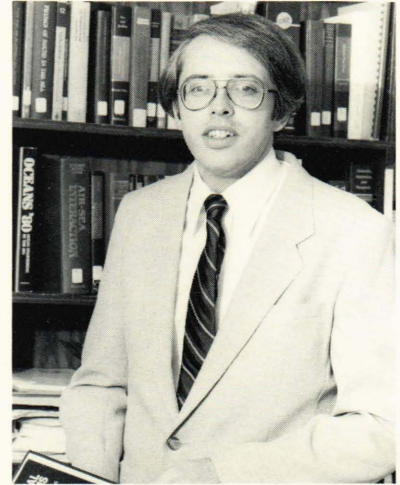


MICHAEL W. ROTH was born in Davenport, Iowa, in 1952, and received a B.A. degree (1971) in physics and mathematics from MacMurray College and M.S. and Ph.D. degrees in physics from the University of Illinois (1972, 1975). He joined APL in 1977, after serving as a research associate at Fermilab. He has served as a manager of wave physics projects and oceanographic experiments. He is a section supervisor in the Wave Physics Group. Dr. Roth's current management responsibilities and research interests are primarily associated with physical oceanography as it relates to Navy needs. Specific areas include the modeling of oceanic internal waves, finestructure, and microstructure, as well as the development of advanced oceanographic instrumentation and signal processing techniques.



STEPHEN A. MACK was born in Jamaica, N.Y., in 1943. He received a B.S. degree in physics from St. Francis College in 1965, and continued his studies at Lehigh University, obtaining an M.S. degree in 1967 and a Ph.D. degree in 1971, both in physics. He worked in the semiconductor group of the University of Illinois Materials Research Department, where he performed experimental studies on the optical properties of solids.

In 1973, Dr. Mack joined APL in the SSBN Security Program and is currently a member of the Wake Physics Group. His research involves studies of ocean mixing processes. He was a principal investigator during ocean experiments in the Atlantic and Pacific during which he utilized vertical profile techniques to measure the ocean temperature and salinity finestructure and microstructure.

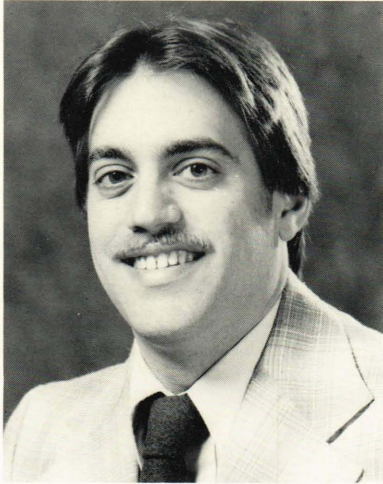


DAVID C. WENSTRAND was born in Council Bluffs, Iowa, in 1944. He received a B.S. degree from Iowa State University (1966) and a Ph.D. degree in physics from Kansas State University (1972). Since joining APL in 1972, he has been involved in research into the characteristics of internal gravity waves and turbulence in the ocean and has participated in a number of oceanographic experiments. Dr. Wenstrand developed instruments to measure oceanic current and shear profiles, and the velocity and temperature fluctuations associated with internal waves and turbulence. At present, he is supervisor of the Wake Physics Group in the Submarine Technology Division.



JACK CALMAN was born (1947) and raised in New York City. He received his B.S. degree (1969) from the City College of New York and his S.M. (1970) and Ph.D. (1975) degrees in applied physics from Harvard University. After leaving Harvard, he developed techniques for ocean current spectral analysis at M.I.T.

Later, he did climatic research at NASA's Goddard Space Flight Center, and worked on air and water pollution problems at a consulting company. Since joining APL in 1980, Dr. Calman has studied turbulent fluid dynamics, in the Wake Physics Group.

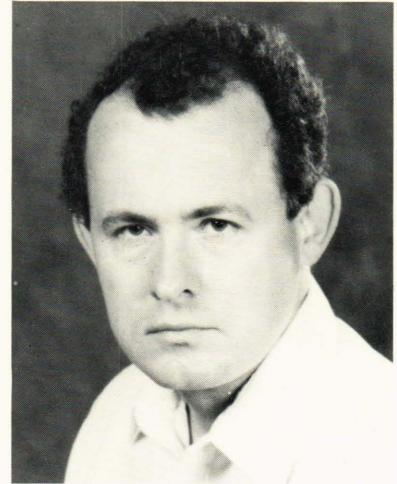


RUSSELL C. BURKHARDT was born in Wilkes-Barre, Pa., in 1957. He came to APL in 1979 after receiving a B.S. degree in mathematics and computer science from Wilkes College. Following completion of the Associate Staff Training Program, he joined the Wake Physics Group of the Submarine Technology Division, where he has been actively involved in the analysis of data collected by oceanographic instruments. He is currently attending The Johns Hopkins University Evening College.

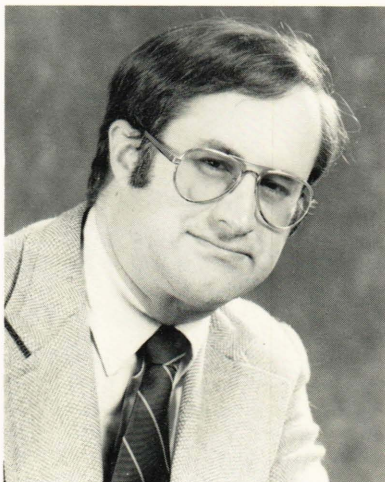


LARRY J. CRAWFORD was born in Painesville, Ohio, in 1941. He received the B.S. degree in physics from Case Western Reserve University (1964), and the M.S.E. degree in space science (1969) and the Ph.D. degree in fluid mechanics (1972) from The Catholic University of America. After he joined APL in 1964, he participated in the analysis and evaluation of the Polaris and Pershing strategic weapon systems, with emphasis on fire control subsystem performance.

After completing his graduate work, Dr. Crawford returned to APL to work 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. From 1975-1981, he served as chief scientist and project manager of several at-sea experiments. In 1981, he was appointed Hydrodynamics Technical Area manager for the SSBN Security Technology Program.



DAVID P. VASHOLZ was born in Milwaukee in 1943. He received the B.S. degree (1965) in mathematics and physics from Valparaiso University and the Ph. D. degree (1970) in physics from the University of Wisconsin. He held post-doctoral fellowships in theoretical particle physics, and taught at the University of Arizona and the University of Florida. In 1975, he joined the Naval Coastal Systems Center at Panama City, Fla., where he conducted research in shallow-water acoustics and wave propagation through a random medium. Dr. Vasholz joined APL in 1978 to work in the Wake Physics Group, where his main activity has been research on the dispersion of passive scalars in the ocean.

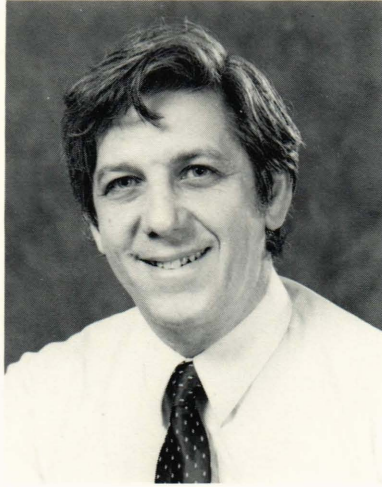


JOHN W. GILES, JR. was born in San Diego in 1944. He received the B.S. degree from Valparaiso University (1966), the M.S. degree from Wichita State University (1969) and the Ph.D. from The Johns Hopkins University (1974), all in physics. From 1966 to 1969, he worked as

an engineer at the Boeing Co. in Wichita. Since joining APL in 1974, he has been a member of the Wake Physics Group and has been involved in applications of optical techniques for the Submarine Technology Division.



CARL J. GUNDERSDORF was born in Baltimore in 1941. He received his B.S. and Ph.D. degrees in electrical engineering from The Johns Hopkins University (1962, 1971). Since joining APL in 1970, he has been involved in various projects in the SSBN Security Technology Program. Dr. Gundersdorf was test scientist in the development and utilization of the APL Thermistor Fluorometer Chain, first in the Coral Trail Experiment and, more recently, in the HYDRO '79 experiments. He was test director of the STANDARD KAYAK experiment and is presently the STANDARD KRYPTON project director.

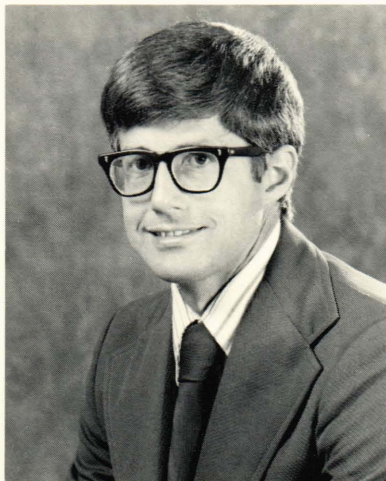


ALAN BRANDT was born in New York City in 1939. He received the B.C.E. degree from The Cooper Union (1959) and M.S.C.E. (1963) and Ph.D. (1966) degrees in civil engineering and fluid dynamics from Carnegie Mellon University. In 1965, he joined APL where he worked on the fluid dynamics and combustion of missile propulsion systems and on the flywheel energy-storage program. During 1971, Dr. Brandt was at Imperial College, London, where he did research in turbulent flow. On his return, he worked on atmospheric dispersion modeling and meteorological data collection for the Power Plant Site Evaluation Program. Since 1973, he has been engaged in laboratory modeling of hydrodynamic flows and ocean data analysis for the Submarine Security Technology Program. He is supervisor of the Applied Research Section of the Wave Physics Group.



DAVID A. HURDIS was born in Providence in 1941. He received B.S. and M.S. degrees in chemical engineering from the University of Rhode Island (1962, 1964) and the Ph.D. degree in fluid mechanics from The Catholic University of America (1973). After a short period with Grumman Aerospace Corp. he worked from 1967 to 1974 at NASA's Goddard Space Flight Center on the thermal design of spacecraft, including the Orbiting Astronomical Observatory. From 1974 to 1977, he was assistant professor of mechanical engineering at the University of Maryland.

Since joining APL in 1977, Dr. Hurdis has worked on the SSBN Security Technology Program in the area of hydrodynamics research and has participated in laboratory studies of internal wave behavior in the ocean. He has managed the APL Hydrodynamics Research Laboratory since 1979.



GEOFFREY B. IRANI was born in Ohio in 1943, but grew up in Chevy Chase, Md. He received a B.S. in 1964 from the University of Maryland. His M.S. (1966) and Ph.D. (1970) were earned from the University of California, Davis, extension at the Lawrence Livermore Laboratory where, as an employee and then as a Hertz Fellow, he researched the mechanical shock properties of various materials and the electronic band structures of several alloys.

In 1970, Dr. Irani joined APL to work on topics related to SSBN submarine security. Specializing in measurement and analysis of ocean surface waves and in optical sensing of ocean surface features, he has been assigned project leadership roles over the intervening years and has been Assistant Supervisor of the Surface Effects Group since 1979. His efforts include conducting two major oceanographic experiments.

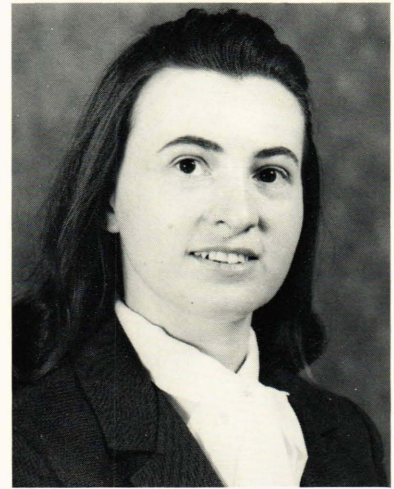


BRUCE L. GOTWOLS was born in Philadelphia in 1941. He received a B.S. in physics from Drexel University in 1963 and did his graduate work at the University of Maryland, receiving an M.S. in physics and astronomy in 1970. Mr. Gotwols joined APL in 1966 as a member of the Space Physics and Instrumentation Group, where he engaged in research in radio astronomy. He was Principal Investigator for the Solar Radio Astronomy Project and co-investigator on a program to predict solar particle events using interplanetary scintillation radio observations. He also worked part-time on several techniques for remote sensing of the ocean. In 1977, this became a full-time endeavor when he joined the Surface Effects Group, where he is engaged in remote sensing of the ocean using optical techniques.



HARVEY W. KO was born in Philadelphia in 1944, and received the B.S.E.E. (1967) and Ph.D. (1973) degrees from Drexel University. During 1964-65, he designed communications trunk lines for the Bell Telephone Company. In 1966, he performed animal experiments and spectral analysis of pulsatile blood flow at the University of Pennsylvania Presbyterian Medical Center.

After joining APL in 1973, he investigated analytical and experimental aspects of ocean electromagnetics, including ELF wave propagation and magnetohydrodynamics. Since 1981, he has been examining radar wave propagation in coastal environments and advanced biomagnetic signal processing for encephalography. He is now on the Technical Staff of the Submarine Technology Division.

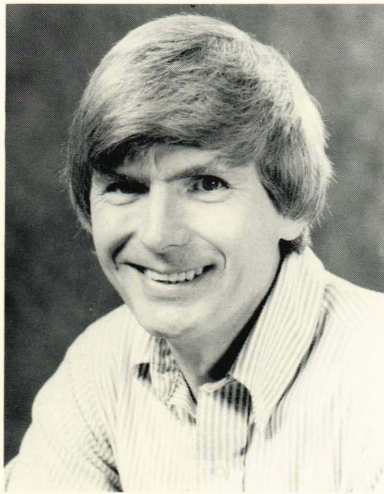


JUDITH A. GIANNINI was born in Philadelphia in 1948. She received her B.S. and M.S. degrees in physics (1974, 1976) from Drexel University, with emphasis on nonrelativistic potential scattering. In 1971, she worked at the Institute for Cancer Research, using X-ray techniques to analyze the structure of antitumor agents. During 1972-73, she worked at the General Electric Co. Space Division, where she analyzed meteoroid detector data from Pioneers 10 and 11. Ms. Giannini joined APL in 1977. As a member of the Magnetics Group of the Submarine Technology Division, she has been involved in studies of the behavior of extremely low frequency electromagnetic fields in the ocean.



PATRICIA J. HERCHENROEDER was born in Takoma Park, Md., in 1953. She received her B.S. degree in physics and astronomy (1975) and the M.S.E.E. degree in electrophysics (1977) from the University of Maryland. She then performed research on the biological effects of microwave radiation for the Department of Health, Education, and Welfare.

Since joining APL in 1977 as a member of the Magnetics Group of the Submarine Technology Division, Ms. Herchenroeder has been involved in oceanographic research concerning underwater extremely-low-frequency magnetic fields, magnetohydrodynamic effects, and the variability of electrical conductivity profiles.



C. ALLAN BOYLES was born in Columbia, Pa. in 1936. He holds B.S. and M.S. degrees in physics from Pennsylvania State University and has completed 60 credits beyond the M.S. degree. He was with the Ordnance Research Laboratory at Penn State (1964-67) and with TRACOR, Inc. (1967-70). Mr. Boyles joined APL in 1970 in what is now the Acoustics Group of the Submarine Technology Division. Since 1964, he has worked on the development of mathematical models for wave propagation and scattering. In particular, he has done extensive work in the development of the theory of the acoustic Luneburg lens and acoustic propagation in an inhomogeneous, oceanic waveguide with a rough sea surface. He is supervisor of the Propagation and Noise Analysis Section.



GERALDINE W. JOICE was born in Raleigh, N.C. in 1950. She completed her undergraduate studies in mathematics at Bennett College (1972) and obtained the M.S. degree in numerical science from The Johns Hopkins University (1974). She has also studied physics and mathematical physics at the University of Maryland and The Johns Hopkins University.

Mrs. Joice joined APL in 1973 as a computer specialist. In 1977, she transferred to the Acoustics Group of the Submarine Technology Division. Since then, she has worked primarily in the areas of underwater acoustic propagation modeling, sea test analysis, and threat assessment. She also serves as a consultant to other users of the various propagation models available at APL.



ROBERT R. NEWTON supervises the Space Sciences Branch. Born in Chattanooga in 1918, he received his training in physics at the Ohio State University (Ph. D., 1946). After two years with Bell Telephone Laboratories and a physics teaching career at the University of Tennessee and Tulane University, he joined APL in 1957, devoting his time to the study of satellite and space probe flight mechanics. His recent interests deal with the use of ancient astronomical measurements to study the time variation of non-gravitational forces in the solar system. Several books have resulted, one of which, *The Crime of Claudius Ptolemy*, (Johns Hopkins Press, 1977) documents that much of the data in *Syntaxis*, Ptolemy's well-known treatise, was fabricated.



MAYNARD L. HILL was born in 1926, into a Pennsylvania family whose home was under the landing approach path to the local airport. Biplanes sputtering over the housetop stirred his interest in aviation; by age 6, he began building and flying model airplanes. He served in a Navy flying boat squadron during World War II and received B.S. and M.S. degrees in metallurgy from Pennsylvania State University (1950, 1951). During 1951-60, at the Westinghouse Research Laboratories, he studied the behavior of gases in

metals and their effects on the mechanical properties of steel forgings.

After joining APL in 1960, Mr. Hill worked on development of materials for high temperature use in hypersonic vehicles, inflatable structures for radar decoys, and metals for biomedical applications. In 1972, at the request of DARPA and the Army, he changed his vocation to the development of remotely piloted vehicles for such military applications as battlefield surveillance, electronic countermeasures, and weather observation.



BORIS W. KUVSHINOFF was born in Monticello, Minn. He received the B.A. degree in political science (1951) from the University of Washington, where he continued graduate work in Slavic studies. He has taken graduate courses in information science at American University and was chief editor at Vitro Engineering Division.

After coming to APL in 1958, Mr. Kuvshinoff established the foreign literature translation service and was document li-

brarian before transferring to the Fire Problems Group. In that assignment he compiled the *Fire Sciences Dictionary*, published by Wiley Interscience. Since 1980, he has been involved in development of online information systems as a member of the Computer Engineering Group. He is a delegate for the U.S./USSR Agreement on Housing and Other Construction.