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- S. C. Jones and V. J. DiLosa, "Computer Model for a Waveguide Relay Link," National Telesystems Conf., San Francisco (14-17 Nov 1983).
- S. M. Krimigis, "Active Experiments in Distant Magnetosphere: The AMPTE Program," Institute for Interplanetary Space Physics, Frascati, Italy (28 Oct 1983).
- S. M. Krimigis, "Space Science Board/European Science Foundation Workshop," Hilton Head, S.C. (20-23 Sep 1983); also presented at the NASA/ESA/ISAS Solar-Terrestrial Physics Meeting, Washington (26-27 Sep 1983).
- A. T. Y. Lui, "Observed Features of the Earth's Cross-Tail Current Sheet," IAU Symp. No. 107 on Unstable Current Systems and Plasma Instabilities in Astrophysics, College Park, Md (Aug 1983).
- R. H. Maurer, "Cosmic Ray Effects on Space-Borne Microelectronics," Joint Colloq. Univ. Delaware Physics Department and the Bartol Research Foundation of the Franklin Inst., Newark, Del. (15 Feb 1984).
- L. F. McGoldrick, "Remote Sensing for Air-Sea Interaction and Oceanography," 5th Conf. on Ocean-Atmosphere Interaction, Miami (10-13 Jan 1984).
- F. F. Mobley, "Passive Attitude Control," AIAA/NCS Seminar on Spacecraft Attitude Control Systems, Goddard Space Flight Center, Greenbelt (24 Oct 1983).
- D. E. Olsen, "The Applied Statistician at APL," Orientation Seminars in Mathematical Sciences," JHU Homewood Campus (28 Feb 1984).
- D. K. Pace, "The Mystique of Weapon System Analysis," JHU School of Advanced International Studies, Security Studies Roundtable, Washington (19 Mar 1984).
- P. P. Pandolfini, P. J. Waltrup, G. A. Sul-lins, and C. E. Stevens, "Dual-Combustion Ramjet Low Mach Number, High Altitude Connected-Pipe Combustor Tests," 1984 JANNAF Propulsion Meeting, New Orleans (7-9 Feb 1984).
- T. A. Potemra, "Birkeland Currents," Univ. California, San Diego (27 Feb 1984).
- T. A. Potemra, "Electrodynamic Coupling Processes in Planetary Magnetospheres," Herzberg Inst. Astrophysics, National Res. Council of Canada, Ottawa (29 Mar 1984).
- S. N. Raja (JHMI), R. A. Meyer (APL), and J. N. Campbell (JHMI), "Halothane Sensitizes Nociceptive C-Fibers in Monkeys," Annual Meeting of the American Society of Anesthesiologists, Atlanta (Oct 1983).
- W. J. Ravich and R. S. Johannes (JHMI), W. Schneider and J. T. Massey (APL), and R. J. Johns and T. R. Hendrix (JHMI), "Portable Continuous pH Monitoring with Computerized Data Analysis," Meeting, American Gastroenterology Association, Washington, D.C. (25-26 Oct 1983).
- L. J. Rueger, "A Satellite Time Dissemination System for the 400.1 MHz Authorized Clear Channel," Interim Working Party 7/4 of International Radio Consultative Committee, Geneva (22 Nov 1984).
- D. M. Rust, "Observations of Fast-Moving Fronts in Solar Flare Loops," International Workshop on Solar Physics and Interplanetary Travelling Phenomena, Yunnan Observatory, Kunming (Nov 1983).
- D. M. Rust (APL), G. M. Simnett (Univ. Birmingham, England) and D. F. Smith (Berkeley Res. Assoc.), "Thermal Wave Fronts in Solar Flares," 163rd Meeting American Astronomical Society, Las Vegas (8-12 Jan 1984).
- V. G. Sigillito, "Expert Systems: Present and Future," Association for Computing Machinery, Baltimore (22 Nov 1983).
- J. F. Smola and N. E. Peterson, "The AMPTE Program — An Overview," Star Motor Space Symp., Univ. Delaware (14-15 Sep 1983).
- H. M. South, "Signal Processing Systems for SSBN Sonar Evaluation," Underwater Acoustics and ASW Colloq., Naval Graduate School, Monterey (8 Mar 1984).
- W. I. Sternberger, "Temperature Compensated Thermistor Anemometer," Salinity-Temperature-Depth 1984 Conf. and Workshop, Marine Technology Society, San Diego (27-29 Feb 1984).
- B. E. Tossman, "Testing Dampers and Attitude Control Subsystems," Internal Federation of Automatic Control Workshop, Stanford Univ., Stanford, Calif. (22-26 Aug 1983).
- L. B. Weckesser, "APL Program on Sensor Windows," Aero-Structures Workshop, Naval Surface Weapons Center, Dahlgren (27 Sep 1983).
- L. B. Weckesser, "ENNK Radome Evaluation Program, 1st ENNK Radome Review Meeting, Georgia Institute of Technology, Atlanta (13 Dec 1983).
- L. B. Weckesser, "Test of Oxidation Resistant Carbon-Carbon Candidates for the AWAM Combustor," JANNAF Ramjet Insulator Testing Workshop, Naval Post Graduate School, Monterey (17 Oct 1983).
- E. E. Westerfield, "Use of GPS for Determining Position of Drifting Buoys," NTC '83 — IEEE National Telesystems Conf., San Francisco (Nov 1983).
- D. J. Williams, "Hot Plasma Effects in the Plasmopause Region," Conf. on Fundamental Magnetospheric Processes in the Plasmopause Region, Univ. Alabama, Huntsville (25-27 Oct 1983).
- L. J. Zanetti, "MAGSAT Birkeland-Ionospheric Currents, Daylight Auroral Imaging from the HILAT Satellite," Seminar, Uppsala Ionospheric Observatory, Uppsala, Sweden (7 Oct 1983).

The following papers were presented at the General Assembly of the International Association of Geomagnetism and Aeronomy, Hamburg, Aug. 1983:

- C. B. Baker (APL), K. Pfizter and W. P. Olson (McDonnell-Douglas), A. Pedersen (European Space Res. and Tech. Centre), and R. A. Greenwald (APL), "The Effect of Induced Electric Fields on the Electric Coupling between the Magnetosphere and Ionosphere;"
- M. Candidi (National Res. Council, Italy) and C. -I. Meng (APL), "Magnetospheric Cusp Electrons and Solar Wind Parameters;"
- S. M. Krimigis and B. M. Mauk, "Diamagnetic Effects of Energetic Oxygen Ions in Saturn's Magnetosphere;"
- B. H. Mauk and C. -I. Meng, "Geostationary 'Injection Boundary' Signatures;"
- C. -I. Meng (APL) and K. Makita (Takushoku Univ.), "Configuration of the Auroral Oval of the Quiescent Magnetosphere;"
- C. -I. Meng (APL) and M. Candidi (National Res. Council, Italy), "Simultaneous Observations of the Conjugate Polar Cusp;"
- C. -I. Meng and B. H. Mauk, "Quiet Time Geostationary Spatial Boundaries as a Manifestation of Dynamical Injection."

The following papers were presented at the Special Magsat Session of the General Assembly of the International Union of Geodesy and Geophysics, Hamburg, Aug 1983:

- P. F. Bythrow, "A Statistical Study of Large-scale Birkeland Currents Compiled over the Lifetime of Magsat;"
- L. J. Zanetti (APL), W. Baumjohann (Max-Planck Inst.), and T. A. Potemra and P. F. Bythrow (APL), "Ionospheric and Birkeland Current Distributions Inferred from the Magsat Magnetometer Data."

The following papers were presented at the 1983 International Geoscience and Remote Sensing Symp., San Francisco, 31 Aug - 2 Sep 1983:

- E. B. Dobson and D. E. Irvine, "Investigation of Gulf Stream Ring Detection with Spaceborne Altimeter Using Mean Sea Height, Wave Height, and Radar Cross Section;"
- J. Goldhirsh, "Comparison of Simultaneous

Radiometer and Radar Derived Slant Path Attenuation Statistics at 28.56 GHz;"

F. M. Monaldo, "Tracking Ocean Surface Waves Using Spaceborne SAR Image Spectra Corrected for Ocean Surface Movement;"

F. M. Monaldo, E. J. Walsh, and J. Goldhirsh, "The Influence of Rain and Clouds on a Satellite Dual Frequency Radar Altimeter System Operating at 13 and 35 GHz."

The following papers were presented at the 5th Washington Area Neighborhood Astronomers Meeting, NRL, Washington, D.C., Oct 1983:

A. F. Cheng, "X-Rays from Radio Pulsars;"

L. J. Zanetti and C. -I. Meng (APL) and R. A. Huffman (Air Force Geophysics Lab.), "Ultraviolet Auroral Imaging from the HILAT Satellite."

The following papers were presented at the 4th Annual Meeting of the American Pain Society, Chicago, Nov 1983:

R. A. Meyer, "Neurophysiology of Neuro-ma Pain;"

S. N. Raja and J. N. Campbell (JHMI) and R. A. Meyer (APL), "Evidence for Different Mechanisms for Primary and Secondary Hyperalgesia."

The following papers were presented at the 1983 Fall Meeting of the American Geophysical Union, San Francisco, 5-10 Dec 1983:

K. B. Baker and R. A. Greenwald (APL) and C. Hanuise (Univ. Toulon), "Preliminary Results from the Goose Bay HF-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.), "High Density Birkeland Currents Observed by HILAT in the Late Evening and Early Morning Sectors;"

M. Candidi (National Research Council, Italy) and C. -I. Meng, "Double Structure of the Polar Cusp Precipitating Electron Fluxes;"

A. F. Cheng (APL), C. G. MacLennan and L. J. Lanzerotti (Bell Labs.), and M. T. Paonessa and T. P. Armstrong (APL), "Longitudinal Asymmetry in the Io Plasma Torus;"

R. B. Decker, A. T. Y. Lui, and S. M. Krimigis, "Numerical Simulation of Lithium Interactions with Earth's Bow Shock: Transmission Coefficients and Energization in Laminar Field Geometry;"

R. E. Gold (APL) and J. Bamber and D. Venkatesan (Univ. Calgary), "The Relationship between Recurrent Cosmic Ray Increases and Solar Wind Velocity;"

M. E. Greenspan, D. J. Williams, B. H. Mauk, and C. -I. Meng, "ISEE-1 Observations of Particle Injections;"

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 (Air Force Geophysics Lab.) and C. -I. Meng (APL), "Auroral/Ionospheric Mapper for Ultraviolet Imaging from the HILAT Satellite;"

T. Iijima (Univ. Tokyo), and T. A. Potemra, L. J. Zanetti, and P. F. Bythrow (APL), "Stable Patterns of Large-Scale Birkeland Currents in the Polar Region during Strongly Northward B_z — A New Birkeland Current System;"

T. W. Jerardi and W. G. Innanen (APL) and B. D. Merritt (DMA) "Kwajalein Test of a New Method of Open Ocean Surveying;"

S. M. Krimigis, "The Active Magnetospheric Particle Tracer Explorers (AMPTE): Program Overview;"

A. T. Y. Lui and S. M. Krimigis, "Association of Energetic Particle Bursts and Magnetic-Field Aligned Currents in the Magnetotail;"

B. H. Mauk and S. M. Krimigis (APL) and R. P. Lepping (NASA), "The High Pressure Contribution of Energetic (>66 keV) Oxygen Ions in the Inner Saturnian Magnetosphere;"

C. -I. Meng (APL) and R. E. Huffman (Air Force Geophysics Lab.), "Observation of Aurora under Full Sunlit Conditions;"

D. G. Mitchell, A. T. Y. Lui, and D. J. Williams, "Three-Dimensional Energetic Particle Distributions across the Flanks of the Magnetopause and Bowshock;"

L. Monchick and C. -I. Meng (APL) and S. Chakrabarti and S. Bowyer (Univ. California, Berkeley), "Observation of the Auroral Display under Full Sunlit Condition by Using Atmospheric EUV Emissions;"

T. A. Potemra, P. F. Bythrow, and L. J. Zanetti (APL), R. E. Huffman (Air Force Geophysics Lab.), and C. -I. Meng (APL), "The Association of Birkeland Currents and VUV Auroral Emission from HILAT;"

E. C. Roelof, "Orientations of the Interplanetary Magnetic Field, 1964-1965: Solar Cycle Effects;"

E. C. Roelof, D. G. Mitchell, and D. J. Williams, "New Results: Energetic Particles Experiments, IMP 7 & 8;"

E. T. Sarris (Univ. Thrace) and R. B. Decker (APL), "Simultaneous Observations of Shock Accelerated Particles at 1 AU and in the Deep Space;"

L. Varga and D. Venkatesan (Univ. Calgary), and C. -I. Meng (APL), "Intensity Variations of Energetic Electrons in the Outer Radiation Belt during Isolated Substorms;"

D. Venkatesan (Univ. Calgary), R. B. Decker and S. M. Krimigis (APL), and J. A. Van Allen (Univ. Iowa), "Multi-Spacecraft Observations of the Cosmic Ray Minimum of Solar Cycle 21 in the Inner and Outer Heliosphere;"

L. Vlahos (Univ. Maryland) and R. B. Decker and A. T. Y. Lui (APL), "Numerical Simulation of Lithium Interactions with Earth's Bow Shock: Effects of Wave-Particle Interactions between Shock Crossings;"

L. J. Zanetti, T. A. Potemra, and P. F. Bythrow (APL), W. Baumjohann (Max-Planck Inst.), and T. Iijima (Univ. Tokyo),

"Birkeland and Hall Current Distributions in the Ionosphere."

The following papers were presented at the AIAA 22nd Aerospace Sciences Meeting, Reno, 9-12 Jan 1984:

E. F. Lucero, "Empirical Curves for Predicting Supersonic Aerodynamics of Very Low Aspect Ratio Lifting Surfaces;"

M. E. White, F. S. Billig, and D. M. Van Wie, "Application of CAE and CFD Techniques to a Complete Tactical Missile Design."

The following papers were presented at the 1984 Naval Aeroballistics Committee Meeting, White Oak, Md., 14-15 Feb 1984:

R. W. Newman, "Report to the Naval Aeroballistics Heat Transfer Panel for 1984;"

M. E. White and J. C. Hagan, "Computational Viscous Analysis of Supersonic Inlets for the Hypersonic Dual Combustion Ramjet."

The following papers were presented at the Chapman Conference on Collisionless Shock Waves in the Heliosphere, Napa Valley, Calif. 20-24 Feb 1984:

R. B. Decker, "The Shock-Drift Acceleration Mechanism at Curved Shocks;"

R. B. Decker (APL) and L. Vlahos (Univ. Maryland), "Effects of Wave-Particle Interactions on the Shock-Drift Acceleration Mechanism."

COLLOQUIA

Feb 3, 1984 — "Enhancement by Degradation: A Problem for Some Agricultural Chemicals," D. D. Kaufman, U.S. Department of Agriculture.

Feb 10 — "Chaos from Field-Induced Resonance in Conservative Systems," L. Reichl, University of Texas.

Feb 17 — "Is Nuclear Power Still Alive?" C. Walske, Atomic Industrial Forum.

Feb 24 — "The Dimension of Chaotic Attractors," E. Jen, University of Southern California; Los Alamos National Laboratory.

Mar 2 — "Picosecond Chemistry and Beyond," P. M. Rentzepis, Bell Laboratories.

Mar 9 — "Are There Giant Black Holes at the Center of Quasars and Other Active Galaxies?" R. F. Mushotzky, NASA/Goddard Space Flight Center.

Mar 16 — "Presolar Matter in Meteorites," E. Anders, University of Chicago.

Mar 23 — "Computational Synergetics and Innovation in Nonlinear Science," N. J. Zabusky, University of Pittsburgh.

Mar 30 — "Factoring Large Integers on a Massively Parallel Processor," M. Wunderlich, Northern Illinois University.

Apr 6 — "A New Approach to Brain Chemistry," H. N. Wagner, The Johns Hopkins University.

Apr 13 — "A Salty Saga: How Salt Causes Hypertension," M. P. Blaustein, University of Maryland.

THE AUTHORS



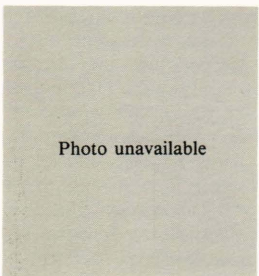
THOMAS A. POTE MRA was born in Cleveland in 1938. He did both his undergraduate and graduate work in electrical engineering and received a Ph.D. from Stanford University in 1966.

Since joining APL in 1965, Dr. Potemra has engaged in research in ionosphere and space physics. He is principal investigator for several spacecraft magnetometer experiments (including TRIAD, MAGSAT, Viking, and HILAT) and is co-investigator for the Atmospheric Explorer photoelectron spectrometer experiment. He is now supervisor of the Space Physics Group. He was associate editor of the *Journal of Geophysical Research* during 1978-81 and is a member of the Committee on Solar-Terrestrial Research of the National Academy of Sciences.



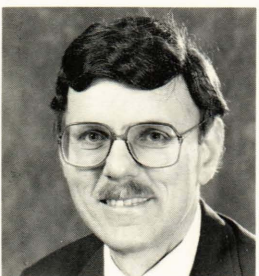
EDWARD J. FREMOUW was born in Northfield, Minn., in 1934 and obtained a Ph.D. in geophysics in 1966 from the University of Alaska. During the International Geophysical Year, he performed auroral observations as a member of the third wintering-over party at Amundsen-Scott Station, South Pole, Antarctica.

Between 1967 and 1977, Dr. Fremouw was on the staff of the Radio Physics Laboratory of what is now SRI International, where he was principal investigator on the DNA Wideband satellite. In 1977, he founded the Northwest Division of Physical Dynamics, Inc., where he is presently a staff scientist and vice president.



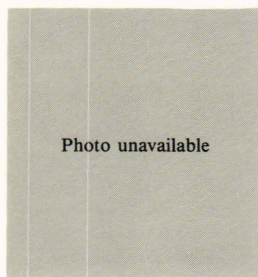
LEON A. WIT TWER is the Defense Nuclear Agency Program Manager for the HILAT satellite. Born in Monroe, Wisc., in 1947, he did his graduate work at the University of California, Davis/Livermore, as a Hertz Foundation Fellow. His thesis concerned the theoretical calculation of low-energy Compton scattering cross sections in heavy elements. Dr. Wittwer worked on a variety of problems related to nuclear effects at

the Air Force Weapons Laboratory from 1972-78. From 1978 to the present, he has done similar work at the Defense Nuclear Agency. Sponsorship of the HILAT satellite is part of a larger program to determine and mitigate the effects of disturbed ionospheric/magnetospheric environments on DoD systems.



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.



MICHAEL D. COUSINS received his Ph.D. in electrical engineering from Stanford University in 1972. His Ph.D. dissertation concerned direction finding on whistlers and related VLF signals. Since joining SRI International in 1970, he has been involved in the design and development of microcomputer- and minicomputer-controlled radio systems, phase coherent receivers, and field data collection equipment. Dr. Cousins directed the

design and development of the HILAT radio beacon and antenna system after the successful completion of similar efforts on the Wideband satellite. He has also done research on scintillation and radio propagation phenomena.

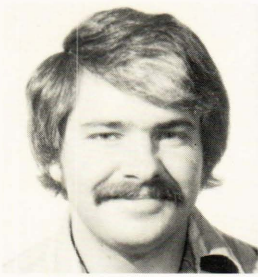


ROBERT C. LIVINGSTON is a senior research engineer in the Radio Physics Laboratory at SRI International. A native of Massachusetts, he received an MSEE from the University of Washington in 1972. After several years in the aerospace industry, Mr. Livingston joined SRI International in 1973. His work there has concentrated on the characterization of ionospheric irregularity structure using scintillation and incoherent scatter techniques.



CHARLES L. RINO is an assistant director of SRI International's Radio Physics Laboratory. He received a Ph.D. in information and computer science from the University of California, San Diego campus, in 1970. Dr. Rino joined SRI International in 1970. He has done research on digital image processing, signal detection, incoherent scatter radar, radio wave propagation, and ionospheric physics. He is currently

working on the HILAT satellite program and pursuing research in propagation theory.



JAMES F. VICKREY works in the Radio Physics Laboratory at SRI International. He was born in Silver City, N. M., in 1953 and received a Ph.D. in electrical engineering from Cornell University in 1978. Since joining SRI International in 1978, Dr. Vickrey has conducted auroral and ionospheric studies using incoherent scatter radar. These experimental investigations have examined the global patterns of conductivity and auroral

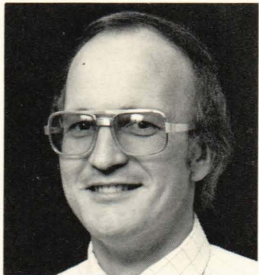
energy deposition. In addition, he has conducted theoretical studies of the sources and loss of ionospheric plasma structure.



FREDERICK J. RICH was born in Greenbelt, Md., in 1947. After working on the Apollo Project for TRW Systems at the NASA/Houston Space Center, he earned his Ph.D. degree in space physics and astronomy from Rice University in 1973. During 1973-76, he worked in research on ultra-high pressure physics at the Benet Weapons Laboratory, Watervliet Arsenal, N.Y. Since 1976, he has worked in research related to ionospheric physics in association with the Air Force Geophysics Laboratory.



B. J. HOLT was born in Ennis, Tex., in 1937. While serving in the Air Force, he was involved in the operation and maintenance of airborne weapons control systems. He received a B.S. degree in mathematics from Southern Methodist University in 1974. Mr. Holt has been with the Center for Space Sciences at the University of Texas at Dallas and with its predecessor since 1967. He has contributed to the design, development, testing, and launch support for numerous sounding rocket payloads and low-energy plasma instruments flown on satellites.



RODERICK A. HEELIS was born in England in 1948 and received a Ph.D. in applied mathematics from the University of Sheffield in 1973. Since joining the University of Texas at Dallas in 1973, Dr. Heelis has worked on both experimental and theoretical studies of the earth's ionosphere. He is currently interested in the integration of satellite data into numerical models of ionospheric electrodynamics and is principal investigator for the ion drift meter experiment on Dynamics Explorer.



LARRY L. HARMON was born in Indianapolis in 1940 and received a B.S. in mechanical engineering from Texas A&M University in 1963. After graduation, he worked for Goodyear Aerospace Corp. and E-Systems, Inc. Since joining the University of Texas at Dallas in 1971, he has been involved in various Apollo mission experiments, sounding rocket programs, the Atmosphere Explorer and Dynamics Explorer programs, the San Marco International Cooperative program, and the HILAT project. Current involvements include instrumentation for the Defense Meteorological Satellite Program, the European Halley's Comet Giotto mission, and the SPICE balloon project.



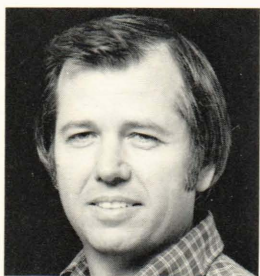
WILLIAM B. HANSON was born in Warroad, Minn., in 1923. He received a Ph.D. in physics from The George Washington University in 1954 while working in the cryogenic physics section of the National Bureau of Standards. He flew ion traps, mass spectrometers, and density gauges on rockets and satellites while spending six years at the Lockheed Missile and Space Co. before he became a professor at the Southwest Center for Advanced Studies in Dallas in 1962. Dr. Hanson is currently professor and director of the Center for Space Sciences at the University of Texas at Dallas and has been the principal investigator for many instruments flown on NASA vehicles during the last two decades, including the Viking Mission to Mars.



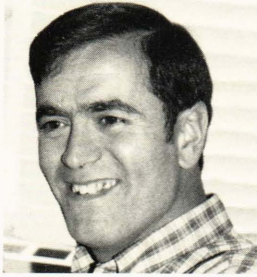
DON ZUCCARO was born in Ft. Worth, Tex., in 1935. He attended the University of Texas at Arlington and did work at Texas Instruments on lasers, light modulators, and distance measuring equipment. In 1964, he joined Microwave Physics, working on microwave YIG filters and microwave panoramic receivers. Since joining what is now the Center for Space Sciences of the University of Texas at Dallas in 1966, he has been the project engineer for the instruments that have flown on the OGO-6, Atmosphere Explorer B, and HILAT satellites and several rocket payloads. He also helped to specify, design, and test the RPA instruments on the Viking Mars Mission and is currently the project electrical engineer for an RPA and drift meter to be flown on an Italian San Marco satellite; he is also involved in design work for the Halley's Comet Giotto project.



PETER B. ANDERSON was born in Auburn, Me., in 1937 and earned a B.E.E.T. degree from Northeastern University in 1971. During 1957-71, he was involved with circuit and system designs at Tufts University, EG&G, and Medical Instruments Research Associates. Since 1971, he has worked in rocket and satellite programs for the Air Force Geophysics Laboratory while employed at Comstock and Westcott, Inc., and the Research Center at Regis College. He has done circuit design, system design, and integration of experiments for satellites such as S3-2, S3-3, and SCATHA; the Defense Meteorological Satellite; and the NASA Shuttle, as well as several Air Force Geophysics Laboratory rocket programs.



C. RON LIPPINCOTT was born in Henrietta, Tex., in 1940. He earned an M.A. in 1964 from the University of Texas at Austin in physics and mathematics and joined what is now the Center for Space Sciences of the University of Texas at Dallas as an instrumentation engineer. Mr. Lippincott has worked on various space instrumentation projects there that include ISIS, Atmosphere Explorer, Dynamics Explorer, and sounding rocket experiments. He is currently a program manager working on the San Marco International Satellite, the Defense Meteorological Satellite Program, the European Space Agency Giotto program, and the HILAT program.



DONALD GIROUARD is a native of Massachusetts and received electronics training at Northeastern University. He has worked at the Air Force Geophysics Laboratory since 1972. He has worked on such diverse projects as timing and control systems for nuclear testing, computer terminal systems, and aerospace instrumentation, and on the design and fabrication of Air Force satellite instruments, including those for the Defense Meteorological Satellite Program, SCATHA, and HILAT, and for rocket programs such as Auroral-E.



WILLIAM P. SULLIVAN was born in Leominster, Mass., in 1938. He received his B.S. in electrical engineering from Northeastern University in 1964. After graduation, he joined the Air Force Geophysics Laboratory. He has been engaged in research engineering on many balloon, rocket, and satellite programs. He has been the project manager for the design, development, and fabrication of ionospheric electric field and plasma

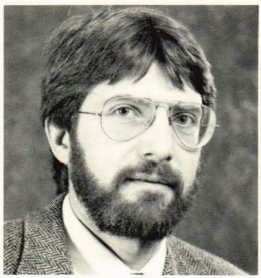
experiments on the S3-2, S3-3, and SCATHA satellites, the Defense Meteorological Satellite Program, and the HILAT satellite. Mr. Sullivan is now project manager for electric and magnetic field experiments on the Combined Release and Radiation Effects Satellite.



PETER F. BYTHROW was born in Quincy, Mass., in 1949. After serving as a USAF pilot until 1975, he received his Ph.D. in space physics at the University of Texas at Dallas in 1980.

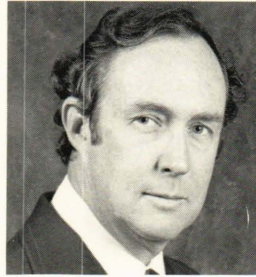
Since joining APL in 1981, Dr. Bythrow has been involved in ionospheric and magnetospheric studies using data from the Atmosphere Explorer, Triad, and MAGSAT Programs. In addition, he is co-investigator on the HILAT magnetometer experiment and has done research on data from the Voyager Saturn encounter.

investigator on the HILAT magnetometer experiment and has done research on data from the Voyager Saturn encounter.



LAWRENCE J. ZANETTI was born in Huntington, N.Y., in 1949. He received a Ph.D. in physics from the University of New Hampshire. Since joining APL in 1978, he has conducted near-space research using the satellite data resources within the Space Physics and Instrumentation Group. His most recent magnetospheric research has included the development of analysis methods for inferring the three-dimensional global Birkeland

and ionospheric current systems from the MAGSAT magnetometer data set. Dr. Zanetti is presently a principal investigator in the above program, as well as being involved in magnetometer analyses and requirements for the HILAT, AMPTE, Viking, Defense Meteorological Satellite Program, and UARS satellite projects.



FREDERICK F. MOBLEY was born in Atlanta in 1932 and received an M.S. degree in aeronautical engineering from the Massachusetts Institute of Technology in 1958. He has been employed at APL since 1955. Since 1960, he has worked on satellite attitude control, including gravity-gradient stabilization of the TRANSIT satellites and the use of magnetic control systems on the Small Astronomy Satellites and MAGSAT. Mr. Mobley

participated in the magnetometer system design for HILAT. He is supervisor of the Space Attitude Control Systems Group.



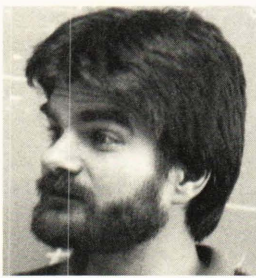
LEONARD SCHEER was born in Washington, D.C., in 1923 and joined APL in 1945, working with the VT Proximity Fuze and the Mk-61 Radar Gun Director Programs. Beginning in 1947, he participated in the early development of the FM/FM telemetry system for the guided missile development program, being responsible for the design and operation of the first complete telemetry data processing facility at APL. During 1960-71, Mr.

Scheer engineered a variety of test instruments for medical research. In 1963, he was lead engineer in the Artificial Intelligence Studies program. In 1971, as an engineer in the Satellite Attitude Control Group, he was responsible for spacecraft subsystems. Mr. Scheer has also designed shipboard recording and data processing systems for subsurface electromagnetic propagation tests. His most recent involvement has been in magnetic control systems for satellites.



DAVID A. HARDY was born in Aniston, Ala., in 1950 and earned his Ph.D. degree in space physics and astronomy from Rice University in 1976. During 1976-81 he served as an Air Force officer at the Air Force Geophysics Laboratory as principal investigator on the rapid scan particle spectrometer for the P78-2 (SCATHA) satellite and the SSJ/3 sensor for the F-2 and F-4 satellites of the Defense Meteorological Satellite Program.

Since then, he has worked as a civilian employee at Air Force Geophysics Laboratory, continuing his work on the construction of particle analyzers and the study of the data they return.



ALAN C. HUBER was born in Evansville, Ind., in 1947. He earned his S.B. degree in physics from the Massachusetts Institute of Technology in 1969. Since 1970, he has worked as an aerospace design engineer at the Physics Research Division of Emmanuel College. He has been responsible for the design, construction, test, and integration of the low-energy proton spectrometer for the P73-6, P74-2, and SOLRAD-HI satellites, the

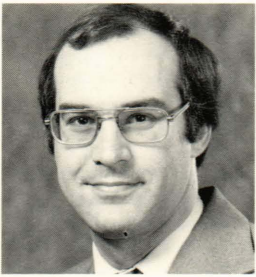
SSJ/3 and SSJ/4 detectors for the F-2 through F-14 satellites of the Defense Meteorological Satellite Program, the CRL-251 detector for the P78-1 satellite, and the J sensor for HILAT. He is a co-founder of AMPTEK, Inc.



JOHN A. PANTAZIS was born in Athens, Greece, in 1941. He received his M.S. in physics from Northeastern University in 1967. While attending Northeastern University, he worked for the High Energy Physics Group at the Cambridge Electron Accelerator. Since 1969, he has worked at the Physics Research Division of Emmanuel College, where he has been involved in development of high-altitude balloon experiments and satellite instrumentation encompassing proton telescope and electrostatic analyzers. He is cofounder of AMPTEK, Inc., a manufacturer of hybrid preamplifiers, as well as an inventor holding several U.S. patents.



FREDERICK W. SCHENKEL was born in Jersey City in 1932 and earned a B.S.E.E. degree at Fairleigh Dickinson University in 1958. During 1955-63, he was engaged in physical electronics R&D and engineering with the Allen B. DuMont and CBS Laboratories. Mr. Schenkel joined APL in 1963 as a section supervisor in the Microelectronics Group. Since 1965, he has been with the Space Department, where he is a program manager and assistant group supervisor. His major involvements are with sensor and electro-optic systems design and analysis, including the DODGE satellite's color TV camera system, which took the first color pictures of the full earth. He was responsible for the Small Astronomy Satellite star mappers built at APL and for the development of the Attitude Transfer System and optical metrology for MAGSAT. He is the program manager and electro-optic system designer for the AIM, AIRS, and OPEN auroral imagers.

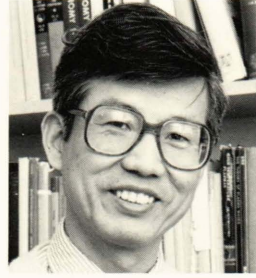


BERNARD S. OGORZALEK was born in Middletown, Conn., in 1951 and joined APL after receiving an M.E. degree in electrical engineering from Cornell University in 1974. Since then, he has been a member of the Space Systems Applications Group, where he has been involved in the digital electronics design of tracking receivers, data collection systems, and, most recently, satellite imaging experiments. For the HILAT auroral imager, he designed the instrument control electronics and performed the instrument integration and testing.



ROBERT E. HUFFMAN was born in Breckenridge, Tex., in 1931 and earned a Ph.D. at California Institute of Technology in 1958. He has been at the Air Force Geophysics Laboratory since 1958, where he is a supervisory research chemist. He has published extensively in the fields of ultraviolet spectroscopy of atmospheric gases and in ultraviolet measurements of the earth's radiative environment. Dr. Huffman was the principal investigator of the Auroral Ionospheric Mapper ultraviolet imaging sensor on the HILAT satellite. He was also principal investigator on the vacuum ultraviolet backgrounds experiment on the S3-4 satellite and on the horizons ultraviolet program on a shuttle flight. He was program manager of Project Chaser and ultraviolet program manager of the Multispectral Measurements Program. These programs measured ultraviolet missile-exhaust plume characteristics.

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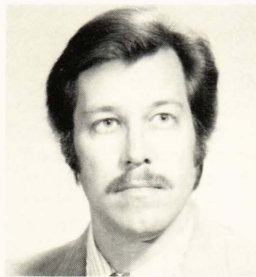
CHING-I. MENG was born in Sian, China, in 1940 and grew up in Taiwan. He came to the United States in 1963 to study such polar geophysical phenomena as the aurora and geomagnetic storms at the Geophysical Institute of the University of Alaska. From 1969 to 1978, he was a research physicist at the Space Sciences Laboratory of the University of California at Berkeley, specializing in the morphology of magnetospheric physics.

Dr. Meng joined APL in 1978 and is involved in the investigation of solar-terrestrial interactions, plasma and field morphology of the magnetosphere, spacecraft charging, and terrestrial atmospheric emissions. He is also studying the global imaging of auroral display.



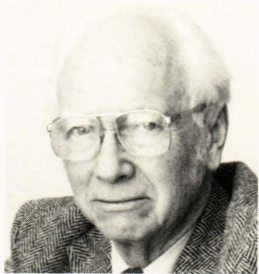
HERBERT C. CARLSON, JR., is chief of the Ionospheric Physics Branch at the Air Force Geophysics Laboratory. Born in Brooklyn in 1937, he received his Ph.D. in radio propagation from Cornell University in 1965. In 1973, leaving the position of head of the Ionospheric Physics Department at Arecibo, he went to the University of Texas at Dallas to participate in the beginning of the Atmospheric Explorer Satellite Program.

He served at the National Science Foundation from 1977-79 as Aeronomy Program Director, while also developing a major new National Science Foundation initiative in atmospheric sciences. From 1979-81, he served as its first program manager for upper atmospheric facilities. His publications are primarily in the areas of ionospheric and plasma physics, ionospheric modification with high-power HF "heating," radar techniques applied to sensing ionospheric properties and mesosphere-stratosphere-troposphere winds, optical sensing of thermospheric properties, and high-latitude ionospheric irregularity processes as they affect RF systems.



MICHAEL J. KESKINEN was born in Washington, D.C., in 1949. He received his Ph.D. in theoretical plasma physics from Cornell University in 1977, where he was a Cornell Graduate Fellow during 1974-75. After leaving Cornell, Dr. Keskinen accepted a National Academy of Sciences Resident Research Associateship at the Naval Research Laboratory in Washington, D.C., and in 1980 joined the Naval Research Laboratory staff.

He has lectured in France and the Federal Republic of Germany on nonlinear plasma theory and space plasma physics. Currently he is a group leader in the theoretical space physics section at the Naval Research Laboratory.



WILLIAM H. AVERY was born in Ft. Collins, Colo., in 1912 and received the Ph.D. in physical chemistry from Harvard in 1937. He engaged in postdoctoral research in molecular physics at Harvard until 1939, when he joined the Shell Oil Co. to do research in combustion kinetics. During World War II, he joined the NDRC group and engaged in rocket propellant development. Since joining APL in 1947, Dr. Avery has engaged

in combustion research, rocket and ramjet development, urban transportation studies, and, most recently, development of ocean thermal energy.

During 1970-77, he was Assistant Director for Research and Development and, since 1977, has been Director of Ocean Energy Programs. He is a Fellow of the AIAA, a director of The Combustion Institute, and has received the Hickman medal of the American Rocket Society and the Sir Alfred C. Egerton Gold Medal of The Combustion Institute.



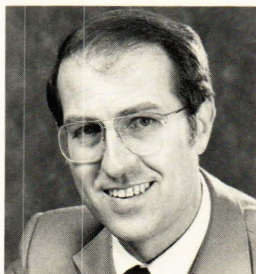
LOUIS MONCHICK received his Ph.D. in chemistry from Boston University in 1954 and worked for the University of Notre Dame and General Electric before joining APL in 1957. Since 1963, he has been a member of the Research Center except for three stints as visiting professor at The Johns Hopkins University and brief stays as visiting scientist at the Max-Planck Institute in Munich and the Universities of Bielefeld and Leiden.

He is a member of the APL Principal Professional Staff and a lecturer in the Johns Hopkins Department of Chemical Engineering. Dr. Monchick has written extensively in the fields of diffusion-controlled reactions, gas transport properties, molecular collisions, and chemically induced dynamic electron polarization, and recently has developed an interest in the aurora.



BRUCE W. HAMILL was born in Boston in 1941 and received a Ph.D. in experimental cognitive psychology from The Johns Hopkins University in 1974. In 1977, he joined the U.S. Army Research Institute for the Behavioral and Social Sciences as a research psychologist. Since joining APL in 1979, Dr. Hamill has been a senior staff psychologist in the Milton S. Eisenhower Research Center, where he has conducted research on

human visual information processing and on the cognitive basis of acquiring and representing knowledge in knowledge-based artificial intelligence systems. He is currently working with the Strategic Systems Department to develop a knowledge-based system for automating analysis of sonar data and is collaborating on the introduction of knowledge-based systems and other artificial intelligence technologies into APL's research and development programs.



DAVID M. RUST was born in Denver, Colo., in 1939 and received a Ph.D. in astrophysics from the University of Colorado in 1966. Before joining APL in 1983, he was employed by American Science and Engineering, Inc., in Cambridge, Mass., and Greenbelt, Md., where he served as the Solar Maximum Mission Observatory Coordinator and as chairman of the Solar Maximum Year Study of Energy Release in Flares. Dr.

Rust's specialties are in the physics of solar activity and in solar observatory instrumentation. He served on the NASA Solar Physics Study Panel, which, in 1975, outlined the goals and requirements for the Solar Maximum Mission. He is an associate editor of *Solar Physics*. At APL, he is the principal investigator for Hard X-Ray Imaging Spectrometer data analysis and manager of the solar magnetograph project.



MAYNARD L. HILL was born in 1926 in Pennsylvania, where his home was under the landing approach path to the local airport. He received an M.S. degree in metallurgy from Pennsylvania State University in 1951. After working at the Westinghouse Research Laboratories, he joined APL in 1960 and 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, Mr. Hill changed his vocation to the development of remotely piloted vehicles for such military applications as battlefield surveillance, electronic countermeasures, and weather observation. His invention of electrostatic stabilization created a new avocational interest in building and flying models to investigate the effects of weather on the electric field.