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- ZIMMERMAN, D. D.—*Evolution of Microelectronic Packaging*, **7**, 2, November–December 1967, pp. 10–14
- ZMUDA, A. J.—*Solar-Terrestrial Disturbances and*

*Solar Protons in July 1961*, **1**, 3, January–February 1962, pp. 16–20

——— *The Auroral Oval*, **6**, 2, November–December 1966, pp. 2–8.

——— See HAAVE, C. R.

## PUBLICATIONS

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

- L. M. Spetner, "Natural Selection versus Gene Uniqueness," *Nature* **226**, No. 5249, June 6, 1970, 948–949.
- W. J. Wright, "The Engineer as an Individual," *EDN* **15**, No. 14, July 15, 1970, 71–76.
- T. O. Poehler and J. R. Apel, "Far Infrared Cyclotron Resonance in  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$ ," *Phys. Letters* **32A**, No. 4, July 27, 1970, 268–269.
- A. Brandt and L. L. Perini, "Particle Injection into a Uniform Flow," *J. Spacecraft and Rockets* **7**, No. 7, July 1970, 880–881.
- W. M. Waters, "Adaptive Radar Beacon Forming," *IEEE Trans. Aerospace and Electronic Systems* **AES-6**, No. 4, July 1970, 503–513.
- S. M. Krimigis, P. Verzariu (APL), J. A. Van Allen (Univ. of Iowa), T. P. Armstrong (Univ. of Kansas), T. A. Fritz (Goddard Space Flight Center), and B. A. Randall (Univ. of Iowa), "Trapped Energetic Nuclei  $Z \geq 3$  in the Earth's Outer Radiation Zone," *J. Geophys. Res., Space Phys.* **75**, No. 22, Aug. 1, 1970, 4210–4215.
- C. S. Leffel, Jr., "Analysis of Ions Extracted from a Plasma Puff in Magnetic Guide Fields," *J. Appl. Phys.* **41**, No. 9, Aug. 1970, 3759–3767.
- A. G. Schulz and F. D. Rollo (JHU Medical Institutions), "A Method for Measuring Radioiodine Uptake which Corrects for Thyroid Depth," *J. Nuclear Med.* **11**, No. 8, Aug. 1970, 508–513.
- W. C. Caywood, G. Dailey, "Dynamic Response Characteristics of the Urban Gravity-Vacuum Transit System," *J. Eng. for Industry*, Aug. 1970, 524–530.
- T. A. Potemra, A. J. Zmuda, B. W. Shaw, and C. R. Haave, "VLF Phase Disturbances, HF Absorption, and Solar Protons in the PCA Events of 1967," *Radio Sci.* **5**, Nos. 8, 9, Aug.–Sept. 1970, 1137–1145.

## ADDRESSES

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

The following four presentations of "Computer Animation" were made in Washington, D.C. by S. E. Anderson:

*National Bureau of Standards, ACM Technical Standards*, June 25, 1970;

*Office of Civil Defense*, August 10, 1970;

*Naval Research Laboratory*, August 19, 1970;

*National Security Agency*, August 27, 1970.

The following two lectures were presented at the *SIAM National Meeting*, Denver, Colorado, July 1, 1970:

D. W. Fox and V. G. Sigillito, "Lower Bounds for the Radial Lithium Atom's Lowest Eigenvalue";

L. W. Ehrlich and J. R. Kuttler, "The Method of Special Choice Applied to a Matrix."

The following three papers were presented at the *Society of Nuclear Medicine*, Washington, D.C., July 10–12, 1970:

L. G. Knowles, E. F. Hart, and A. G. Schulz, "Effect of Line Spacing and Time Smoothing on Lesion Detectability in Scanning";

L. C. Kohlenstein and A. G. Schulz, "Observer Performance Criteria for Evaluating Radionuclide Imaging Systems";

F. D. Rollo (Upstate Medical Center, Syracuse, N.Y.) and A. G. Schulz, "A Quantitative Evalua-

tion of Pulse Height Selection in Scanning Systems."

R. K. Frazer, "Thermal Stress Limitations of Alumina and Pyroceram 9609 A-Sandwich Radomes," *Georgia Institute of Technology, 10th Electromagnetic Window Symposium*, Atlanta, July 29–31, 1970.

The following two papers were presented at the *AIAA Guidance, Control, and Flight Mechanics Conference*, Santa Barbara, California, August 17–20, 1970:

C. E. Williams, B. E. Tossman, and N. K. Brown, "Interactive Hybrid Computer Simulation of Magnetically Damped Spacecraft";

B. E. Tossman, "Variable Parameter Nutation Damper for SAS-A."



## HONORS AND AWARDS

The Applied Physics Laboratory was the recipient of an I-R 100 Award, sponsored by Industrial Research, Inc., for its work in developing a rechargeable cardiac pacemaker, in collaboration with The Johns Hopkins Medical Institutions.

G. L. Dugger, Supervisor of the Hypersonic Propulsion Group, and F. S. Billig, Supervisor of the Ramjet Project, received in August 1970 the Silver Medal of the Combustion Institute for their paper entitled "Inter-

action of Shock Waves and Heat Addition in Design of Supersonic Combustors." The presentation was made at the 13th Symposium on Combustion, held at the University of Utah.

Certificates of Commendation were awarded by the Navy in a June 4 ceremony to nine APL staff members for their contributions to the Ship's Anti-Missile Integrated Defense (SAMID) program. Those honored were J. M. Aitchison, B. K.

Carter, R. N. Cauble, E. R. Chatham, C. E. Dorsett, W. P. Reese, R. O. Robinson, T. W. Sheppard, and E. K. Wharton. Letters of Appreciation were distributed to 24 additional staff members.

On July 2, 1970, the Institute of Navigation awarded to R. B. Kershner, Supervisor of the Space Development Department, the 1969 Norman P. Hays Award for "providing outstanding encouragement, inspiration, and support contributing to the advancement of navigation."

## WITH THE AUTHORS



F. E. Nathanson, co-author of "Frequency Agility for Radar Target Detection and Tracking," was born in Baltimore, Maryland. After receiving the B.E. degree in electrical engineering from The Johns Hopkins University, he attended Columbia University on a Higgins Fellowship and was awarded an M.S. degree in electrical engineering in 1956. Mr. Nathanson joined the staff of the Applied Physics Laboratory in 1956 as a specialist in radar search techniques, radar map matching, and electronic-optical devices. At APL he designed an optical map-matcher, worked on search and detection

techniques for the AWS radar, and was responsible for laboratory and prototype search, ECM, and track-while-scan systems. In 1965 he was appointed Assistant Group Supervisor of the Advanced Radar Techniques Group. He is the author of the reference book, *Radar Design Principles—Signal Processing and the Environment*, published by McGraw-Hill Book Company in 1969. In June 1970 Mr. Nathanson joined the Technology Service Corporation as Manager of their Washington Division.



J. Patrick Reilly, co-author of "Frequency Agility for Radar Target Detection and Tracking," is a native of Detroit, Michigan. He received the B.E.E. degree from the University of Detroit in 1962 and the M.S. degree in Applied Science from George Washington University in 1967. Mr. Reilly joined the Applied Physics Laboratory in 1962. He participated in the Navy's Typhon Radar Program in the design and conduction of reliability acceptance testing. As a member of the Laboratory's Advanced Radar Techniques Group, he has worked in the areas of signal processing, clutter problems, and target characteristics, both

from the theoretical and experimental viewpoints. He has also participated in radar developmental programs, and has worked on a number of problems involving existing Fleet radars. Recently Mr. Reilly has worked in developing signal-processing techniques for acoustic signatures in battlefield surveillance. He is the author of a chapter on MTI systems and has contributed other portions to a reference book authored by F. E. Nathanson: *Radar Design Principles—Signal Processing and the Environment*, published by McGraw-Hill Book Company in 1969.