

Summer Session courses were successfully introduced at the Laboratory in the summer of 1967 and continued in 1968.

In 1966-67 the proportion of non-Laboratory participants exceeded the number of APL staff members for the first time. This trend has continued and the ratio of non-Laboratory to APL staff members increased to 2 to 1 in 1968-69 and 3 to 1 in the summer of 1968.

The degree program of Master of Science (with a major in Numerical Science) was first announced in 1966-67 and attracted 102 candidates. Twenty

persons have now received that degree.

Twelve APL staff members received the degree of Master of Science (with a major in Electrical Engineering) at the June 1968 Commencement. A check of the 31 other individuals who received the degree at that time showed that 27 of these had taken a substantial part of their program at the APL Center.

The evening College added two additional Master of Science programs at the Laboratory, commencing in September 1967, in Space Technology and in Applied Physics. The program in Space Technology provides a special-

ized training in space environment and spacecraft systems. The master's degree in Applied Physics is designed to provide the background for the development and implementation of advanced complex systems.

#### PERSONNEL CHANGES

The Laboratory staff decreased from 2566 as of June 30, 1967 to 2519 as of June 30, 1968. There was a gain of 32 in the professional senior staff, bringing the number to 644, and in the associate staff a net loss of 41 reduced the total to 577.

R.E. GIBSON  
Director

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## ADDRESSES

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

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- G. M. Starken, "Science of the Sea," *American Society of Mechanical Engineers, Ohio Section, Parkersburg, West Virginia*, December 10, 1968.
- A. N. Jette, "Comments on the Hyperfine Interactions of  $V_K$  Centers," *American Physical Society, San Diego, California*, December 19, 1968.
- R.M. Fristrom, "Fire Research and Chemistry," *American Chemical Society, Texas Section, San Antonio, Texas*, January 7, 1969.
- R.M. Fristrom, "The Chemistry of Flames," *American Chemical Society, El Paso Section, El Paso, Texas*, January 8, 1969.
- R.M. Fristrom, "Molecular Beams—A Tool for Chemical Research," *University of Texas, Department of Chemistry Colloquium, El Paso, Texas*, January 8, 1969.
- G.H. Mowbray, "Some Research on and Theorizing about a Visual Transient Phenomenon," *University of Arizona, Psychology Colloquium, Tucson, Arizona*, January 8, 1969.
- C. Feldman and K. Moorjani, "Amorphous Semiconductors," *NASA Electronic Research Center, Cambridge, Massachusetts*, January 9, 1969.
- R.M. Fristrom, "The Chemistry of Flames," *American Chemical Society, Wichita Falls, Duncan Section, Wichita Falls, Texas*, January 9, 1969.
- R.M. Fristrom, "Fire Research and Chemistry," *Midwestern University,*

*Department of Chemistry Colloquium, Wichita Falls, Texas, January 9, 1969.*

R.M. Fristrom, "Molecular Beams—A Tool for Chemical Research," *American Chemical Society, South Plains Section, Lubbock, Texas, January 10, 1969.*

K. Moorjani and T. Tanaka (Catholic University), "Decoupling Schemes in the Green's Function Theory of Spin  $\frac{1}{2}$  Heisenberg Ferromagnet," *American Physical Society, New York, New York*, February 3-6, 1969.

S.N. Foner, "Mass Spectrometry of Very Fast Reactions," *Fourth Middle Atlantic Regional Meeting, American Chemical Society, Washington, D.C.*, February 12-15, 1969.

A.I. Mahan, "Some Boundary Value Problems Involving Cylindrical Dielectric, Absorbing, and Active Media," *Optical Society of America, San Diego, California*, March 11-15, 1969.

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## PUBLICATIONS

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

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C. Feldman and W.A. Gutierrez (Melpar, Inc.), "Switching and Negative Resistance in Amorphous Boron Layers," *J. Appl. Phys.* **39**, No. 5, Apr. 1968, 2474-2476.

N. Rubinstein, V.G. Sigillito, and J.T. Stadter, "Upper and Lower Bounds to Bending Frequencies of Non-Uniform Shafts, and Applications to Missiles," *Shock and Vibration Bull.*

No. 38, Part 2, Aug. 1968, 169-176.

R. Turner and T.O. Poehler, "Emission from HCN and H<sub>2</sub>O Lasers in the 4 to 13  $\mu$ m Region," *Physics Letters* **27A**, Sept. 9, 1968, 479-480.

W.H. Guier, "Note on Determining Range from Sextant Altitude," *Navigation* **15**, No. 4, Winter 1968-69, 366-375.

A.N. Jette and P. Cahill, "Theory of Polarization of Molecular Line Radiation Excited by Electron Impact," *Phys. Rev.* **176**, No. 1, Dec. 5, 1968, 186-193.

W.G. Spohn, "On the Lattice Constant for  $|x^3 + y^3 + z^3| \leq 1$ ," *Math. Computation* **23**, No. 105, Jan. 1969, 141-149.

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## APL COLLOQUIA

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Jan. 10—"Design of Small Submersibles," by J.P. Craven, Department of the Navy.

Jan. 17—"Airborne Collision Avoidance Technology," by F. White, Aviation Transport Association.

Jan. 24—"Ultra-Short Laser Pulses," by A.J. DeMaria, United Aircraft Research Laboratories.

Jan. 31—"Terradynamics," by J.L. Colp, Sandia Laboratories.

Feb. 7—"An Open-Ended Discussion on Human Settlements," by C.A. Doxiadis, Doxiadis Associates, Athens, Greece.

Feb. 14—"How One Reconstructs an Ancient Civilization," by W.S. Albright, The Johns Hopkins University.

Feb. 28—"Are the Continents Drifting?" by J.L. Worzel, Lamont Geological Observatory, Columbia University.

## WITH THE AUTHORS



*R.W. Hart*, co-author of "Theory of Corneal Structure," was previously represented in the *Digest* as author of "Combustion Instability in Solid Rockets," published in the July-August 1962 issue. He was born in Yankton, S.D., and received his B.A. and M.S. degrees from the University of Iowa, and the Ph.D. degree in physics from the University of Pittsburgh in 1949. He was a lecturer and instructor in physics at the University of Pittsburgh and later at The Catholic University of America. Dr. Hart came to APL in 1950 as a Physicist in the Research Center Task Study Group and presently is Supervisor of the Theoretical Problems Group. He has contributed to the development of theories of ramjet engine optimum performance, of low-angle beam-rider missile guidance, statistical mechanics, scattering theory and microwave spectroscopy, and has directed research in other fields related to the APL missile programs. Currently, he is engaged in theoretical work on physics of the eye.

*R.A. Farrell*, Co-author of "Theory of Corneal Structure," is a native of Providence, Rhode Island. He received the B.S. degree in physics from Providence College; the M.S., also in physics, from the University of Massachusetts; and the Ph.D. in physics from The Catholic University of America in



1965. Before coming to the Laboratory in 1965, Dr. Farrell had experience at the Newport Underwater Ordnance Station in the test and evaluation of measuring apparatus, torpedo components, and explosives. From 1962 to 1965 he was at Catholic University in the Statistical Mechanics Group, first as a research assistant, and then as a post-doctoral researcher. At APL Dr. Farrell is a member of the Theoretical Problems Group in the Research Center and is interested primarily in problems of theoretical statistical mechanics. He is a member of the American Physical Society.

*M.E. Langham*, co-author of "Theory of Corneal Structure," was born in London, England. He received a B.Sc. degree in Chemistry in 1945 and a Ph.D. degree in Physiology in 1949 from London University. Before coming to the United States in 1959, he was a Senior Research Investigator of the Medical Research Council in England. In 1959 he was invited to the Johns Hopkins Medical School to become Director of Research of the Wilmer Institute and



Associate Professor of Ophthalmology. His main interest has been in the physiology of the circulation of fluids in the eye, the regulation of intraocular pressure, and physiology of corneal hydration and transparency. Dr. Langham is a member of the Physiological Society of Great Britain, The American Physiological Society, and The Association for Research in Ophthalmology.