

WRITING AND RESEARCH AND DEVELOPMENT AWARDS

The Applied Physics Laboratory annually honors members of its professional staff for meritorious writing and accomplishments under its Independent Research and Development (IR&D) programs. The 16 November 1992 dinner meeting of the Principal Professional Staff marked the occasion of the formal announcement of recipients of the Lifetime Achievement Awards, the 1991 writing awards, and the R. W. Hart prizes in research and development.

The Lifetime Achievement Award is APL's most prestigious publishing honor, presented when an individual's publication record reflects sustained and meritorious achievement and publication in science and engineering. Unlike awards for outstanding publication in a specific calendar year (the influence and significance of which may not yet be demonstrated), the Lifetime Achievement Award can be judged on a more comprehensive scale. Carl O. Bostrom and Robert M. Fristrom were selected for this honor because of their singular contributions, spanning productive and distinguished lifelong careers.

The Director of the Applied Physics Laboratory from 1980 to 1992, Carl Bostrom is the author of numerous scientific papers published in highly regarded archival and peer-reviewed journals and books. His various designs of instruments to study low-energy charged particles in space have had a significant effect on space physics exploration and have been used on twenty-seven Navy and NASA spacecraft.

Robert Fristrom is a world-recognized authority on combustion and flame processes. His expertise in the study of the structure of laminar flames led to the publication of *Flame Structure* in 1965. The book is a critical, quantitative discussion of the measurement and interpretation of flame structure data and remains a frequently consulted reference. A revised and expanded version will be published by Oxford University Press in the near future. Fristrom is the recipient of several awards, most notably the Silver Medal of the Combustion Institute and the Hillebrand Award of the Chemical Society of Washington. His publications include three books and over ninety technical and review articles.

Fifty-one publications were submitted by eight departments in this year's writing awards program. Sponsored and evaluated by the Editorial Board of the *Johns Hopkins APL Technical Digest*, judges based their selections of winning publications primarily on mastery of the subject matter, literary quality, and importance of the science and engineering. Nine papers and four books won awards in the 1991 competition, and eight papers and two books received honorable mention.

Awards given for outstanding work published in the *Technical Digest* were dominated by articles appearing in the well-reputed Volume 12, Number 2 issue dedicated to the JHU/APL-Medical School Collaborative Biomedical Program. James A. St. Ville and his co-authors, including APL's John A. Ecker, won the Walter G. Berl Award for their article on sources of midhigh pain after human total hip joint replacement surgery. Dale Olsen, John H. Cristion, and Charles W. Spaur received honorable mention for their article on the development of a reliable automatic seizure detection algorithm using a single electroencephalographic channel. Also awarded honorable mention were Moise H. Goldstein, Jr., and his co-authors, including Robert E. Jenkins of the Space Department, for their article discussing a new approach to sensory information processing through a study of the physiology of the human ear.

This year's program saw a precedent-setting number of books—six—submitted for the Technical and Scientific Book Award. Historically, few books were submitted because of the enormity of the effort, and they were included in the special publications "catchall" category. The record number of books competing in the 1991 program perhaps indicates a new trend in publishing at APL.

The R. W. Hart Prize for Excellence in Independent Research and Development was established in 1989 to signify the importance of the IR&D program to the long-term future of the Laboratory. The prize was named for Robert W. Hart, former Assistant Director for Research and Exploratory Development, to recognize his many contributions to these activities. Two annual prizes are awarded, one for research and the other for development, to recognize high-quality innovative projects during the preceding year. Candidates are recommended by their department heads and judged by review criteria developed by the IR&D Committee. Three projects were recognized in the 1991 program: two received prizes and one honorable mention. The R. W. Hart Prize for research was awarded to James D. Franson and Hillar Ilves for their work in encrypting information utilizing quantum physics techniques. Honorable mention was given to Isaac N. Bankman for contributions in mathematical models of the single neuron. In the development category, Robert E. Jenkins and Andreas G. Andreou received the prize for their work in exploiting very large scale integrated chips tailored to specific advanced signal processing applications.

The recipients of the 1991 awards are listed on the following pages, along with the titles of their publications and projects.

Linda L. Maier

LIFETIME ACHIEVEMENT AWARD

Carl O. Bostrom, “*in recognition of his experimental and analytical contributions to the understanding of space plasmas, his leadership of the Space Department and of the Laboratory, and his years of dedication to the support and development of space science and of the missions and goals of the Applied Physics Laboratory.*”

Robert M. Fristrom, “*in recognition of his experimental studies of combustion and flame processes and his co-authorship with Arthur A. Westenberg of the trailblazing book Flame Structure.*”

AWARDS RECOGNIZING PUBLICATIONS BY APL STAFF MEMBERS (1991)

OUTSTANDING FIRST PAPER IN AN UNCLASSIFIED OR CLASSIFIED PUBLICATION

Award

Kenneth E. Williams, “Prediction of Solar Activity with a Neural Network and Its Effect on Orbit Prediction,” *Johns Hopkins APL Technical Digest* **12**(4), 310-317 (1991).

OUTSTANDING PAPER IN THE *JOHNS HOPKINS APL TECHNICAL DIGEST*

Walter G. Berl Award

James A. St. Ville (Orthopaedic Bioengineering Institute), John A. Ecker (APL), James M. Winget (Silicon Graphics, Inc.), and Meri H. Berghauer (Consultant), “The Anatomy of Midhigh Pain after Total Hip Arthroplasty,” *Johns Hopkins APL Technical Digest* **12**(2), 198-214 (1991).

Honorable Mention

Dale E. Olsen, John A. Cristion, and Charles W. Spaur, “Automatic Detection of Epileptic Seizures Using Electroencephalographic Signals,” *Johns Hopkins APL Technical Digest* **12**(2), 182-191 (1991).

Moise H. Goldstein, Jr. (JHU/JHMD), Weimin Liu (JHU), and Robert E. Jenkins (APL), “Speech Processing by Real and Silicon Ears,” *Johns Hopkins APL Technical Digest* **12**(2), 115-128 (1991).

OUTSTANDING RESEARCH PAPER IN AN UNCLASSIFIED REFEREED PUBLICATION

Awards

John C. Sommerer (APL), William L. Ditto (College of Wooster), Celso Grebogi and Edward Ott (University of Maryland), and Mark L. Spano (NSWC), "Experimental Confirmation of the Scaling Theory for Noise-Induced Crises," *Physical Review Letters* **66**(15), 1947-1950 (1991).

Anthony T. Y. Lui (APL), Charles L. Chang and Alan Mankofsky (Science Applications International Corp.), Hung K. Wong (Southwest Research Institute), and Dan Winske (Los Alamos National Laboratory), "A Cross-Field Current Instability for Substorm Expansions," *Journal of Geophysical Research* **96**(A7), 11,389-11,401 (1991).

Honorable Mention

Richard A. Meyer (APL), Karen D. Davis (University of Toronto), Richard H. Cohen (Gillette Research Institute), Rolf-Detlef Treede (University of Mainz, Germany), and James N. Campbell (JHU/JHH), "Mechanically Insensitive Afferents (MIAs) in Cutaneous Nerves of Monkey," *Brain Research* **561**, 252-261 (1991).

James D. Franson, "Violations of a Simple Inequality for Classical Fields," *Physical Review Letters* **67**(3), 290-293 (1991).

OUTSTANDING DEVELOPMENT PAPER IN AN UNCLASSIFIED REFEREED PUBLICATION

Awards

Bradley G. Boone, Oodaye B. Shukla, and David H. Terry, "Extraction of Features from Images Using Video Feedback," in *Proceedings SPIE Automatic Object Recognition* **1471**, 390-403 (1991).

Norman A. Blum, Bliss G. Carkhuff, Harry K. Charles, Jr., Richard L. Edwards, and Richard A. Meyer, "Multisite Microprobes for Neural Recordings," *IEEE Transactions on Biomedical Engineering* **38**(1), 68-74 (1991).

Honorable Mention

Scott M. Glenn (Rutgers University), David L. Porter (APL), and Allan R. Robinson (Harvard University), "A Synthetic Geoid Validation of Geosat Mesoscale Dynamic Topography in the Gulf Stream Region," *Journal of Geophysical Research* **96**(C4), 7145-7166 (1991).

Craig R. Moore, William C. Trimble, Marion L. Edwards, and Thomas R. Sanderson, "Cryogenic Performance of a GaAs MMIC Distributed Amplifier," *IEEE Transactions on Microwave Theory and Techniques* **39**(3), 567-571 (1991).

OUTSTANDING PAPER IN A CLASSIFIED REFEREED PUBLICATION

Awards

John R. Benedict, "Missions and Roles for U.S. Submarines in Third World Operations (U)," in *Proceedings of the Fourth Submarine Technology Symposium*, JHU/APL STD-R-2034, pp. 31-45 (1991).

Vernon L. Stark, "Role of the Environment in Submarine Nonacoustic Detectability (U)," in *Proceedings of the Fourth Submarine Technology Symposium*, JHU/APL STD-R-2034, pp. 99-111 (1991).

SCIENTIFIC AND TECHNICAL BOOK AWARD

Awards

John C. Curlander (JPL) and Robert N. McDonough (APL), *Synthetic Aperture Radar Systems and Signal Processing*, John Wiley & Sons, Inc., New York (1991).

Fred E. Nathanson (Georgia Technology Research Institute), J. Patrick Reilly (APL), and Marvin N. Cohen (Georgia Technology Research Institute), *Radar Design Principles*, McGraw-Hill, New York (1991).

Ching-I. Meng (APL), Michael J. Rycroft (British Antarctic Survey), and Louis A. Frank (University of Iowa) (eds.), *Auroral Physics*, Cambridge University Press, Cambridge (1991).

Robert C. Beal (ed.), *Directional Ocean Wave Spectra*, The Johns Hopkins University Press, Baltimore (1991).

Honorable Mention

Larry H. Bennett (NIST), Yury Flom (NASA), and Kishin Moorjani (APL), *Advances in Materials Science and Applications of High Temperature Superconductors*, NASA (1991).

Teun Timmers (Erasmus University, Rotterdam) and Bruce I. Blum (APL), *Software Engineering in Medical Informatics*, Elsevier North-Holland, Amsterdam (1991).

SPECIAL PUBLICATIONS AWARD

Award

John C. Murphy, Leonard C. Aamodt, and Jane W. Maclachlan Spicer, "Principles of Photothermal Detection in Solids," Chapter 2 in *Principles & Perspectives of Photothermal & Photoacoustic Phenomena* 1, pp. 43-94, Elsevier, New York (1991).

Honorable Mention

Michael E. Thomas, Thomas M. Cotter, and William J. Tropf, "Temperature Dependence of the Complex Index of Refraction," "Aluminum Oxynitride (ALON)," "Spinel," "Magnesium Aluminum Spinel ($MgAl_2O_4$)," "Magnesium Fluoride (MgF_2)," and "Yttrium Oxide (Y_2O_3)," chapters in *Handbook of Optical Constants of Solids II*, Academic Press, New York (1991).

Robert S. Bokulic, "Use Basic Concepts to Determine Antenna Noise Temperature," *Microwaves & RF* 30(3), 107-115 (1991).

R. W. HART PRIZES HONORING EXCELLENCE IN INDEPENDENT RESEARCH AND DEVELOPMENT (1991)

RESEARCH

Prize Winner

Quantum Mechanical Encryption

James D. Franson
Hillar Ilves

Honorable Mention

Applied Mathematics—Analyzing the Electrical Activity of Individual Neurons

Isaac N. Bankman

DEVELOPMENT

Prize Winner

Application of Custom VLSI to Advanced Processing

Robert E. Jenkins
Andreas G. Andreou