The APL Colloquium

David M. Silver

The APL Colloquium has been a 59-year tradition at the Laboratory. The lectures are held weekly, generally from October to May, and cover an eclectic range of topics. The early history of the APL Colloquium, covering its first four decades through 1988, has been previously described in the *Technical Digest*. The present article highlights some of the history of the institution and provides a chronological inventory of the colloquium lectures from 1988 to 2006.

INTRODUCTION

A colloquium is a meeting for the exchange of views covering a broad range of topics, usually led by a different lecturer on a different topic at each meeting, and followed by questions and answers. A colloquium series is aimed at a diverse audience and differs from a seminar series, which tends to be geared to specialists in the field and is consequently more restrictive and esoteric with respect to the topics covered. Given this distinction between colloquium and seminar, the APL Colloquium is certainly rightly named, covering an eclectic range of topics intended to appeal to the APL staff in general.

The APL Colloquium, begun in 1947, is held weekly, generally on Friday afternoons from October to May, and is one of the longest standing technical and scientific lecture series in the Washington/Baltimore area. The goal of the colloquium has been to bring to the Laboratory scientific scholars, technical innovators, industry leaders, government sponsors, military personnel, policy makers, authors, journalists, commentators, and photographers to inform, educate, and enlighten Laboratory staff on what is currently exciting, relevant, and of value to the work and people of APL.

The colloquium schedule has been chronicled in previous *Technical Digest* articles, beginning with the first issue in 1961 of the precursor *APL Technical Digest*.[1] This tradition has continued to the present in the *Digest*, where the "Miscellanea" section regularly contains a list of recent colloquia (the Laboratory has traditionally used the Latin plural, colloquia, rather than the English form, colloquiums). The early history and first four decades of the colloquium through 1988 have been described in another previous issue of the *Digest* in an article by Ernest Gray and Albert Stone.[2]

Although information regarding the earliest days was fragmentary (there were no surviving records from that period), Gray and Stone managed to provide the flavor of the colloquium series and some specification of memorable speakers, some of whom were or later became Nobel Laureates. Speakers through the 1950s included Jesse Beams, Robert H. Dicke, C. Stark

Draper, Scott Forbush, Buckminster Fuller, George Gamow, Peter Goldmark, Donald R. Griffin, Marc Kac, Herman Kahn, Polykarp Kusch (later awarded the Nobel Prize), Otto Neugebauer, Franco Rasetti, then Captain Hyman Rickover, Richard B. Roberts, Arnold Siegert, S. Fred Singer, John C. Slater, Nobel Laureate Harold C. Urey, John A. Wheeler, Nobelist Eugene Wigner, and Nobelist Chen N. Yang.

Starting with 1960 through 1988, Gray and Stone were able to give a year-by-year summary of colloquium speakers. The list of notable presenters included the following. *1960s:* William S. Albright, Nobelist Nicolaas Bloembergen, Richard W. Courant, Nobelist Peter Debye, Milton S. Eisenhower, Nobelist Leon M. Lederman, Margaret Mead, Nobelist Marshall W. Nirenberg, and Nobelist Norman F. Ramsey. *1970s:* Nobelist Hannes Alfvén, Amar G. Bose, Wernher von Braun, Louis B. Leakey, Arnall Patz, Nobelist Ilya Prigogine, Paul S. Sarbanes, Joseph D. Tydings, James A. Van Allen, and E. Bright Wilson. *1980s:* Harold Brown, Nobelist Melvin Calvin, W. Edwards Demming, Nobelist Riccardo Giacconi, Douglas R. Hofstadter, Paul W. Klipsch, Philip E. Leakey, Nobelist Alan G. MacDiarmid, Hans Mark, Elliott W. Montroll, Nobelist Daniel Nathans, Raold Z. Sagdeev, Nobelist Herbert A. Simon, Solomon H. Snyder, and Jerome B. Wiesner. In addition, the colloquium also featured several APL staff members as speakers each year.

The present article provides a few brief highlights of the history of the APL Colloquium and documents activities from 1988 to 2006.

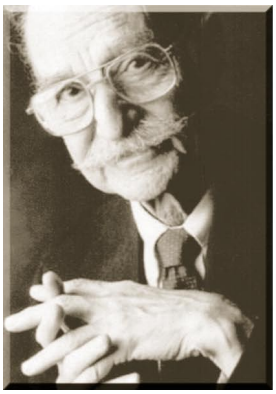
HIGHLIGHTS OF APL COLLOQUIUM HISTORY

The founder of the APL Colloquium was Robert Herman (now deceased), whose initial conception in 1947 was a scientific research lecture series intended for the APL Research Center staff, but the colloquium quickly broadened in scope to include the entire APL community. The early lecture series was held late on Friday afternoons at the Laboratory's 8621 Georgia Avenue facility in Silver Spring. Robert Herman was in charge of the colloquium from 1947 to 1955, when he left the Laboratory.

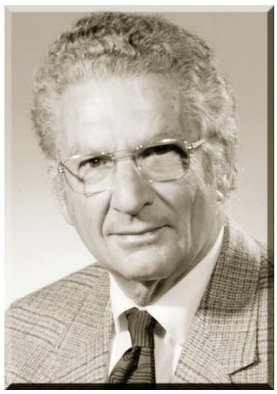
Albert Stone took over and ran the colloquium from 1955 to 1961. At the start of this period, the William S. Parsons Auditorium in the then-new Howard County facility was phased in as the venue for the colloquium, with the first one held there on 21 October 1955. Parsons Auditorium greatly expanded the colloquium accessibility with its capacity of 200 participants. The tradition of having a colloquium luncheon for the speaker and attended by a small number of APL staff was also established. In 1961, Stone handed over the responsibility of running the colloquium to Ernest Gray.

Gray held the reins from 1961 until he retired in 1994. During this 33-year period, between 25 and 30 colloquia per year—around 900 colloquium lectures—were conducted under Gray's command. One of the innovations during this period started in November 1961, when all colloquia were audiotaped and then, by 1962, videotaped. Video permitted the lectures to be transmitted on closed circuit to remote TV monitors in the Howard County cafeteria whenever the audience exceeded the capacity of Parsons Auditorium. Copies of the videotapes in VHS format were deposited in APL's R. E. Gibson Library so that staff members who had to miss a lecture could catch up later. In 1969, a weekly Colloquium Information Sheet and a monthly colloquium schedule were distributed to the APL staff. The Colloquium Information Sheet provided a half-page biography of the speaker and a half-page synopsis of the talk. The Kossiakoff Center opened in 1983, allowing some colloquia to be held in the much larger 500-seat auditorium. Also in 1983, live broadcast of the colloquium lecture to Homewood via a microwave link to TV monitors in Maryland Hall was instituted, but eventually abandoned in 2004.

Colloquium Leaders

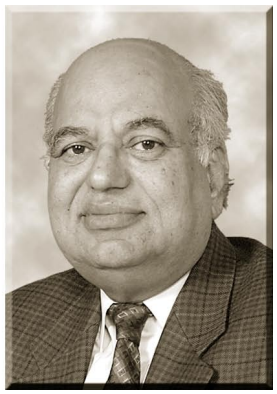


Robert Herman
1947–1955



Albert Stone
1955–1961

Ernest Gray
1961–1994



Kishin Moorjani
1994–2002

Kishin Moorjani became the next colloquium leader in 1994. A colloquium website, www.jhuapl.edu/colloquium, was established in 1995, providing the schedule of talks and an archive of previous talks. Starting in 1999, the website included an author biography and topic synopsis for each colloquium. In late 2001, the Colloquium Information Sheet and the monthly colloquium schedule transitioned from paper sent to the staff to an electronic version e-mailed to staff. However, the recipients on the external mailing list continued to receive paper announcements. Moorjani was in charge of the colloquium from 1994 until his retirement in 2002, whereupon I was given the task of running the colloquium.

In 2003, a colloquium feedback page was added to the colloquium website to provide a mechanism for comments, suggestions, and evaluations of the lectures. Also that year, the distribution of the Colloquium Information Sheet and schedule transitioned to a fully electronic mailing, with the commencement of e-mail to external recipients. Another development in 2003 was the move to record the colloquium lectures on DVD-R, in addition to VHS, for deposit in the Gibson Library, where they are available for viewing or borrowing.

SPECIAL COLLOQUIA

During the year, there are certain special colloquia. One of them is the Archie I. Mahan Colloquium, held annually since its inauguration in December 1991. Under the provisions of his will, former APL staff member Dr. Mahan bequeathed a sum of money to APL to establish a special memorial fund in his name, to invest the money and to use the earnings from his bequest "to establish and maintain an annual Christmas lecture on scientific subjects." The Laboratory has honored this request by designating a colloquium lecture close to Christmastime to be the Archie I. Mahan Colloquium. The rostrum of speakers has been as follows: Isaac N. Bankman, Robert F. Behler, Marc H. Brodsky, Dennis M. Bushnell, Sayeed Choudhury, Bruce A. Dale, Donald Duncan, James D. Franson, Stuart Gilman, R. G. Greenler, David J. Nagel, Thomas A. Potemra, J. W. Wagner, E. Wolf, and Neil Zimmerman.

Dr. Mahan was a member of the APL staff from 1955 until he retired in 1979. He held an A.B. in physics and mathematics (1931) from Friends University in Wichita, Kansas, and a Ph.D. in physics (1940) from The Johns Hopkins University. At APL, his research focus was physical and geometric optics and lasers, while outside the Laboratory he was particularly active in the Optical Society of America as well as the Washington Philosophical Society and the American Institute of Physics.

On 7 October 1994, the annual Ernest P. Gray Colloquium was inaugurated to honor Ernie's 33 years of running the colloquium. The first of these was given by Gray himself on "Reminiscence of My Association with APL Colloquia." Typically, the Ernest P. Gray Colloquium is held early in the colloquium year and is presented by an APL staff member. The list of speakers in this series follows: Frederick S. Billig, Wayne A. Bryden, Denis J. Donohue, James Franson, Robert Fry, Tom Krimigis, Donald G. Mitchell, John Sommerer, James C. Spall, Joseph J. Suter, and Paul J. Waltrup.

With the beginning of the 21st century, eight colloquia were held and designated "Millennial Challenges: Colloquia 2000." The speakers in this series shared their expectations and speculations for the new century in the areas of national security, space science and technology, and education. The list of speakers in this series was as follows: William R. Brody, Frank L. Fernandez, Daniel S. Goldin, Shirley Ann Jackson, then Rear Admiral Michael G. Mullen, then Admiral Rodney P. Rempt, Richard T. Roca, Robert Skinner Jr., and Virginia Trimble. An issue of the *Technical Digest* documents these lectures.[3]

Following 9/11, 15 colloquia were held through the 2001–2003 period labeled "The New Critical Challenge: The War on Terrorism." These colloquia dealt with aspects of the terrorist threat, bioterrorism, counterterrorism, defense policies, legal issues, military responses, and intelligence concerns. The list of speakers was as follows: Stephen Biddle, Marius Deeb, Richard D. Fisher Jr., Vicki Freimuth, Sheldon Greenberg, Richard Haver, Bruce Hoffman, James F. Jarboe, Edward MacKerrow, Bradley Roberts, S. Frederick Starr, Peter F. Verga, Michael Vlahos, Ruth Wedgwood, and R. James Woolsey.

Two additional special colloquia are held each year to focus on the diversity of talent in two communities. A Black History Month Colloquium each February since 2001 has hosted Ellis Barksdale, Ronald Demon, Anthony D. King, Calvin Mackie, John Slaughter, and Woodrow Whitlow. A Hispanic Awareness Month Colloquium, held during the mid-September to mid-October period, was initiated in 2004 and hosted Orlando Figueroa. The U.S. Surgeon General, Vice Admiral Richard Carmona, MD, MPH, was the speaker for the 2005 event.

COLLOQUIUM CHRONOLOGY: 1988–2006

The following are groupings of colloquia for the approximately October to May colloquium season, alphabetized within each time frame. The speaker's name and affiliation and the title of the talk are provided. Again, more information for some of the later talks (after 1999) can be found at the colloquium website, www.jhuapl.edu/colloquium, which contains a brief biography of the speaker and a synopsis of the talk. The current colloquium schedule is also available at that website.

1988–1989

John N. Bahcall (Institute for Advanced Study), *Solar Neutrinos*
Harry K. Charles Jr. (APL), *Electronic Packaging*

Rafael De La Llave (Princeton University), *Computer-Assisted Proofs in Mathematical Physics*
Alexander J. Dessler (Rice University), *Status of the Small-Comet Hypothesis*
Farouk El-Baz (Boston University), *In Search of Pharaoh's Boat*
David Emin (Sandia National Laboratories), *Large Bipolarons and High-Temperature Superconductivity*
Raul Fainchtein (APL), *Scanning Tunneling Microscopy and Spectroscopy at APL*
Paul D. Garnett (SYSCON Corp.), *Computer Viruses*
John A. Goodman (University of Maryland), *The Anomalous Muon Content of Air Showers from Hercules X-1*
Henry F. Gray (Naval Research Laboratory), *Field-Emitter Arrays: A Basis for Vacuum Microelectronics*
Celso Grebogi (University of Maryland), *Chaos and Fractals in Nonlinear Dynamics*
O. W. Greenberg (University of Maryland), *How Well Is the Pauli Exclusion Principle Obeyed?*
James J. Griffin (University of Maryland), *The Quadronium-Rosetta Stone for the Electron-Positron Puzzle*
Steven H. Hanke (JHU), *Privatization: Public Versus Private Costs*
Alexander E. Kaplan (JHU), *Nonlinear and Quantum Optics of a Single Electron*
Julian H. Krolik (JHU), *Problems in the Formation of the Cosmic Microwave Background*
Paul D. Lett (National Institute of Standards and Technology), *Laser Cooling of Atoms to Microkelvin Temperatures*
M. Masuda (Research Association of Superconducting Magnetic Storage, Japan), *Recent Topics on Energy Storage Using Superconductivity*
Paul S. Miller (JHU), *Potential Therapeutic Applications for Anti-Sense Nucleic Acid Analogs*
Kishin Moorjani (APL), *Superconducting Technology: A Look at Japan*
Roger A. Morse (Cornell University), *The Africanized Honeybee*
Richard S. Muller (University of California, Berkeley), *New Opportunities with Microdynamic Systems*
Eugene N. Parker (University of Chicago), *Do We Really Understand Our Nearest Star, the Sun?*
Per-Anders Persson (New Mexico Institute of Mining and Technology), *New Developments in Explosives Technology*
David Savitz (University of North Carolina), *Childhood Cancer and Exposure to 60-Hz Magnetic Fields from Power Lines*
John Sheffield (Oak Ridge National Laboratory), *Fusion Energy*
Abner Shimony (Boston University), *Hidden Variables and Bell's Theorem: Theory and Experiment*
A. W. Sleight (DuPont and University of California, Santa Barbara), *The Chemist's View of High Temperature Superconductivity*
Thomas H. Stix (Princeton University), *Atmospheric Processing*
F. Whittle (ret.), *ISOABE Award Address: The Invention and Development of the Gas Turbine Engine*

1989–1990

John R. Apel (APL), *Internal Waves in a Norwegian Fjord: "Dead Water" Revisited*
Bruno W. Augenstein (The Rand Corp.), *Antiproton Science and Technology*
K. K. Bajaj (Arizona State University), *Quantum Well Opto-Electronics*
Bruce A. Barnett (JHU), *New Results from the Stanford Linear Collider Z^0 Experiment: A Limit on the Number of Neutrino Types*
Nancy W. Boggess (NASA Goddard Space Flight Center), *The Initial Cosmic Background Explorer (COBE) Results*
S. Denardi (University of Massachusetts), *Indoor Air Quality*
Walter J. Doherty (IBM Watson Research Laboratories), *Computing Directions for the 1990s*
Robert C. Dynes (AT&T Bell Laboratories), *Vortex States in Superconductors: Microscopics and Macroscopics*
A. R. Eastham (Queens University, Canada), *Magnetically Levitated Trains*
Martin O. Harwit (National Air and Space Museum), *Astronomical Discovery and Astrophysical Understanding*
Roderick V. Jensen (Yale University), *Chaos in Classical and Quantum Systems: From Atoms to Asteroids*
Donald J. Kessler (NASA Johnson Space Center), *Orbital Debris: Implications for Spacecraft Operations*
Daniel J. Kleitman (Massachusetts Institute of Technology), *Computational Complexity and Economics*
A. Refik Kortan (AT&T Bell Laboratories), *Scanning Tunneling Microscope Observations of Nonperiodic Crystals*
Henry A. Kues (APL), *Effects of RF Radiation on the Primate Eye*
Barbara G. Levi (*Physics Today*), *Land-Based Missiles: The Basis for Decision*
Thomas S. Mang (Roswell Park Memorial Institute), *Clinical Treatment of Various Cancer Types by Means of Photodynamic Therapy*
Reinhold Mann (Oak Ridge National Laboratory), *Mobile Robotics for Nuclear Energy–Related Applications*
Paul H. Nitze (JHU School of Advanced International Studies), *From Hiroshima to Glasnost: Reflections on Four Perilous Decades*
P. L. Olson (JHU), *The Structure of Convection in the Earth's Mantle*
Allan Robinson (Harvard University), *Progress in Geophysical Fluid Dynamics*
Michael W. Roth (APL), *Neural Networks, Machine Vision, and Automatic Target Recognition*
Richard Samuels (Massachusetts Institute of Technology), *Getting America Ready for Japanese Science and Technology*
Edward C. Stone (California Institute of Technology), *The Voyager Encounter with Neptune*
Darrel F. Strobel (JHU), *The Atmospheres of the Outer Planets and Their Satellites*
Alexander Szalay (JHU), *Correlations of Galaxies on a Cosmic Scale*
Theodore B. Taylor (Independent Consultant), *Nuclear Disarmament: How Far Shall We Go?*
Zlotko Tesanovic (JHU), *Superconductivity in a Very High Magnetic Field*
Joseph J. Tribbia (National Center for Atmospheric Research), *Modern Weather Prediction*
Samuel A. Werner (University of Missouri, Columbia), *The Aharanov-Bohm Effect with Neutrons*
Alfred Y. Wong (University of California, Los Angeles), *Active Global Experiments for Preserving the Ozone Layer*
Joseph Zyss (Centre National d'Études des Télécommunications), *Symmetry, Chemistry, and Optics: Approach to Molecular Engineering in Nonlinear Optics*

1990–1991

Ronald M. Atlas (University of Louisville), *Bioremediation of Oil Spills*
Eliot A. Cohen (JHU School of Advanced International Studies), *American Strategy After Desert Storm*
Robert Constanza (University of Maryland Chesapeake Biological Laboratory), *Ecological Economics*
Samuel T. Durrance and Arthur F. Davidsen (JHU Center for Astrophysical Sciences), *The Hopkins Ultraviolet Telescope: An Odyssey in Space and Time*
T. Fischell (Stanford University), *Advances in the Treatment and Understanding of Coronary Artery Disease*
M. H. Goldstein (JHU), *Speech Processing by Real and Silicon Ears*

Ronald E. Gots (National Medical Advisory Service), *Toxins and Health: Science vs. Perception*
Wayne M. Itano (National Institute of Standards and Technology), *The Quantum Zeno Effect*
Dwight L. Jaggard (University of Pennsylvania), *Fractal Electrodynamics*
Mark Kastner (Massachusetts Institute of Technology), *The Single Electron Transistor*
Gerald M. Masson (JHU), *Software Fault Tolerance Using Certification Trails*
Guy M. McKhann (JHU), *Approaches to the Neurobiology of Language*
P. G. Nelson (National Institutes of Health), *Electrical Activity and Development of the Nervous System*
Donald L. Price (JHU), *The Neurobiology of Alzheimer's Disease and Animal Models: Mechanisms of Disease and Prospects for Therapy*
Michael Prise (AT&T Bell Laboratories), *Optical Computation Using SEEDs (Self-Electro-optic Effect Devices)*
Mark A. Reed (Yale University), *Quantum Semiconductor Nanostructures: Physics and Applications*
Raymond G. Roble (National Center for Atmospheric Research), *Modeling the General Circulation of the Thermosphere/Ionosphere and Its Response to Solar Variability*
Edmond C. Roelof (APL), *Global Imaging of Planetary Magnetospheres*
Raold Z. Sagdeev (University of Maryland), *Crisis of the Soviet Space Science Program*
Thomas Schelling (University of Maryland), *Meeting the Greenhouse Challenge*
Bassam Z. Shakhashiri (University of Wisconsin), *Communicating Science*
Richard E. Smalley (Nobelist, Rice University), C_{60}*: Chapter Two*
Horst L. Stormer (AT&T Bell Laboratories), *Optics with Two-Dimensional Electrons*
Katherine J. Strandburg (Northwestern University and Argonne National Laboratory), *Phase Transitions in Limited Connectivity Neural Networks*
Kevin E. Trenberth (National Center for Atmospheric Research), *Global Warming and Recent Climate Change: Observation and Modeling*
Edwin L. Turner (Princeton University), *Gravitational Lensing and Cosmology*
Ralph R. Weichselbaum (University of Chicago), *Molecular Mechanisms for Radiation Metabolism in Tumor Cells*
Carl E. Wieman (JILA/University of Colorado), *Developments in Laser Trapping and Cooling*
J. R. Williams (JHU), *Treatment of Cancer with Radiolabeled Antibodies*
James A. Yorke (University of Maryland), *Chaos and Fractals in the Forced Damped Pendulum*

1991–1992

J. R. Austin, Christina Myles-Tochko, Mark A. Baker, Jeffrey L. Hanson, and R. J. Taylor (APL), *The Ocean Environment: Introduction; Global Ocean Characteristics; Internal Ocean Dynamics; Sound in the Ocean; Remote Sensing of the Ocean*
Chris J. Burrows (JHU Space Telescope Science Institute), *Fixing the Hubble Space Telescope*
Praveen Chaudhari (IBM Research Laboratories), *Critical Current, Grain Boundaries, and SQUIDs in the High Temperature Superconductors*
Gerald Cook (George Mason University), *Two Topics in Robotics: Kinematic Redundancy and Uncertain Environments*
John Dassoulas, George C. Weiffenbach, William H. Guier, Alexander Kossiakoff, Carl O. Bostrom, Vincent L. Pisacane, and Stamatios M. Krimigis (APL), *35 Years of Space Science at APL*
Alexander J. Dessler (Rice University), *The Dirigible and the Space Shuttle: An Historic Analogy*
Quentin E. Dolecek (APL), *Scientific Visualization with Personal Computers*
C. W. Francis Everitt (Stanford University), *Testing of Einstein in Space: A Marriage of Physics and Technology*
Fereydoon F. Family (Emory University), *Dynamics of Fractal Surfaces*
Murray Feshbach (Georgetown University), *Health and Environmental Crises in the Former Soviet Union*
Albert A. Galeev (Institute for Space Research, Russia), *Space Research in the Former Soviet Union*
Vitaly L. Ginzburg (Russian Academy of Sciences Lebedev Physical Institute), *High Temperature Superconductivity*
Steven H. Hanke (JHU), *Transforming the Russian Economy*
James W. Head III (Brown University), *Venus Volcanism: Recent Results from Magellan*
Arthur F. Hebard (AT&T Bell Laboratories), C_{60} *from Soot to Superconductivity*
Robert E. Kanigel (JHU), *Ramanujan: The Man Who Knew Infinity*
Alan J. Krupnick (Resources for the Future), *The Cost and Benefits of Smog Control*
Stephen P. Maran (NASA Goddard Space Flight Center), *What the Hubble Telescope Is Telling Us*
P. Meakin (DuPont Co.), *Droplet Coalescence: Physics Application and Aesthetics*
Leslie Misrock (Pennie and Edmonds), *Planning for and Surviving the Patent Wars of the 1990s*
T. Mitchell (North Carolina State University), *A Fault-Tolerance Super Network of the U.S. Air Force's Major Operational Commands*
Steven Muller (Twenty-First Century Foundation), *Technology and Society in the 21st Century*
Walter H. Munk (Scripps Institution of Oceanography), *Global Acoustics*
Jagdish Narayan (National Science Foundation and North Carolina State University), *Emerging Areas in Materials Research*
D. M. Pardon (JHU), *Molecular Engineering of the Anti-Tumor Immune Response*
Andrea Prosperetti (JHU), *The Sound of Bubbles*
Calvin F. Quate (Stanford University), *Imaging and Surface Modification with Scanning Probes: The Tunneling and Force Microscopes*
Peter C. Searson (JHU), *Light-Emitting Porous Silicon Structures*
Leonard Shlain (Author), *Art and Physics: Parallel Visions in Space, Time, and Light*
S. Fred Singer (University of Virginia), *Are Human Activities Affecting the Climate?*
John C. Sommerer (APL), *Confronting Chaos Theory with Experiments*
G. R. Uhl (JHU and National Institute for Drug Abuse), *Structure of the Dopamine Transporter: Receptor for Cocaine and Parkinson's Disease Neurotoxins*
George W. Wetherhill (Carnegie Institution of Washington), *The Formation of the Solar System*
Emil Wolf (University of Rochester), *The Redshift Controversy and Correlation-Induced Changes in Spectra*
Eric D. Young (JHU), *Information Processing in the Auditory System*

1992–1993

R. K. Adair (Yale University), *The Physics of Baseball*
J. V. Badding (Pennsylvania State University), *High-Pressure Chemistry of Hydrogen in Metals*

Daniel R. Baum (Hughes Aircraft-Hughes Training, Inc.), *Virtual Reality: Applications, Requirements, and Promise*
Robert R. Birge (Syracuse University), *The Biochemistry of the Visual Process*
Eleanor Chelimsky (Government Accounting Office), *Interactions of Social Science and Public Policy*
Chia-Ling Chien (JHU), *Giant Magneto-Transport Properties in Artificially Structured Solids*
Joel Darmstadter (Resources for the Future), *Policy Options for Managing the Greenhouse Problem*
Ingrid Daubechies (Rutgers University and AT&T Bell Laboratories), *Wavelets—An Overview*
Arthur F. Davidsen (JHU), *Scientific Results from the Hopkins Ultraviolet Telescope*
William L. Ditto (College of Wooster), *Controlling Cardiac Chaos*
Donald L. Eddins, John M. Watson, and Ronald L. Wilson (APL), *Strategic Systems Department—The Challenges of the Past/The Promise of the Future; The Birth of SSD (1955–1964); APL Involvement in Containing Soviet Expansionism; The 90s and Beyond*
John B. Fenn (Yale University), *Electrospray Mass Spectrometry: Wings for Molecular Elephants*
James A. Fill (JHU), *The Mathematics of Card Shuffling and a Self-Organizing List Scheme*
Anthony F. Garito (University of Pennsylvania), *The Nonlinear Optics of Organic Systems*
G. Richard Garritson, J. T. Stadter, John J. Wozniak, Paul J. Waltrup, and F. G. Arcella (APL), *Aeronautics Department: From Bumblebee to the Twenty-First Century; Engineering Programs in the Aero Department; Applications of Fluid Dynamics; From COBRA to NASP—48 Years of Ramjet Engine Development at APL; Meeting New Opportunities*
Michael W. Geis (Massachusetts Institute of Technology Lincoln Laboratory), *Thin Film Diamond Devices and Diamond Transistors*
Robert G. Greenler (University of Wisconsin, Milwaukee), *Some Atmospheric Optical Phenomena: Rainbows, Halos, and Glories*
Eugene J. Hinman, R. L. Trapp, and Lewis H. Zitzman (APL), *The Fleet Systems Department in the New World Order*
Lawrence Hunter (National Library of Medicine), *Mega-Classification of Protein Sequences*
Klaus H. Jacob and Leonardo Seeber (Columbia University Lamont-Doherty Observatory), *Earthquake Hazards in Eastern North America and the Recent Earthquake Sequence Near Columbia, MD*
A. F. Karr (University of North Carolina and National Institute of Statistical Sciences), *Buy the Number? A Probabilistic Analysis of the Maryland State Lottery*
Haris N. Koutsopoulos (Massachusetts Institute of Technology), *Intelligent Vehicle-Highway Systems*
K. Lande (University of Pennsylvania), *Present Status of Solar Neutrino Observations and Plans for New Experiments*
John M. Logsdon (George Washington University), *The Outlook for the Space Program in the Clinton Administration*
Noel C. MacDonald (Cornell University), *Nanomechanisms for Transporting Atoms, Molecules, and Other Small Objects*
C. Kumar N. Patel (AT&T Bell Laboratories), *Photonics*
John D. G. Rather (NASA Headquarters), *Asteroid and Comet Impact Hazards and Potential Mitigation Methods*
Peter Riesz (National Cancer Institute), *Some Chemical Effects of Ultrasound*
J. Anthony Tyson (AT&T Bell Laboratories), *Mapping Cosmic Dark Matter*
Donald J. Williams (APL), *The NASA Galileo Program: Mission to Jupiter*
Larry B. Wolff (JHU), *Polarization Vision*
Henryk Wozniakowski (Columbia University), *The Curse of Dimensionality*
Ka-Che Yip (University of Maryland, Baltimore County), *Medical Modernization in China: The Search for a Chinese Model*

1993–1994

Thomas L. Carroll (Naval Research Laboratory), *Synchronizing Chaotic Circuits*
Donald M. Eigler (IBM Almaden Research Center), *Quantum Corrals*
Catherine C. Fenselau (University of Maryland, Baltimore County), *Biological Applications of Mass Spectrometry*
Carl E. Fichtel (NASA Goddard Space Flight Center), *The Compton Gamma-Ray Observatory: New Eyes to View the Universe*
Robert W. Flower (APL), *Developing, Using, and Marketing a New Technology for Visualizing Ocular Blood Flow*
Holland C. Ford (JHU Space Telescope Science Institute), *New Results from the Hubble Space Telescope*
James D. Franson (APL), *Nonlocality in Quantum Optics: From Paradox to Practical Applications*
Lori S. Goldner (National Institute of Standards and Technology), *Kicking and Splitting Atomic Beams with Light*
T. P. Hughes (University of Pennsylvania), *Managing Polaris: An Historical Perspective*
Joseph L. Katz (JHU), *Formation of Mixed Oxide Powders in Flames: Processes, Products, and Industrial Applications*
T. W. Keller (IBM Federated Sector Services Corp.), *Providing Quality Software for the Space Shuttle*
D. L. Kershner, Raymond L. Yuan, and Kim E. Richeson (APL), *Transportation Research at APL*
Kenneth L. Koch (Pennsylvania State University Hershey Medical Center), *Motion Sickness: Stomach and Hormone Responses During Nausea*
Francis P. Kuhajda (JHU), *New Approaches to the Diagnosis and Treatment of Breast Cancer*
Robert W. Massof (JHU), *Low Vision Enhancement: Applications of Virtual Environments*
Charles V. Meneveau (JHU), *Self-Similarity of Fractals and Turbulent Flows*
William H. Murray (Deloitte and Touche), *Security, Audit, and Control of Client-Server Computer Architectures*
Stanford R. Ovshinsky (Energy Conversion Devices, Inc.), *The Nickel Metal Hydride Battery for Electric Vehicles*
G. R. Pasternack (JHU), *Tackling the Diagnostic Dilemmas of Prostate Cancer by Molecular Approaches*
P. James Peebles (Princeton University), *Cosmology—Past, Present, and Future*
Ivars Peterson (*Science News*), *Chaos in Newton's Clock: The Historical Origins of Chaos Theory*
Eugene W. Shoemaker (U.S. Geological Survey), *The Crash of Periodic Comet Shoemaker-Levy 9 on Jupiter*
S. Fred Singer (University of Virginia and The Science and Environmental Policy Project), *Stratospheric Ozone: Politically Correct and Other Views*
Alan D. Sloan (Iterated Systems, Inc.), *Fractal Image Compression for Pattern Recognition*
Rao Tummala (Georgia Institute of Technology), *Status and Challenges in Multichip Packaging*
C. M. Varma (AT&T Bell Laboratories), *Why High-Temperature Superconductivity Is Such an Important Problem*
L. Washington (University of Maryland, College Park), *Fermat's Last Theorem*
Albert Wattenberg (University of Illinois), *The Birth of the Nuclear Age: December 2, 1942*

Joseph Weber (University of Maryland, College Park), *New Approaches to Neutrino Detection*
David B. Weishampel (JHU), *Under Our Feet: Dinosaurs of the East Coast*

1994–1995

Charles Bolden (Colonel, U.S. Naval Academy), *The Importance of Space Exploration by Humans*
Andrew F. Cheng (APL), *Near Earth Asteroid Rendezvous: APL's First Planetary Mission*
Leon Cohen (Hunter College), *Time-Frequency-Scale Description of Signals*
Sankar Das-Sarma (University of Maryland), *Self-Organized Critical Phenomena: Non-Equilibrium Growth*
David DeVorkin (National Air and Space Museum), *APL's Participation in the V-2 Era*
E. Donald Elliott (Fried, Frank, Harris, Shriver, and Jacobson), *Rethinking the Role of Science in Risk Evaluation*
Adam Falk (JHU Department of Physics and Astronomy), *The Beautiful Bottom Quark*
Holland C. Ford (JHU), *Searching for Black Holes*
Ernest P. Gray (APL, ret.), *Reminiscence of My Association with APL Colloquia*
V. Daniel Hunt (Technology Research Corp.), *Quality Management: State of the Practice*
James S. Langer (University of California, Santa Barbara), *Dynamics of Earthquakes and Fracture*
Charles M. Lieber (Harvard University Department of Chemistry), *High-Temperature Superconductors: Probing the Magnetic Flux Lines*
Ho J. Paik (University of Maryland, College Park), *Superconducting Gravity Gradiometers: Design and Applications*
Charles S. Peskin (New York University Courant Institute of Mathematical Sciences), *Muscle and Blood: A Computer Model of the Heart*
Mark Robbins (JHU Department of Physics and Astronomy), *Molecular Mechanisms for Friction*
Steven L. Rolston (National Institute of Standards and Technology), *Laser-Cooled Atoms: The Coldest Thing Around*
Azriel Rosenfeld (University of Maryland, College Park, Center for Automation Research), *Perspectives on Computer Vision*
Donald Saari (Northwestern University Department of Mathematics), *Mathematical Complexity of Simple Economics*
Erica Schoenberger (JHU Department of Geography and Environmental Engineering), *Corporate Transformations: Culture, Strategy, and Competitiveness*
William N. Sharpe Jr. (JHU Department of Mechanical Engineering), *Tensile Testing of Small Specimens*
Mark J. T. Smith (Georgia Institute of Technology), *Data Compression for Image and Video Signals*
Barry A. Solomon (WR Grace and Co.), *Membrane-Based Hybrid Artificial Organs*
Michael F. Summers (University of Maryland, Baltimore County, Department of Chemistry), *The Structure of HIV-1 Proteins by Nuclear Magnetic Resonance*
James J. Valdes (U.S. Army Edgewood Research, Development, and Engineering Center), *Destruction of the World's Chemical Agent Stockpiles: Alternative Technologies and Political Issues*
John Wack (National Institute of Standards and Technology), *Internet Security*
J. W. Wagner (JHU), *Measuring Dimensions with Light*
Fred C. Wellstood (University of Maryland, College Park), *Magnetic Microscopy Using Superconducting Sensors*
John Wozniak (APL), *Advanced Natural Gas Vehicle Development*
Maria T. Zuber (JHU), *Shape and Internal Structure of the Moon from the Clementine Mission*

1995–1996

L. Edward Antosek (Captain, USS *Abraham Lincoln*), *U.S. Navy Telemedicine*
Dimitri T. Azar (JHU Wilmer Ophthalmological Institute), *Refractive Surgery*
Frederick S. Billig (APL), *Missions Technology and Prospects for Hypersonic Flight*
Samuel A. Bowring (Massachusetts Institute of Technology), *The Earth's Early Evolution*
Ludwig Brand (JHU Department of Biology), *Macromolecular Confirmations by Picosecond Spectroscopy*
Rama Chellappa (University of Maryland, College Park), *Context-Based Exploitation of Aerial Images*
Joel A. Cohen (Rockefeller University), *Population Growth and Earth's Human Carrying Capacity*
Robert J. Cotter (JHU Department of Pharmacology and Molecular Science), *Smart Molecular Detectors for Biological Research*
Tim V. Cranmer (National Federation of the Blind and The Braille Research Center), *Pencils, Pictures, and Computers: Technologies for the Blind in Sight*
Arthur F. Davidsen (JHU Department of Physics and Astronomy), *Observations of Intergalactic Helium with the Hopkins Ultraviolet Telescope*
Sylvester J. Gates Jr. (University of Maryland, College Park, Department of Physics), *Superspace: Can You Really Get There from Here?*
Donald A. Henderson (JHU School of Public Health and Hygiene), *New and Emerging Infections*
Maynard L. Hill (APL, ret.; Consultant on UAV), *World Record Model Aeroplanes*
Jan Hines (AT&T Microelectronics), *Japanese Manufacturing Methodologies and Practices*
Gerald L. Kulcinski (University of Wisconsin), *Safe and Clean Energy from the Moon*
Robert S. Langer Jr. (Massachusetts Institute of Technology), *Polymeric Delivery Systems for Drug Delivery and Tissue Engineering*
Richard S. Lindzen (Massachusetts Institute of Technology), *Global Warming*
Ralph L. McNutt (Massachusetts Institute of Technology), *A New Perspective on the Solar Neutrino Problem*
Stuart L. Pimm (University of Tennessee), *The Future of Biodiversity*
Gary H. Posner (JHU Department of Chemistry), *Designer Drugs for Healthier Living*
Thomas A. Potemra (APL), *A Century of Polar Expedition*
Daniel E. Prober (Yale University), *Hot Electronic Physics and Detectors in Superconductors*
Noah Rifkin (U.S. Department of Transportation), *Advanced Technology Needs and Applications in Transportation*
Barbara Ryden (Ohio State University), *The Fate of the Universe*
Joel M. Schnur (Naval Research Laboratory), *Lipid Tubules: Formation, Characterization, and Applications*
William S. Seegar (U.S. Army Edgewood Research, Development, and Engineering Center), *Space Technology and Natural Resource Conservation*
Michael Unser (National Institutes of Health), *Fast Algorithms for Wavelet Transforms*

1996–1997

Jeffrey D. Abramson (Brandeis University), *Electronic Democracy: Implications of the New Technologies*
David Bloom (Harvard University), *Demographic Transitions and Economic Miracles*
Gilbert B. Chapman II (Chrysler Corp.), *Nondestructive Evaluation of Automotive Materials*

Robert W. Farquhar (APL), *Missions to Comets and Asteroids: Past, Present, and Future*
Paul D. Feldman (JHU Department of Physics and Astronomy), *Recent Observations of Comets*
Frederick Jelinek (JHU Department of Computer Engineering), *Speech-Related Research in the United States*
John Kauer (Tufts University School of Medicine), *Odor Encoding by the Olfactory System: From Biology to an Artificial Nose*
Henry W. Kendall (Massachusetts Institute of Technology), *Disposal of Nuclear Waste*
Daniel Kleppner (Massachusetts Institute of Technology), *Bose-Einstein Condensation*
Lucy-Ann McFadden (University of Maryland, College Park, Department of Astronomy), *Making Sense of the Remote Sensing of Planetary Surfaces*
Elliott McVeigh (JHU Department of Biomedical Engineering), *Magnetic Resonance Imaging of the Heart*
James G. Neal (JHU Milton S. Eisenhower Library), *Technology and the Future of Scholarly Communications*
Gerard Piel (*Scientific American*), *Population, Environment, and Development*
Fred H. Proctor (NASA Langley Research Center), *Interaction of Aircraft Wakes with the Ground and Atmosphere*
Daniel H. Reich (JHU Department of Physics and Astronomy), *Magnetism in Arrays of Superconducting Rings*
Paul Richards (Columbia University Lamont-Doherty Observatory), *The Rotation of Earth's Inner Core*
George D. Rose (JHU Department of Biophysics and Biophysical Chemistry), *Protein Folding*
Vera C. Rubin (Carnegie Institution of Washington), *Multispin Galaxies*
Edward R. Scheinerman (JHU Department of Mathematical Science), *Circular Reasoning: From Partially Ordered Sets to Special Relativity*
Robin Blumberg Selinger (Catholic University of America), *Why Things Bend*
Peter Shor (AT&T Laboratories), *Quantum Computing and Error Correction*
Dava Sobel (Author), *Longitude*
Sara A. Solla (AT&T Laboratories), *The Dynamics of Learning from Examples*
James C. Spall (APL), *The Simultaneous Perturbation Method for System Optimization*
Donald J. Williams (APL), *Galileo's Arrival at Jupiter: Early Results*
Neil Zimmerman (National Institute of Standards and Technology), *Counting and Storing Electrons, One by One*

1997–1998

Andreas G. Andreou (JHU Department of Electrical and Computer Engineering), *Optoelectronic VLSI Microsystems*
R. Dean Astumian (University of Chicago), *Brownian Motion and Biomolecular Motors*
Charles H. Bennett (IBM), *Quantum Computers*
Richard P. Binzel (Massachusetts Institute of Technology), *Where Do Meteorites Come From?*
Marc H. Brodsky (American Institute of Physics), *The Role of Scientific Societies in the Changing World*
Wayne A. Bryden (APL), *Tiny TOF Mass Spectrometer for Biosensing*
Roger Crouch (NASA), *Microgravity Experiments: Adventures of an Astronaut*
Kenneth Dere (Naval Research Laboratory), *Solar Corona and Solar Wind: A New View*
Glenn S. Edwards (Vanderbilt University), *Vibrational Dynamics and Laser Surgery*
Raul Fainchtein (APL), *Think Small to Improve MRI*
Richard Fish (University of California, Berkeley), *Designer Resins for Environmental Remediation*
Anirvan Ghosh (JHU School of Medicine), *Molecular Mechanisms of Neural Development*
Marty R. Hall (APL), *The JAVA Revolution*
Alan A. Halpern (Michigan State University School of Medicine), *Magnetically Directed Chondrogenesis*
A. Frederick Hasler (NASA Goddard Space Flight Center), *Atmospheric Dynamics Observed by GOES Satellites*
Robert Kanigel (Author), *The Enigma of Efficiency*
Bernhard Keiser (Keiser Engineering, Inc.), *Digital Cellular and Personal Radio Systems*
David E. Keyes (Old Dominion University and NASA Langley Research Center), *Death and Taxes: Nets and Caches*
Michael Kleinberger (National Highway Traffic Safety Administration), *The Safety of Automobile Passengers: Biomechanical Testing and Analysis*
Arnold J. Mandell (Emory University and Florida Atlantic University), *Eigenfunction Styles: From Early Beethoven to Late Monk*
Elizabeth Ofili (Morehouse School of Medicine), *Telemedicine*
Stephen D. Senturia (Massachusetts Institute of Technology), *MEMS: Past Successes and Future Challenges*
Tycho Sleator (New York University), *Interferometry with Neutral Atoms*
Paul Smolensky (JHU Department of Cognitive Sciences), *Optimization in Language*
Jerry C. Taylor (Cato Institute), *Global Warming*
Edward J. Wegman (George Mason University), *Image Grand Tour*
Andreas Weigend (New York University), *Hidden Information in Financial Data*
James E. West (Bell Laboratories), *Auralization of Complex Environments*
Arjun G. Yodh (University of Pennsylvania), *Entropic Forces and Instabilities in Colloids*

1998–1999

Miquel Antoine (APL), *Mass Spectrometry and Human Spaceflight*
Arthur Bienenstock (White House Office of Science and Technology Policy), *National Science Policy*
Ilene J. Busch-Vishniac (JHU Whiting School of Engineering), *Design of Highway Noise Barriers*
Dennis M. Bushnell (NASA Langley Research Center), *Future Strategic Issues*
Al Christman (Former Historian of the Navy), *Deak Parsons: The Proximity Fuze and the Atomic Bomb*
Denis J. Donohue (APL), *Radar Propagation and Scattering from Ocean and Terrain*
Claire Ferguson and Helaman Ferguson (Authors and Institute for Defense Analysis), *Mathematics in Bronze and Stone*
William I. Gasarch (University of Maryland), *The Complexity of Problems*
Corey Gay (Institute for Science and International Security), *Verification of the Comprehensive Test Ban Treaty*
Anthony Kossiakoff (University of Chicago), *The Role of Molecular Adaptation in Cellular Communication*
Hans Mark (Director, Defense Research and Engineering), *Ice on the Moon*
John W. Melvin (Tandelta, Inc.), *Improving Vehicle Safety*
Scott L. Murchie (APL), *Mars: A Perspective from the Pathfinder*
Robert C. Pfahl Jr. (Motorola Advanced Technology Center), *Future Changes in Electronics*
George S. Philander (Princeton University), *Why Global Warming Is a Controversial Issue*
Stephanie L. Reel (JHU School of Medicine), *The Future of Healthcare*

Alan G. Robinson (University of Massachusetts), *Corporate Creativity: World-Class Idea Systems*
Steven L. Rolston (National Institute of Standards and Technology), *Optical Lattices: A New Solid State?*
Peter Schultz (Brown University), *Killer Impacts: Effect of Impact Angle*
Michael F. Shlesinger (Office of Naval Research), *Protein/Receptor Matching*
James A. Simmons (Brown University), *Signal Processing for Target Imaging*
Gregory W. Sullivan (University of Maryland), *The Search for Neutrino Mass at Super-Kamiokande*
Nitish Thakor (JHU Department of Biomedical Engineering), *Neuroengineering*
Forrest Tobey (JHU Peabody Institute), *The 21st Century Musical Ensemble*
Peter C. van Zijl (JHU School of Medicine), *MRI Methods for Studying Brain Functions*
Samuel L. Venneri (NASA), *Intelligent Synthesis Environment*
Ellen D. Williams (University of Maryland), *Fluctuations in Materials Science*
Robert S. Winokur (National Oceanic and Atmospheric Administration), *Environmental Satellite Information Systems: The Future Is Now*
Robert L. Wolke (University of Pittsburgh), *Kitchen Chemistry and Physics*
Donald K. Yeomans (Jet Propulsion Laboratory), *The Impact of Comets and Asteroids upon the Earth*

1999–2000

Mario Acuña (NASA), *The Mars Global Surveyor*
John D. Anderson (National Air and Space Museum), *Breaking the Sound Barrier*
Isaac N. Bankman (APL), *Laser Radar in Ballistic Missile Defense*
William R. Brody (President, JHU), *The Quantum Physics Model of the University in the New Millennium*
Claude R. Canizares (Massachusetts Institute of Technology), *First Results from the Chandra X-ray Observatory*
Gregory Chaitin (IBM), *A Century of Controversy over the Foundations of Mathematics*
Ralph Chapman (Smithsonian Institution), *The Virtual Triceratops: Creating the First Digital Dinosaur*
Ronald Demon (VectraSense Technologies, Inc.), *Footwear Technology on the Cutting Edge: Computerized Footwear*
Robert A. Eisenstein (National Science Foundation), *The Future of Physical Science: A View from Washington*
Frank L. Fernandez (Director, Defense Advanced Research Projects Agency), *DARPA in the 21st Century*
Roy Frieden (University of Arizona), *Physics from Fisher Information*
C. Lee Giles (NEC Research Institute), *Searching the Web: It Is Worse Than You Thought*
Thomas H. Guderjan (St. Mary's University), *Blue Creek: An Ancient Maya City*
James W. Head (Brown University), *Water on Mars: Recent Results on Oceans and Polar Deposits*
Russell Howard (Naval Research Laboratory), *Space Weather*
Shirley Ann Jackson (President, Rensselaer Polytechnic Institute), *Science and Engineering Education of Women in the 21st Century*
Douglas B. Lenat (Cycorp), *The CYC Project*
James Mayfield (APL), *Intelligent Web Searching*
Frank E. McGarry (Computer Sciences Corp.), *Attaining Level 5 in the Capability Maturity Model*
Michael I. Miller (JHU Center for Imaging Science), *Deformable Templates and Image Understanding*
Marc G. Millis (NASA), *Breakthrough Propulsion Physics Research Program*
David E. Moncton (Argonne National Laboratory), *Advanced Photon Source*
John J. Quinn (University of Tennessee), *The Fractional Quantum Hall Effect*
Eberhardt Rechtin (University of Southern California, ret.), *Systems Architecting of Organizations*
Rodney P. Rempt and Michael G. Mullen (Rear Admirals, U.S. Navy), *U.S. Navy in the 21st Century*
Richard T. Roca (Director, APL), *A Telecommunications Architecture for the 21st Century*
Steven Salzberg (Institute for Genomic Research), *Annotating Whole Genomes*
Robert Skinner Jr. (Transportation Research Board), *Transportation in the 21st Century*
Joseph J. Suter (APL), *Innovative Battery Technologies*
Michael Zolensky (NASA Johnson Space Center), *Extraterrestrial Water*

2000–2001

Jim Allen (Sandia National Laboratories), *Intelligent Micromachine Initiative and MEMS Fabrication Technologies*
Athena Andreadis (University of Massachusetts Medical School), *Human Settlement of Other Planets*
Stephen G. Brush (University of Maryland, College Park), *Why Was Relativity Accepted*
Andrew Cheng (APL), *NEAR at Eros*
Chia-Ling Chien (JHU Department of Physics and Astronomy), *Heterostructures and Spintronics*
Sayeed Choudhury (JHU Milton S. Eisenhower Library), *The Digital Knowledge Center*
Terry Collins (Carnegie-Mellon University), *Green Chemistry*
Robert W. Flower (University of Maryland), *Medical Applications of One APL Technology: Coming Full Circle*
Richard J. Foch (Naval Research Laboratory), *Unmanned Autonomous Vehicles*
Daniel S. Goldin (Director, NASA), *NASA in the 21st Century*
Tee L. Guidotti (George Washington University), *Bioterrorism*
Gregory Hager (JHU Department of Computer Science), *Software Systems for Vision-Based Interaction and Control*
James Hahn (George Washington University), *The Virtual World of the Computer*
William Harris (Critical Information Assessment Office), *Improving Surface Transportation Security*
Anne Kinney (NASA Headquarters), *From Red Dropouts to Pale Blue Dots: The Science of the Origins Theme*
Peter Loscocco (National Security Agency), *Security-Enhanced Linux*
Dennis McBride (University of Central Florida), *Simulation and Training*
Donald G. Mitchell (APL), *Images of the Magnetosphere*
Joseph Peri (APL), *Data Fusion and Target ID: Dempster-Shafer and Probability Theories Holy War*
Kenna Peusner (George Washington University Medical Center), *A Promising Model to Investigate Brain Plasticity*
David M. Schubert (Office of Naval Research), *Naval Science and Technology Initiatives*
Louise Shelley (American University), *Transnational Crime and Corruption*
Raman Sundrum (JHU Department of Physics and Astronomy), *Extra Dimensions and the Weakness of Gravity*
Alexander Szalay (JHU Department of Physics and Astronomy), *Digital Sky Survey*
Virginia Trimble (University of Maryland, College Park), *Astrophysics Faces the Millennium*
Stansfield Turner (Admiral; Ex-Director, CIA), *The Dilemma of Nuclear Weapons in the 21st Century*

William A. Wulf (President, National Academy of Engineering), *Technology Societal Issues*

2001–2002

Marius Deeb (JHU School of Advanced International Studies), *On Why Bin Laden?*
Donald Duncan (APL), *RDT&D in Navy Programs: Optics at ADSD*
Walter Dyer (Ballistic Missle Defense Organization), *Advanced Electro-Optic Technologies for Ballistic Missile Defense*
Millard Firebaugh (General Dynamics Electric Boat Div.), *Submarine Design and Construction*
John Gearhart (JHU School of Medicine), *Stem Cell Research*
Richard Haver (Office of the Secretary of Defense), *Technology and the Needs of the Intelligence Community*
Bruce Hoffman (The Rand Corp.), *Change and Continuity in Terrorism*
James F. Jarboe (FBI Headquarters), *Counterterrorism*
David W. Jourdan (Nauticos Corp.), *The Discovery and Salvage of DAKAR*
David Kestenbaum (National Public Radio), *My Father Sees Muons in the Driveway or How to Explain Physics to Everybody Else*
Scot Kuo (JHU Department of Biomedical Engineering), *Nano-Tracking: Cell Mechanics Without Pulling or Prodding*
John Langford (Aurora Flight Sciences Corp.), *Advanced UAV for Science Defense and Applications*
Mario Livio (JHU Space Telescope Science Institute), *Beauty and the Accelerating Universe*
Christopher J. Lobb (University of Maryland), *Smaller, Faster, Cheaper: From Transistors to Artificial Microstructures*
Calvin Mackie (Tulane University), *African Americans and Technology: A Harbinger of the Future*
Melissa McGrath (JHU Space Telescope Science Institute), *Jupiter's Galilean Satellites*
John N. Moore (University of Virginia), *Law of the Sea Treaty*
Michael E. O'Hanlon (Brookings Institute), *Military Transformation and Defense Policy Choices*
Norman Owsley (Office of Naval Research), *On Environmental Limits to Sonar Performance*
R. Keith Raney (APL), *From Geosat into the ABYSS: Ocean Radar Altimetry at APL*
Gail Richter-Nelson (JHU Milton S. Eisenhower Library), *Center for Educational Resources at Homewood*
Bradley Roberts (Institute of Defense Analysis), *Bioterrorism*
Lester Salamon (JHU Institute for Policy Studies), *Global Civil Society: Dimensions of the Nonprofit Sector*
Roger R. Schell (Aesec Corp.), *Computer Security*
S. Frederick Starr (JHU School of Advanced International Studies), *Central Asia*
Michael Vlahos (APL), *Upcoming Upheavals*
Paul J. Waltrup (APL), *Hypersonic Air Breathing Propulsion: Future Flight Vehicles*
Michael O. Wheeler (SAIC), *Changing Directions in U.S. Defense Policy*
R. James Woolsey (Shea and Gardner), *Possible U.S. Responses to Terrorism*
Jeng-Hwa Yee and David Kusnierkiewicz (APL), *The TIMED Spacecraft: Science and Technology*
David Zubrow (Carnegie-Mellon Institute), *Measurement and the Capability Maturity Model Integration*

2002–2003

George Ayittey (American University), *West Africa: Its Strategic Importance*
Stephen Biddle (U.S. Army War College Strategic Studies Institute), *Afghanistan and the Future of Warfare: Implications for Army and Defense Policy*
Benjamin F. Chao (NASA Goddard Space Flight Center), *Time-Variable Gravity from Space: A Quarter Century of Observations, Mysteries, and Prospects*
Samuel C. Colbeck (U.S. Army Cold Regions Research and Engineering Laboratory), *The Physics of Snow and Skiing: What Is Snow Anyway?*
Robert Ehrlich (George Mason University), *Crazy Ideas in Science*
Jason Ellis (National Defense University), *The Best Defense: Counterproliferation and U.S. National Security*
William Farrell (NASA Goddard Space Flight Center), *The Electro-Meteorology of Dust Devils*
Thomas Ferguson (U.S. Department of the Treasury Bureau of Engraving and Printing), *Design and Counterfeit Deterrence*
Robert Fischell (Fischell Biomedical, LLC), *Coated Stents: A Major Breakthrough in the Treatment of Heart Disease*
Richard D. Fisher Jr. (The Jamestown Foundation), *China's Military Modernization*
Vicki Freimuth (Center for Disease Control), *The Anthrax Attacks and CDC's Communication Response*
Robert Fry (APL), *The Engineering of Cybernetic Systems: From Neurons to Ballistic Missile Defense*
Stuart Gilman (The Ethics Resource Center), *Ethics in Science, Engineering, and Organizations*
Sheldon Greenberg (JHU Division of Public Safety Leadership), *The Hidden Facts About First Responder Readiness*
Anthony D. King (Ventana Medical Systems, Inc.), *Global Connectivity: Leveraging Remote Access Technology*
Edward Liszka (Pennsylvania State University Applied Research Laboratory), *Applied Research Laboratory at Penn State University: An Overview*
Edward MacKerrow (Los Alamos National Laboratory), *Threat Anticipation Program: Agent-Based Simulation of Factors Motivating Terrorism*
Guy M. McKhann and Marilyn S. Albert (JHU School of Medicine), *Keeping Your Brain Young*
Tim Miller (APL), *High-Energy Neutrino Astronomy at the South Pole*
Alan Rudolph (Defense Advanced Research Projects Agency), *Harvesting Biology for Defense Technology*
Angela Stent (Georgetown University), *U.S.–Russian Relations After the Iraq War*
Gerald M. Stokes (University of Maryland and Pacific Northwest National Laboratory), *Two Grand Challenges of Climate Research*
Victor Utgoff (Institute for Defense Analyses), *Running for Sheriff*
Peter F. Verga (Department of Defense Homeland Security), *DoD Role in Homeland Security*
Ruth Wedgwood (JHU School of Advanced International Studies), *Preemptive Self-Defense and the U.N. Charter*
Victor Yakovenko (University of Maryland), *Statistical Mechanics of Money, Income, and Wealth*

2003–2004

Knox Andress (Christus Schumpert Health System), *Hospital Emergency Management for WMD: An Overview*
Ellis Barksdale (Barksdale Solutions), E^3 = *Egypt, Engineering, and Education*
Robert F. Behler (Major General, USAF, ret.; APL), *Enforcing U.S. Foreign Policy from the Edge of Space*
Dennis C. Blair (Admiral, USN, ret.; President, Institute for Defense Analyses), *Future Strategic Strike Forces*
Arthur K. Cebrowski (Vice Admiral, USN, ret.; Director, Force Transformation, Office of the Secretary of Defense), *Force Transformation*

Griff Corpening (NASA), *X-43A— The First Flight of a Scramjet-Powered Airplane*
David Dunham (APL), *Exploring the Cosmos by "Doing Something Different"*
Antulio J. Echevarria II (U.S. Army War College), *Globalization and the Nature of War*
Bradley C. Edwards (Institute for Scientific Research), *The Space Elevator*
John T. Emmert (George Mason University and Naval Research Laboratory), *Climate Change at the Edge of the Atmosphere: Evidence of Long-Term Thinning*
James Franson (APL), *Quantum Computing Using Linear Optics*
George Friedman (Strategic Forecasting, Inc.), *The Iraq Campaign: An Episode in a War*
Norman Friedman (Defense Analyst), *Where Is the Navy Likely To Go?*
James B. Hickey (Colonel, U.S. Army), *The Capture of Saddam Hussein*
Maynard Hill (APL, ret.), *Trans-Atlantic Radio Controlled Model Flight*
Sheldon Jacobson (University of Illinois, Urbana), *Understanding Aviation Security Issues Using Operations Research Models and Analysis*
Sunil Khilnani (JHU School of Advanced International Studies), *South Asia on the Edge*
Phillip Longman (New America Foundation), *The Geo-Politics of Global Aging: Fertility Decline and the Fate of Nations*
Wayne Merry (American Foreign Policy Council), *The Future of Trans-Atlantic Relations: Thinking Beyond NATO*
James Oberg (Author), *China's Great Leap Upward—How Realistic Are Its Space Ambitions?*
Richard Restak (Neurology Associates), *The New Brain: The Role of Technology in Changing Our Concepts About Neuroscience*
Avi Rubin (JHU), *Security Issues in Electronic Voting*
Robert H. Scales Jr., (Major General, U.S. Army, ret.; Independent Consultant), *Lessons Learned from the Iraq War*
Dava Sobel (Author), *Galileo in the Applied Physics Laboratory*
Srinidhi Varadarajan (Virginia Tech), *System X: Building the Virginia Tech Supercomputer*
Johnny R. Wolfe Jr. (Commander, U.S. Navy), *The Shuttle Columbia Accident Investigation—A Member's Perspective*

2004–2005

Raymond W. Baker (Trinity College), *The Future of Islam: Egypt and the New Islamists*
Steven Bellovin (Columbia University), *Permissive Action Links and the History of Public Key Cryptography*
James P. Blair (National Geographic Society), *Where God Lives*
John M. Carroll (Pennsylvania State University), *Scenarios and Design Cognition*
Duane W. Deal (Brigadier General, USAF), *Beyond the Widget: Columbia Accident Lessons Affirmed*
Francis M. Deng (JHU School of Advanced International Studies), *A Clash of Identities: Darfur's Crisis in the National Context*
Douglas Farah (Author and Journalist), *Diamonds, Weapons, and Passports: The Strategic Challenge of Failed States to U.S. National Security*
Orlando Figueroa (NASA Deputy Associate Administrator for Programs in the Science Mission Directorate), *Science and the Vision for Space Exploration*
Stephen Flynn (Council on Foreign Relations), *America the Vulnerable: Can the Homeland Be Secured?*
Robert E. Gold (APL), *Defending the Earth from Asteroid Impacts*
Colin S. Gray (University of Reading, England), *What Do We Know About Future Warfare?*
Thomas X. Hammes (Colonel, USMC; National Defense University), *The Sling and the Stone: On War in the 21st Century*
Peter Heller (International Monetary Fund), *Confronting Long-Term Fiscal Challenges*
Stamatios Krimigis (APL), *Cassini at Saturn: Wonders of the Giant Planet Revisited*
Gal Luft (Institute for the Analysis of Global Security), *Terrorism on the High Seas*
Hans Mark (University of Texas, Austin), *Naval Applications of Electro-Magnetic Guns*
David J. Nagel (George Washington University), *Low-Energy Nuclear Reactions: Problems, Progress, and Prospects*
Norman Polmar (Analyst, Consultant, and Author), *Surprise! U.S. and Western Intelligence and Warning Failures During the Cold War*
Louise Richardson (Radcliffe Institute for Advanced Study), *Democracy and Counterterrorism: Lessons from the Past*
Michael Scheuer (Anonymous Author; CIA, ret.), *They Still Don't Get It: The Danger of Ignoring Reality in the War on Terrorism*
John Slaughter (National Action Council for Minorities in Engineering), *Black History: A Time for a New Chapter in Science and Technology*
John Stenbit (Formerly CIO and Assistant Secretary of Defense for C3I), *Why Net-Centric?*
Jill Tarter (SETI Institute), *Search for Extraterrestrial Intelligence: Pulling Signals out of Cosmic Noise*
Ashley Tellis (Carnegie Endowment for International Peace), *U.S.–India Strategic Relations*
Vincent Vitto (Charles Stark Draper Laboratory), *The Naval Studies Board and Its Views on Naval Issues*
Michael Vlahos (APL), *The War At Midpassage: Where Do We Go From Here?*

2005–2006

Steven M. Anlage (University of Maryland), *Physics and Applications of Negatively Refracting Electromagnetic Materials*
Tom P. M. Barnett (Author and Strategic Planner), *Warfighting in the Twenty-First Century*
Ron Beard (Naval Research Laboratory), *The Future of the UTC Time Scale*
Richard Carmona (Vice Admiral, U.S. Surgeon General), *Hispanic Heritage Month Lecture*
Cristopher Coker (London School of Economics), *Ethics of the Long War*
Victor N. Corpus (Brigadier General, Armed Forces of the Philippines, ret.), *American Crossroad*
Bruce A. Dale (*National Geographic*), *A Lifetime of BAD Photographs*
David Dinges (University of Pennsylvania), *Sleep, Fatigue, and Stress: Monitoring Human Behavioral Capability*
Frank Doyle (University of California, Santa Barbara), *A Systems Approach to Modeling and Analyzing Biological Systems*
Nathaniel Fick (Former Captain, USMC), *The Wars in Afghanistan and Iraq: A Junior Officer's Perspective on What We've Learned and Where We're Going*
Husain Haqqani (Carnegie Endowment for International Peace), *Pakistan: Between Mosque, Military, and Nuclear Weapons*
Kay Jamison (Johns Hopkins School of Medicine), *Scientific Exuberance*
Ted G. Kamatchus (Sheriff, Marshall County, Iowa), *A Sheriff's View of Homeland Security*
Theodor Krauthammer (Pennsylvania State University), *R&D Needs for Effective Blast, Shock, and Impact Mitigation*
Mark Lewis (USAF Chief Scientist), *Speed as a Critical Issue for the USAF*
Geoffrey Ling (DARPA), *Revolutionizing Prosthetics*
Carey Lisse (APL and University of Maryland), *Deep Impact and Comet 9P/Tempel 1: From Evolved Surface to Interior Primeval Dust*

William J. McDaniel (Rear Admiral USN, ret.), *Faces of the Tsunami*
Charles Nicholas (University of Maryland Baltimore County), *Who Wrote This Document?*
Michael A. Roberto (New York University Stern Business School), *Why Great Leaders Don't Take Yes for an Answer: Managing for Conflict and Consensus*
Barry Rubin (Global Research in International Affairs Center), *The Arab Struggle for Democracy in the Middle East*
Harold Schmitz (Chief Scientist, Mars Inc.), *The Science of Cocoa and Chocolate: What Do Migratory Birds and Nitric Oxide Synthesis Have in Common?*
John C. Sommerer (APL), *Science and Technology: Why Should We Care?*
Paul Spudis (APL), *Robot Precursor Missions for a Human Return to the Moon*
Tom Voltaggio (U.S. Environmental Protection Agency), *Responding to Weapons of Mass Destruction Incidents and Natural Disasters*
Kim Weaver (NASA Goddard Space Flight Center), *New Eyes on the Universe: Observing Beyond Hubble with NASA's Other Space Telescopes*
Woodrow Whitlow (Director, NASA Glenn Research Center), *Breakthrough Technologies That Enable Space Exploration*

CONCLUSION

Tradition does rule the colloquium to some extent, but flexibility is part of today's game plan. The colloquium continues to be held in either the Parsons or Kossiakoff Center auditorium. Audiences sometimes fill the seats and crowd onto the stairs, while others stand in the back of the room and an overflow crowd watches remote closed circuit TV monitors. Overflow of this type is more common in Parsons and rare in the much larger Kossiakoff Center, but it has occurred even there in the last year. Friday afternoon from 2:00 p.m. to 3:00 p.m. remains the canonical time for the colloquium, although often other days of the week or other hours of the day are required to meet the needs of our speakers' schedules.

Another tradition, noted earlier, is a luncheon with the colloquium speaker and 6–12 APL staff preceding the lecture. Typically the conversation evolves around the speaker and the lecture topic, offering an excellent opportunity to further "pick the brain" of the speaker in a one-on-one mode. A different group of APL participants attends each of the colloquium luncheons. In some cases, the luncheon participants are present because they have helped organize the particular colloquium or they have an acquaintance with or some connection to the speaker. Other participants have been invited to attend "out of the blue" because their Professional Staff resume indicates a connection to the speaker or the subject. An informal refreshment period in the lobby outside the auditorium follows the lecture and offers the possibility of a direct conversation with the speaker. The speakers also enjoy the experience of addressing and conversing with the diverse and sophisticated APL audience.

Interest in the colloquium remains high, with many suggestions for future colloquium speakers coming from all quarters of the Laboratory. Current topics of interest include science, engineering, technology, intelligence, military affairs, public policy, current events, legal issues, financial questions, health interests—and the list goes on. By volunteering suggestions, the APL staff influences the evolution and diversity of topics and guides the future direction of the colloquium. In this way, the APL Colloquium is expected to continue to offer a rewarding opportunity for APL staff to be apprised of interesting and important things happening in today's and tomorrow's world.

REFERENCES

[1]"APL Colloquia Summaries," *APL Tech. Dig.* **1**(1), 23 (1961).
[2]Gray, E. P., and Stone, A. M., "The History of the APL Colloquium," *Johns Hopkins APL Tech. Dig.* **10**(2), 118–128 (1989).
[3]*Johns Hopkins APL Tech. Dig.* **22**(1), Special Issue, *Millennial Challenges* (2001).

THE AUTHOR

David M. Silver received his B.S. in 1962 from the Illinois Institute of Technology, his M.A. in 1964 from The Johns Hopkins University, and his Ph.D. in 1968 from Iowa State University. He was a National Science Foundation Postdoctoral Fellow at Harvard University from 1968 to 1970, and a Visiting Scientist at the Faculty of Science, University of Paris XI, Orsay, France, in 1970. Dr. Silver began his APL career in 1970 in the Research Center (currently the Research and Technology Development Center). He is a member of the Principal Professional Staff and from 1977 to 1995 had been a Group Supervisor in Chemical Physics, Computational Physics, and Fluid Mechanics. He was the J. H. Fitzgerald Dunning Professor in the JHU Wilmer Eye Institute from 1998 to 1999, and a Visiting Professor in Ophthalmology at the Debrecen University Medical Center in Hungary in 2001. His research interests include molecular physics, combustion, computational electromagnetics, spacecraft-induced contamination environments, and ophthalmology. Since 2002, Dr. Silver has been in charge of the APL Colloquium and has been the Editor-in-Chief of the *Johns Hopkins APL Technical Digest*. His e-mail address is david.m.silver@jhuapl.edu.

David M. Silver