

Sigma Xi Today

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Lynn Margulis Wins 1999 Procter Prize



Lynn Margulis

University of Massachusetts biologist Lynn Margulis will receive Sigma Xi's 1999 William Procter Prize for Scientific Achievement at the annual meeting in Minneapolis in November.

Sigma Xi's highest honor, the Procter Prize has been awarded annually since 1950 to scientists who have made outstanding contributions to research and have also demonstrated an ability to communicate the significance of their work to scientists in other disciplines.

Margulis played a major role in introducing the "serial endosymbiosis theory," which posited that cells with nuclei (eukaryotic cells) evolved through symbiotic relationships with other cell types. It is now widely accepted that such cell components as mitochondria and chloroplasts were once separate organisms, bacteria, that over the course of evolution were incorporated into the make-up of modern eukaryotic cells.

Margulis is also known for her long collaboration with British scientist James E. Lovelock, originator of the provocative Gaia Hypothesis. First proposed 30 years ago, the theory suggested that life has had a greater influence on the evolution of the Earth than was ordinarily assumed,

affecting the global environment in ways that favor the continuity of life. According to the theory, life provides a cybernetic, homeostatic feedback system on Earth, leading to stabilization of global temperature, atmospheric chemistry and other factors.

An energetic popularizer of science and spokesperson for environmental issues, Margulis has written many books on a wide range of scientific topics, including *Microcosmos: Four Billion Years of Evolution from Our Microbial Ancestors* (with her son, Dorion Sagan), *Five Kingdoms: An Illustrated Guide to the Phyla of Life on Earth* (with co-author Karlene V. Schwartz and foreword by Stephen Jay Gould), *Symbiosis in Cell Evolution* and *Slanted Truths: Essays on Gaia, Symbiosis, and Evolution* (with Dorion Sagan and foreword by Phylis and Philip Morrison).

In addition to her extensive scholarly work, she has contributed to popular magazines and education journals and has produced several videos. She is a member of the National Academy of Sciences and her other honors include the University of Chicago Citation for Professional Excellence, the Boston University MacDonald Award for Excellence in Research and a Distinguished Service Award from the National Association of Biology Teachers. Margulis is also a Foreign Member of the Russian Academy of Natural Sciences, one of only three U.S. scientists to be so honored.

The Procter Prize consists of a certificate of award, a Steuben glass sculpture and \$5,000. A unique feature of the award is that the recipient is asked to designate a younger scholar, usually working in the same field, to receive a \$5,000 Grant-in-Aid of Research from the Procter Prize Fund.

Sigma Xi Chapter President Honored

John R. McConnell, president of the Mesa State College Chapter of Sigma Xi, was one of 10 people nationwide to receive the first John Stanford Education Heroes Award from the U.S. Department of Education, in recognition of his efforts to improve science and math education in Grand Junction, Colorado.

McConnell is a retired physicist from Los Alamos National Laboratory who spends much of his time as a volunteer doing hands-on science with elementary and middle school kids. In an effort to inspire K-12 students, teachers and parents to develop a love for science and math, he created and helped fund the Sci-Tech Exploratorium in an empty elementary school classroom.

The Exploratorium is open to any student in the district and provides a place for teachers to conduct workshops on science content, work on curriculum, develop science assessments and gain hands-on science experience.

Additionally, the Exploratorium provides a resource site and training facility for education majors at Mesa State College. For further information on this project, visit <http://wingate.mesa.k12.co.us>.

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Joann Rodgers, Brian Hayes Elected Sigma Xi Honorary Members



Joann Rodgers

Joann Rodgers, deputy director of public affairs for the Johns Hopkins Medical Institutions, and Brian Hayes, a former editor of *American Scientist*, will be inducted as honorary members of Sigma Xi at the Society's annual meeting in Minneapolis this November. United Nations special adviser Maurice Strong will also be inducted then. He was elected last year but was unable to attend the 1998 Annual Meeting.

Since 1983, honorary membership has been conferred upon 23 individuals for their service to science or Sigma Xi. Recent inductees include award-winning television broadcaster Bill Kurtis, *Consumer Reports* science editor David Ansley, *Time* science correspondent J. Madeleine Nash, *BusinessWeek* science editor Paul Raeburn and science cartoonist Sidney Harris.

Joann Rodgers became deputy director of public affairs and director of media relations at Johns Hopkins in 1984 after 18 years as an award-winning journalist and columnist for the Hearst newspapers. In her post at Hopkins, she is a principal spokesperson for the institutions and deputy director of a 25-person communications and public relations program responsible for all internal and external print, radio and television communications.

She has daily responsibility for a 10-person news and information staff, which produces all research and policy news releases and statements. Also

at Hopkins, Rodgers spearheaded and now coordinates a major for-profit publishing program that includes *The Hopkins Medical Letter*, *Health After 50* (with 500,000 paid subscribers) and numerous books.

She is past president of the Council for the Advancement of Science Writing and the National Association of Science Writers and has served on the national boards of the American Heart Association and the Alan Guttmacher Institute. A frequent contributor to science and general interest magazines, she is the author of six books, including *Cancer and You*, *Drugs and Sexual Behavior*, *Drugs and Pain*, *Raising Sons*, and *Media Guide for Academics*. A fellow of the American Association for the Advancement of Science, she is a frequent lecturer on the public understanding of science and has received many professional honors, including awards from the Lasker Foundation, the Kidney Foundation and the American Medical Association, among other organizations.

Brian Hayes has had a distinguished career as a science writer and editor and also performed an invaluable service to Sigma Xi as 1990-92 editor of *American Scientist* by overseeing the transition of the magazine from New Haven to the Society's new offices in Research Triangle Park, North Carolina. His regular "Computing Science" column continues to be a popular feature of the magazine. Hayes has been an editor-at-large for *American Scientist* and continues to serve as a consulting editor.

"Following the move of Sigma Xi's administrative offices in 1990, Brian recruited a first-class editorial and production staff," said Sigma Xi Executive Director Peter D. Blair. "Much of the current outstanding editorial and production quality of the magazine, as well as the staff's continuing progressive attitudes toward innovation, have evolved from his early efforts. Sigma Xi and *American Scientist* are much better off as a result of his vision and energy, and I can

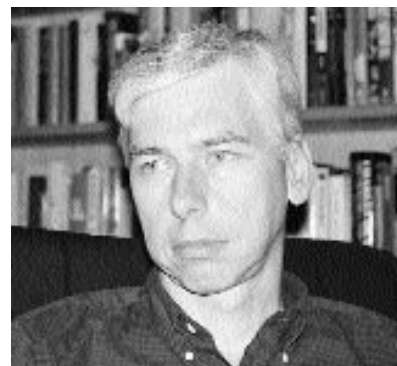
think of few people who deserve this recognition as much as Brian."

Hayes is currently completing a six-month fellowship as Journalist in Residence at the Mathematical Sciences Research Institute in Berkeley. He is also working on a book called *Infrastructures: A Field Guide to the Industrial Landscape*, to be published by W.W. Norton and Company, with support from the Alfred P. Sloan Foundation.

He has been a copy editor and book-review editor for the *Baltimore Sun* and, in 1973, joined *Scientific American* as staff editor. He became associate editor and a columnist there in 1980.

From 1984-90, Hayes was a free-lance writer, editor and consultant for *Scientific American*, Time-Life Books, Memorial Sloan-Kettering Cancer Center, Texas Instruments, Honeywell, the Massachusetts Institute of Technology, *Discover* and others. He has also been a columnist for *Computer Language* and *The Sciences*, where he was a contributing editor, and has served as a member of the board of editors for *Pixel: The Magazine of Scientific Visualization*.

Hayes was elected a fellow of the American Association for the Advancement of Science in 1992 and is a member of the National Association of Science Writers, the Association for Computing Machinery and the Mathematical Association of America, among others.



Brian Hayes

Landweber Wins Young Investigator Award

Princeton University biologist Laura F. Landweber, a rising star in the field of molecular evolution, has been selected to receive the first Sigma Xi Young Investigator Award in the life and social sciences, which includes a \$5,000 prize.

She will present a lecture on aspects of her work at Sigma Xi's 1999 Annual Meeting in Minneapolis this November. To be presented annually, the Sigma Xi Young Investigator Award alternates between the physical sciences and the life and social sciences. The nomination deadline for the 2000 award is June 1, and guidelines are available on the Web at <www.sigmaksi.org>.

An assistant professor of biology and vice president of the Princeton Chapter of Sigma Xi, Landweber received her undergraduate degree in molecular biology at Princeton in 1989 and her M.A. in 1991 and Ph.D. in 1993, both at Harvard University.

Her talent was recognized early in her career with National Science Foundation (NSF) and Howard Hughes Medical Institute predoctoral fellowships and election to the Harvard Society of Fellows, and she has since received a variety of grants and awards, including a 1998 Burroughs Wellcome Fund New Investigator Award in Molecular Parasitology and NSF research grants.

In addition, she has participated in summer workshops for science teachers and led freshman seminars on "Jurassic Park: Myth or Reality?" and "DNA Computing." The Princeton biologist also has been a panelist on National Public Radio for a discussion about the possibilities of life on Mars. She became a member of the National Aeronautics and Space Administration's Working Group on Exobiology in 1998.

Her laboratory combines two approaches—comparative sequence analysis and functional *in vitro* selection experiments—to study early molecular evolution, the origin of



Laura F. Landweber

genetic systems and how cells and DNA process information.

"Protozoa, in particular, have surprised molecular biologists with a bewildering diversity of gene organization," she says, "from 'scrambled genes' in ciliates to bizarre forms of RNA processing, including splicing and editing. Therefore they seem to be the natural place to look for primitive or aberrant systems."

Landweber and her colleagues are currently pursuing several lines of experiments. One is the study of the origin and distribution of RNA editing in protozoan mitochondria. This involves sequence comparisons of a representative gene and its transcripts from several taxa, such as some unusual slime-molds.

A second approach uses the powerful new technology of *in vitro* genetics to select RNA molecules with desired properties from large pools of random sequence. The steps involve an iterative procedure of selection (usually on an affinity column or by a functional assay) and PCR amplification of the rare sequences.

"We can study *in vitro* evolution of the pool of RNA molecules by sampling the population after each round of selection," Landweber says. "The ability to isolate novel ribozymes from random sequences has fueled a new excitement about the possibility of uncovering early pathways of RNA evolution."

Regional Winners Named for Young Investigator Award

The following four regional 1999 Young Investigator Award winners were also recognized with certificates.

North Central

David N. Arnosti, an assistant professor of biochemistry at Michigan State University, developed a novel *drosophila* embryo system for examining transcriptional repression. This led, in turn, to his studies on the mechanism of repression by Knirps, a factor which he found causes a combination of both quenching and repression in a variety of genes.

Southeast

Lee Alan Dugatkin, an assistant professor of biology at the University of Louisville, has published 70 papers and three books on evolutionary behavioral biology, including *Game Theory and Animal Behavior* and *Why Be Nice? The Nature of Cooperation*, examining how the study of cooperation among animals can provide insights applicable to humans.

Northeast

Mohamed A. F. Noor, an assistant professor of biology at Louisiana State University, is an expert on genetic isolating mechanisms in *drosophila* and is studying the mechanisms of speciation. He served as president of the Cornell University Chapter of Sigma Xi while a postdoc there.

Southwest

Todd A. Anderson, an assistant professor of biological sciences at Texas Tech University, is an environmental toxicologist whose research has focused on the degradation and mobility of synthetic chemicals in the environment. His work is credited with revolutionizing the U.S. Environmental Protection Agency's approach to remediation of hazardous waste sites.

1999 Forum Call for Presentations

Undergraduate education reform will be the focus of the 1999 Sigma Xi Forum, *Reshaping Undergraduate Science and Engineering Education: Tools for Better Learning*, to be held November 4-5, 1999 in Minneapolis, Minnesota. This interactive conference will allow participants to experience innovative science instruction, experiment with state-of-the-art educational materials and discuss a variety of models for institutional reform, science curriculum and pedagogy.

Format of Presentations

Formats may include, but not be limited to: demonstrations, discussion groups, workshops, active-learning activities, poster presentations.

Individuals may submit abstracts for a single presentation or may propose to organize a workshop or discussion group.

Abstracts

Abstracts should include (1) a description on the subject matter to be addressed, (2) the proposed format (including length of time needed, space and facility requirements), (3) the ideal audience or group size, (4) full name and contact information for the presenter/facilitator/organizer.

Submission and Review

While the abstract deadline is July 1, the organizing committee will begin to review submissions on May 1. The inclusion of presentations on the program is at the discretion of the committee. Authors will be notified about the status of their presentations no later than May 31 for those received by the early deadline and July 31, 1999 for those received by the second deadline. Presenters will be expected to register for the forum.

After consulting the Sigma Xi Web site for more details on abstract submission, please submit abstracts/proposals and any questions electronically to forum@sigmaxi.org or via the Web site.



Jason Chin Receives First Plasma Science Grant-in-Aid

Yale University chemistry graduate student Jason W. Chin was awarded the first Sigma Xi-Consortium for Plasma Science Grant-in-Aid of Research in January. The \$5,000 grant will support his efforts to develop a novel method to detect and remove viruses in human blood plasma. For more information on this grant visit the Sigma Xi Web site at www.sigmaxi.org. Shown here with Chin are, left to right: Frederick Dombrose, executive director, Consortium for Plasma Science; Thomas Malone, past president of Sigma Xi; and Yale chemistry professors Alanna Schepartz and Donald Crothers.

Elion Documentary Nears Completion

At the time of her death in February at the age of 81, Sigma Xi member Gertrude B. Elion was one of only 10 women ever to receive a Nobel Prize in science. The inspiring story of her life and work is the subject of an hour-long documentary biography, "The Living Legacy of Gertrude Elion," which is nearing completion.

Produced by Bella International Productions, Inc., under the auspices of Sigma Xi, the documentary recounts the remarkable career of a pioneering scientist who, if not for World War II, might not have had the opportunity for a research career. Talks are under way about possible outlets for television distribution.

In 1941, Elion's master's degree in chemistry wasn't enough to gain her admission into the male-dominated halls of academe. She was unable to find a laboratory position and instead went to work teaching high school chemistry and physics, providing laboratory instruction for nurses and testing pickles and berries for the Quaker Maid Company.

Her big break came in 1944 when, as men were being drafted for military service, careers ordinarily closed to women opened up. She joined the

Burroughs Wellcome Company as an assistant in the laboratory of George Hitchings, with whom she would later share the Nobel Prize.

Her contributions to medicine included a life-saving leukemia drug, as well as anti-rejection drugs for kidney transplant recipients. She and her research team also were prominent in the development of allopurinol for the treatment of gout, and acyclovir, used to battle herpes virus infections.

Affectionately known as "Trudy" by friends and colleagues, she retired officially in 1983 but continued a busy schedule advancing science through the World Health Organization, honorary university lectureships and frequent visits to elementary and high school classrooms. During interviews at her Chapel Hill home and her office in Research Triangle Park, she shared her feelings about being a role model for young people, particularly young women.

Funding for the documentary was provided by The Burroughs Wellcome Fund, The Wellcome Trust, Glaxo Wellcome Inc., The Pharmaceutical Researchers and Manufacturers of America and The Mary Duke Biddle Foundation.