

# Sigma Xi Today

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## Procter Prize Goes to Murray Gell-Mann

Nobel laureate Murray Gell-Mann, distinguished fellow at the Santa Fe Institute, will receive Sigma Xi's 2004 William Procter Prize for Scientific Achievement and give the annual Procter Prize Lecture at the Society's annual meeting in Montreal in November.

A theoretical physicist, Gell-Mann is the author of the popular science book *The Quark and the Jaguar* and has been a Sigma Xi member since 1947.

He received the 1969 Nobel Prize in physics for his work on the theory of elementary particles. His "eightfold way" theory brought order to the chaos created by the discovery of some 100 particles in the atom's nucleus.

Then he found that all of those particles, including the neutron and proton, are composed of fundamental building blocks that he named "quarks." The quarks are permanently confined by forces coming from the exchange of "gluons."

He and others later constructed the quantum field theory of quarks and gluons, called "quantum chromodynamics," which seems to account for all the nuclear particles and their strong interactions.

Among other honors, Gell-Mann has received the Ernest O. Lawrence Memorial Award of the Atomic Energy Commission, the Franklin Medal of the Franklin Institute, the Research Corporation Award and the John J. Carty medal of the National Academy of Sciences.

In 1988 he was listed on the United Nations Environmental Program Roll of Honor for Environmental Achievement (the Global 500). In 1994 he shared the 1989 Ericc "Science For Peace" Prize.

Gell-Mann is the Robert A n d r e w s M i l l i k a n Professor of Theoretical P h y s i c s Emeritus at the California Institute of Technology, where he taught from 1955 until 1993. A mem-



Murray Gell-Mann

ber of the National Academy of Sciences and a member of the American Academy of Arts and Sciences, he helped to found the Santa Fe Institute.

A fellow of the American Physical Society, he is also a Foreign Member of the Royal Society of London, a member of the Council on Foreign Relations and a former member of the President's Science Advisory Committee (1969-1972). He was a member of the President's Committee of Advisors on Science and Technology from 1994-2003.

Gell-Mann's interests extend to many subjects, including natural history, historical linguistics, archaeology, history, depth psychology and creative thinking, all subjects connected with biological evolution, cultural evolution, and learning and thinking.

His recent research has focused on complex adaptive systems, which brings all these areas of study together. He is also concerned about policy matters related to world environmental quality, restraint in population growth, sustainable economic development and stability of the world political system.

## Share the Honor Of Membership

Induction into Sigma Xi has been a milestone in many distinguished research careers, including those of nearly 200 Nobel laureates.

Membership is professionally rewarding and offers a chance to participate in ongoing programs and activities at the local and Society levels.

Nominating someone for Sigma Xi membership has never been easier, thanks to convenient online nomination forms available through the "Membership Services" link at [www.sigmaxi.org](http://www.sigmaxi.org).

Any active (dues paying) full member may nominate an individual for membership or promotion from associate to full membership. Membership qualification guidelines are also available online.

For nominations to be considered by a local chapter, print and fill out a nomination form and send it to a local chapter officer (listed online under the "Chapters" link).

If a local chapter is not available, the nomination can be considered by the Committee on Qualifications and Membership via Sigma Xi's administrative office.

E-mail [memberinfo@sigmaxi.org](mailto:memberinfo@sigmaxi.org) or call 800-243-6534 for more information.

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## Nieh Wins Young Investigator Award

Columbia University computer scientist Jason Nieh has been selected to receive Sigma Xi's 2004 Young Investigator Award in the physical sciences. The first computer scientist to receive this national award, he was inducted into Sigma Xi in 1989.



Jason Nieh

Nieh will give a talk about his work in November at the Society's annual meeting in Montreal.

Sigma Xi's annual Young Investigator Award, which includes a certificate of recognition and \$5,000, alternates between the physical sciences, including engineering and mathematics, and the life sciences, including social sciences.

It recognizes individuals within 10 years of earning their highest graduate degree for their scientific achievements, interdisciplinary research and the ability to communicate the significance of their achievements to the general public. Visit [www.sigmaxi.org](http://www.sigmaxi.org) for details.

An associate professor, Nieh is director of Columbia University's Network Computing Laboratory. The lab builds experimental software systems that demonstrate significant functional and performance improvements with real applications.

Current research focuses on transforming computing into a simple-to-use and reliable service that is always available and easily accessible anywhere, like telephone service.

According to colleagues, Nieh is widely recognized for research in computer operating systems that has resulted in significant contribu-

tions in a broad range of areas, including process migration, scheduling, thin-client computing, file systems, Web and multimedia systems, and performance analysis.

"His resume is replete with achievements in developing computer utility technologies useful to the academic community and industry," one nominator notes.

Not only is he an outstanding researcher, Nieh is also a dedicated teacher and leader in operating systems education. He teaches an innovative operating systems course that leverages thin clients and virtual machines.

The course enables both on-campus and distance learning students to learn important computer science concepts hands-on by applying them in the Linux kernel, the widely-used open-source operating system. Students note that Nieh's course is a distinguishing feature of Columbia's computer science education.

Nieh also serves as the technical advisor for nine states on compliance issues pertaining to the Microsoft antitrust settlement.

"His remarkable professional talents and superb ability to communicate his work positions him as an advocate of science in society," another nominator says.

Nieh has published more than 50 technical papers and has served on numerous conference program committees. His honors include a National Science Foundation CAREER Award, a Department of Energy Early Career Award and two IBM Shared University Research Awards.

Nieh received his Ph.D. and M.S. degrees from Stanford University and his B.S. from the Massachusetts Institute of Technology, all in electrical engineering. He enjoys playing guitar and squash. He and his wife, Belinda, have a daughter, Joanna. They live in New York City.

## Overbye Named Honorary Member

*New York Times* science writer Dennis Overbye will be inducted as an honorary life member of Sigma Xi at the Society's annual meeting in Montreal in November.

Since 1983, distinguished individuals not otherwise eligible for membership in Sigma Xi, who have served science, or the Society, in a manner or to a degree that merits such recognition, have been elected honorary life members by the Board of Directors.

After studying physics at the Massachusetts Institute of Technology, a stint, he says, that "was notable mainly for my adventures steering the heavyweight crew," and a year in graduate school at the University of California at Los Angeles studying astronomy, Overbye went back to Cambridge to pursue a writing career, which had always been his first love.

He moved to New York in 1980 when Time Inc. started *Discover* magazine, where he was a staff writer and editor. He has also been a writer and editor for *Sky and Telescope*.

In 1985, he signed a book contract and moved to Woodstock, where he stayed for 13 years, and finished two books, *Lonely Hearts of the Cosmos* and *Einstein in Love*. He joined *The New York Times* as deputy science editor in 1998, but is now a reporter covering cosmic affairs.

Overbye's writings have appeared in *Time*, *The New York Times Magazine* and many other publications. *Lonely Hearts of the Cosmos* was nominated for a National Book Critics' Circle Award in nonfiction and a *Los Angeles Times* Book Award in Science and won the 1992 American Institute of Physics Science Writing Award.

He also won the AIP Science Writing Award in 1980 for an *Omni Magazine* article called "The Wizard of Time and Space." He lives in Manhattan with his wife, the writer Nancy Wartik, and their daughter, Mira.

## Montreal Hosts 2004 Sigma Xi Student Research Conference

Sigma Xi will hold its fourth annual Student Research Conference on November 12-13 in Montreal, Canada.

Held in conjunction with the Society's annual meeting, the 2004 Student Research Conference offers the opportunity for undergraduate students from North America and abroad to submit abstracts for participation in a poster competition.

Students also attend career development workshops, participate in mentoring activities, join discussions with Sigma Xi members about research, hear talks by award winning scientists and network at various social events throughout the two-day meeting.

Recognition, including monetary awards, is given for outstanding student research.

Sigma Xi chapters are encouraged to participate by increasing awareness of the event, sponsoring student participants and encouraging annual meeting delegates to serve as research poster judges.

Exhibition space is also available for institutions to recruit students or feature their programs.

Visit [www.sigmaxi.org/meetings/student](http://www.sigmaxi.org/meetings/student) for highlights from past Sigma Xi Student Research Conferences. E-mail [src@sigmaxi.org](mailto:src@sigmaxi.org) for more information. Online registration will be available in July.

The Sigma Xi Web site also contains guidelines and tips for poster presentations to help students focus their efforts.

The conference format has been expanded in recent years to a two-day event, allowing students more time to interact with Sigma Xi members attending the annual meeting.

Conference speakers have included Sigma Xi award winners and honorary members.



More than 350 undergraduate students, parents, mentors and exhibitors attended lectures and workshops and networked at a variety of social events during Sigma Xi's two-day 2003 Student Research Conference in Los Angeles. Prizes were awarded for the best poster presentations.

## Kyoto Laureates Speak in San Diego

Sigma Xi was an honorary co-sponsor in March of the Kyoto Laureate Symposium in San Diego, celebrating the lives and works of those receiving the Kyoto Prize.

The featured laureates were University of Chicago astrophysicist Eugene Newman Parker, Harvard University nanotechnologist George McClelland Whitesides and bunraku puppet master Tamao Yoshida of Osaka, Japan, who won in the arts.

The laureates discussed their work and heard other lecturers in their fields.

The formal symposium began with a luncheon on the San Diego State University campus when University of California at San Diego (UCSD) professors Charles Kennel and Peter Wolynes paid tribute to Parker and Whitesides.

Parker is renowned for his work on the solar wind that blows toward earth, while Whitesides is best known for his research on self-assembling organic molecules for nanotechnology.



PHOTO BY GARY PAYNE

From left to right are Sigma Xi Board Member James Baur, Kyoto laureates Eugene Parker and George Whitesides and Sigma Xi Board Member-elect Donald McGraw, who chaired the symposium planning committee.

The symposium then moved to its original home on the UCSD campus for presentations by Whitesides and Parker at the Joan B. Kroc Institute for Peace and Justice. There, Stephen Berry of the University of Chicago and Edward C. Stone of Caltech's Jet Propulsion Laboratory made presentations

Kazuo Inamori established the Kyoto Prize in 1984, a quarter century after founding Kyoto Ceramics Co., which became known as Kyocera. Famous for non-conductive housings for semiconductors, the Japanese concern established its American headquarters in San Diego in 1971.

## Working to Preserve New England's Wildflower Heritage

Sigma Xi Grant-in-Aid of Research recipient Eric Jeremiah von Wettberg is working as a graduate student at Brown University to save part of New England's botanical heritage, namely an increasingly rare wildflower called northern blazing star.

His work also has broader implications for the impact of development on biodiversity.



Northern blazing star is a showy perennial that sports purple spiky button blossoms and is found on dry, sandy grasslands from Maine to Pennsylvania.

**Northern blazing star**

Blooming from late July to early September, it is the only blazing star native to New England.

"Many of the sites where it formerly flourished are under development region-wide, while other protected locations are slowly converting to forests," von Wettberg says. "Natural disturbances that once benefited the plants, such as fires, are now controlled."

In addition to these threats, deer browse on the plant, and the larvae of several moths eat its setting seeds.

Some of the remaining flower patches in Rhode Island are on land protected by conservation groups. Others grow on private property on the same type of land—sandy hilltop—coveted by people looking to build.

By demonstrating the impact of threats on this rare species, von Wettberg and his colleagues in Johanna Schmitt's lab at Brown may be able to view northern blazing star as the canary in the coal mine for

overall impact of development and deer browsing on biodiversity and ecosystems.

Von Wettberg graduated from Swarthmore College in 1999 and received a Sigma Xi grant to study sibling competition and inter-annual variation in seed characteristics in northern blazing star.

"I am primarily interested in evolution and landscape genetics of phytochrome-mediated shade avoidance responses," he says, "as well as plant ecological genetics, gene duplications, the evolution of shade avoidance and plant morphology, and conservation genetics."

He says that one of the most rewarding parts of his research has been working on the conservation biology of a rare plant.

"Although some of my work and the project Sigma Xi funded are not directly related to conservation, some of my work has helped reserve managers identify management problems and design better conservation approaches," von Wettberg says.

For example, demographic data he collected is allowing managers to target their efforts towards seed production and creating bare spaces, rather than protecting adult plants.

"I have enjoyed working outside and visiting the grassland habitats across New England. I have seen some amazing, beautiful places, such as Hither Hills State Park on Long Island, the hidden corners of Block Island, Chappy Island on Martha's Vineyard, Nantucket, Horseneck Beach, and the Kennebunk Plains of Maine."

From his research experience, he has gained a much better appreciation for how little is known about many plants and about grassland ecosystems. "I have learned much about grasslands and about doing research," von Wettberg says, "and there is much to do yet."



**Brown University undergraduate Kelly Gravuer and Sigma Xi grant recipient Eric Jeremiah von Wettberg by the university's wind-tunnel, which they used to determine how characteristics of northern blazing star seeds affect their dispersal ability. Northern blazing star, which has wind dispersed seeds, depends on dispersal between grassland patches for long-term persistence.**

### Honoring Others With Your Gift

You can honor someone who has played an important part in your life or career by making a gift to the Sigma Xi Center building fund.

Gifts of any size will be acknowledged on a Roll of Honor displayed via an interactive plasma screen in the lobby. Those contributing \$100 or more may write a brief tribute to their honorees.

Contributions of \$1,000 or more are also being acknowledged with plaza paving stones engraved with the names of donors and honorees.

Visit [www.sigmax.org](http://www.sigmax.org) for photos of the new Sigma Xi Center and more information on the capital campaign.