

# Sigma Xi Today

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## 2006 Sigma Xi Awards Honor Scientists and Journalists

Massachusetts Institute of Technology (MIT) biologist **Susan L. Lindquist**, MIT physicist and novelist **Alan Lightman**, Oak Ridge National Laboratory astrophysicist **W. Raphael Hix** and science journalists **Claudia Dreifus** and **Richard L. Hill** have been selected to receive Sigma Xi's prestigious annual awards.

Susan Lindquist will receive the 2006 William Procter Prize for Scientific Achievement. A professor of biology at MIT, she is a pioneer in the stress response and protein folding.



**Susan Lindquist**

Protein folding is a process in which a protein molecule assumes a distinct and intricate three-dimensional shape. Physiological activity is closely linked to the three-dimensional architecture of most proteins.

Lindquist's research has provided a framework for understanding diseases such as Alzheimer's and mad cow, which are marked by plaque in the brain caused by the misfolding of proteins.

The Procter Prize has been presented annually since 1950 to an outstanding scientist or engineer who is known for effective communication of complex ideas.

The prize includes a Steuben glass sculpture and \$5,000. The recipient also selects a young colleague to receive a \$5,000 Sigma Xi Grant-in-Aid of Research.

Alan Lightman will receive the John P. McGovern Science and Society Award, presented annually since 1984 for contributions to science and

society. The award consists of a medal and \$5,000.

Lightman is a best-selling novelist, essayist, physicist and educator. His essays on science have appeared in many publications, including *The New Yorker*, *Smithsonian*, *Discover*, *Harper's*, *Nature* and *The New York Times*.



**Alan Lightman**

His 1993 best-selling novel, *Einstein's Dreams*, was adopted for campus-wide readings at many colleges and universities. Lightman teaches at MIT.

W. Raphael Hix, a theoretical astrophysicist at Oak Ridge National Laboratory, will receive the 2006 Young Investigator Award. The award includes \$5,000 and a certificate of recognition. Sigma Xi members within 10 years of their highest earned degree are eligible for this award.



**W. Raphael Hix**

Hix is described by colleagues as one of the most talented young researchers in theoretical nuclear astrophysics in the world today.

He is working in the areas of nuclear physics, novae, supernovae, X-ray and gamma-ray bursts and stellar structure and evolution. His expertise is in nucleosynthesis—the study of the cosmic origins of the elements that make up the world and everything in it.

Claudia Dreifus and Richard Hill will be inducted as honorary Sigma Xi members.

A science writer for *The New York Times*, Dreifus collected many of the interviews for which she is famous in a book called *Scientific Conversations*.



**Claudia Dreifus**

Hill is an award-winning science writer for *The Oregonian* and a leading advocate for increasing public awareness about science.

Since 1983 some of the nation's top science journalists, as well as others who have made important contributions to science but who are ineligible for Sigma Xi membership, have been elected honorary members.



**Richard L. Hill**

The 2006 Sigma Xi awards will be presented at the Society's annual meeting in Detroit next November 2-5. Profiles of award-winners will appear in upcoming issues of *Sigma Xi Today*.

Nominations for Sigma Xi awards should be sent to the Committee on Awards at the Society's administrative offices.

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## Chapters Receive Recognition

Sigma Xi's more than 500 chapters constitute a unique network for education, mentoring, public involvement and collegial interaction.

It is at the chapter level, working within the local community, that Sigma Xi has its greatest influence and potential.

Each year, outstanding chapters are recognized with Certificates of Excellence at the Society's annual meeting. The 2005 recipients were highlighted in the last issue of *Sigma Xi Today*. Winning a chapter award one year makes a chapter ineligible for the next three years.

But Sigma Xi chapters that continue to achieve still merit recognition.

At the 2005 Sigma Xi Annual Meeting and Student Research Conference in Seattle, the following award-winning chapters were honored for their continued noteworthy work:

**Washington College**

**McGill-Montreal**

**University of New Mexico**

**Southern Illinois University-Carbondale**

**Pace University**

**Rockefeller University**

**Howard University**

Also, the following chapters were recognized for initiating the most new members the previous year:

**Massachusetts Institute  
of Technology**

**Princeton**

**Brown University**

**Smith College**

**Swarthmore College**

**Claremont Colleges**

**University of California-Irvine**

**Carleton College**

**Tampa Bay**

**Southern Maine**

**Washington University**

**Miami University-Ohio**

**Mount Holyoke College**

**University of Chicago**

**Lafayette College**

## New Multi-Chapter Grants Available

Sigma Xi is offering a new funding opportunity for chapter collaborations.

Up to five awards, at a maximum of \$1,000 each annually, will be granted for a two-year activity (\$2,000 total per collaboration).

Chapters need not have geographic proximity to one another to qualify for funding.

Collaborations may be real or virtual, and grant guidelines are sufficiently broad and flexible to encourage a wide range of activities.

Proposals are due March 1. Visit [www.sigmaxi.org](http://www.sigmaxi.org) for complete guidelines and an application form.

Chapters will be notified of funding results by July 1.

## New Directors Elected at Annual Meeting in Seattle

*New directors elected at Sigma Xi's 2005 Assembly of Delegates in Seattle included the following, all of whom will serve three years starting July 1, 2006.*

Baccalaureate Colleges Constituency Group: **David C. Lever**, Ohio Wesleyan University Chapter

Canadian/International Constituency Group: **Antonio Pita**, Swiss Chapter

*The following were elected associate directors by geographic regions and constituency groups to serve three years beginning July 1, 2006.*

Research & Doctoral Universities Constituency Group: **Robert Zand**, University of Michigan Chapter

North Central Region: **Christian W. Kreipke**, Wayne State University Chapter

Southwest Region: **Richard E. Miller**, Texas A&M University Chapter

*The following will serve as associate directors for two years beginning July 1, 2006.*

Northwest Region: **Kelly O. Sullivan**, Tri-Cities, Washington Chapter

Southeast Region: **John Knesel**, University of Louisiana at Monroe Chapter

*The following were elected to the Sigma Xi Committee on Nominations by geographic regions and constituency groups to serve three years starting November 6, 2005.*

Comprehensive Colleges & Universities Constituency Group: **Bertis B. Little**, Tarleton State University Chapter

Area Groups, Industries, State & Federal Laboratories Constituency Group: **Kelly O. Sullivan**, Tri-Cities, Washington Chapter

Mid-Atlantic Region: **Andrew J. Velkey, II**, Tidewater Chapter

Northeast Region: **Pamela K. Kerrigan**, Manhattan College Chapter

## Bird Mimics Other Species in the Sri Lankan Rainforest

*This is part of a series on recent Sigma Xi grant recipients. The next Grants-in-Aid of Research application deadline is March 15. Visit [www.sigmaxi.org](http://www.sigmaxi.org) for details.*

While watching mixed-species bird flocks in the Sri Lankan rainforest over the past decade, Eben Goodale and Sarath Kotagama were sometimes mystified to hear what they thought was a flock, only to find a greater racket-tailed drongo perched all by itself.

It took them a few years to realize that drongos could make all the noise themselves by imitating other species.

"I still remember vividly the moment that I first observed this behavior," Goodale says. "I was following a mixed-species flock through the rainforest. These flocks are large and noisy, averaging 12 species and nearly 40 individuals."



From the back of the flock, one bird, a greater racket-tailed drongo, swooped down and approached him to within three meters at head height. "The drongo was clearly mobbing me—a behavior that

birds use to notify other individuals of the presence of a stationary predator."

The familiar scene quickly changed, according to Goodale. "The drongo did an extraordinary thing: it began to mimic the mobbing-specific note types of other species. It kept rotating through the mobbing notes of other species, in addition to its own notes."

Goodale wouldn't have understood what was happening if he hadn't just completed a study on the alarm-associated calls of all the species in the flock system.

An animal behaviorist who just finished his Ph.D. at the University of Massachusetts, Amherst, Goodale says the two Sigma Xi Grants-in-Aid of Research he received have been invaluable to his work, contributing much to the success of the project.

It was the way drongos mimic that the researchers found surprising. In an article last year in the British journal *Proceedings of the Royal Society: Biological Sciences*, they reported that when a drongo is alarmed, it doesn't merely make the alarm calls of its own species. It mimics the alarm calls of other species as well and appears to know just the right call for a given situation.

This marks the first time, the two researchers say, that a cognitive ability of this kind has been seen in birds in the wild.

"While many birds copy the songs of other species," Goodale says, "there usually is not a connection between the sound they mimic and the situation that they are in. They may mimic alarm calls, but not use them in the appropriate situation."

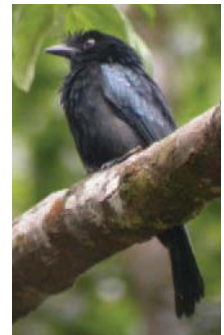
He and Kotagama, a professor at the University of Colombo, Sri Lanka, have worked together since Goodale was an undergraduate at Harvard and then a Fulbright Junior Scholar.

In studying drongos, the two first developed a "dictionary" of drongo calls made when drongos were attacked by predators.

Since drongos combine mimicry with their own calls, it's possible to see that when drongos are alarmed, they mimic the alarm calls of other species as well as the calls of nest predators, eagles and hawks.

"Although we are not yet sure why drongos imitate in this way, we suspect that by using other species calls or the calls of dangerous predators, they can communicate about a threat directly with other species," Goodale says. "That's the hypothesis we're now hoping to test."

He continues, "What's fascinating about this behavior is that it's reminiscent of what we know some birds—notably parrots—are able to do in the laboratory:



PHOTOGRAPH BY AMILA SALGADO

learn to use other species' signals in a context-dependent manner. But such context-dependent mimicry has not yet been demonstrated in the wild."

"It's very significant," says fellow Sigma Xi member Bruce E. Byers, a UMass biology professor and one of Goodale's thesis advisors. "The idea that signals could have evolved beyond species boundaries hasn't really been demonstrated before."

Byers says Goodale's paper also reveals "the pretty extraordinary cognitive abilities of the drongo," an area that his former student is continuing to investigate.

Other aspects of Goodale's research were published last year in *Auk* and the *Journal of Tropical Ecology*.

Goodale and Kotagama have conducted their field studies primarily in the Sinharaja World Heritage Reserve, the largest tract of lowland rainforest remaining in Sri Lanka, home to many of the country's endemic and endangered plants and animals.

The Sigma Xi Grant-in-Aid recipient is planning further fieldwork in Sri Lanka, India and Papua New Guinea.

So far, this line of research has also led to the production of a CD called *Sounds of Sinharaja: A Day's Walk Through a Rainforest in Sri Lanka*. Proceeds from its sale go to the student fund of the Field Ornithology Group of Sri Lanka. Visit [www.sigmaxi.org](http://www.sigmaxi.org) for an mp3 file of bird sounds and more information about the CD.

## Sigma Xi News Briefs

### George Bugliarello Prize

Sigma Xi announces its first prize for writing in *American Scientist*, the Society's 93-year-old bimonthly magazine of science and engineering.

The George Bugliarello Prize will be awarded to a superior interdisciplinary essay, review of research or analytical article published in the magazine.

The goal of the prize is to inspire thoughtful discourse about how technology, human society, our biological needs and the needs of other life on our planet can be advanced.

A prize of \$5,000 will be awarded biennially, beginning in 2007. Articles published in *American Scientist* during 2005 and 2006 will be considered for the first prize.

Prospective authors are encouraged to submit an outline or abstract to the editors ([editors@amsci.org](mailto:editors@amsci.org)) to determine the suitability of a proposed manuscript for publication in *American Scientist*.

### New Program Manager

Syed Ahmad has joined the staff of Sigma Xi as manager of international programs.

Ahmad has more than 17 years of experience in program and project management, organized basic and applied research, international civil service, conferencing and networking.

He is a former program officer for the Asian Productivity Organization (APO) in Tokyo, Japan, an inter-governmental, international non-profit organization established in 1961 to help improve productivity in Asia and the Pacific region through mutual cooperation.

Ahmad also served as director of the National Productivity Organization (NPO) in Dhaka, Bangladesh, a department under the Ministry of Industries dedicated to promoting and improving productivity in the country through research, policy formulation, training and consultancy.

A graduate of People's Friendship University in Moscow, he has an M.S. in mechanical engineering and a Ph.D. in economics.

### National Medal Winner

At 91, Norman Borlaug can look back on a lifetime of work in agriculture, aimed at feeding the world's hungriest, poorest nations.

A Sigma Xi member since 1942, Borlaug pioneered discoveries in high-yield agriculture that sparked the Green Revolution in the mid-1960s, saving millions around the world from starvation.

For his efforts, he was awarded the Nobel Peace Prize in 1970. His many other honors include Sigma Xi's 2003 John P. McGovern Science and Society Award.

Borlaug's most recent accolade is the National Medal of Science, announced in November by President George W. Bush.

From his office at Texas A&M University, where he is distinguished professor of international agriculture, Borlaug said he hopes this latest honor will help draw attention to the importance of agriculture in solving a large and ongoing problem: world hunger.

### TOYchallenge Nationals

On May 6, hundreds of inventive middle school students are expected to participate in Sally Ride Science's TOYchallenge East Coast Nationals at the Sigma Xi Center in Research Triangle Park, North Carolina. The West Coast Nationals will be held at the San Diego Aerospace Museum on April 29.

Sigma Xi is pleased to be a national sponsor once again of this innovative toy- and game-design competition that encourages middle school students, and especially girls, to excel in science and engineering. Visit [www.sigmaxi.org](http://www.sigmaxi.org) for more information.

### Nomination Deadline

April 1 is the nomination deadline for Sigma Xi president-elect and regional and constituency group elections.

Elections will take place at the Assembly of Delegates during the 2006 Sigma Xi Annual Meeting and Student Research Conference in Detroit on November 2-5.

Candidates are being sought for directors in the following geographic regions and constituency groups: North Central Region; Southwest Region; Comprehensive Colleges & Universities Group; and the Area Groups, Industries, State & Federal Laboratories Group.

Associate directors will be elected for: Mid-Atlantic Region; Northeast Region; Baccalaureate Colleges Group; and the Canadian/International Group.

Committee on Nominations seats are open for: Northwest Region; Southeast Region; and the Research & Doctoral Universities Group.

Nominations for these positions should be sent to Sigma Xi Deputy Executive Director Evan Ferguson at [eferguson@sigmaxi.org](mailto:eferguson@sigmaxi.org).

### Chubb Award Deadline

April 7 is the nomination deadline for Sigma Xi's first Walston Chubb Award for Innovation, designed to honor creativity in science and engineering.

The award carries a \$4,000 honorarium and an invitation to present the Walston Chubb Award Lecture at Sigma Xi's annual meeting.

The award is open to any U.S. citizen. After 10 years, U.S. citizenship will no longer be required. Membership in Sigma Xi is not a requirement.

Visit [www.sigmaxi.org](http://www.sigmaxi.org) for complete guidelines on this and other Sigma Xi awards. Nominations should be sent to the Sigma Xi Committee on Awards, P.O. Box 13975, Research Triangle Park, NC 27709.