

# UPDATE



June 2006

## SANTA FE INSTITUTE

### INSIDE SFI: ON AND OFF THE COWAN CAMPUS

<http://www.santafe.edu/events/update/insidesfi.php>

#### BOWLES AWARDED WASSILY LEONTIEF PRIZE

SFI Professor **Samuel Bowles** has been awarded the Wassily Leontief Prize for Advancing the Frontiers of Economics. Leontief pioneered the development of mathematical methods for studying the complex interactions among economic producers. Bowles was Leontief's colleague at Harvard, where, as a new PhD, his first assignment was to teach a graduate course jointly with the Nobel Prize winner. The first Leontief Prize winners were Nobel Laureate Amartya Sen and the late John Kenneth Galbraith. Bowles shares this award with Juliet Schor from Boston College. Schor, who also taught economics at Harvard, is, like Galbraith, an intellectual descendant of Thorsten Veblen, whose *Theory of the Leisure Class* launched the economic analysis of "conspicuous consumption." Schor's book *The Overworked American* was a best seller. Bowles' research has contributed to the mathematical economics of complex exchanges, the dynamics of economic inequality, and the evolutionary biology of human altruism. His most recent book is *Microeconomics: Behavior, Institutions and Evolution*. The prize ceremony in October 2006 at Tufts University will be on the theme "Economics for an Imperfect World" and will honor Galbraith's contributions. At SFI Bowles heads the Behavioral Sciences Program.

#### TALK AND BOOK SIGNING

SFI External Faculty member **Seth Lloyd** will present a talk on his newly released book entitled *Programming the Universe* at Garcia Street Books, on Saturday, July 15 at 2:00 pm.

**About the Book:** *Programming the Universe* explores the implications of the computing universe. Because it computes, the universe necessarily gives rise to complex structures such as galaxies, planets, life, and human beings. Everything that exists participates in, and contributes to the universe's ongoing computation.

**About the Author:** Seth Lloyd is Professor of Quantum Mechanical Engineering at MIT and an Adjunct Professor at the Santa Fe Institute. He was the first person to show how quantum computers could be built, and has worked with researchers around the world to build and operate quantum computers.

#### McCARTHY HONORED

Former Visiting Researcher **Cormac McCarthy** was honored by *The New York Times Book Review*. His novel *Blood Meridian* was named one of the best works of American fiction in the last 25 years.

For more information please see <http://www.nytimes.com/2006/05/21/books/fiction-25-years.html?ex=1148011200&en=cc8e7b60447ef26e&ei=5070&emc=eta1>

#### STUDENTS RECEIVE SFI PRIZE FOR SCIENTIFIC EXCELLENCE

The Santa Fe Institute presented the annual Prize for Scientific Excellence to 11 seniors from local high schools on Friday, May 12, 2006. This award is given to senior high school students whose work most closely embodies the spirit and rigor of the science pursued at the Santa Fe Institute. Students were nominated by their science teachers for their creativity, originality, and academic excellence. One student from each high school received a \$500 award: **Andrew J. Meilstrup**, Capital High School; **Derreck Barber**, New Mexico Academy for Sciences and Mathematics; **Caitlen Armijo**, Santa Fe High School; **Terrinda Charley**, New Mexico School for the Deaf; **Matt Matson-Tibbetts**, Santa Fe Secondary; **Rachel Candelaria**, Santa Fe Indian School; **John Perez, Jr.**, SER/SFPS Career Academy; **William Judd**, Academy for Technology and the Classics; **Antonia Clifford**, St. Michael's High School; **Alexei Pesic**, Santa Fe Preparatory; and **Stuart Daniel Pollock**, Desert Academy.

The Outstanding Teacher Award was given to **Paige Prescott** from Monte Del Sol Charter School. Paige was nominated and introduced by Monte del Sol Principal, Tony Gerlicz. The Prize for Outstanding Teacher includes a \$1000 check and an award certificate.

Thanks to the Los Alamos National Bank for supporting this program.

June 2006

## JULY PUBLIC LECTURE

The Santa Fe Institute will present a Public Lecture on Wednesday, **July 12, 2006**, at 7:30 pm at the James A. Little Theater.

The lecture, entitled “The Mother of Mass Extinctions: How Life on Earth Nearly Ended 250 Million Years Ago,” will be presented by **Douglas Erwin**, Senior Scientist, National Museum of Natural History, Smithsonian Institution and Professor, Santa Fe Institute, with **David Krakauer**, Professor, Santa Fe Institute.

During the greatest biodiversity crisis in the history of life some 250 million years ago, over 90% of all the species in the oceans died off in just a few hundred thousand years. Douglas Erwin, author of the new book *Extinction: How Life on Earth Nearly Ended 250 Million Years Ago* discusses his research in China, South Africa and the western US in search of the causes and consequences of this great mass extinction.

## BOOKS FROM THE SFI COMMUNITY

*Extinction: How Life on Earth Nearly Ended 250 Million Years Ago*, by **Doug Erwin** (Princeton University Press)

*Perfect Order: Recognizing Complexity in Bali*, by **Steve Lansing** (Princeton University Press)

*Programming the Universe: A Quantum Computer Scientist Takes On the Cosmos*, by **Seth Lloyd** (Knopf)

*More Than You Know: Finding Financial Wisdom in Unconventional Places*, by **Michael J. Mauboussin** (Columbia University Press)

*Complex Adaptive Social Systems: The Interest in Between*, by **John Miller and Scott Page** (Princeton University Press)

*Diversity*, by **Scott Page** (Princeton University Press)

## BUSINESS NETWORK NEWS

<http://www.santafe.edu/events/update/businessnetwork.php>

## BUSINESS NETWORK MEMBER FEATURED IN HARVARD BUSINESS REVIEW

**Jeffrey R. Cares**, President and CEO of SFI Business Network Member **Alidade Incorporated**, was selected by the *Harvard Business Review* for *The List – Breakthrough Ideas for 2006*. Jeff was featured at #5 – Battle of the Networks, writing, “Now enough companies derive competitive advantage from their

networks that they are coming up against one another. That means we must learn a whole new set of principles: not how companies compete against networks but rather how networks compete against networks.” The article appeared in the May 2006 issue.

## ANNUAL SCIENCE BOARD MEETING — DVDs AVAILABLE

The scientific presentations at SFI’s Annual Science Board Meeting talks were captured on video and are available in a three-DVD set. DVDs will be mailed to SFI Business Network Members and Trustees the first week of June. Other interested parties may request the DVD set from **Kay Frew** (kfrew@santafe.edu). A nominal fee of \$20 may be charged to cover SFI costs and shipping.

## PUBLICATIONS

<http://www.santafe.edu/events/update/publications.php>

## WORKING PAPERS

<http://www.santafe.edu/research/publications/working-papers.php>

**06-05-017**

Long-Range Memory Elementary 1D Cellular Automata: Dynamics and Nonextensivity  
*Thimo Rohlf and Constantino Tsallis*

**06-05-016**

A Generalization of the Central Limit Theorem Consistent with Nonextensive Statistical Mechanics  
*Sabir Umarov, Constantino Tsallis, and Stanly Steinberg*

**06-05-015**

The Visible Hand in a Production-Chain Market: A Market Equilibrium from Network Analytical Perspective  
*Tsutomu Nakano and Douglas R. White*

**06-05-014**

Information Flows in Causal Networks  
*Nihat Ay and Daniel Polani*

## REFEREED LITERATURE

<http://www.santafe.edu/events/update/publications.php>

**Halloy, Stephan R. P., Anton Seimon, Karina Yager, and Alfredo Tupayachi.** “Multidimensional (Climatic, Biodiversity, Socioeconomic, and Agricultural) Context of Changes in Land Use in the Vilcanota Watershed, Peru.” In *Land Use, Change, and Mountain Biodiversity*, edited by Eva Spehn, Maximo Liberman, and Christian Korner, 323. CRC Press, 2006.

**Halloy, Stephan R. P., and Jeffrey A. Lockwood.** "Ethical Implications of the Laws of Pattern Abundance Distribution." In *Emergence: Complexity and Organization* 7(2) (2005): 41-53.

**Hidalgo, C. A., A. Castro, and C. Rodriguez-Sickert.** "The Effect of Social Interactions in the Primary Consumption Life Cycle of Motion Pictures." *New Journal of Physics* 8 (2006): 29-39.

**Hofacker, I. L., and P. F. Stadler.** "Memory Efficient Folding Algorithms for Circular RNA Secondary Structures." *Bioinformatics* 22(10) (2006): 1172-1176.

**Krakauer, D. C., and A. Sasaki.** "The Greater than Twofold Cost of Integration for Retroviruses." In *Proceedings of the Royal Society B-Biological Sciences* 273 (1590)(2006): 1159-1163.

**Muckstein, U., H. Tafer, J. Hackermuller, S. H. Bernhart, P. F. Stadler, and I. L. Hofacker.** "Thermodynamics of RNA-RNA Binding." *Bioinformatics* 22(10) (2006): 1177-1182.

## LIBRARY ACQUISITIONS

For a list of recent purchases by the SFI library, please see <http://www.santafe.edu/events/update/library.php>

## CALENDAR OF EVENTS

<http://www.santafe.edu/events/calendar.php>

### June 4 - 30, 2006

Educational Program — "Complex Systems Summer School - Santa Fe," Director: **Dr. Dan Rockmore** (Dartmouth College and SFI). Administered by the Santa Fe Institute (SFI). Held at St. John's College in Santa Fe, New Mexico.

### June 28, 2006

Business Network Meeting — "Scaling and Growth of Complex Networks - Seattle." Co-hosted by SFI and Boeing.

### July 6 - 8, 2006

Workshop — "Degeneracy and Complexity in The Immune System," organized by **Eli Sercarz** (Torrey Pines Institute), **Alan Perelson** (LANL and SFI). Held at the Santa Fe Institute.

### July 9 - August 4, 2006

Educational Program — "Complex Systems Summer School - Beijing," Co-directors: **Dr. David P. Feldman** (College of the Atlantic and SFI), and **Dr. Chen Xiao-song**, (Institute for Theoretical Physics, CAS). Sponsored by SFI in cooperation with The Institute of Theoretical Physics, and the Graduate School, Chinese Academy of Sciences (CAS). Held at the Institute of Theoretical Physics in Beijing, China.

### July 9 - 22, 2006

Educational Program — "Grad Workshop in Computational Social Sciences," organized by **John Miller** (Carnegie Mellon University and SFI) and **Scott Page** (University of Michigan-Ann Arbor). Held at St. John's College.

### July 10 - 18, 2006

Workshop — "Emergence of the First States in Central China," organized by **Henry Wright** (University of Michigan/SFI). Held in Luoyang, China.

### July 12, 2006

Public Lecture — "The Mother of Mass Extinctions: How Life on Earth Nearly Ended 250 Million Years Ago," by **Douglas Erwin** (Smithsonian and SFI) with **David Krakauer** (SFI), organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater.

### July 16 - 23, 2006

Educational Program — "Foundations of Theoretical Medicine," organized by **David Krakauer** (SFI). Held at the Santa Fe Institute.

### July 18, 2006

Business Network Meeting — "Living Computation and Evolvable Software - San Jose," Co-hosted by SFI and Cisco.

### August 14, 2006

Working Group — "Cosmology and Cognition," organized by **George Gumerman** (SFI). Held at the Santa Fe Institute.

### September 10 - 12, 2006

Workshop — "Probing the Limits," organized by **Doug Erwin** (Smithsonian and SFI). Held at the Santa Fe Institute.

### September 12 - 14, 2006

Public Lecture — Thirteenth Annual Stanislaw Ulam Memorial Lecture Series: "On Plants-From Genes to Genomes to Genetically Modified Foods," by **Nina Fedoroff** (Pennsylvania State University and SFI) organized by **Ginger Richardson**. Held at the James A. Little Theater.

### September 15 - 19, 2006

Working Group — "Global IP Fellows Meeting," organized by **Shannon Larsen** (SFI). Held at the Santa Fe Institute.

### September 28 - October 1, 2006

Working Group — "Unifying Current Theories of Ecology," **Drew Allen** (University of California-Santa Barbara); **Jessica Green**, Organizer (University of California- Merced); **Steve Hubbell**, (University of Georgia and Smithsonian Tropical Research Institute); **Pablo Marquet**, (Catholic University of Chile and former SFI International Fellow). Held at the Santa Fe Institute.

**October 4, 2006**

Business Network Meeting — “Complex Adaptive Systems Applications Seminar — London,” Co-hosted by SFI and BT.

**November 1 - 2, 2006**

Workshop — “ARCS (Adaptive and Resilient Computer Security) Workshop BusNet,” organized by **Robert Ghanea-Hercock** (BT) and **Shannon Larsen** (SFI). Held at the Santa Fe Institute.

**November 3 - 5, 2006**

Meeting — “Annual Business Network and Board of Trustees Meeting,” organized by **Bill Miller** (Legg Mason), **Geoff West** (SFI), and **Chris Wood** (SFI). Held at the Santa Fe Institute and the Inn at Loretto.

**November 15, 2006**

Public Lecture — “Forecasting Natural Disasters in the Chaotic and Complex Earth,” by **John Rundle** (University of California-Davis) with **Geoffrey West**, organized by **Ginger Richardson**. Held at the James A. Little Theater.

## JUNE VISITORS AND ARRIVALS

<http://www.santafe.edu/events/monthlyvisitors.php>

**Tony Bell** (6/25-30), Computational Neurobiology, The Salk Institute, La Jolla, CA

**Elizabeth Bradley** (6/4-9), Department of Computer Science, University of Colorado

**Juan-Camilo Cardenas** (6/20-7/25), Facultad de Economia - CEDE, Universidad de los Andes

**Thomas Carter** (6/1-30), Computer Science/Cognitive Studies, California State University-Stanislaus

**Carlton Caves** (6/27-30), Department of Physics and Astronomy, University of New Mexico

**Shelley Copley** (6/18-7/8), Molecular, Cellular, and Developmental Biology, University of Colorado

**George Cybenko** (6/21-24), Engineering and Computer Science, Dartmouth College

**Rob de Ruyter** van Steveninck (6/26-7/1), Biophysics and Neural Science, University of Indiana

**Gidon Eshel** (6/12-18), Geophysical Sciences, University of Chicago

**Hunter Fraser** (6/17-25), The Broad Institute of Harvard and MIT

**John Geanakoplos** (6/6-7/6), Economic Theory, Cowles Foundation, Yale University

**Eric Goles** (6/25-30), Dept de Ingenieria Matematica, University of Chile

**Alfred Hubler** (6/5-8/20), Department of Physics, University of Illinois-Urbana

**Willemien Kets** (6/30-8/1), Economics, Tilburg University, The Netherlands

**Michael Lachmann** (6/10-25), Max Planck Institute for Evolutionary Anthropology

**John Lafferty** (6/18-25), Computer Science and Machine Learning, Carnegie Mellon University

**John Machta** (6/7-8), Physics, University of Massachusetts-Amherst

**Neo Martinez** (6/13-18), Ecology, Pacific Ecoinformatics and Computational Ecology Lab, Berkeley, CA

**Lauren Meyers** (6/10-7/1), Integrative Biology, University of Texas at Austin

**Melanie Mitchell** (6/18-23), Department of Computer Science, Portland State University

**Mark Newman** (6/11-25), Department of Physics, University of Michigan

**Bruno Olshausen** (6/25-28), University of California-Berkeley

**Larry Polansky** (6/22-27), Department of Music, Dartmouth College

**Jose Principe** (6/28-7/1), Computational NeuroEngineering Lab, University of Florida

**Scott Rifkin** (6/17-25), Department of Organismic and Evolutionary Biology, Harvard

**Peter Stadler** (6/5-8), Bioinformatik, Inst.f.Informatik, University of Leipzig

**Libby Wood** (6/29-8/1), Political Science, Yale University

**Daniel Yamins** (6/25-7/8), Applied Mathematics, Harvard University