

UPDATE



January 2006

SANTA FE INSTITUTE

INSIDE SFI: ON AND OFF THE COWAN CAMPUS

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

SCIENTISTS EARN 2006 UNIVERSITY OF LOUISVILLE GRAWEMEYER AWARD FOR PSYCHOLOGY

Two scientists who have helped identify the brain's mapping system have earned the 2006 University of Louisville Grawemeyer Award for Psychology.

They are **John O'Keefe** (Professor of Cognitive Neuroscience at University College London) and **Lynn Nadel** (Regent's Professor of Psychology and Cognitive Science, Director of the Cognition and Neural Systems Program at University of Arizona, and former SFI External Faculty member).

They found that the brain forms a cognitive mapping system in the hippocampus section of its temporal lobe that acts as an internal global positioning system. Powering the system are "place cells," neurons that use data about distance and directions to pinpoint locations.

For more information see <http://www.grawemeyer.org/psychology/>

ASU LAUNCHES NEW SCHOOL OF HUMAN EVOLUTION & SOCIAL CHANGE

Arizona State University is launching its new School of Human Evolution and Social Change (SHESC) to re-energize the field of anthropology and focus it on the challenges of modern societies.

The new school, housed in the College of Liberal Arts and Sciences, was officially launched November 8 and builds on an already highly-ranked ASU Department of Anthropology by including non-anthropology faculty members. "The result is a school that will focus not only on the past and present, but also on the future functioning of humans and human societies," said **Sander van der Leeuw** (Director of SHESC and SFI External Faculty member).

For more information see http://www.asu.edu/news/stories/200511/20051103_anthropology.htm

WORKING GROUP AT SFI

Stephanie Forrest (UNM and SFI Professor) organized a small working group entitled "Sensitive Data in a Wired World." The purpose of the meeting was to discuss the technical challenges of handling sensitive data, and the policy and legal issues facing data subjects, data owners, and data users in a world of proliferating on-line sensitive data.

Members of the working group and the SFI community were invited to attend the talk by **Dan Boneh** (Stanford University) entitled "Enforcing Compliance in Enterprise Networks."

ROCKMORE, ART, AND AUTHENTICATION

Dan Rockmore (SFI External Faculty member) is featured in "The Rembrandt Code," by Bijal P. Trivedi (*Wired* magazine, December, 2005). Rockmore plans to digitally analyze a work of art by Rembrandt. Is it real or is it fake? Millions of dollars are at stake, and the art and science worlds are taking note.

For more information see <http://www.wired.com/wired/>

January 2006

TSALLIS CO-DIRECTS SCHOOL AND CONFERENCE

Constantino Tsallis (SFI Visiting Researcher, Brazilian Academy of Sciences) and **Ugur Tirnakli** (Ege University, Turkey) will codirect the ICTP School and Conference on Complex Systems and Nonextensive Statistical Mechanics in Miramare, Trieste, Italy (July 31 – August 8, 2006).

The aim of the event is to focus on recent developments in the nonlinear dynamical foundations of nonequilibrium statistical mechanics, more specifically, nonextensive statistical mechanics, its applications to complex systems in physics, economics, geophysics, astrophysics, biology and elsewhere.

J. Doyne Farmer (SFI Professor) and **Murray Gell-Mann** (SFI Distinguished Fellow) are members of the ICTP International Scientific Committee.

For more information see <http://www.ictp.it/>

SFI ALUMNUS RECEIVES NSF GRANT

Jeff Brantingham (Anthropology, UCLA and former SFI postdoc) and his group have been awarded a three-year grant by the National Science Foundation Human and Social Dynamics Program for their research on Mathematical and Simulation Modeling of Crime Hotspots.

The project centers on theoretical, methodological, and empirical work to develop analytical and computational models of crime pattern formation.

Crime mapping forms a key feature of current approaches to understanding offender behavior and is a tool used increasingly by police departments and policy makers for strategic crime prevention. However, despite the availability of sophisticated digital mapping and analysis tools there is a substantial gap in our understanding of how low-level behaviors of offenders lead to aggregate crime patterns such as crime hot spots. Thus, for example, we are unable to specify exactly why directed police action at crime hot spots sometimes leads to displacement of crime in space but, surprisingly, often can also lead to hot spot dissipation and a real reduction in crime incidences.

For more information please see <http://paleo.sscnet.ucla.edu/ucmasc.htm>

WORKSHOP FOR GRADUATE AND MEDICAL STUDENTS

SFI is pleased to announce the Foundations in Theoretical Medicine workshop, supported by the National Institutes of Health, for graduate and medical students. The workshop will be held at SFI and St. John's College from July 16-23, 2006. The program will explore how mathematical and computer models may reveal new and clinically promising approaches to the understanding of disease. **David Krakauer** (SFI Professor) will direct the workshop.

For more information see <http://www.santafe.edu/medicine06.html>

VISITOR AND COLLOQUIUM SPEAKER

Rob Axtell (Senior Fellow, The Brookings Institution and SFI External Faculty member) presented a colloquium at SFI on December 15, 2005, entitled "A General Theory of Behavioral Discounting with Applications to Finance and the Environment: Hyperbolic Laws, Integrability, and Negative Probability."

SFI IN THE NEWS

Steen Rasmussen (LANL and SFI External Faculty member) was featured in an article entitled "Education: The Meaning of Life" that appeared Sunday, December 18, 2005, in *The New Mexican*.

Steen has been mentoring high school students from Monte del Sol Charter School, Santa Fe, NM, in their Origins of the Universe class on the meaning of life.

For more information see <http://www.freewmexican.com/news/36497.html>

BUSINESS NETWORK NEWS

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

ANNOUNCING THREE NEW BUSINESS NETWORK MEMBERS

The Santa Fe Institute is pleased to welcome three new organizations to the Business Network: **Arience Capital Management**, **Morgan Stanley Investment Management**, and **Susquehanna International Group**.

Arience Capital Management, L.P. is a private fund management company located in New York City (Website unavailable).

Morgan Stanley Investment Management is the asset management division of Morgan Stanley & Co., the global financial services firm. To learn more, visit www.morganstanley.com.

Susquehanna International Group, LLP (SIG) is a market research and trading firm. See www.susq.com for more information.

BUSINESS NETWORK FELLOWSHIP

The application process for the 2006 Business Network Fellowship begins this month. The Fellowship is open to individuals from member companies of the Santa Fe Institute Business Network. The fellowship supports an individual up to four weeks over a two-year period to pursue research congruent to the research of the Santa Fe Institute. More information about the fellowship and how to apply will be available on January 10, 2006. Questions should be directed to **Ann Stagg** at annstagg@santafe.edu.

NOTES FROM THE INTERNATIONAL PROGRAM

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

COMPLEX SYSTEMS SCHOOL IN INDIA

SFI's International Program is pleased to support the Complex Systems School hosted by the Institute of Mathematical Sciences in Chennai, India. The school, directed by Dr. **Sitabhra Sinha**, will take place January 2-27, 2006. SFI faculty members lecturing at the school include **Geoffrey West** (President), **D. Eric Smith** (Professor), and **Lauren Buckley** (Postdoctoral Fellow). **Shannon Larsen** (International Program Director) will also visit the school during the first week to attend the opening week events.

WORKING GROUP CONTINUES

The Next Generation Simulations of Human-Environmental Interactions working group met

December 12-14, 2005, at the University of Arizona in Tucson, Arizona, to continue work started at the Anthropogenic Landscapes: Social and Environmental Complexity in Lowland Latin America workshop held in Brazil in May 2005. This working group was organized by **Steve Lansing** (SFI Professor and University of Arizona) and funded by the SFI Robustness Program. The group is focused on examining the methods used to model human-environmental interactions in various research communities.

INTERNATIONAL FELLOW VISITS SFI

Elena Alvarez-Buylla (SFI International Fellow) from Universidad Nacional Autonoma de Mexico returned to Santa Fe on December 18, 2005, as part of her International Fellowship and as a participant in the Evolution of Gene Regulatory Logic workshop organized by **David Krakauer** (SFI) and **Tanya Berger-Wolf** (DIMACS & UIC).

PUBLICATIONS

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

WORKING PAPERS

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

REFEREED LITERATURE

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

Casati, G., C. Tsallis, and F. Baldovin. "Linear Instability and Statistical Laws of Physics." *Europhys. Lett.* 72(3) (2005): 355-361.

Montero, M., J. Perello, J. Masoliver, F. Lillo, S. Micciche, and R. N. Mantegna. "Scaling and Data Collapse for the Mean Exit Time of Asset Prices." *Phys. Rev. E* 7205(5 PT 2) (2005): 57- 66.

Valverde, S., and R. V. Sole. "Logarithmic Growth Dynamics in Software Networks." *Europhys. Lett.* 72(5) (2005): 858-864.

Washietl, S., I. L. Hofacker, M. Lukasser, A. Huttenhofer, and P. F. Stadler. "Mapping of Conserved RNA Secondary Structures Predicts Thousands of

Functional Noncoding RNAs in the Human Genome." *Nature Biotechnol.* 23(11) (2005): 1383-1390.

Zimmermann, M. G., and V. M. Eguiluz.
"Cooperation, Social Networks, and the Emergence of Leadership in a Prisoner's Dilemma with Adaptive Local Interactions." *Phys. Rev. E* 7205(5 PT 2) (2005): 201- 215.

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>

January 6-8

Workshop - The Evolution of Gene Regulatory Logic, organized by **David Krakauer** (SFI) and **Tanya Berger-Wolf** (DIMACS & UIC)

January 21-22

Education Program - Adventures in Modeling, organized by **Eric Klopfer**, **Irene Lee**, and **Ginger Richardson**

February 8-10

Workshop - General Patterns of Migration, organized by **Ilia Perios**

February 17-18

Working Group - Inequality and Social Interactions, organized by **Samuel Bowles**

JANUARY VISITORS AND ARRIVALS

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

David Albers (1/8-10), Mathematics in the Sciences, Max Planck Institute for Mathematics in the Sciences, Leipzig

Sam Bowles (1/2-3/6), Research Faculty, Santa Fe Institute

Jung-Kyoo Choi (1/16-2/22), School of Economics and Trade, Kyungpook National University

Simone D'Alessandro (1/22-2/5), Economics, University of Siena

Charles Efferson (1/1-3/7), Environmental Science and Policy, University of California, Davis

Duncan Foley (1/22-2/4), Economics, New School for Social Research, New York

Stephan Mertens (1/29-2/26), Institut für Theoretische Physik, Otto-von-Guericke Universität

John Miller (1/2-7/30), Social and Decision Sciences, Carnegie Mellon University

Martina Pignatti Morano (1/22-2/7), Department of Economics (Siena University), Centre for the Study of African Economies (Oxford University)

Norman Packard (1/2-6), ProtoLife, Venice, Italy

Ilia Peiros (1/5-9/20), Evolution of Human Language, Santa Fe Institute

W.L. Rathje (1/3-6), Stanford Archaeology Center, Stanford University

Rajiv Sethi (1/2-16), Department of Economics, Columbia University

Carlos Sickert (1/7-31), Instituto de Sociología, Universidad Católica de Chile

Christopher Stephens (1/8-11), Instituto de Ciencias Nucleares, U.N.A.M.

Jessika Trancik (1/3/06-), Engineering, Columbia University

Jorge Velasco-Hernandez (1/21-31), Matematicas Aplicadas y Computacion, Instituto Mexicano del Petroleo

Libby Wood (1/2-3/9), Professor of Political Science, Yale University

Paolo Zanutto (1/3-2/6), Director of the Laboratory of Molecular Evolution and Bioinformatics [LEMB], University of Sao Paulo

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