

# UPDATE



December 2006

SANTA FE INSTITUTE

## INSIDE SFI: ON AND OFF THE COWAN CAMPUS

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

### FARMER IN THE NEWS

An article entitled "Shun the Rational Agent to Rebuild Economics" by Paul Ormerod appeared in FT.com (Financial Times) on November 5, 2006, which cites work by **J. Doyne Farmer** (SFI Professor). It describes his model that replicates many of the subtle features of prices on the London Stock Exchange.

For more information please see <http://www.ft.com/cms/s/213a532e-6cf7-11db-9a4d-0000779e2340.html>

### MOROWITZ AND SMITH IN THE NEWS

**Harold Morowitz** (SFI Science Board, George Mason University) and **Eric Smith** (SFI Professor) were mentioned in an article entitled "Was Life on Earth Inevitable?" by Philip Ball that appeared in *news@nature.com*, on November 14, 2006.

"This view implies not only that life had to emerge on the Earth, but that the same would happen on any similar planet. Smith and Morowitz hope ultimately to predict the first steps in the origin of life based on the laws of physics and chemistry alone."

For more information please see [http://www.nature.com/news/2006/061113/pf/061113-9\\_pf.html](http://www.nature.com/news/2006/061113/pf/061113-9_pf.html)

### ERWIN ON NOVA

SFI Trustee and Professor, **Doug Erwin** (Smithsonian Institution) appeared on *Nova ScienceNow* on

November 21, 2006, discussing "MASS Extinction: what caused the mother of all extinctions 250 million years ago?"

For more information please see <http://www.pbs.org/wgbh/nova/sciencenow/3318/01.html>

### NEW BOOK BY BOWLES, BARDHAN, AND BALAND

*Inequality, Cooperation, and Environmental Sustainability*, written and edited by **Samuel Bowles** (SFI Professor), **Pranab Bardhan** (University of California at Berkeley), and **Jean-Marie Baland** (University of Namur, Belgium) has just been published by Princeton University Press.

Drawing on mathematical models and field studies of environmental degradation around the world they seek to answer the question: would improving the economic, social, and political condition of the world's disadvantaged people slow—or accelerate—environmental degradation? Drafts of the book's chapters were initially presented at a working group at the Institute funded by the Russell Sage Foundation as part of a research project on *persistent inequality*. The cover image is a painting by Santa Fe artist Patrick McFarlin, representing the Acequia Madre, an example of cooperation in the management of environmental resources. This is the fourth in a series of Princeton University Press books based on SFI workshops on inequality organized by Bowles. Earlier volumes are *Unequal Chances: Family Background and Economic Success*, *Poverty Traps*, and *Globalization and Egalitarian Redistribution*.

### BUSINESS NETWORK NEWS

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

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## NEW BUSINESS NETWORK WEB-BASED COMMUNITY

In partnership with Shared Insights, Business Network members will have access to a new community website featuring SFI content such as video, SFI Working Paper and Library archives, and, most importantly, increased interaction and networking opportunities with fellow members. The beta testing phase for this new web-based community began December 1 and will continue through December 24.

## COMPETITIVE STRATEGIES IN COMPLEX NETWORKS

The last Topical Meeting of 2006, "*Competitive Strategies in Complex Networks*," will be held December 5-6 in Newport, RI. The Topical Meeting is co-presented by Alidade, Inc. and CNO Strategic Studies Group.

## ANNUAL BUSINESS NETWORK AND BOARD OF TRUSTEES' SYMPOSIUM—FEEDBACK

Over 160 Business Network members, trustees, researchers, and special guests attended the annual meeting. The theme, *infectivity*, included models of infection and contagion in biological, social, and technological systems. A complete DVD set of the November meeting will be sent to Business Network members and trustees on December 1. If you would like to purchase a DVD please email Peg Shearer at [peg@santafe.edu](mailto:peg@santafe.edu)

As we always want to improve our Annual Meeting, please visit the online form to submit your feedback and suggestions at: <https://websurveyor.net/wsb.dll/41539/AnnualMtg.htm>

## PUBLICATIONS

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

## WORKING PAPERS

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

**06-11-046**

Language Diversity of Measured Quantum Processes  
*Karoline Wiesner and James P. Crutchfield*

**06-11-045**

Intrinsic Quantum Computation  
*James P. Crutchfield and Karoline Wiesner*

**06-11-044**

Emergence of Proto-cellular Growth Laws  
*Tristan Rocheleau, Steen Rasmussen, Peter E. Nielsen, Martin N. Jacobi, and Hans Ziock*

**06-11-043**

Infinite Correlation in Measured Quantum Processes  
*Karoline Wiesner and James P. Crutchfield*

**06-11-042**

How Random is a Coin Toss? Bayesian Inference and the Symbolic Dynamics of Deterministic Chaos  
*Christopher C. Strelhoff and James P. Crutchfield*

**06-11-041**

Topological Vulnerability of the European Power Grid under Errors and Attacks  
*Marti Rosas-Casals, Sergi Valverde, and Ricard V. Solé*

**06-11-040**

Doi-Peliti Methods for Non-commuting Observables  
*D. Eric Smith*

**06-11-039**

K-Scaffold Subgraphs of Complex Networks  
*Bernat Corominas-Murtra, Sergi Valverde, Carlos Rodriguez-Caso, and Ricard V. Solé*

## REFEREED LITERATURE

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

Ahuja, S. K., F. Aiuti, B. Berkhout, P. Biberfeld, D. R. Burton, V. Colizzi, S. G. Deeks, R. C. Desrosiers, M. P. Dierich, R. W. Doms, M. Emerman, R. C. Gallo, M. Girard, W. C. Greene, J. A. Hoxie, E. Hunter, G. Klein, B. Korber, D. R. Kuritzkes, M. M. Lederman, M. H. Malim, P. A. Marx, J. M. McCune, A. McMichael, C. Miller, et al. "A Plea for Justice for Jailed Medical Workers." *Science* 314(5801) (2006): 924-925.

Bacon, D., I. L. Chuang, and A. W. Harrow. "Efficient Quantum Circuits for Schur and Clebsch-Gordan Transforms." *Physical Review Letters* 9717(17) (2006): 49-52.

Erwin, D. H. "Evolutionary Contingency." *Current Biology* 16(19) (2006): 825-R826.

**Ferrari, M. J., S. Bansal, L. A. Meyers, and O. N. Bjornstad.** "Network Frailty and the Geometry of Herd Immunity." *Proceedings of the Royal Society B—Biological Sciences* 273(1602) (2006): 2743-2748.

**Kauffman, S. A.** "The Evolution of Future Wealth." *Scientific American* 295 (5) (2006): 44.

**Sardanyes, J., and R. V. Solé.** "The Role of Cooperation and Parasites in Non-Linear Replicator Delayed Extinctions." *Chaos, Solitons & Fractals* 31(5) (2007): 1279-1296.

**Smith, E., H. J. Morowitz, and V. Spinivasan.** "Experimental Search for Minimal Organisms and the Last Universal Common Ancestor." *Complexity* 12(1) (2006): 11-12.

**Trancik, J. E., and K. Zweibel.** "Technology Choice and the Cost Reduction Potential of Photovoltaics." Conference Record of the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion 1 & 2 (2006): 2490-2493.

## 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 2-4, 2007

Working Group — "The Co-evolution of Behaviors and Institutions," organized by **Sam Bowles** (SFI). Held at the Santa Fe Institute.

### January 4-6, 2007

Workshop — "Dynamic Structure of Robustness," organized by **Erica Jen** (SFI) and **Michelle Girvan** (SFI). Held at the Santa Fe Institute.

### January 9-11, 2007

Meeting — "SFI-NREL Energy Meeting," organized by **Geoffrey West** (SFI) and **Dan Avizu** (National Renewable Energy Laboratory NREL). Held at the Santa Fe Institute.

### February 7, 2007

Public Lecture — "More Than Pretty Pictures: The Power of Images in Science," **Felice Frankel** (Harvard

University, Envisioning Science Program) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

### February 12-13, 2007

Working Group — "Ecosystem Models," organized by **Carlos Castillo-Chavez** (Arizona State University). Held at the Santa Fe Institute.

### February 15-18, 2007

Working Group — "The Inheritance of Inequality in Pre-modern Societies," organized by **Sam Bowles** (SFI). Held at the Santa Fe Institute.

### March 1-3, 2007

Working Group — "The Continued Study of Language Acquisition and Evolution," organized by **John Holland** (SFI & University of Michigan, Ann Arbor). Held at the Santa Fe Institute.

### March 1-4, 2007

Workshop — "Deception: Methods, Motives, Contexts & Consequences," organized by **Brooke Harrington** (Brown University). Held at the Santa Fe Institute.

### March 14, 2007

Public Lecture — "The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies," **Scott E. Page** (SFI & University of Michigan - Complex Systems, Political Science & Economics) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

### April 18, 2007

Public Lecture — "Inevitable Life?" **D. Eric Smith** (SFI - Frontiers in Integrative Biological Research Program) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

### May 4-5, 2007

Meeting — "Annual Science Board Meeting and Symposium," organized by **Geoffrey West** and **Chris Wood** (SFI), and Science Board Co-Chairs **David Campbell** (Boston University) and **Simon Levin** (Princeton University). Held at the Santa Fe Institute.

### May 9, 2007

Public Lecture — "New Mexico's Renewable Energy Future," **Ben Luce** (Los Alamos National Laboratory; Director - New Mexico Coalition for Clean Affordable Energy) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

**June 1 - August 15, 2007**

Educational Program — “NSF Undergraduate Internship Program,” organized by **Geoffrey West** (SFI). Held at the Santa Fe Institute.

**June 3-19, 2007**

Educational Program — “Complex Systems Summer School 2007 - Santa Fe,” Director: **Daniel Rockmore** (SFI & Dartmouth College). Held at St John’s College, Santa Fe & the Santa Fe Institute.

**June 13, 2007**

Public Lecture — “Stylish Mathematics,” **Dan Rockmore** (SFI & Dartmouth College, Mathematics) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

**June 19-21, 2007**

Workshop — “Nucleic Acid: The First Billion Years,” organized by **Harold Morowitz** (George Mason University), **D. Eric Smith** (SFI), **Shelley Copley** (University of Colorado) and **Nigel Goldenfield** (University of Illinois). Held at the Santa Fe Institute.

**July 8-21, 2007**

Educational Program — “Graduate Workshop in Computation, Social Science Modeling and Complexity,” organized by **John Miller** (SFI & Carnegie Mellon University) and **Scott E. Page** (SFI & University of Michigan). Held at St John’s College, Santa Fe & the Santa Fe Institute.

**July 8 - August 4, 2007**

Educational Program — “Complex Systems Summer School 2007 - Beijing,” Co-directors: **David P. Feldman** (SFI & College of the Atlantic) and **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 25, 2007**

Public Lecture — “Sexual Violence during War,” **Elisabeth Wood** (SFI & Yale University, Political Science) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

**August 15, 2007**

Public Lecture — “Investor Behavior and Market Efficiency,” **Terrance Odean** (Haas School of Business, University of California at Berkeley) organized by

**Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

**September 11, 12, & 13, 2007**

Fourteenth Annual Ulam Memorial Lecture Series — “Twenty First Century Climate,” **Daniel Schrag** (Harvard University, Laboratory for Geochemical Oceanography) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

**November 14, 2007**

Public Lecture — “Technology Creating Technology,” **W. Brian Arthur** (SFI & Intelligent Systems Lab, PARC) organized by **Ginger Richardson** (SFI). Held at the James A. Little Theater, New Mexico School for the Deaf.

## DECEMBER VISITORS AND ARRIVALS

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

**Shona Brown** (12/6-9), Senior Vice President, Business Operations, Google.

**Iain Couzin** (12/3-10), Department of Zoology, University of Oxford.

**Sanmay Das** (12/9-12), University of California - San Diego.

**Judy Gilbert** (12/6-8), Director of Staffing/College Programs, Google.

**Bobbi Low** (12/5-15), Professor of Resource Ecology, University of Michigan.

**Bob Moomey** (12/5-7), Communications Training and Consulting, Bob Moomey Communications.

**Carl Simon** (12/5-15), Mathematics, Economics, and Public Policy, University of Michigan.

**Peter Stadler** (12/13-26), Bioinformatik, Inst. f. Informatik, University of Leipzig.