Jerry Sabloff named new SFI President

SFI’s Board of Trustees, with input from the Institute community, has named Jerry Sabloff to replace Geoffrey West and become the Institute’s 7th President.

Sabloff is an eminent archaeologist known for his discoveries in prehistoric settlement patterns, pre-industrial cities, and ancient Maya civilization (see “Jerry Sabloff’s background” on page 3). His contributions to archaeological theory and method provide a strong link to the research at SFI that focuses on uncovering the fundamental scientific principles that govern physical, living, and social systems.

Sabloff will take the reins August 1, 2009. (See “An interview with incoming SFI President Jerry Sabloff” on page 3.)

“We are delighted Jerry has accepted our offer,” says Bill Miller, Chairman of SFI’s Board of Trustees and Chairman and Chief Investment Officer of Legg Mason Capital Management. “We need a broad and deep intellectual investment to build SFI’s scientific footprint, and Jerry uniquely combines an understanding of our multidisciplinary science with executive-level administrative and fundraising experience.”

Geoffrey is stepping down after four years as President and will return to his research full time as an SFI Distinguished Professor. He plans to continue his work in biological scaling and continue to extend these ideas to cities and corporations as a means of exploring a more holistic framework for sustainability.

Says Geoffrey: “I am so pleased to turn the reins over to such a distinguished and accomplished scientist, knowing that Jerry will both build SFI’s scientific leadership position and broaden our base of financial support.”

Balancing innovation and regulation in financial markets

The massive disruption of the world economy in recent months has many in government and the general public calling for new regulations to control the system’s sensitivities to upsets.

Market practitioners are often wary of any new regulatory mechanisms, arguing that with new regulations comes a reduced ability to innovate, or create the new financial instruments that can help distribute capital efficiently. But in many highly complex adaptive systems – in biology, physics, society, or economics, for example – regulation and innovation co-evolve in ways that make separating them difficult.

At a May 15 Business Network meeting at Fidelity Investments headquarters in Boston, some 50 financial experts and scholars spent a day sharing ideas from a variety of fields about the interconnected nature of these two forces. SFI and Fidelity co-sponsored the gathering.

“Financial practitioners will say that regulation stunts innovation,” says the meeting’s organizer, SFI External Professor and Dartmouth College Professor of Mathematics and Computer Science Dan Rockmore. “We know, in fact, that regulatory mechanisms, whether naturally occurring or intentionally imposed, are not always bad for the system. Regulation and innovation work and evolve together at times to either make the system more stable or destabilize it.”

The meeting’s participants, he says, spent the day looking at different kinds of regulatory mechanisms and the back and forth between the two actors and, in typical SFI fashion, “tried to find big, central ideas across disciplines.”

SFI Faculty Chair and Professor David Krakauer spoke to the group about the co-evolution of innovation and regulation in biological selection and development, and its possible implications for complex social systems such as the economy.

Jeff Madrick, editor of Challenge magazine and director of policy research at the Schwartz Center for Economic Policy Analysis, The New School, surveyed lessons from previous economic collapses. He said innovation is almost always considered a healthy characteristic of finance, but waves of innovation often lead to crashes and recessions. A lack of or loosening of regulations also have repeatedly given rise to tidal waves of innovation that create severe instability. These patterns call for a deeper look at regulatory control of economic systems, he said.

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Three new Omidyar Fellows to join SFI

Ten current SFI Postdoctoral Fellows were named Omidyar Fellows earlier this year; they will be joined by three new Omidyar Fellows for 2009 in the fall and winter.

The Omidyar Fellows Program was established at SFI in late 2008 with a gift from eBay Founder Pierre Omidyar, an SFI Trustee. The program aims to attract scholars from the social, physical, and natural sciences to spend two to three years as postdoctoral fellows at SFI delving into the major questions facing science and society, using a multidisciplinary, systems-thinking approach.

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“Three are extraordinary offers in this economy and job climate, but then these are extraordinary young researchers,” says Omidyar Fellows Program Manager Barbara Kimbrell.

Dan Hruschka becomes an associate professor in the School of Human Evolution and Social Change at Arizona State University in August 2009.

Sander van Doorn will join the University of Bern, Switzerland, as an associate professor in the fall of 2009.

Jessika Tranck has accepted a position beginning in January 2010 as an assistant professor in the Engineering Systems Division at MIT.

Aaron Clauset plans to join the University of Colorado, Boulder, in fall 2010 as an assistant professor in the Department of Computer Science.
teachers to bring LIt BiTs Culture and epidemiology special issue: Towards an Annals of Human Biology 36 (3), 2009, pp. 235-247


Random arcigraph networks; Karrer, B.; Neuman, Mark SM (Annals of Science and Society Board Member), Physical Review Letters 102 (1), March 27, 2009, pp. 305-308


Explosive percolation in random networks; Achlioptas, D.; Sussa, Rassie (SM Experimental Professor and Science Steering Committee Member), Science J. Science 293 (5532), March 13, 2009, pp. 1455-1505

Partial protection of simian immunodéficiency virus/SIV-infected primate monkeys against superinfection with a heterosexual SIV isolate; Ye, X.W.; Janzarok, P.; Nanchang, Y.; Aarnoutse, M.; Ho, S.S.; Burby, A.P.; Montefiori, D.C.; Korber, Bette (SM Research Professor and Science Steering Committee Member), Journal of Virology 83 (6), May 15, 2009, pp. 5864-5866

Random arcigraph networks; Karrer, B.; Neuman, Mark SM (Annals of Science and Society Board Member), Physical Review Letters 102 (1), March 27, 2009, pp. 305-308


The adaptive dynamics of tumour; Collins, Nathan (SM Experimental Fellow); Kam, S.; Bender, J.; The Journal of Experimental Medicine 209 (11), May 2009, pp. 1831-1836

On the generative nature of prediction; Luscher, W.; Ay, Nilufar (SM Experimental Professor); Advances in Complex Systems 12 (3), June 2009, pp. 227-235

Mathematical modeling of tuberculosis epidemics; Aparicio, J.P.; Castillo-Chavez, Carlos (SM Experimental Professor), Mathematical Biosciences and Engineering 6 (2) (SP), April 2009, pp. 239-257

Stability criteria for re-infection: Hanel, R.; Thumer, Stefan (SM Experimental Professor), Physica A 373 (1), April 6, 2008, pp. 1450-1452

An integrative framework for stochastic, size structured communities; Boettiger, C.; Brown, J.P. Laix, J.X.; Ouellet, A.; Savage, V.M.; Green, Jessica (SM External Professor), Proceedings of the National Academy of Sciences 106 (15), April 2009, pp. 5161-5167

Stability criteria for re-infection: Hanel, R.; Thumer, Stefan (SM Experimental Professor), Physica A 373 (1), April 6, 2008, pp. 1450-1452

Epidemic thresholds in dynamic contact networks; Volz, E.; Sperath, Lauren (SM Experimental Professor), Journal of the Royal Society Interface 6 (32), March 6, 2009, pp. 233-241

These two automatically-generated images show different two-dimensional slices of high-dimensional data about human blood cells.
An interview with incoming SFI President Jerry Sabloff

The Update spoke with Jerry Sabloff recently about his selection as SFI’s President and his thoughts on the Institute’s past and future. He joins SFI August 1.

Update: First, congratulations on your selection. What have your past interactions been with the Institute, and what are your impressions?

Sabloff: Certainly I have known about SFI for many years. I participated in a symposium there two years ago, and last year I gave a lead talk in a Science Board Symposium session on cities, focusing on how an understanding of pre-industrialized cities might shed light on modern cities. I also taught at the University of New Mexico in the late ’70s and early ’80s, and I served on and chaired the board of the School for Advanced Research in Santa Fe. So I’ve followed the Institute, and I’ve always viewed it with a great deal of admiration.

Update: What stood out for you during those interactions?

Sabloff: The people. The people of SFI, both the resident faculty and the external faculty, as well as the people the Institute collaborates with, are tremendous, outstanding scholars. The sense of intellectual excitement when I’m building in the paddal.

Update: From your perspective, what are the high points of SFI’s research portfolio and how might it evolve in the coming years?

Sabloff: I don’t envision radical changes. The general trajectory of SFI’s research will likely continue. Geoffrey [West] and his staff have done a tremendous job not only of fundraising and enhancing and strengthening its research endeavors. Still, we cannot afford to wait very long. One major phenomenon, and in particular what we can learn from the past that applies to today’s big questions, is that the dovetails beautifully with SFI’s interests.

Update: What are some of your priorities as SFI’s President?

Sabloff: The first thing I need to do is learn more about the overall operation and get to know SFI’s faculty and staff. And I need to do it quickly. Clearly my experience [as Director of the University of Pennsylvania Museum of Archaeology and Anthropology] will serve me in good stead. Obviously we need to stabilize SFI’s finances for the future so SFI can enhance and strengthen its research endeavors. I must say that Geoffrey and the staff have done a tremendous job not only of fundraising over time but also of managing limited resources and managing some difficult financial challenges. SFI, we cannot afford to wait very long. One particular priority is to meet the Omohundro Challenge, as soon as that is feasible. I want to further strengthen the administrative side of SFI. And I am a big proponent of outreach. I strongly believe one responsibility of scientists is to make their understanding and tangible to the public, so that will be a continued focus. That said, I am optimistic by nature, and accomplishing each of these is eminently feasible.

Update: What can you tell us about you and your personal situation during the transition?

Sabloff: My wife, will also join SFI on August 1 as a resident Research Scientist. We plan to rent a place in the near term until we find a more permanent and permanent home. We know Santa Fe well, and we know a lot of people in Santa Fe, and so the transition

Jerry Sabloff with daughter LIndi and wife Paula

Jerry Sabloff received his PhD from Harvard University in 1969 and has since taught at a number of American universities, including Harvard, the University of New Mexico, the University of Pittsburgh, and the University of Utah.

He is a leading archaeologist known for his discoveries in prehistoric settlement patterns, pre-industrial cities, and ancient Maya civilization. He recently completed a major study entitled The Williams Director of the University of Pennsylvania Museum of Archaeology and Anthropology.


He has been a proponent for the advancement of science and technology, serving as Chair of the Smithsonian Institution Science Commission and is a Fellow of the American Academy of Arts and Sciences and a member of the National Academy of Sciences and the American Philosophical Society. He should not be very difficult for us personally.

[Editor’s note: Dr. Paula Sabloff, of the University of Pennsylvania Anthropology Department, pursues research interests in cognitive anthropology, political anthropology, Mongoloia, democracy, and public anthropology.]

Update: Anything else you want to mention?

Sabloff: Yes. I am absolutely excited about coming to SFI and it is a privilege to have this opportunity. I am looking forward to August 1.
The three new 2009 Omidyar Fellows are:

**Simon DeDeo** – Simon’s education includes post-doctoral fellowships at the Institute for the Physics and Mathematics of the Universe, University of Tokyo, and the Kavli Institute for Cosmological Physics, University of Chicago. He holds a PhD in astrophysics from Harvard University, a master’s in applied mathematics and theoretical physics from Cambridge University, and an AAB in astrophysics from Harvard University. He is a past short-term visitor to SFI.

His research examines ways to use astrophysical and cosmological phenomena to test novel ideas in fundamental physics. At Princeton, he demonstrated ways to use neutrons stars to test the nature of gravity and new tools for extracting information on how the universe condensed from a primordial state into the galaxies and larger structures we see today. At the Universities of Chicago and Tokyo, he extended this work to show how more radical theories of spacetime structure could be tested with the universe as laboratory, while collaborating with experimenters to develop new techniques optimized for such tests.

His work at SFI extends the “historical reasoning” and cosmological phenomena to test novel ideas in the unrepeatable accidents of development and evolution.

**Jeremy Van Cleve** – Jeremy’s education includes a PhD in biology from Stanford University and a BA in mathematics and biology from Oberlin College. He participated in SFI’s 2001 Research Experiences for Undergraduates summer program and, as a high school student, received a 1999 SFI prize for scientific excellence.

He is broadly interested in applying analytical and simulation methods to problems in evolutionary and ecological theory. As part of his dissertation research, he has studied the evolution of genomic imprinting, exploring interactions of genetic dynamics with population structure and, through models, the evolution of behaviors that increase the payoff of a social partner.

Jeremy’s SFI research will extend his thesis work through exploration of epigenetic phenomena and their role in adaptation, and developing theory that builds on the recent explosion in empirical data from epigenetics.

**Laura Fortunato** – Laura holds a PhD in anthropology from University College London (including one year of cross-disciplinary training in biology), a masters in anthropology from University College London, and a dottore in biological sciences from the University of Padova. She is a past participant in SFI’s Complex Systems Summer School in Beijing.

Laura’s research examines the evolution of human social organization, focusing on the social norms regulating kinship and marriage, including the differing norms among societies (monogamy vs. polygamy, for example) and how these variations across. She combines theoretical and statistical methods used in the study of nonhuman social systems with theory and data from the historical and social sciences, including anthropology, linguistics, and archaeology.

Her future research will investigate how societies’ organizations of relatedness and reproduction explain the evolution of unique features of our species’ social behavior, such as our predisposition to cooperate in large groups of unrelated individuals.

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SFI in the News

A May 10 USA Today article describes a collaboration between computer scientists and art historians to use a statistical technique, dubbed “stylometry,” to determine whether a painting purchased by Japanese insurance executive Yasuo Goto is a genuine Van Gogh or a clever forgery. SFI External Professor and Dartmouth College mathematician Dan Rockmore, who has used the technique to study other works of art, is quoted: “There are techniques that allow you to turn an artwork into a point in some geometric space and ask, ‘Is there a neighborhood of work of a particular artist?’”


A June 4 article in The Economist summarizes two papers in that week’s issue of Science exploring human morality and culture, including one by SFI Professor Sam Bowles. “[Bowles] flashes out his paradoxical theory that much of human virtue was forged in the crucible of war. Conquers in arms, he believes, become comedies in other things, too… Dr. Bowles’s argument starts in an obscure cranny of evolutionary theory called group selection. This suggests that groups of collaborative individuals will often do better than groups of selfish ones, and thus prosper at their expense. It is therefore no surprise, according to group-selectionists, that individuals might be genetically predisposed to act in self-sacrificial ways.” Sam’s paper also was covered in Nature, Wired News, and The Independent.

www.economist.com/science/displaystory.cfm?story_id=13778696

SFI External Professor Steven Strogatz, in a May 9 guest column in the New York Times “The Wild Side” blog by evolutionary biologist Olivia Judson, writes about recent research into the mathematics of chaos and its relation to biological scaling. Using the work of SFI President and Distinguished Professor Geoffrey West and SFI External Professors Jim Brown and Brian Enquist. “[They] have argued that a 3/4-power law is exactly what you’d expect if natural selection has evolved a transport system for conveying energy and nutrients as efficiently and rapidly as possible to all points of a three-dimensional body, using a fractal network built from a series of branching tubes – precisely the architecture seen in the circulatory system and the arteries of the lung, and not too different from the roads and cables and pipes that keep a city alive. These numerical coincidences seem to be telling us something profound. It appears that Aristotle’s metaphor of a city as a living thing is more than merely poetic. There may be deep laws of collective organization at work here, the same laws for aggregates of people and cells.”&nbsp; http://udsonblogs.nymag.com/2009/05/19/math-and-the-city/ &nbsp;

A May 12 article in US News & World Report mentions the work of Nigel Frankes (University of Bristol) and Tom Seeley (Cornell University) exploring collective decision making in bees and ant colonies, including a multidisciplinary meeting they organized at SFI in January, www.usnews.com/articles/science/2009/05/12/how-bees-ants-and-other-animals-vice-group-decision-making.html

SFI Postdoctoral Fellow Nathan Eagle’s launch of “txteagle,” which uses cell phones to distribute assignments for simple tasks to people around the world, was covered in Nature News on April 22. www.nature.com/news/2009/090423/full/45895a.html

SFI External Professor Stefan Thurner, director of complex systems research group at the Medical University of Vienna, reported in the April 24 issue of Science that leverage – the practice by hedge funds and other investors of borrowing money to buy investments – is the root of many nettlesome problems of financial markets that classical economics cannot explain, including a propensity to crash. The work, done in collaboration with SFI Professor Doyne Farmer and SFI External Professor John Gnanakopoulos, shows that many of the distinctive statistical properties of financial markets emerge together as rates of leverage climb. www.sciencemag.org/index/dfl

In a recent issue of American Scientist, James Trefil, SFI Science Board Chair Emeritus Harold Trefil, and SFI Professor Eric Smith present their research on the chemical origins of life. “Using analogies of the complexity of the U.S. Interstate highway system, they illustrate their point that “the current complexity of life should be understood as the result of a multistep process, beginning with the catalytic chemistry of small molecules acting in simple networks...elaborating these reaction processes through studies of simple chemical selection, and only later taking on the aspects of cellularization and organismal individuality.” The continued research and experiments into this “Malthusian First” theory could lead to the ability to re-create life in laboratories. www.americanscientist.org/issues/num2/2009/2/the-origin-of-life1/