

The Bulletin of the Santa Fe Institute is published by SFI to keep its friends and supporters informed about its work. The Santa Fe Institute is a private, independent, multidisciplinary research and education center founded in 1984. Since its founding, SFI has devoted itself to creating a new kind of scientific research community, pursuing emerging synthesis in science. Operating as a visiting institution, SFI seeks to catalyze new collaborative, multidisciplinary research; to break down the barriers between the traditional disciplines; to spread its ideas and methodologies to other institutions; and to encourage the practical application of its results.

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Balancing Convention and Risk to Create Transformation

By Geoffrey West, President

The advent of a New Year is a good time to take a retrospective look at some of the developments and achievements of last year and to speculate on where the Institute might be headed in the coming year. This issue of the *Bulletin* does some of that. It explores many subjects, but a common thread is that of conflict and threat. Topics ranging from the threat of “malware” to the loss of diversity in ecosystems and financial markets are examined from the broad, big-picture viewpoint characteristic of SFI.

One of the more gratifying events of 2007 was the approval of our core umbrella proposal to the National Science Foundation. Our award is unique because, almost without exception, the NSF typically entertains proposals that are for specific, relatively narrow research projects, at least compared to the scale of SFI activities! Our proposal encompasses a mix of questions ranging from anthropology and archaeology, through economics, biomedical sciences and biological sciences, across mathematics, computer science and physics, all the way to the interpretation of quantum mechanics and the wave-function of the universe!

Despite its good intentions and professed commitment to cross-disciplinary, transformative research, the NSF doesn’t yet have in place a formal structure for handling such unusually broad proposals. Needless to say, this put ours at some risk. The “normal” mechanism would break ours into 10 to 15 separate proposals, each focused on a specific topic within some sub-discipline, which, of course, is antithetical to a basic philosophy of SFI: transdisciplinary research transcending canonical disciplinary boundaries.

Establishing this and its implications for problems in complexity as a major and exciting component of the research landscape has arguably been SFI’s greatest impact. I am delighted to report that the award was a 30 percent increase over the previous one. It is to the credit of the NSF that they were willing to entertain our proposal despite its unique character. I would like to thank them

and all of our researchers who contributed to this effort, and the staff for seeing it to fruition. It’s gratifying to know that even though we support research that sometimes doesn’t quite fit, we can still be successful when we play on the conventional academic playing field.

Although this award represents less than 10 percent of our funding (indeed, by design, only about one third is derived from government sources), it’s extremely important and we value it tremendously. We need that credibility and, by extension, the approval from the academic community, when it comes to soliciting funding from private foundations, universities, and other government agencies.

Regarding research trends in 2007, we’ve had some tremendous successes, as evidenced by the wealth of SFI publications and reporting about SFI in books, articles in professional journals such as *Nature* and *Science*, and in popular publications such as *Wired*, *New Scientist*, *The Atlantic Monthly*, *The New York Times*, and many more. For example, Samuel Bowles’ work on altruism was featured in *The Atlantic* and on National Public Radio. Michael Mauboussin’s financial wisdom was also featured on NPR, as was my own work on scaling and lifespan, as well as on cities and innovation, done with my wonderful group of collaborators. Many accolades came to SFI researchers. Among those recognized were Nina Fedoroff, named Science and Technology Advisor to the U.S. Secretary of State, who also received the National Medal of Science; David Sherrington won the 2007 Dirac Medal and Prize from the Institute of Physics; Cormac McCarthy received the Pulitzer Prize for his book *The Road*; and both Duncan Watts and I were featured in *Harvard Business Review*’s list of Breakthrough Ideas for 2007 (which meant that two of the 20 such ideas were associated with SFI).

In looking at the future, we have a number of exciting research areas we plan to address. This year we began to recognize that much of the work at the Institute falls under the umbrella of sustainability: e.g., our programs on innovation, robustness, financial markets, networks, and those areas that interface with energy, the environment, and organization. While we are not going to solve or provide detailed models of global warming or sustainable urban infrastructures, we look to provide a holistic, integrated conceptual scientific framework for understanding some of these critical world concerns.

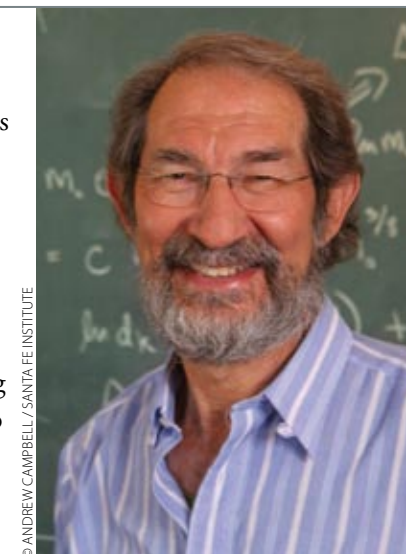
We are also looking at a series of questions that might

be considered outliers on the conventional scientific landscape. For example, David Krakauer, together with Yale History Professor John Gaddes, is organizing a workshop asking to what extent history can be viewed as a science. This may not be as crazy as it

sounds; after all, both astronomy and geology are accepted as “historical sciences.” In addition, we are planning to look at law as a complex system. Can we learn something about jurisprudence, about the conceptual framework of law that might impact new emerging legal questions of the 21st century?

Another incipient area of exploration is what we are calling international negotiations and complexity. This arose because people involved in international negotiations approached us stating that the traditional system of diplomacy is broken. They suggested that this system evolved in a “simpler” world of the 19th century where the negotiating paradigm was “linear and Newtonian”; international relations have changed dramatically and can now be characterized as “complex”! Such a line of thinking naturally leads to the Santa Fe Institute. Like all of these new areas of potential investigation we don’t yet know if progress will be made by bringing together unlikely combinations of creative people. It is the very nature of SFI to explore such avenues, to see if there might be new insights provided by a “complexity” lens.

A continuous challenge for the Institute is identifying talented people who might be attracted to the spirit of SFI, those exciting minds who really have eclectic, wide tastes, and a passion for some of the big questions that transcend traditional boundaries, and who, at the same time, have the powerful technical tools, background and discipline to execute their ideas. How do we identify those people and get them on board here as resident faculty? Indeed, I believe this is our major challenge, but one we can meet. Our past track record and recent kudos, along with the many awards and publications, offer strong encouragement for our future direction. ◀



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