

The Nature of Complexity

Templeton Foundation Grant Supports SFI Research

JOHN TEMPLETON
FOUNDATION

SFI has been awarded a major new grant from the John Templeton Foundation to pursue fundamental understandings of the hidden regularities in complex biological and social systems.

As a philanthropic organization, the Templeton Foundation supports research on subjects ranging from complexity, evolution, and infinity to creativity, forgiveness, love, and free will. More about the Foundation is available at www.templeton.org.

The three-year, \$5 million SFI grant will generate new concepts and quantitative methods of general scientific and social value. It recognizes the opportunity presented by recent advances in data collection and computational power. According to the award, the grant “initiates a groundbreaking research program on the nature... of complexity with the potential for illuminating many hidden regularities in the biological and social worlds.”

The project holds the promise of developing fundamentally new quantitative theories and focuses on “areas where new research and analysis are likely to make a real difference.” Specifically, it supports exploration of the following questions:

- The evolution of complexity and intelligence on Earth, led by SFI External Professor David Krakauer (University of Wisconsin–Madison).
- The hidden laws that pervade complex phenomena, especially biological and social phenomena, led by SFI Distinguished Professor Geoffrey West.
- Universal patterns in the emergence of complex societies, led by SFI President Jerry Sabloff.

All projects seek to understand the interconnectedness among competition and cooperation. They also examine the increasingly efficient and robust means of acquiring and communicating information. The grant award states that the projects “consider the crucial role of multiple temporal and spatial scales in complex systems, why hierarchical and modular structure is ubiquitous, how mechanisms have evolved to exploit rapid changes in their surroundings, and how adaptive systems have found a way of overcoming and exploiting the rapid turnaround and loss of their most elementary components.”

“These projects fit the progression of SFI science well,” says President Jerry Sabloff. “Although they are quite different in terms of the complex

systems they examine—from genes and neurons to large human social systems—they are all concerned with the fundamental processes underlying complexity and the evolution of complexity. These are questions SFI has been asking since its founding in 1984.”

“With the Templeton Foundation’s generous support,” he adds, “we hope to make significant progress in understanding the principles that span and unify many complex systems.”

Coming Soon: Complexity Explorer

The Templeton grant also supports a significant education outreach project. As part of the grant, SFI will create an online resource called the Complexity Explorer. “At the Explorer’s core will be a wealth of learning materials associated with the sciences of complexity,” says SFI Vice President for Education and Outreach Ginger Richardson.

SFI has a long history of both developing the sciences of complexity and offering educational programs in complexity, says External Professor Melanie Mitchell, faculty coordinator for the Explorer project.

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A professor at a university might use the Explorer, for example, to interactively generate a recommended syllabus for a graduate-level course in complexity, along with supporting online exercises and simulations found in the Explorer’s Virtual Lab. A professional interested in applying complexity to business problems could search for and find relevant

papers and paper summaries.

A student, who perhaps doesn’t know where to start, will find definitions pertinent to the field and use multimedia demonstrations of complexity-related principles and concepts.

“Wherever I go, people ask me where they can learn more about complex adaptive systems,” Mitchell says. “This project, supported by the Templeton Foundation, will transform a longtime need into a reality.” ◀