



National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230

Directorate for Social, Behavioral and Economic Sciences
NSF 08 – 014

November 7, 2007

Subject: Encouraging Submission of Proposals involving Complexity and Interacting Systems to Programs in the Social, Behavioral and Economic Sciences

Dear Colleague:

Beginning in FY 2008, the Directorate of Social, Behavioral and Economic Sciences (SBE) will augment funding in its regular programs in order to encourage submission of proposals that advance understanding of complexity and interacting systems phenomena in SBE fields.

In recent years, SBE scientists have found mathematical, computational, empirical and other methods from complexity and systems thinking productive for understanding how and under what conditions patterns both emerge from and feed back into local interactions, at levels extending from the molecular through the social to the global and across multiple time scales. Often taking advantage of agent-based modeling, neural-network modeling, and other computer-enabled modes of discovery, such studies have refined understanding of such properties as interdependence, self-organization, and emergence in complex SBE systems. Complexity can sometimes be understood and explained in terms of the interaction of simple systems.

Topics might include, **but are not limited to:**

- Projects that advance understanding of emergent phenomena in behavioral and social systems, such as the emergence of creative breakthroughs in a scientist or artist; or of major structural shifts in the history of language; or of skilled behaviors like walking or talking; or of norms in a fictional online community.
- Projects that examine stability and transformation in behavioral and social systems, such as the political systems tipping from stability to instability; a sudden cascade of suicidal behavior in a population of teenagers; or stability in the face of strong perturbations, such as the resilience of communities faced with serious natural disasters.
- Projects examining complex interdependent, multi-scale and emergent behavioral, neural, cognitive, or social phenomena by building on, for example, scaling analyses; recurrence quantification; graph-theoretic, time-series, or symmetry-group techniques.
- Advances in theory and methods to validate results from models or simulations of complex systems.

Prospective SBE complexity proposals can involve data from field, lab or simulations. Proposals may, when submitted through our Science and Technology Studies Program, examine philosophical, sociological, ethical or policy implications of complexity in SBE fields.

This is not a special competition or new program. Investigators who wish to have a proposal considered in response to this Dear Colleague Letter, should include, as the last sentence of its Project Summary, the sentence: "This proposal is submitted in response to NSF 08-014." The proposal should be submitted to an existing SBE program in compliance with normal target dates and/or deadlines. Such proposals will be reviewed by means of the standard review practices of those programs.

Investigators may wish to contact the Program Director of the program to which they expect to submit in order to determine if their proposed idea is a good fit for the program. A brief e-mail note of inquiry in advance of conversations is strongly encouraged.

We look forward to receiving your proposals.

Sincerely,

David Lightfoot
Assistant Director, National Science Foundation
Social, Behavioral and Economic Sciences

Additional examples of some, but not all, topics involving complexity and interacting systems in SBE domains are contained in the final reports of two recent SBE-funded workshops:

Modeling Social Dynamics, Oct. 2-6, 2006. Available online at:
<http://seattle.intel-research.net/MSD/>

Behavioral and Cognitive Dynamical Systems, August 6-9, 2007. Available online at:
<http://behavioralcognitivedynamicalsystems.pbwiki.com/>

Links to SBE's programs and target dates, including Program Director information, are available at:

For the Behavioral and Cognitive Sciences:
<http://www.nsf.gov/div/index.jsp?div=BCS>

For the Social and Economic Sciences:
<http://www.nsf.gov/div/index.jsp?div=SES>