Science of Science & Innovation Policy Newsletter

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SciSIP Update

This marks the first of a regular newsletter series intended to update the SciSIP community on recent events in the SciSIP program.

The innovation process—from research investments to social outcomes—remains poorly understood and requires basic research, exploratory model building, development of a community of researchers, and new and improved datasets. SciSIP is a focal point for federal government efforts to improve concepts, models, and data to support empirically-based science and innovation investment policies and help to assess their results.

NSF's Social, Behavioral and Economic Sciences Directorate (SBE) is at the forefront of this effort. It has two components. The first of these is an investigator initiated program of funded research. The second is a statistical program based in the Science Resources Statistics Division.

The **investigator initiated** component just completed the second round of awards made in its FY 2008 solicitation. More information on these awards, as well as the FY2007 awards, is available later in the newsletter. The third solicitation is available at http:www.nsf.gov/pubs/2008/nsf08520/nsf08520.htm.

The **statistical** component has initiated a number of survey redesigns, which are highlighted on the SRS website http://www.nsf.gov/statistics. One of the most exciting is the redesign of the Business Sector R&D survey to include a set of questions on innovation.

A number of activities are scheduled for the coming year. These include

1. A luncheon panel on innovation sponsored by the Kauffman Foundation Nov 21 (http://www.kauffman.org/dataSymposium/2008index.cfm)
2. A presentation at the Allied Social Science Association meetings Jan 3, 2009
3. A session at the AAAS meetings February 2009
4. A PI workshop (organized by AAAS) to be held March 24-25, 2009
5. A panel at the AAAS Science and Technology Forum in May 2009
6. An international conference on innovation, globalization and organizations May 29-30 2009 (http:www.asigo.de).

New Innovation Survey

An important focus of SciSIP is to develop an evidence based platform for decision making. The newly designed Business R&D and Innovation survey is aimed at doing just that, and has been highlighted by Businessweek as a major step forward in the collection of innovation data (see http://www.businessweek.com/magazine/content/08_38/b4100052741280.htm). The survey has five sections: four on R&D finance, R&D strategy, R&D funding and R&D human resources. The fifth section, on innovation, collects a number of important measures, notably information on:

- innovative activities in goods, services and related activities;
- patent activity and returns;
- Intellectual property transfer activities;
- Intellectual property protection.

The survey will be fielded to over 30,000 enterprises,

New Program Solicitation

The new program solicitation has two new foci in addition to the standard SciSIP call for proposals.

The new program solicitation has two new foci in addition to the previous SciSIP calls for proposals. One focus is based on the recognition that at the same time that there is increased interest in research on innovation with organizations, there have also been vast changes in data collection capacities, ranging from web-scraping to imaginative users of cyber-tools. The solicitation requests proposals that demonstrate viable approaches to the collection and analysis of data on knowledge generation and innovation in organizations. Up to four demonstration projects will be funded, in amounts up to $750,000. The demonstration projects should provide evidence of the scalability and sustainability of the approach, have a data protection and dissemination plan, and include a plan describing how the project's progress towards its scientific goals can be evaluated and assessed.

This solicitation also calls for proposals which use new techniques to analyze and visualize complex datasets.

The solicitation has a due date of December 16, 2008. Interested PI's should contact Julia Lane at jlane@nsf.gov or 703-292-5145 for more details after they've read the solicitation http:www.nsf.gov/pubs/2008/nsf08520/nsf08520.htm

Research Workshop Summaries

Two workshops were held at NSF headquarters. The first of these, organized by Carol Corrado of the Conference Board, was aimed at identifying the components necessary to build a national research data infrastructure for the study of innovation and business performance. It brought together behavioral and social scientists, businesses and computer and information scientists to examine the ways in which new data collection techniques and new confidentiality protection modalities could inform the collection of data by researchers, for research purposes. More information is at http://www.conference-board.org/events/nsf. The final report will be presented at a Nov. 21 Kauffman Foundation sponsored luncheon.

The second workshop, organized by Susan Cozzens of Georgia Tech, was intended to provide a deeper look at the visualization of scientific discovery in the federal context. The focus was on examining the robustness, validity and usability of the visualization tools for program management. The participants included program managers from many federal agencies, SciSIP grantees, researchers in the field of visual analytics, as well as behavioral and social scientists.

2008 SciSIP Awards

Describing the Role of Firms in Innovation

The Division of Innovative Labor: Features, Determinants and Impacts on Innovative Performance -- (Ashish Arora; Carnegie Mellon, Wes Cohen; Duke, John Walsh; Georgia Tech)

The Rise of International Coinvention: A New Phase in the Globalization of R&D? (Lee Branstetter, Carnegie Mellon)

Modeling Innovation Chains Using Case-Based Econometrics (Kenneth Flamm; University of Texas, Austin)

Patent Pools and Biomedical Innovation (Josh Lerner; NBER and Jean Tirole; Fondation Jean-Jacques Laffont-TSE)

Quantifying The Resilience of the U.S. Innovation Ecosystem (Erica Fuchs; Carnegie Mellon)

Measuring and Tracking Innovation

Improving Productivity and Innovation Metrics: The Case of Financial Services (Carol Corrado, Janet Hao, and Bart Van Ark; The Conference Board and Charles Hulten; University Of Maryland)

Linking Government R&D Investment, Science, Technology, Firms and Employment: Science & Technology Agents of Revolution (Star) Database (Lynne Zucker and Michael Darby; University of California, Los Angeles)

Measuring and Evaluating Scientific Progress

Measuring and Tracking Research Knowledge Integration and Transfer, (Alan Porter; Georgia Tech Research Corporation - Georgia Institute of Technology)

Early Prediction of the Impact of Research Through Large-scale Analysis and Modeling of Citation Dynamics (Marta Sales-Pardo; Northwestern University)

Universities, Innovation and Economic Growth, (Sheila Slaughter, University of Georgia)

Advancing Understanding of Collaboration and Creativity

A Social Network Database of Patent Co-authorship to Investigate Collaborative Innovation and its Economic Impact (Lee Fleming; Harvard University)

Modeling Productive Climates for Virtual Research Collaborations (Sara Kiesler, Carnegie Mellon and Jonathon Cummings; Duke)

Dynamics of Creativity and Innovation in Cyber-enabled Scientific Commons (Levent Yilmaz; Auburn University)

OPEN PATENT: Modeling Tagging and Visualization Technologies to Enhance Comprehension of Patent Information: (Beth Noveck; New York Law School, and John Riedl; University of Minnesota)

Knowledge Sharing and Creativity

Integrating Social and Cognitive Elements of Discovery and Innovation (Chris Schunn University of Pittsburgh)

Inspiration as transmission of creative insight (Todd Thrash; College of William and Mary)

Transmission of Tacit Skills in East Asian Graduate Science Programs (Marcus Antonius Ynalvez; Texas A&M International University and Noriko Hara; Indiana University)

Implementing Science Policy

Impacts of Institution-Level Policies on Science and Engineering Education, Employment, Earnings and Innovation: A "Natural" Experiment (Catherine J. Weinberger; University of California Santa Barbara)

Funding R&D when Ideas are Scarce, (Suzanne Scotchmer; University of California, Berkeley)

University Research Parks and the Innovative Performance of Park Firms (Albert N. Link; University of North Carolina at Greensboro and Donald S. Siegel; University of California at Riverside)

Comparing Models for Integrating Societal Impacts Concerns into the Peer Review of Grant Proposals (Robert Frodeman; University of North Texas)

Scholar's Award Proposal for Investigating the Origins and Evolution of the "Basic Research" as a Political Symbol (Roger Pielke; University of Colorado)

A Political-Economic Model of Science and Innovation Policy (Mark Zachary Taylor, Georgia Tech)

For more information, visit http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501084&org=SBE

2007 SciSIP Awards

Human capital development and the collaborative enterprise:

Architecture of Collaboration in Transdisciplinary Research Teams—(Barbara Gray and Raghu Garud; Pennsylvania State University)

Estimating the Effect of Exposure to Superstar Scientists: Evidence from Academia and the Biopharmaceutical Sector—(Joshua Graff Zivin; NBER and Columbia University and Pierre Azoulay; MIT)

Measurement and Analysis of Highly Creative Research in the US and Europe—(Philip Shapira, Juan Rogers and Jan Youtie; Georgia Tech)

Social Network Analysis of the Collaborative Interaction of Scientists in Academic and Non-academic Settings—(Christopher McCarty, Nandita Basu and James Jawitz; University of Florida)

Examining the Link between Informal Social Networks and Innovation: Using Netometrics to Quantify the Value of a Distributed Hetarchical Network—(Brooks B. Robinson, Martha Crosby, Leigh Jerome, and Laurel King; University of Hawaii)

Evaluation of Research Groups: An Endogenous Approach—(Francisco Veloso; Carnegie-Mellon University)

Returns to international knowledge flows

The Causal Impact of Foreign and Domestic Doctoral Students on Knowledge Creation and Innovation in US Universities: Evidence from Enrollment Shocks—(Ahmed M. Mobarak and Keith Maskus; University of Colorado)

Contributions of Foreign Students to Knowledge Creation and Diffusion (Collaborative Proposal)—(Shulamit B. Kahn; Boston University; Donna K. Ginther; University of Kansas)

Models of International Research Collaboration—(Susan E. Cozzens and Marylin Brown; Georgia Tech)

Creativity and innovation

Stimulating Creative Insight - A Cohesive Model of Design Innovation Across Individuals, Groups and Computer Agents—(Jonathan Cagan and Kenneth Kotovsky; Carnegie-Mellon University)

Design Tools to Cognitive Processes to Innovation—(Christian D. Schunn and Michael Lovell; University of Pittsburgh)

Knowledge production systems

Developing the Science of Science and Innovation Policy: Profiles of Innovativeness and Gaps in the Idea Innovation Network—(Jerald Hage and Jonathon Mote; University of Maryland)

Modeling the Dynamics of Technological Evolution—(Doyne J. Farmer, William Brian Arthur, and Jessika Trancik; Santa Fe Institute, Douglas H. Erwin; US National Museum of Natural History, Walter W. Powell; Stanford University); as well as several senior collaborators

Towards a Macroscope for Science Policy Decision Making—(Katy Borner and Weixia Huang; Indiana University and Kevin Boyack; Sandia National Labs)

Research and Technology Partnerships: Quantifying Strategic Relationships—(Nicholas S. Vonortas; George Washington University)

Science policy implications

Assessing the Impact of Science Policy on the Rate and Direction of Scientific Progress: Frontier Tools and Applications—(Jeffrey Furman; NBER and Boston University, Fiona Murray; MIT and Scott Stern; Northwestern University)

Innovation and Technology Implementation: Theory and Policy Implications—(Diego Comin; NBER and Harvard University and Bart Hobijn; New York University

State Science Policies: Modeling Their Origins, Nature, Fit, and Effects on Local Universities—(Maryann Feldman and James Hearn; University of Georgia)

Public Value Mapping: Developing a Non-Economic Model of the Social Value of Science and Innovation Policy—(Daniel R. Sarewitz; Arizona State University and Barry Bozeman; University of Georgia)