# Knowledge Management & Visualization Tools
## IN SUPPORT OF DISCOVERY

## Workshop I

**Goal**
The first two-day workshop brings together application holders from science of science studies and biology from the U.S. but also from Japan and Europe.

Science Policy Challenges relate to the study of:

- The evolution of scientific communities/fields – birth, growth, maturation, decline.
- Interactions among fields. Who 'eats' who's papers?
- Trends, patterns, or emergent research frontiers, feedback loops, etc.
- Interplay of competition and collaboration.
- Diffusion of people, ideas, skills, etc. in geospatial space and topic space.
- Effects of different funding models, e.g., few large vs. many small grants.

Biomedical challenges comprise:

- Build the Encyclopedia of Life, Watch E. O. Wilson's TED Prize wish
- Prevent the Next Pandemic, Watch Larry Brilliant's TED Prize wish
- Creating an Inventory of Genotypes and Using it for Clean Energy and Nutrition. Watch Craig Venter's TED talk.

**Date**
March 10 & 11, 2008

**Meeting Place**
NSF, Room II-555, 4201 Wilson Boulevard, Arlington, VA



View more pictures from the Workshop

## Organizers

**Katy Börner**
Indiana University
Mapping Science (PNAS Issue, Exhibit), CI Design (IVC, NWB Tool)
PR^2 Intro PPT

**Luis M. A. Bettencourt**
Los Alamos National Laboratory
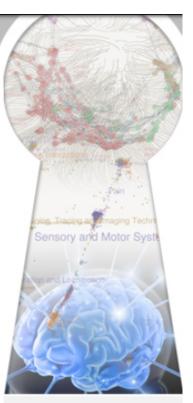Social Dynamics and Organization, Information systems for streaming data, Innovation and Development
PR^2

**Mark Gerstein**

**Stephen Miles Uzzo**

Image Credits

**Yale University**
Genomics, Proteomics,
Structural Genomics,
Computational Biophysics
PR^2

**New York Hall of Science**
Ecology, Scientific
Visualization, Cybernetics,
Education and
Epistemology
PR^
Intro PPT

**Weixia (Bonnie) Huang**
Indiana University (NWB
Tool System Architect)
*note-taking*
PR^2

## Participants

The four workshop organizers identified two promising application domains: The application of network science to advance our understanding of complex biomedical systems and the study of science itself by scientific means. Both application domains benefit from recent advances in network science and complex systems research and both have a strong focus on education.

**Network Science Applied to Understand:**

### Complex Biomedical Systems

**Richard Bonneau**
New York University
Systems Biology and
Protein Modeling
PR^2
Intro PPT

**Kei-Hoi Cheung**
Yale University
*Medical Informatics*
PR^2

**Neo Martinez**
Rocky Mountain Biological
Lab
Pacific Ecoinformatics and
Computational Ecology Lab
PR^2

**Martin Storksdieck**
Director of Project
Development
Institute for Learning
Innovation
PR^2

### Science of Science Studies

**Peter van den Besselaar**
Rathenau Institute,
Netherlands
PR^2

**Kevin W. Boyack**
SciTech Strategies, Inc.
*Science Indicators and Maps*
PR^2

**Olga Brazhnik**
NIH/NCRR
Government
Administration
PR^2

**John T. Bruer**
President, James S.
McDonnell Foundation
*Philosophy of Science*
PR^2

**Masatsura Igami**
National Institute of
Science and Technology
Policy, Japan, Science
and Technology
Foresight
*Science Policy Studies*
PR^2
Intro PPT

**Stefan Hornbostel**
Institut für
Forschungsinformation und
Qualitätssicherung, DFG,
Germany
*Science Indicators*
PR^2
Intro PPT

**Bill Valdez**
DOE Office of Science
*Science Planning and
Analysis*
PR^2

**Alex Soojung-Kim Pang**
Institute for the Future
History and Sociology of
Science
PR^2

*Interested (but cannot attend)*

- **Albert-László Barabási**, Northeastern University
  Physics, Network Science
- **Harmen Bussemaker**, Columbia University
  Biological Sciences
- **Nina Fedoroff**, Pennsylvania State University
  Plant Stress Response, Hormone Signaling, Transposable Elements,
  Epigenetic Mechanisms
- **Trey Ideker**, UCSD

Bioengineering
- Doug Lauffenburger, MIT
  Molecular Cell Bioengineering
- Deborah Estrin, UCLA
  Environmental Monitoring

**Workshop Preparation**

All participants will be asked to submit a brief bio, a photo, as well as answers to a set of questions relevant to the workshop goals. All supplied material will be distributed to all workshop attendees before the meeting in order to complement the introduction of participants and to structure the workshop more effectively. Participants should plan to bring their laptops for note taking and sharing.

## Agenda

This is a 1 ½ day workshop. Given the diverse backgrounds of the attendees and the goals of the workshop, we will use the first ½ day for brief self introductions of the participants followed by an overview of the goals of the workshop and associated challenges and opportunities as identified by the organizers and extracted from the material submitted by the workshop participants. A shared dinner follows. The following full day features brainstorming and discussion sessions in different team sizes.

**Day 1:**

| | |
|---|---|
| 12:00pm | Welcome by Organizers by Katy Borner (PPT) |
| 12:15pm | Introduction by Participants (5 min per person/organization). Led by Stephen Uzzo |
| 2:00pm | *Break* |
| 2:15pm | Presentation of NSF CDI program by Mary L. Maher, NSF (PPT) |
| 2:30pm | Challenges and Opportunities by Luis Bettencourt (PPT) |
| 3:00pm | Breakout Sessions on "$10 Million SciPolicy and BioMed Challenge". Intro by Stephen Uzzo |
| 4:00pm | Breakout Session Reports |
| 4:30pm | Interactive Timeline Assembly - see connections and build on them. Led by Alex Pang |
| 6:30pm | *Adjourn* |
| 7:00pm | *Joint Japanese dinner at Matsutake* |

**Day 2:**

| | |
|---|---|
| 9:00am | *Light Breakfast* |
| 9:30am | All the Data and Publications from Science on Web:□A Vision for Harnessing this to Study the Structure of Science presentation by Mark Gerstein (PPT) |
| 10:00am | Breakout Sessions on "Envision and Draw your Dream Tool" Intro by Katy Borner |
| 11:00am | Breakout Session Reports |
| 11:30am | Science Mapping: Convergence, Consensus, Policy Implications presentation by Kevin Boyack (PPT) |
| 12:00pm | *Joint Lunch* |
| 1:00pm | Write Description of 2nd Best Idea for CDI Grant Proposal. Led by Alex Pang |
| 2:00pm | Presentation to Group |
| 2:45pm | *Break* |
| 3:00pm | Collective Exercise on "Who would like to collaborate with whom on what?" Lead by Katy Borner |
| 4:00pm | Discussion of Next Steps, Funding Opportunities, etc. |
| 5:00pm | *Adjourn* |

## Venue

For directions and more information about visiting NSF, see
http://www.nsf.gov/about/visit.

NSF is accessible by Metro at the Ballston-George Mason University Metro stop on the Orange Line and there are Colonial Parking Garages beneath the Stafford I and Stafford II buildings with parking fees ranging from $6-$10/day. Additional parking is

available at the Ballston Commons Shopping Mall (cheaper than Colonial), at on-street metered spots, and at other surrounding public parking lots. For more area parking information, see www.parkarlington.com.