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### Mapping Indiana’s Intellectual Space

Identify
- Pockets of innovation
- Pathways from ideas to products
- Interplay of industry and academia
Mapping the Evolution of Co-Authorship Networks

Legend
Nodes = Authors
Node size = Number of papers published
Node color = Number of citations
Edges = Co-authorship relationships
Edge color = Year of first co-authorship

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Displayed Year: 1988
Displayed Year: 2004
Studying the Emerging Global Brain: Analyzing and Visualizing the Impact of Co-Authorship Teams

Research question:
• Is science driven by prolific single experts or by high-impact co-authorship teams?

Contributions:
• New approach to allocate citational credit.
• Novel weighted graph representation.
• Visualization of the growth of weighted co-author network.
• Centrality measures to identify author impact.
• Global statistical analysis of paper production and citations in correlation with co-authorship team size over time.
• Local, author-centered entropy measure.

Mapping Transdisciplinary Tobacco Use Research Centers Publications
Compare R01 investigator based funding with TTURC Center awards in terms of number of publications and evolving co-author networks.
Zoss & Börner, forthcoming.
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Data:
WoS and Scopus for 2001–2005, 7.2 million papers, more than 16,000 separate journals, proceedings, and series.

Similarity Metric:
Combination of bibliographic coupling and keyword vectors

Number of Disciplines:
554 journal clusters further aggregated into 13 main scientific disciplines that are labeled and color coded in a metaphorical way, e.g., Medicine is blood red and Earth Sciences are brown as soil.

Interactive Science Map of NIH Funding

Interactive Maps of Science – NIH Funding

Google maps with charts and tables


Where Are the Academic Jobs? Interactive Exploration of Job Advertisements in Geospatial and Topical Space

Angela Zoss, Michael Connover, Katy Börner (2010)

http://cns-nd3.slis.indiana.edu/mapjobs/geo

Mapping Science Exhibit – 10 Iterations in 10 years

The Power of Maps (2005)

Science Maps for Economic Decision Makers (2008)


Science Maps for Science Policy Makers (2009)

The Power of Forecasts (2007)

Science Maps for Scholars (2010)

Science Maps as Visual Interfaces to Digital Libraries (2011)

Science Maps for Kids (2012)

Science Forecasts (2013)

How to Lie with Science Maps (2014)

Exhibit has been shown in 72 venues on four continents. Currently at
- NSF, 10th Floor, 4201 Wilson Boulevard, Arlington, VA
- Marston Science Library, University of Florida, Gainesville, FL
- Center of Advanced European Studies and Research, Bonn, Germany
- Science Train, Germany.

Illuminated Diagram Display


Questions:
• Who is doing research on what topic and where?
• What is the ‘footprint’ of interdisciplinary research fields?
• What impact have scientists?

Contributions:
• Interactive, high resolution interface to access and make sense of data about scholarly activity.

Large-scale, high resolution prints illuminated via projector or screen.

Interactive touch panel.
Nanotechnology

This overlay shows the distribution of nanotechnology within the paradigms of science. The majority of current work in nanotechnology takes places in physics, chemistry, and materials science, at the upper right portion of the map. However, an increasing amount of nanotechnology is being applied in the biological and medical sciences, at the lower right.

All Topics
- Change through all sciences
- Nanotechnology
- Sustainability
- Biology & Chemistry

Nanotechnology
- Francis H. C. CRICK
- Albert EINSTEIN
- Michael E. FISHER

Sustainability
- The source behind our long-term hopes

Biology & Chemistry
- The interface between those two vital fields
- Joshua LEDERBERG
- Derek J. de Solla PRICE
- Richard N. ZARE

About this display
- Pedestals & presentation that helped create it

Science Maps in “Expedition Zukunft” science train visiting 62 cities in 7 months
12 coaches, 300 m long
Opening was on April 23rd, 2009 by German Chancellor Merkel
http://www.expedition-zukunft.de

This is the only mockup in this slide show.
Everything else is available today.
CI for a Science of Science Studies

- Scholarly Database: 23 million scholarly records
  [http://sdb.slis.indiana.edu](http://sdb.slis.indiana.edu)
- VIVO Research Networking
  [http://vivoweb.org](http://vivoweb.org)
- Information Visualization Cyberinfrastructure
  [http://iv.slis.indiana.edu](http://iv.slis.indiana.edu)
- Network Workbench Tool + Community Wiki
  [http://nwb.slis.indiana.edu](http://nwb.slis.indiana.edu)
- Sci² Tool and Science of Science CI Portal
  [http://sci.slis.indiana.edu](http://sci.slis.indiana.edu)
- Epidemics Cyberinfrastructure
  [http://epic.slis.indiana.edu](http://epic.slis.indiana.edu)

Computational Scientometrics

References


All papers, maps, cyberinfrastructures, talks, press are linked from [http://cns.slis.indiana.edu](http://cns.slis.indiana.edu)