

Innovative Maps Chart a Course into Unknown Regions of Science in Exhibition at The New York Public Library

Places & Spaces: Mapping Science on view from April 4 – August 31 at the Science, Industry and Business Library

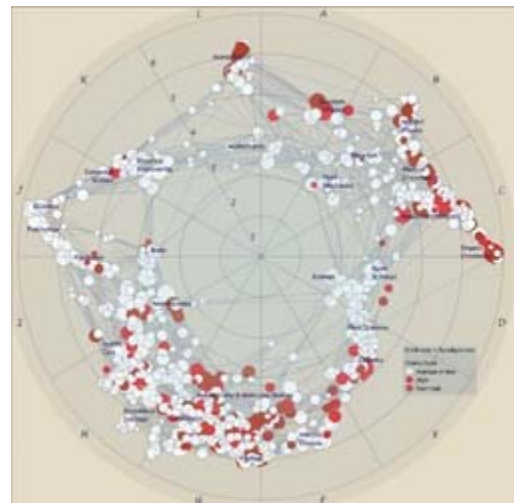
DNA, Patents, Anthrax, and Other Major Scientific Research and Discoveries are Mapped in Exhibition

An exhibition opening April 4 at The New York Public Library focuses on innovative methods of using maps and globes to convey and explain complex scientific developments. Geographic maps of physical places have guided mankind's exploration for centuries, drawing a line between the known and unknown. The maps in *Places & Spaces: Mapping Science* chart abstract concepts in and across a variety of scientific disciplines using information from journals, publications, and public dialogue as landmarks and guideposts. In a manner similar to the maps that explorers used, these new kinds of maps track the emergence, evolution, and disappearance of scientific topics to help identify the most promising areas of research. *Places & Spaces: Mapping Science* features twenty maps, a series of globes by Ingo Günther, and interactive illuminated diagrams by W. Bradford Paley. The exhibit is on view at The New York Public Library's Science, Industry and Business Library at 34th Street at Madison through August 31, 2006. Admission is free.

Expanding the concept of mapping geographic places, *Places & Spaces* traces the development of science by following the path of research in individual disciplines and science as a whole. Each map is based on information taken from an aggregate of published works and by looking at patterns and trends that emerge from examining a breadth of publications and citations. Curated by Dr. Katy Börner, School of Library and Information Science, Indiana University, Bloomington, and Deborah MacPherson, with the Vienna, Virginia-based, nonprofit organization Accuracy&Aesthetics, the exhibit includes high resolution digital prints of maps from the 15th, 17th, 18th, and 19th centuries, but consists mostly of original maps of science created for this exhibition. John Ganly, Assistant Director for Collections, Science, Industry and Business Library, The New York Public Library, is the exhibition adviser.

### Scientific Information Mapped in the Exhibition

*Places & Spaces* illustrates in detail how science is embedded in our lives. What does a timeline of 60 years of **anthrax research** literature tell the viewer? Dr. Steven A. Morris's 2005 map of research papers on the topic shows the increase of new anthrax studies in late 2001, when the research community responded to the bioterror attacks of that year. **Wikipedia's entry on "evolution"** has changed in many minor and major

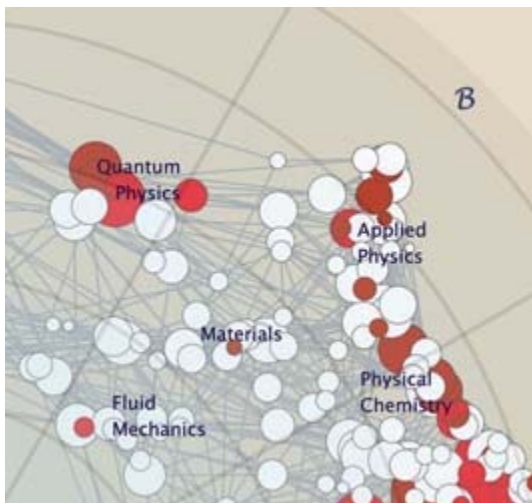


Map of Scientific Paradigms, by Kevin W. Boyack Albuquerque NM and Richard Klavans, Berwyn PA, USA; 2006. Courtesy of Kevin Boyack, Sandia National Laboratories and Richard Klavans, SciTech Strategies, Inc.

ways, as the visualization of the dictionary entry by Dr. Martin Wattenberg and Dr. Fernanda B. Viégas shows. Eugene Garfield's *HistCite Visualization of DNA Development* is a colored map revealing citation patterns within major core papers on DNA, in which the viewer can find groundbreaking scientific writings such as Gregor Mendel's 1865 paper, the 1953 Watson-Crick work on the structure of DNA, and many others.

The first set of maps in the exhibition compares and contrasts early maps of the entire planet (starting from Ptolemy's *Cosmographia* in 1482) with some of the first maps documenting science (the earliest being from 1996). The exhibition shows that each type of map is limited by information available at the map's creation and therefore incomplete and possibly obsolete with today's knowledge. Although scientists are aware that it is impossible to map science completely and with total accuracy, partial maps help researchers navigate vast quantities of scholarly knowledge. Additional maps in this section include Charles Joseph Minard's **19th-century map of Napoleon's March to Moscow**; Dr. André Skupin's **geographic 2005 visualization of New Orleans**, derived from more than 22,000 abstracts submitted to the Annual Meetings of the Association of American Geographers from 1993-2002; and Dr. Marc Smith's *Treemap View of 2004 Usenet Returnees*, depicting the activity of 257,442,374 Internet postings contained in 189,144 electronic newsgroups from 2004.

The second set of maps aims to inspire discussion on developing a common reference system for all of science to improve national standards for the storage, access, management, and communication of scholarly knowledge and expertise. It contrasts existing reference systems from different areas of science, such as the electromagnetic spectrum and the periodic table of elements, with potential methods of organizing and conveying the structure and evolution of current scientific knowledge. An example of a map using an existing reference system is Roger W. Sinnott and Interactive Factory's *Sky Chart of New York City in April 2006*, a printed still of an Interactive Sky Chart from *Sky & Telescope* magazine that simulates the view from above New York City in April 2006. Highlights from the potential reference systems include Ingo Günther's Worldprocessor-globe **plotting the total number of patents granted worldwide**, beginning in 1883 with just under 50,000 and continuing to 2002 in a rapid climb toward 1 million; W. Bradford Paley's **visualization of the book *The History of Science***, of which he makes a map, using time lines of the physical and life sciences; and illustrator Murray Robinson and chemist John Emsley's *Visual Elements Periodic Table*, commissioned by the Royal Society of Chemistry in the United Kingdom.



### Organizing the Exhibit

"Mapping science is a cutting-edge methodology that has emerged in recent years, and we're excited to be presenting *Places & Spaces* to our users," said **Kristin McDonough**, Robert and Joyce Menschel Director, Science, Industry and Business Library, The New York Public Library. "The exhibit fits right into our Library's mission to deliver innovative information and education services. The scientific information depicted is vast, and *Places & Spaces* demonstrates that information is conveyed in many ways."

"The *Places & Spaces* exhibit has been created to demonstrate the power of maps to navigate not only physical spaces but also semantic spaces," explains **Katy Börner**, exhibition co-curator and

Map of Scientific Paradigms (detail), by Kevin W. Boyack Albuquerque NM and Richard Klavans, Berwyn PA, USA; 2006. *Courtesy of Kevin Boyack, Sandia National Laboratories and Richard Klavans, SciTech Strategies, Inc.*

Associate Professor at the School of Library and Information Science, Indiana University. "The exhibition's main purpose is to inspire cross-disciplinary discussion about how mankind's collective scholarly knowledge can be best organized, managed, and communicated. Ultimately, science maps might become as common as the political map of the world and daily science forecast as common as weather

forecasts."

"The online counterpart to the exhibit is also important, as it provides links to a selected series of maps and their makers along with detailed explanations of why these maps work," says **Deborah MacPherson**, exhibition co-curator and Projects Director of the nonprofit organization Accuracy&Aesthetics, whose mission is to develop easier ways to help everyday people find online teaching resources and research results using maps, pictures, and plain language. "*Places & Spaces* was originally created in early 2005 as part of the 101st Annual meeting of the Association of American Geographers in Denver, Colorado. It will continue to expand and explore mapmaking in its many dimensions and purposes over time."

A link to [the online exhibition](http://www.nypl.org/research/calendar/exhib/sibl/uelistsibl.cfm) is available at <http://www.nypl.org/research/calendar/exhib/sibl/uelistsibl.cfm>.

*Places & Spaces: Mapping Science* will be on view from April 4 through August 31, 2006, at The New York Public Library's Science, Industry and Business Library, located at 188 Madison Avenue at 34th Street, in New York City. The exhibition is open during normal library hours, Tuesday through Thursday, 10 a.m. to 8 p.m., and Friday and Saturday, 10 a.m. to 6 p.m.; closed Sundays, Mondays, and holidays. Admission is free. For further information, call 212-592-7000 or visit [www.nypl.org/sibl](http://www.nypl.org/sibl).

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