

## **Mapping Scientific Discovery through Advanced Computing**

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Cartographic maps of physical places have guided mankind's explorations for centuries. They enabled the discovery of new worlds while also marking territories inhabited by unknown monsters. Science maps of abstract topic spaces (see <http://scimaps.org>) aim to serve today's explorers' understanding and navigating the world of science and technology. Through maps of science, we can begin to see all that we know as landscape—viewed as if from above or from a great distance. Similar to cartographic or topographic maps, science maps provide guidance for navigating, understanding, and communicating the dynamic and changing structure of science and technology. The career trajectories of individual researchers and their professional networks, the intellectual footprint of any given institution or country, and emerging research frontiers or bursts of activity can be projected onto science maps and animated over time. Science maps complement local fact retrieval via search engines by providing information used to determine context and relevance. They serve as visual interfaces to immense amounts of data—depicting perhaps millions of objects that we can perceive rapidly to effectively discern apparent outliers, clusters, and trends.

This talk will present an overview of advanced techniques, tools, and workflows used to analyze and visualize temporal, geospatial, topical, and network datasets at a micro, meso, and macro level. Emphasis is on the design of insightful visualizations.