



Data Visualization for Public Outreach: an interdisciplinary approach

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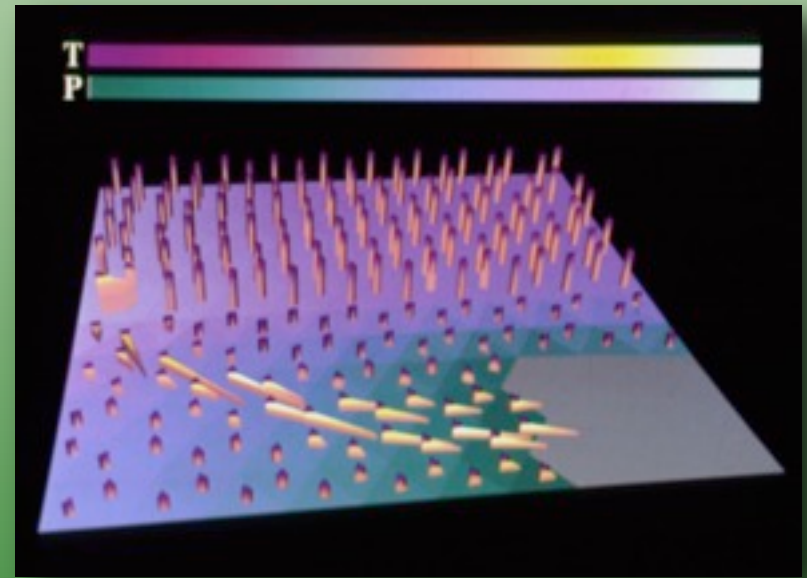
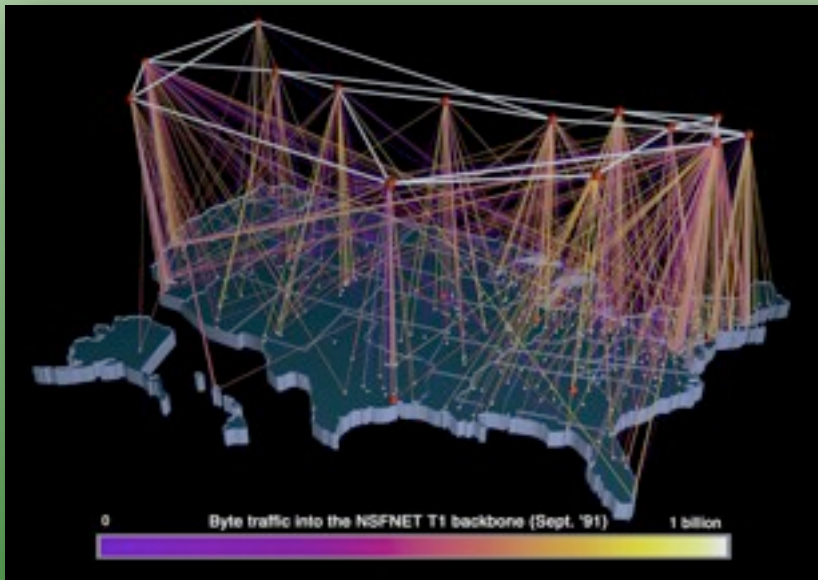
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Research Focus: Data Visualization of Computational Science

Complexity into visual insight: large-scale computational data into time-evolving animated graphics

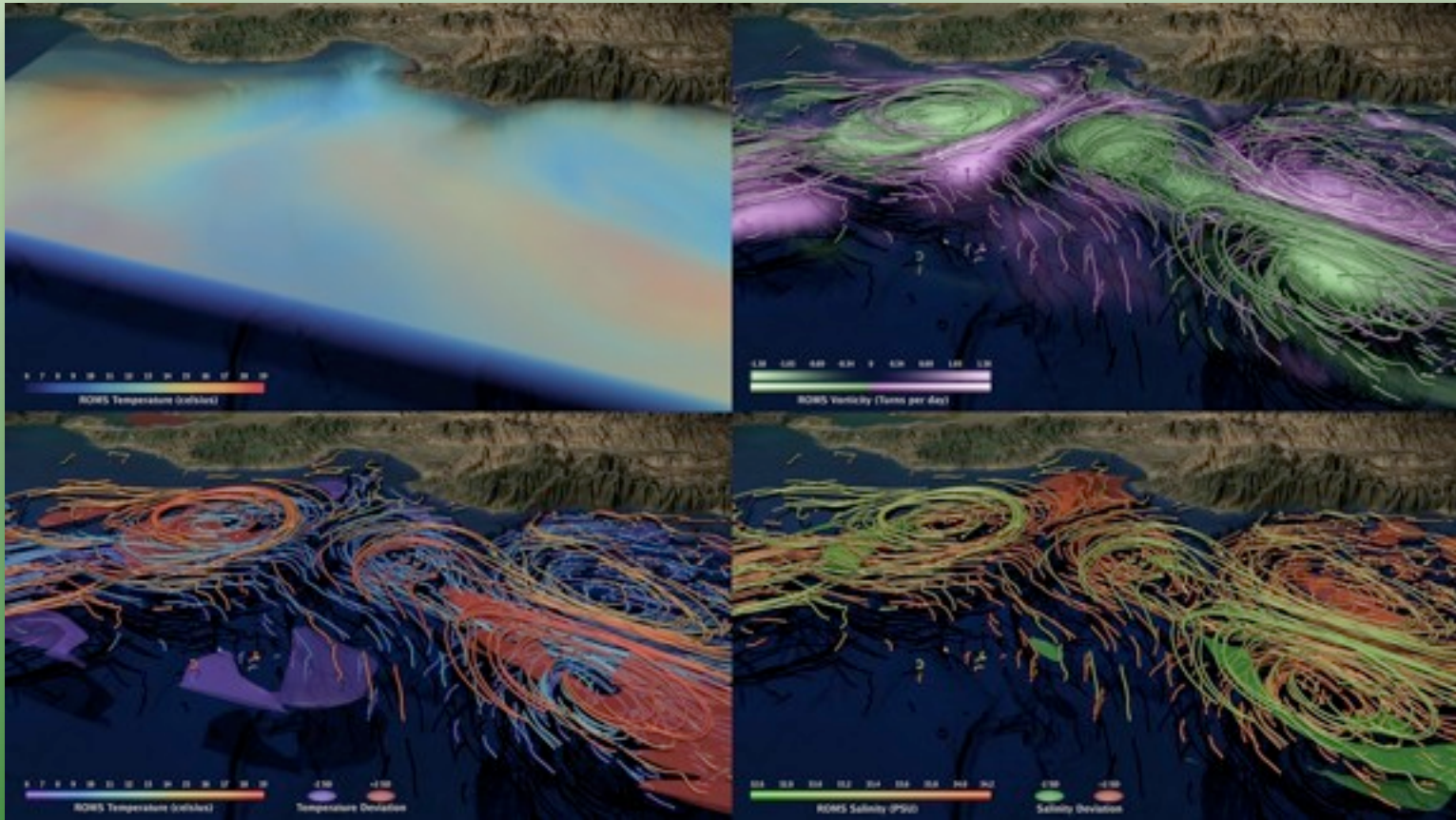


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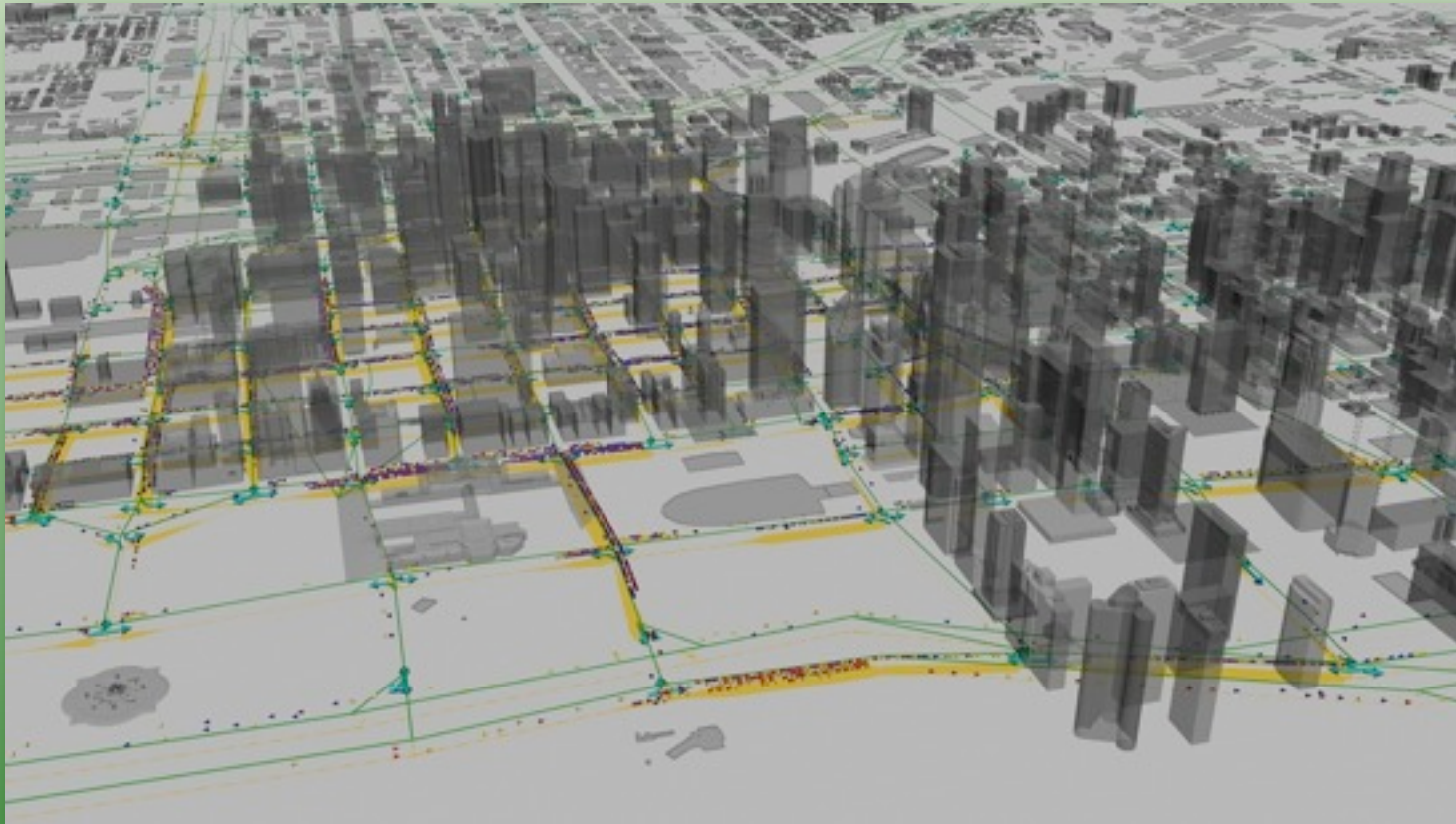
Complexity into visual insight: large-scale computational data into time-evolving animated graphics



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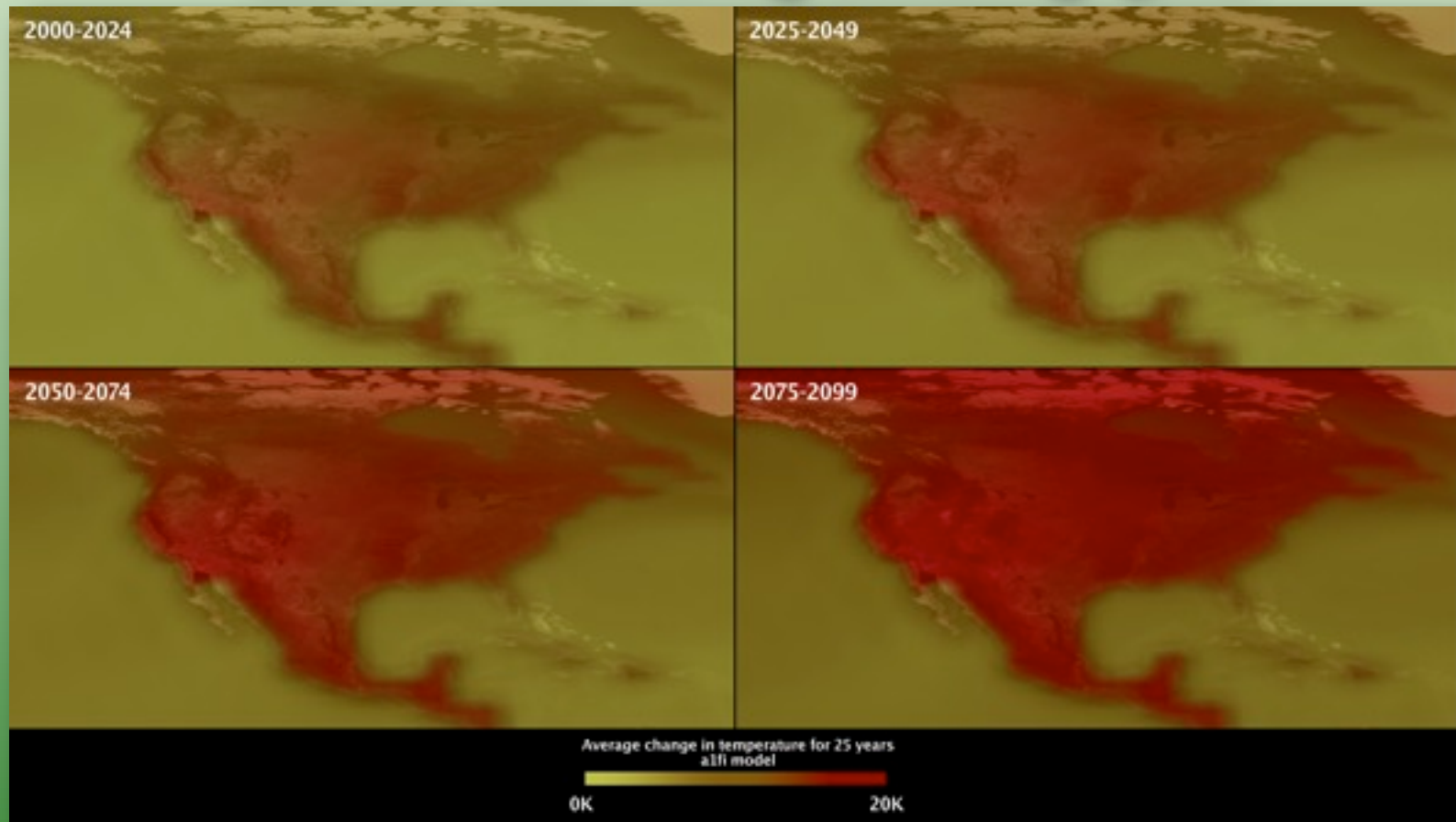
Complexity into visual insight: large-scale computational data into time-evolving animated graphics



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Complexity into visual insight: large-scale computational data into time-evolving animated graphics



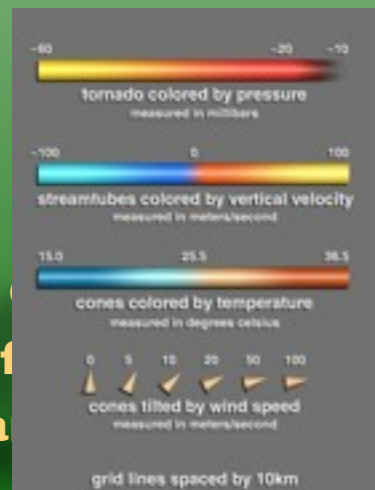
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Collaborating with computational scientists and educators: data visualization is the only telescope

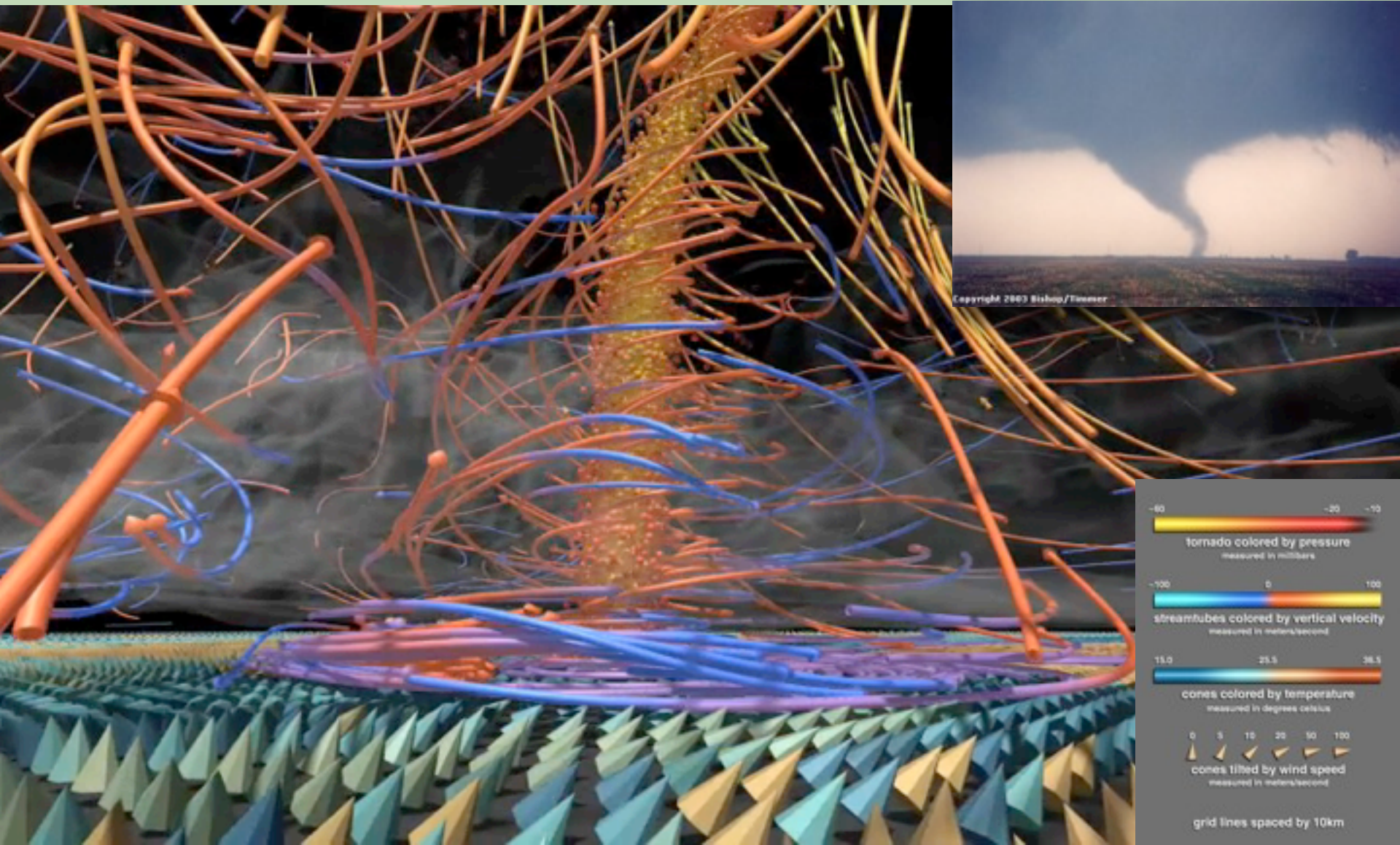


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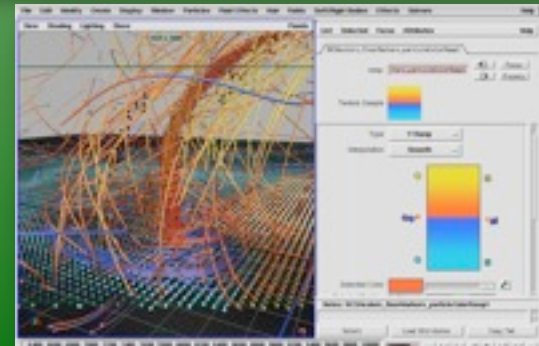
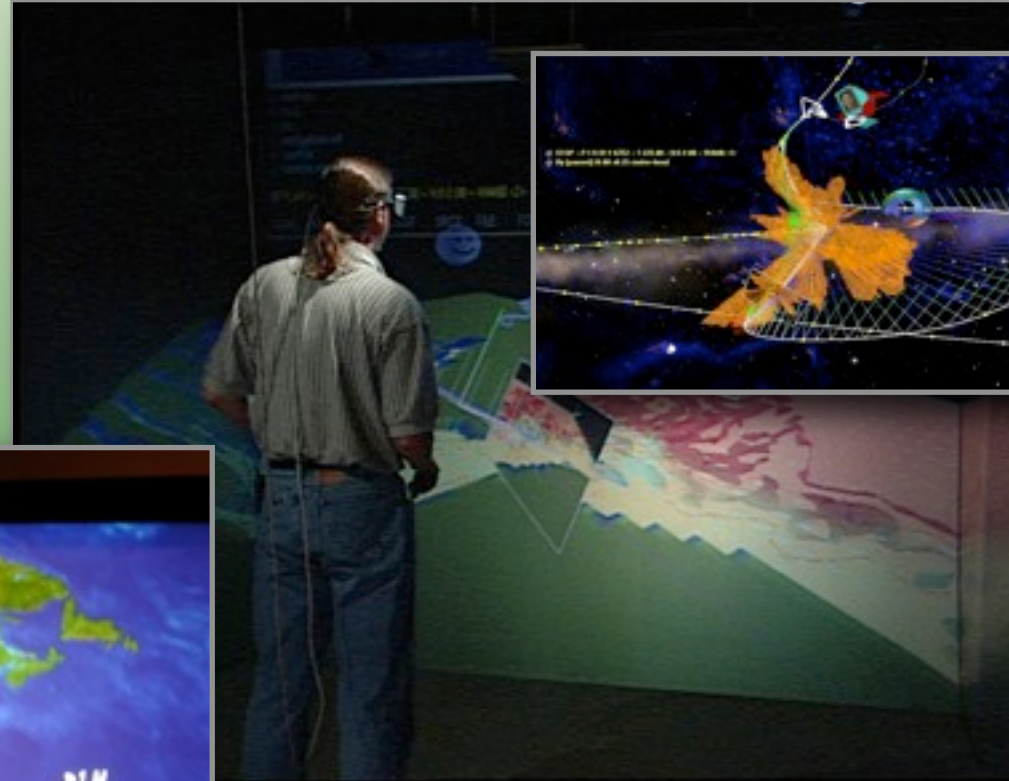
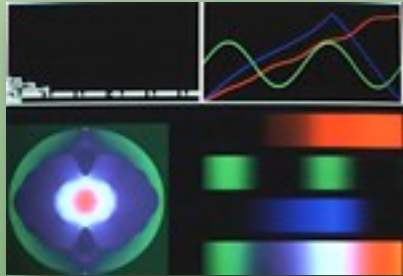


Collaborating with computational scientists and educators: data visualization is the only telescope



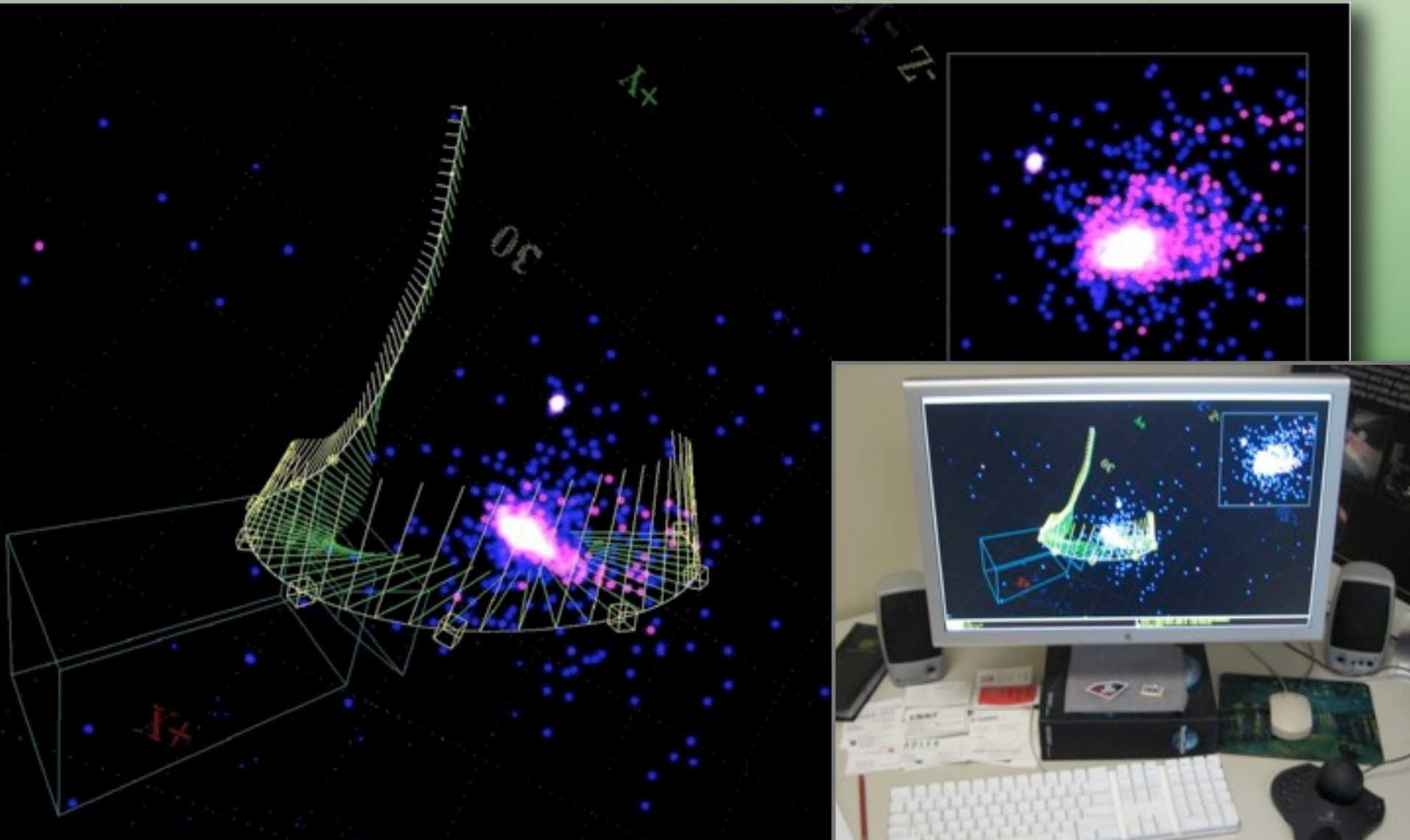


Collaborating with computational scientists and educators: data visualization is the only telescope





Collaborating with computational scientists and educators: data visualization is the only telescope





Outreach: Inspiring, educating, using computations instead of special effects

Cosmic Voyage IMAX film

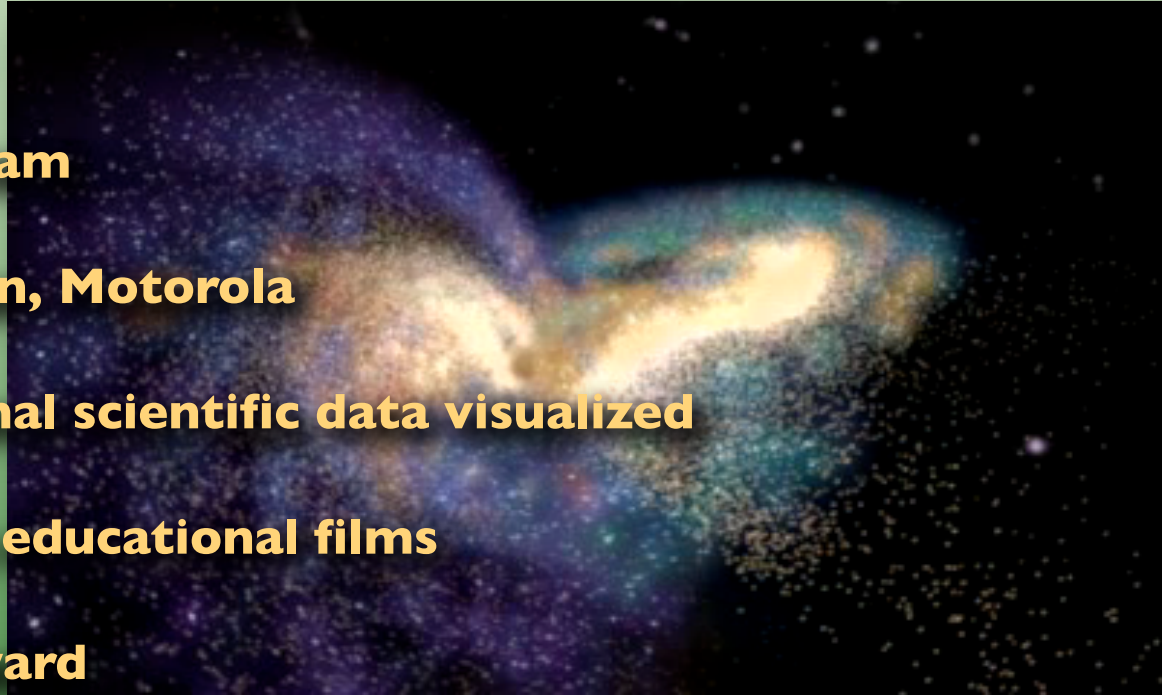
Distributed Renaissance Team

Funded by NSF, Smithsonian, Motorola

Peer-reviewed computational scientific data visualized

Set a precedent for science educational films

Nominated for academy award



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“Cosmic Voyage” IMAX Film, 1996

“Runaway Universe”, NOVA 2000

“Passport to the Universe”, AMNH Dome Show, 2000

“Unfolding Universe”, Discovery Channel, 2002

“Search for Life: Are We Alone”, AMNH Dome Show, 2002

“Hunt for the Supertwister”, NOVA, 2004

“Black Holes: The Other Side of Infinity”, DMNS Dome Show, 2006

“Monster of the Milky Way”, NOVA 2006

“The Fragile Planet”, Calif. Academy of Science, 2007

“Black Hole Monster”, National Geographic HDTV, 2008

IBEX Dome Show, Adler Planetarium, 2008

“Science Storms”, Chicago Museum of Science and Industry, 2009

Hubble3D IMAX film, 2010

Dynamic Earth, 2011



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Outreach: Inspiring, educating, using computations instead of special effects

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Digital format venues: Communication, education & outreach via museums, IMAX movies, etc.





Communication, education & outreach via museums, IMAX movies, etc.



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Communication, education & outreach via museums, IMAX movies, etc.



Visualizations are both interactive & portable



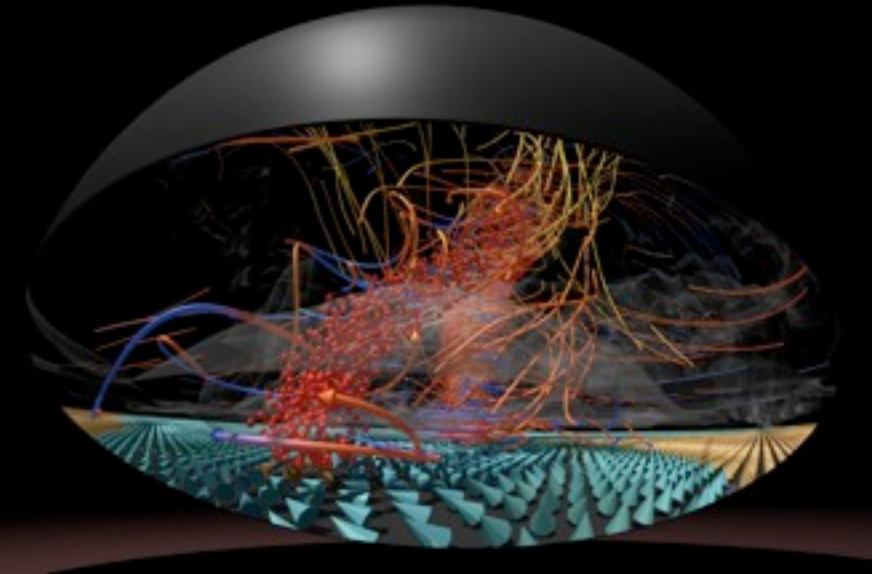
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Visualizations are portable across venues



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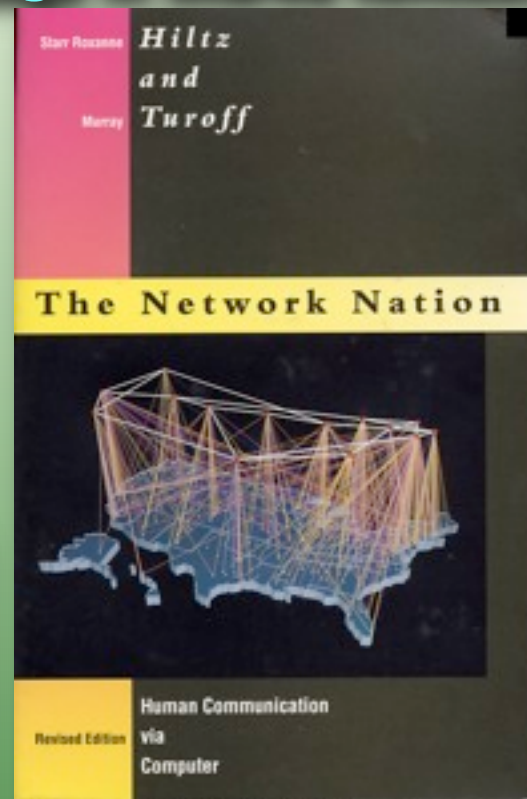
Visualizations are portable & scalable across displays



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Learning is reinforced by being redundant across all media:
developing a new visual language in shared contexts



How do you measure success?



- **Pre-project evaluation:**
 - **Marketing studies on concept and title**
- **Formative evaluations**
 - **Focus groups during rough cuts of the show**
- **Summative evaluations Multimedia Research**
 - **126 random sample adults and teens (21%)**
 - **24% minority**
 - **45% rated graphics spectacular**
- **Audiences in lower age range (4th and 5th graders)**
 - **pre-show 12% and 16% “How do scientists know a BH exists?”**
 - **post-show 60% and 63 %**
 - **“successfully both entertains and educates the upper elementary age student”**



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Large exposure is a form of measurement and difficult to measure



3 million in homes, 1 evening decline in broadcast TV



1 million in homes, over months incline in internet TV



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Research Focus: Data Visualization of Computational Science

I am looking for educators to work with and to provide visualizations, software.

Believe that we are helping the public and future generations to learn a new visual language of science

within new shared contexts of social computing as well as traditional museum environments



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without NSF, then popular science may or may not communicate accurately

leaving it up to discovery channel, pbs, sometimes they use bogus or misleading visualizations

visuals: good thing, they are portable

bad thing, they are portable



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