NSF Space Weather Priorities and Challenges

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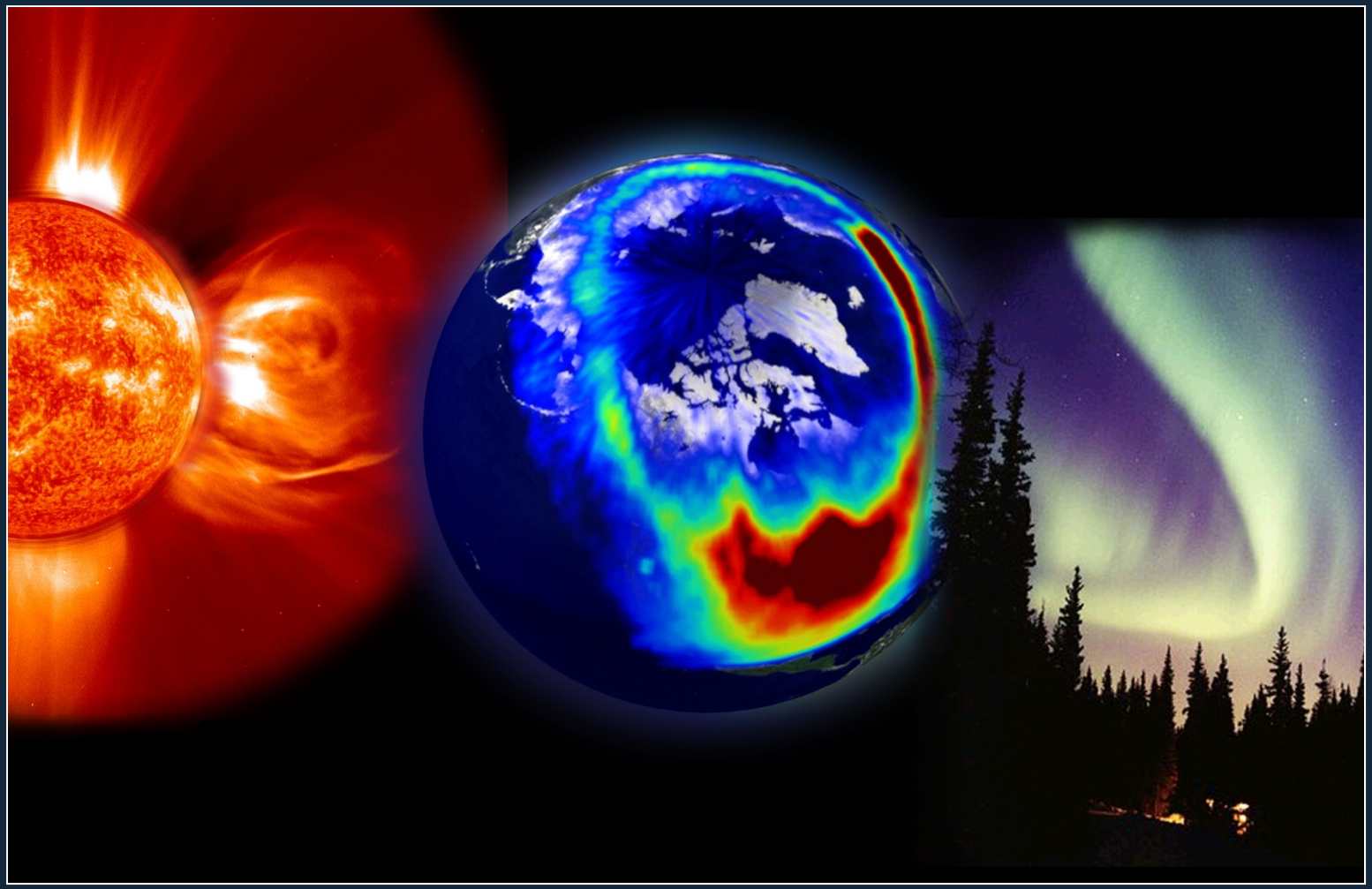
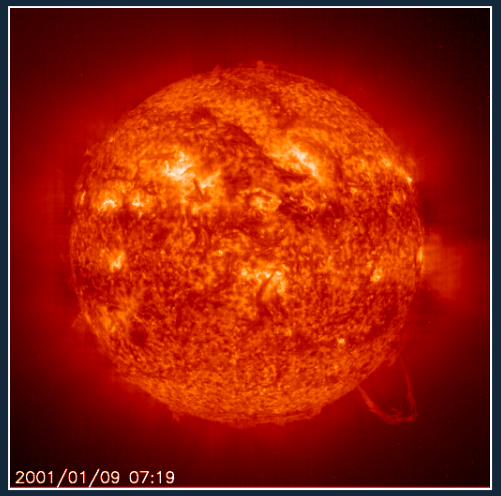
Space Weather

A highly coupled system



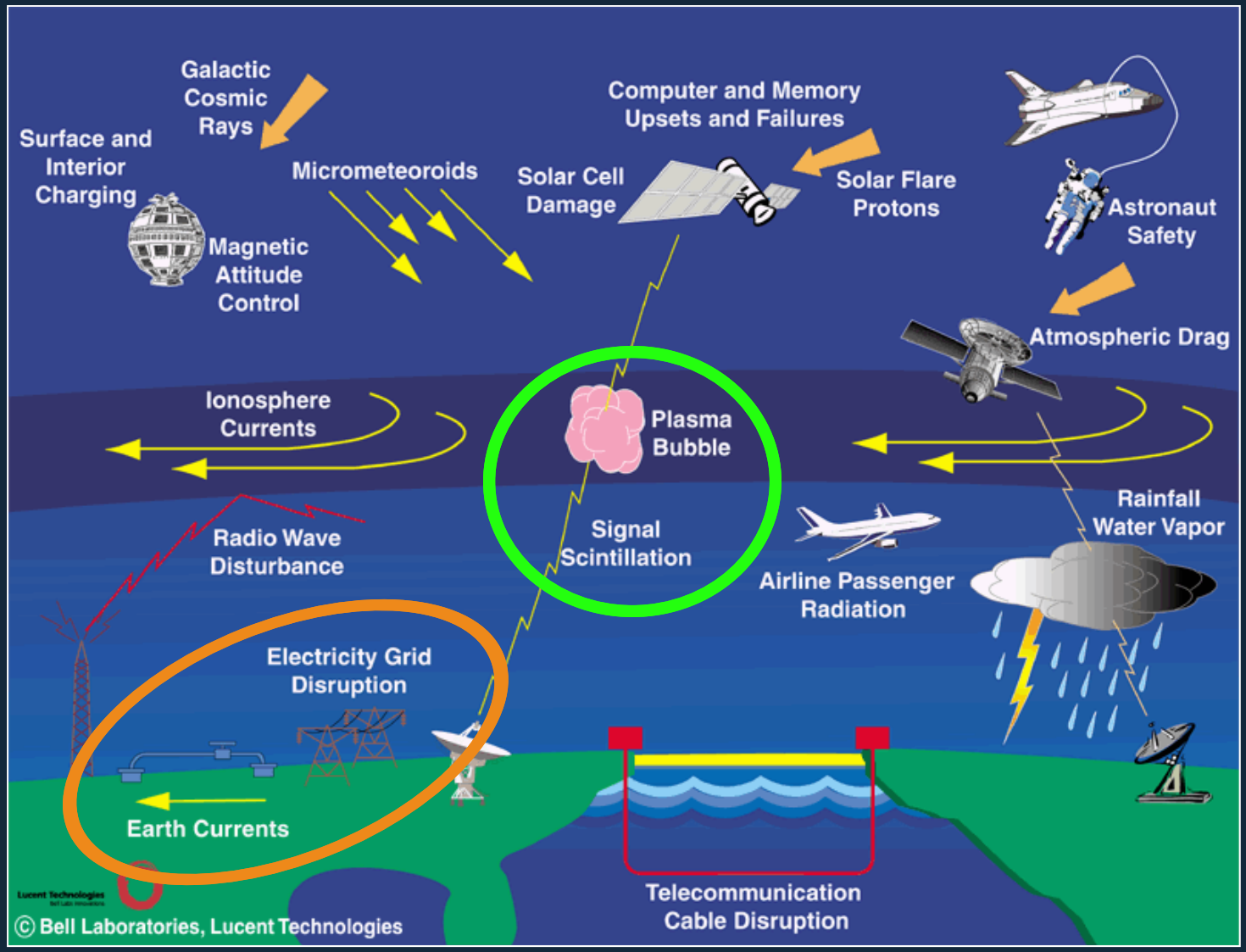
Space Weather

- NSF has played a pioneering role in the National Space Weather Program by contributing to the fundamental understanding of the space weather system.



- NSF has actively partnered with other agencies and stakeholders to facilitate the transition of this knowledge to address societal needs.

Impacts and Concerns



High Level Government Response

Coordinating ways to develop and implement mitigation strategies that safeguard critical infrastructure from the impacts of severe space weather

The New York Times

The Opinion Pages

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY

I.H.T. OP-ED CONTRIBUTOR

Celestial Storm Warnings

By JOHN P. HOLDREN and JOHN BEDDINGTON
Published: March 10, 2011

Weather is often in the headlines. But largely unnoticed last month was the weather that forced airlines flying the polar route between the United States and Asia to detour south over Alaska. This unusual routing was a response to a "space weather" event — an enormous ejection of charged gas from the Sun capable of scrambling terrestrial electronic instruments.

***John P. Holdren** is the science and technology adviser to President Barack Obama. **John Beddington** is the chief scientific adviser to Prime Minister David Cameron.*

Op Ed in NY Times on space weather by John Holdren and John Beddington (10 Mar, 2011)

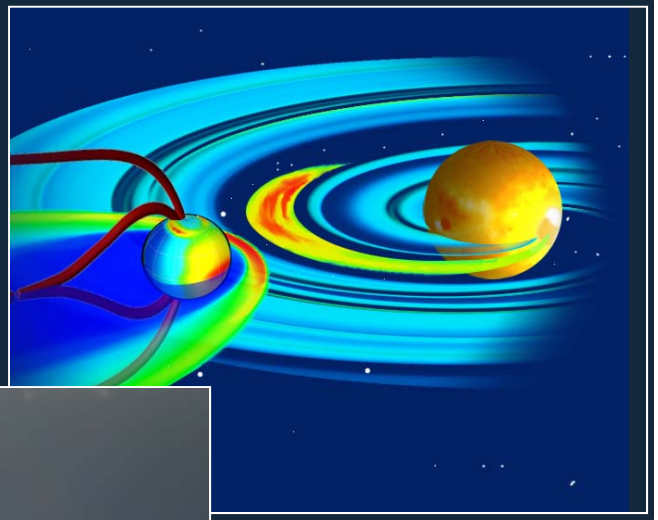
Space weather: applications *and* basic research

"While it is true that important applications will result from the National Space Weather Program, the science that will be accomplished will be first rate. The initiative provides a context in which much of solar-terrestrial physics can and should be done."

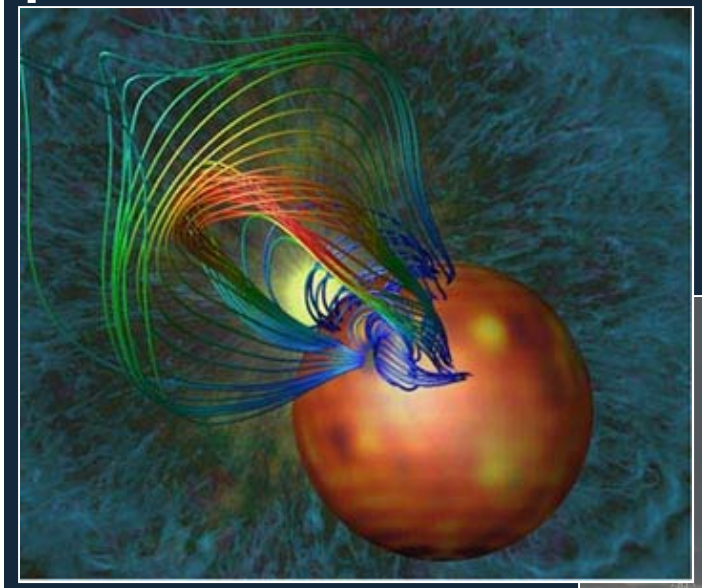
Lou Lanzerotti, former NSB Member

Advancing Fundamental Knowledge

Improved Sun to Earth models

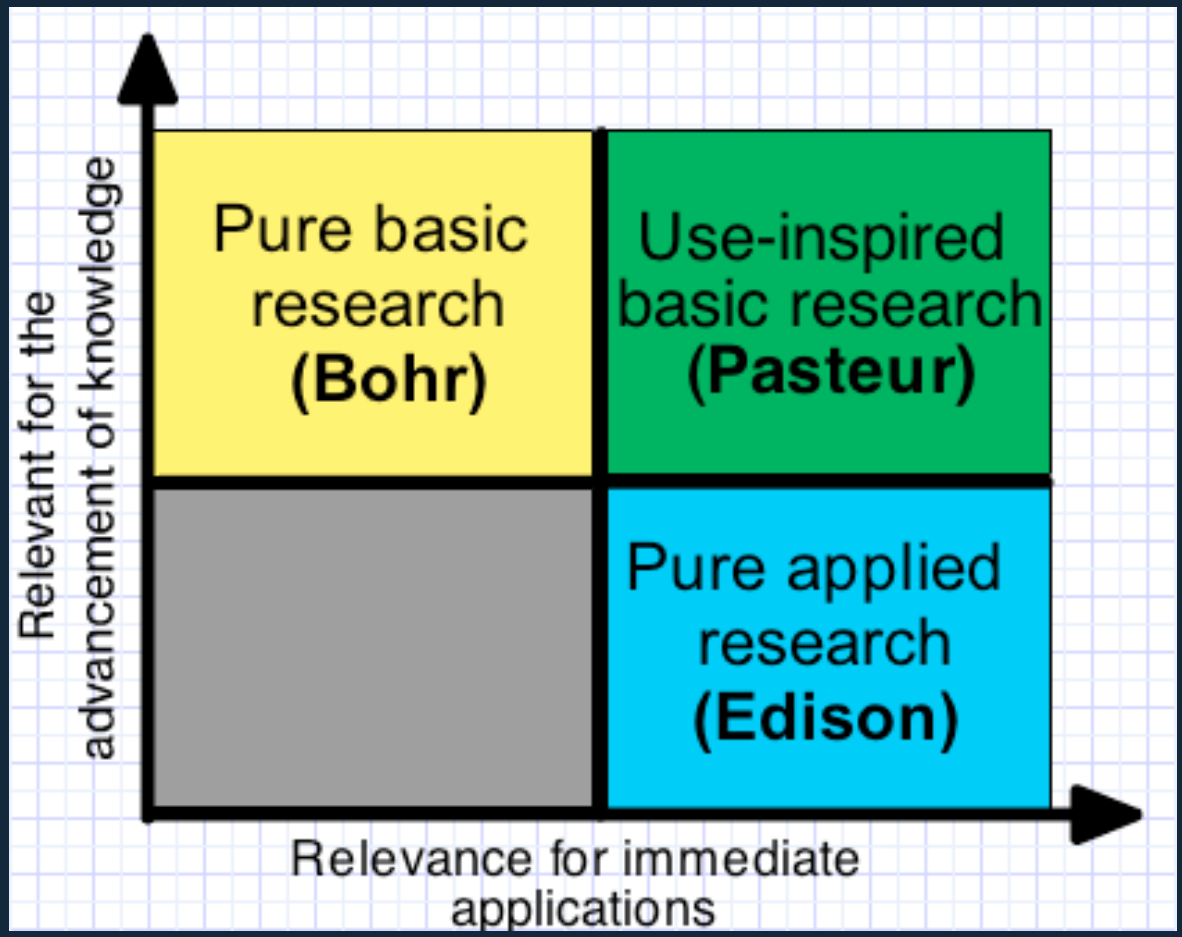


Understanding processes



Better observations

Space Weather Lives in Pasteur's Quadrant



From Pasteur's Quadrant: Basic Science and Technological Innovation by Donald Stokes

Strengthening Space Weather Within NSF and Beyond

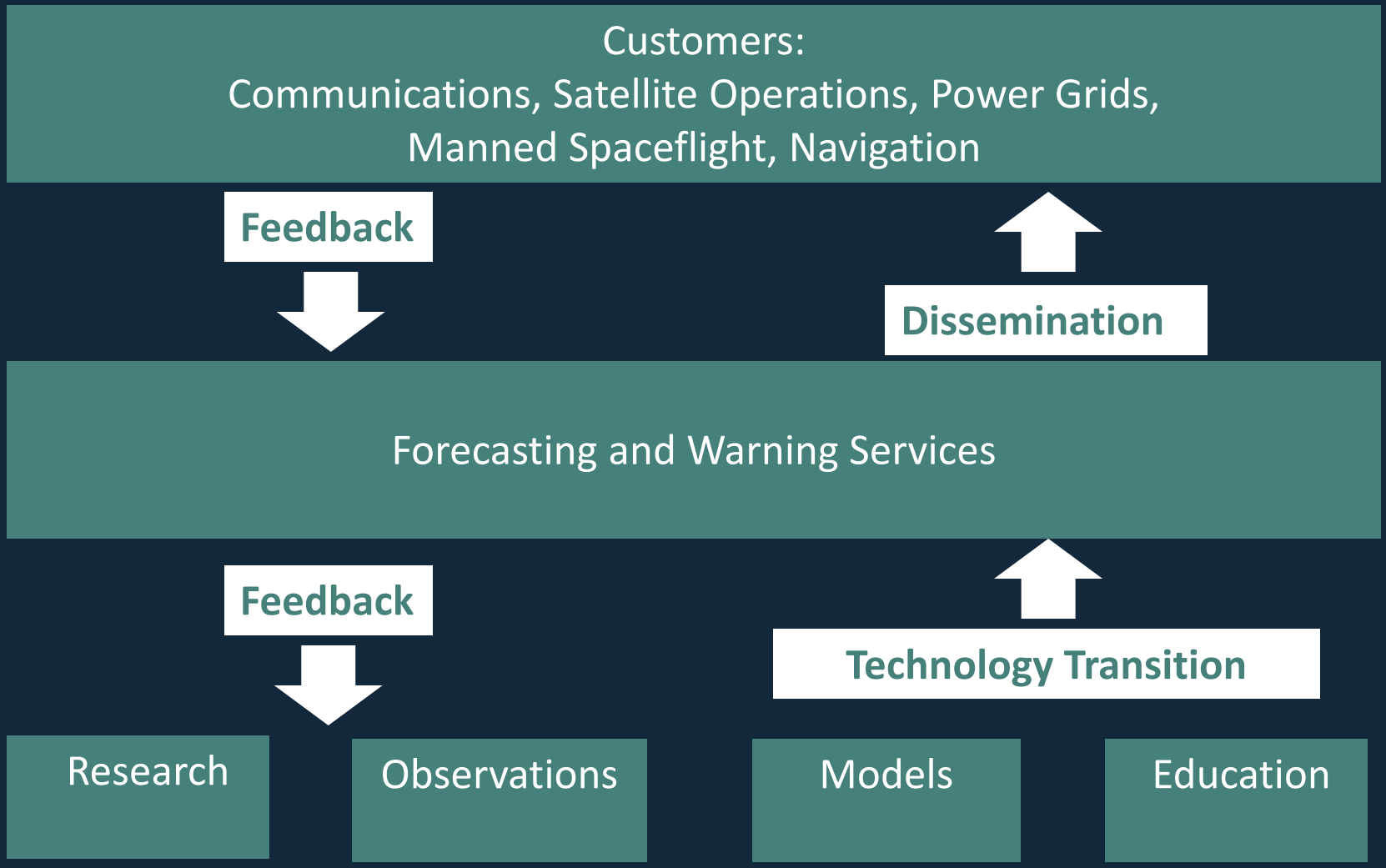
- Pursue collaborations with other NSF offices and directorates
- Continue and establish new interagency partnerships
- Take advantage of cross-cutting programs

CubeSats at NSF

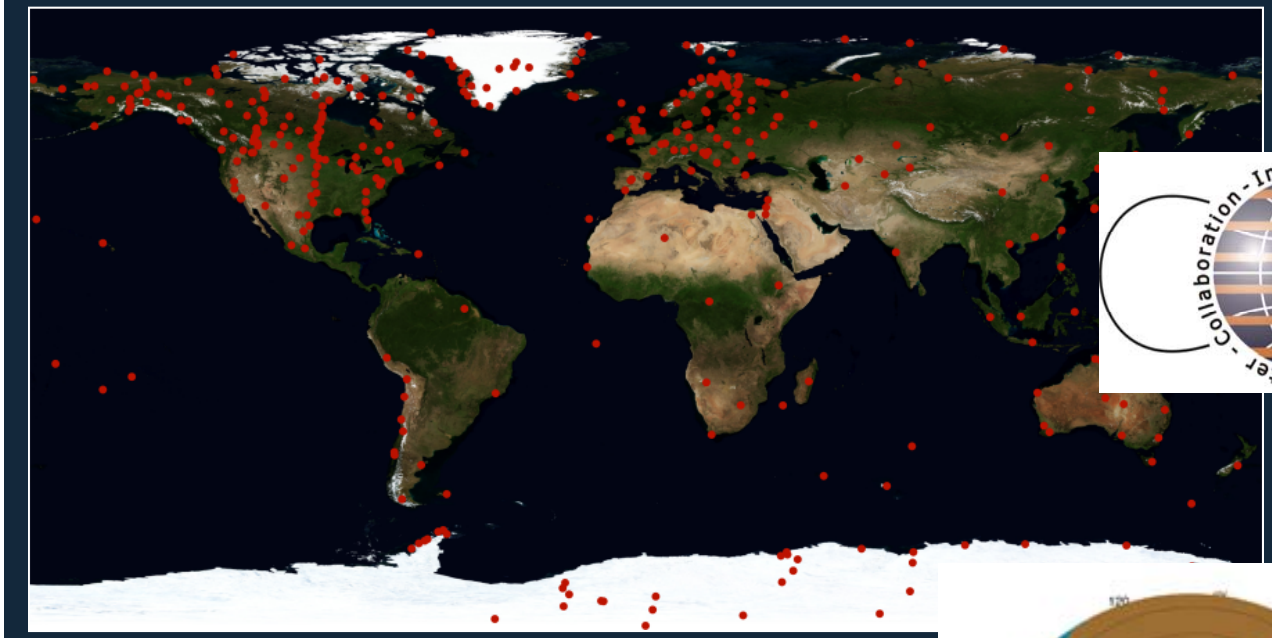
An example of the integration of research and education

From the NSF CubeSat Atrium Event on May 24, 2012
University of Michigan Team with replica of RAX – NSF's first Cubesat

“Space weather is a team sport.”

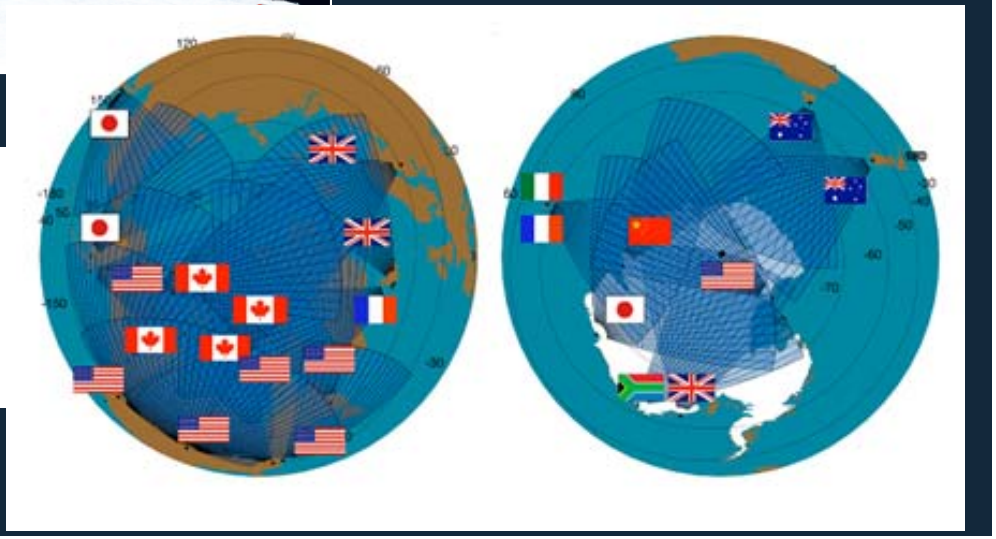


Examples of International Participation in Space Weather



SuperMAG

SuperDARN



Moving Forward

NSF will continue to provide frontier research for:

- A better understanding of the space weather system
- More realistic models based on better observations
- Enhanced observing platforms
- Education of the next generation of space weather scientists

Our Commitment

- To continue to support frontier, “use-inspired” research
- Strengthen our ties with the operational community
- Maintain a leadership role in the National Space Weather Program