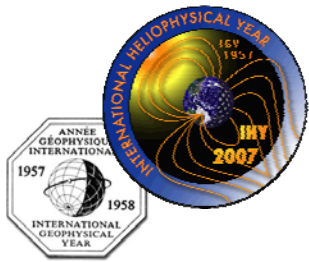


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# PLANS FOR THE INTERNATIONAL HELIOPHYSICAL YEAR (IHY)

An international program of scientific  
research to understand external drivers of  
climate and the space environment

Joseph M. Davila  
March 2, 2004



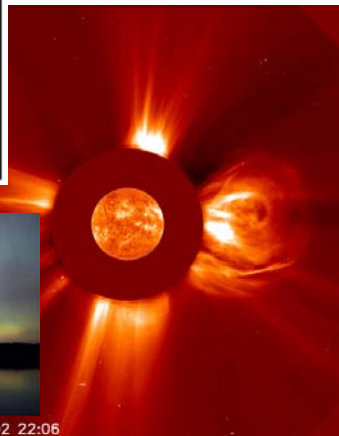
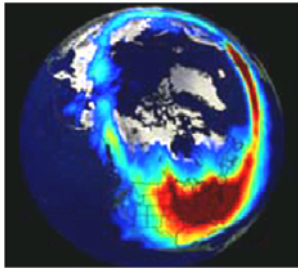
# Why IHY? Historical Perspective

- **First International Polar Year**

- *January 1875, at the Academy of Sciences in Vienna, Carl Weyprecht suggested a coordinated study of the north polar region*
- *Polar meteorological and magnetic observations commenced on Aug 1, 1882, and concluded Sep 1, 1883*

- **Second International Polar Year**

- *Scientific activities were significantly limited by the world-wide economic depression*
- *Polar meteorological and magnetic observations to be made in 1932-1933, fifty years after the first IPY*

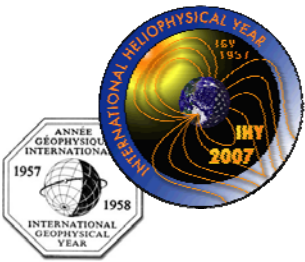


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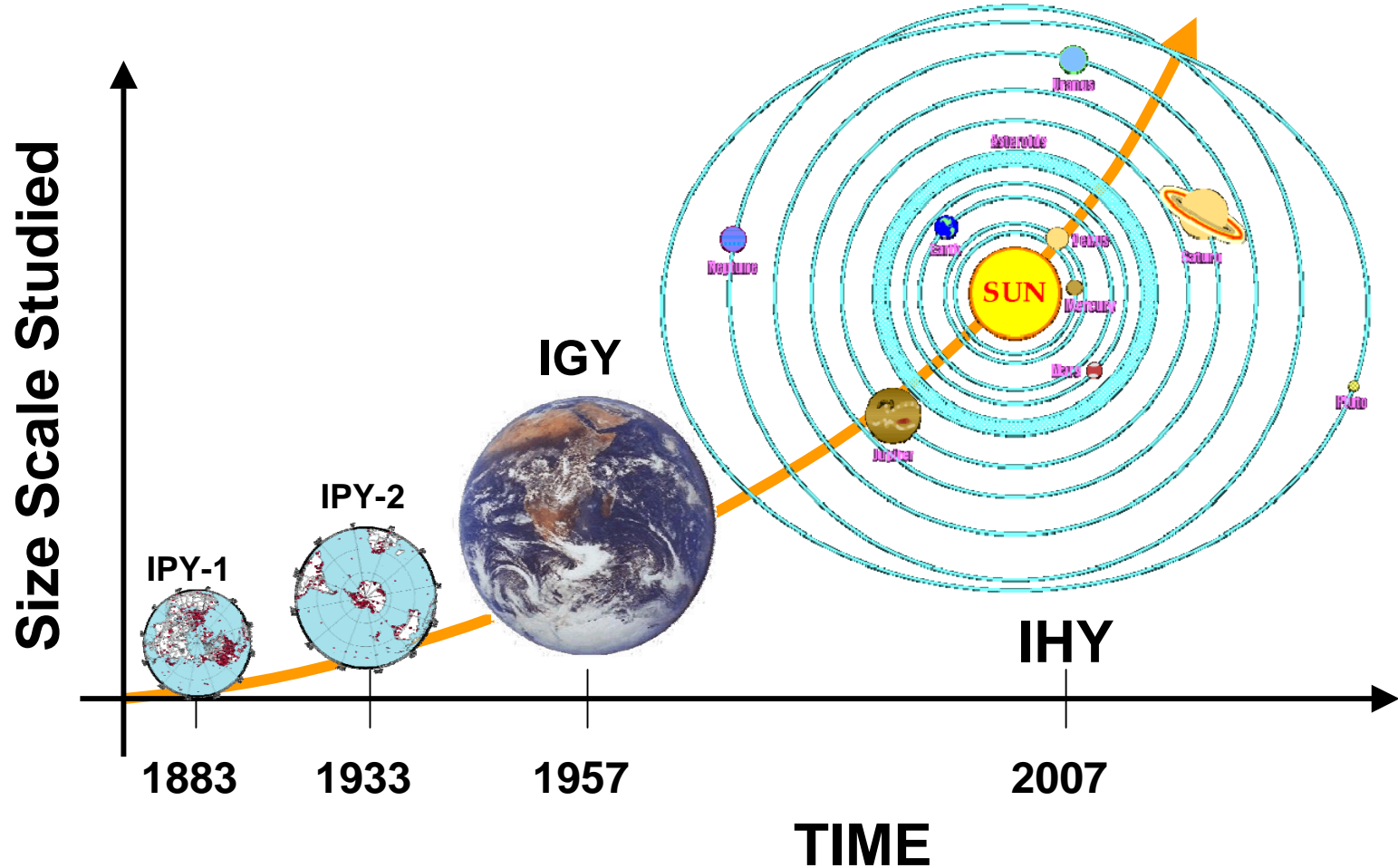
- **International Geophysical Year**

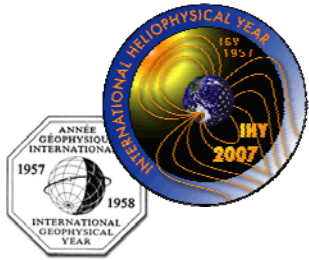
- *In 1957 the IGY involved about 60,000 scientists from 66 nations*
- *To obtain simultaneous, global observations on Earth and in space*

**The logical next step is to extend global studies into the Heliosphere to incorporate the drivers of Geophysical change into the global system-The IHY.**



# Evolution of System Studies

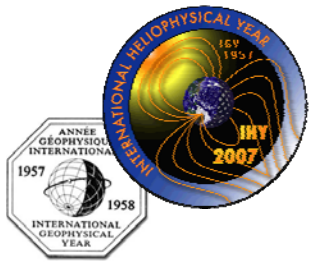




# IHY Scientific Goals

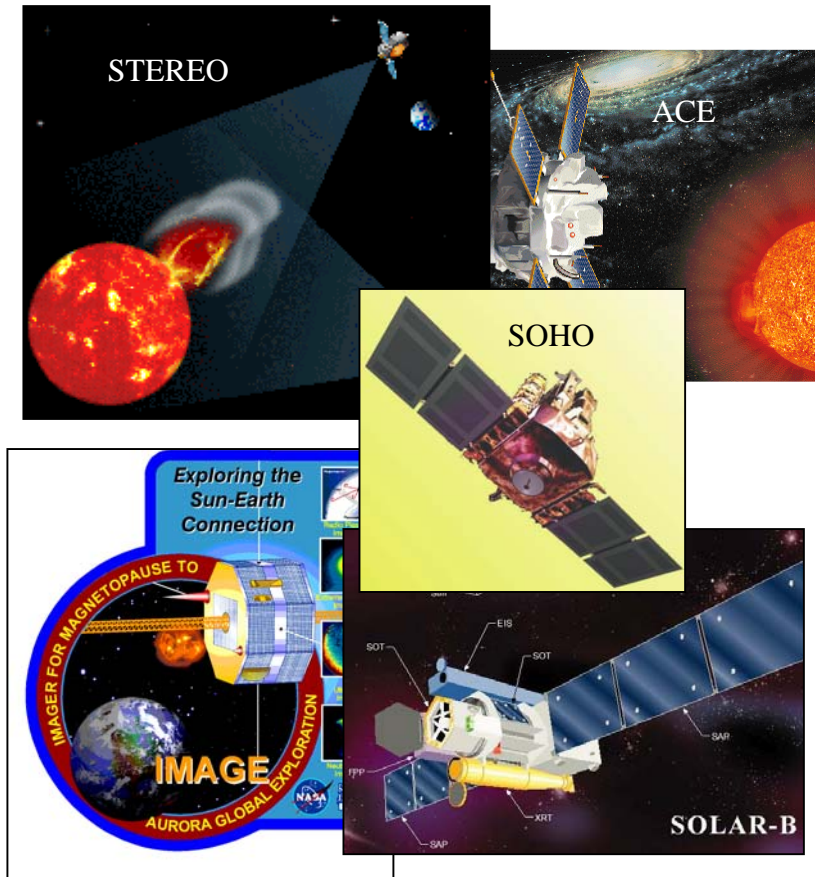
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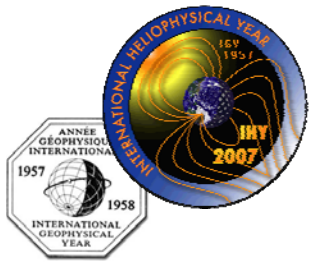
- Provide benchmark measurements of the response of the magnetosphere, the ionosphere, the lower atmosphere and Earth surface to identify global processes and drivers which affect the terrestrial environment and climate
- Global study of the Sun-heliosphere system outward to the heliopause to explore this new frontier, and to understand the external, and historic drivers of geophysical change
- Foster international scientific cooperation in the study of Heliophysical phenomena now and in the future
- To communicate the unique scientific results of the IHY to the interested scientific community and to the general public



# Why Now?

- A large armada of existing or planned spacecraft is in place to provide the most comprehensive global measurements of the sun-earth interplanetary system yet obtained
- Earth-based observatories can provide measurements of terrestrial effects at the poles and elsewhere
- International collaboration is easier today than in previous international years with abundant and cheap electronic communication available
- No single country has sufficient resources to obtain all required observations





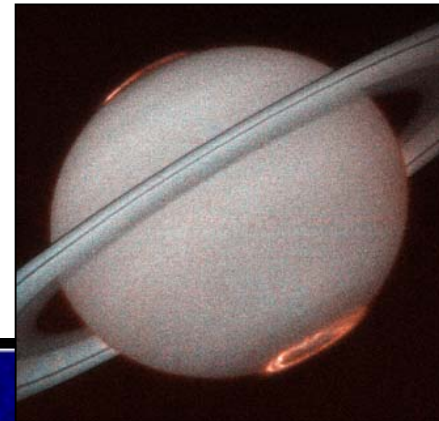
# What is the Opportunity?

## Universal Processes: Cross-cutting solar system science

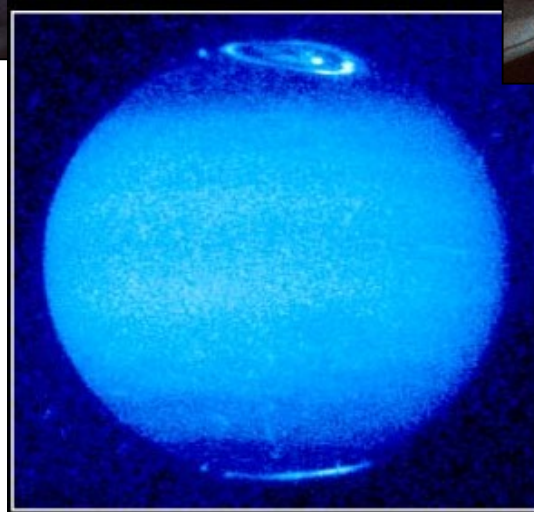


*True-color image of Earth's aurora taken from Space Shuttle*

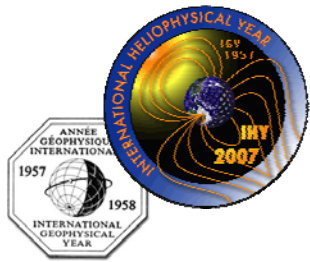
- **Similar physical processes are evident in vastly different environments**



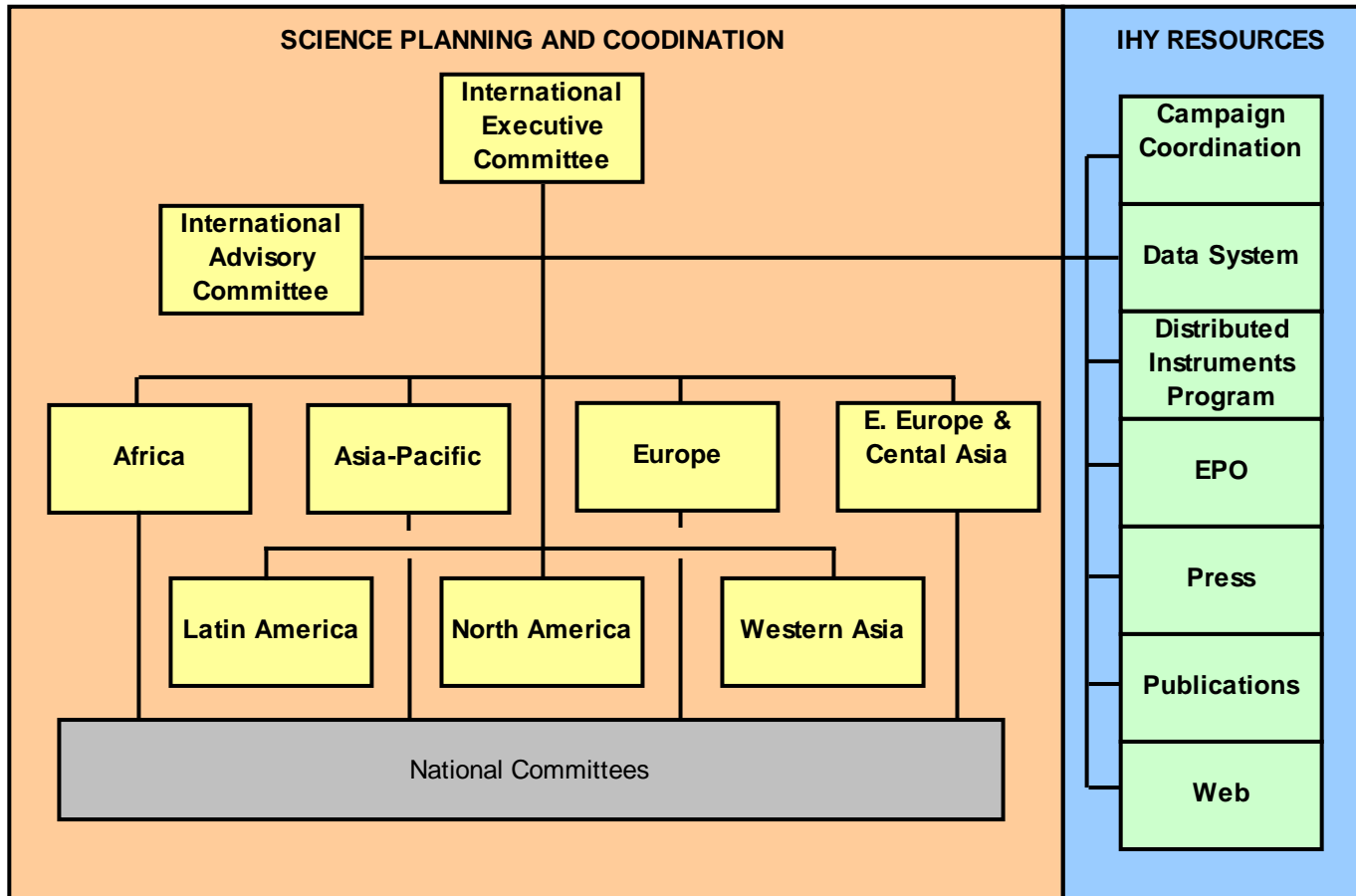
*Aurora at Saturn's poles*

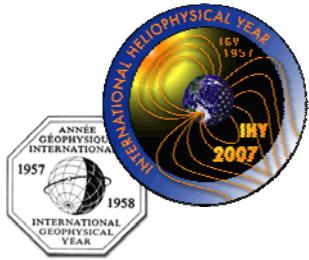


*Jupiter's aurora imaged with HST*



# Grass-roots Planning Process



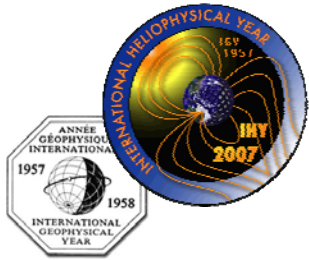


# Elements of IHY Plan

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- Observing (or modeling) campaigns
- Distributed small instrument arrays
  - *Magnetometers, radio dish, GPS receivers, all-sky cameras, etc.*
  - *Lead investigator provides instruments*
  - *UNBSS members may choose to provide instruments, local facilities, or data acquisition*
- Series of cross-cutting Coordinated Data Analysis Workshops to develop interpretations
- Publication of workshop results
- Outreach and History Initiatives





# Near Term Events

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- North American Planning Workshop
  - *Boulder, Colorado, February 16-18, 2005*
  - *<http://ihy.gsfc.nasa.gov>*
- Notice of Intent for Distributed Array Concepts
  - *March 2005*
  - *Contact Justin Kasper ([jck@mit.edu](mailto:jck@mit.edu))*
- 1<sup>st</sup> International Meeting
  - *International Association of Geomagnetism and Aeronomy, Toulouse, France, July 22, 2005 followed by a business meeting July 23, 2005.*
  - *Contact Barbara Thompson ([barbara.j.thompson@nasa.gov](mailto:barbara.j.thompson@nasa.gov))*
- UNBSS Planning Workshop
  - *United Arab Emirates, November 2005*
  - *Contact Nat Gopalswamy ([gopals@fugee.gsfc.nasa.gov](mailto:gopals@fugee.gsfc.nasa.gov))*