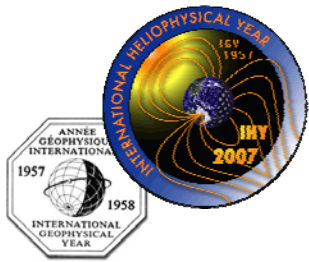


PLANS FOR THE INTERNATIONAL HELIOPHYSICAL YEAR (IHY)

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

Joseph M. Davila
March 2, 2004



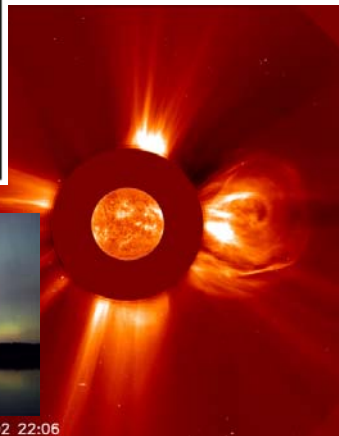
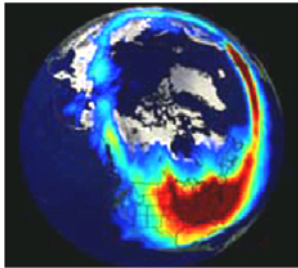
Why IHY? Historical Perspective

- **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*

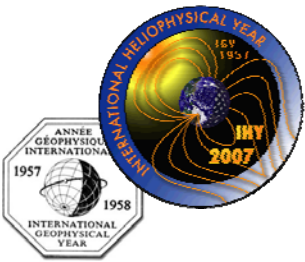


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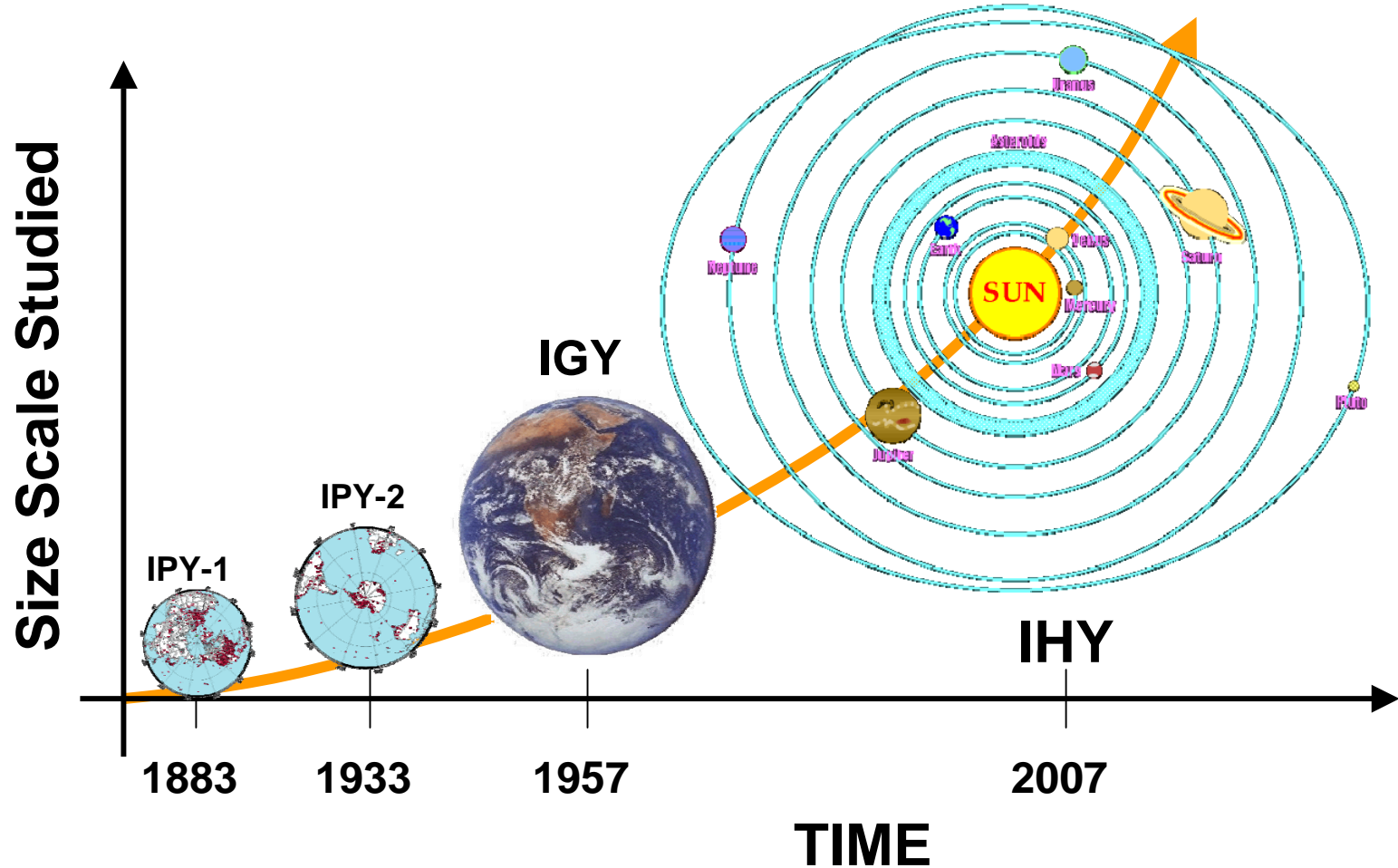
- **International Geophysical Year**

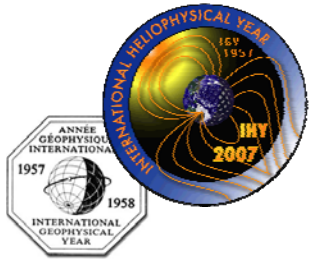
- *In 1957 the IGY involved about 60,000 scientists from 66 nations*
- *To obtain simultaneous, global observations on Earth and in space*

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.



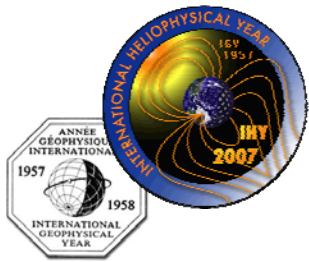
Evolution of System Studies





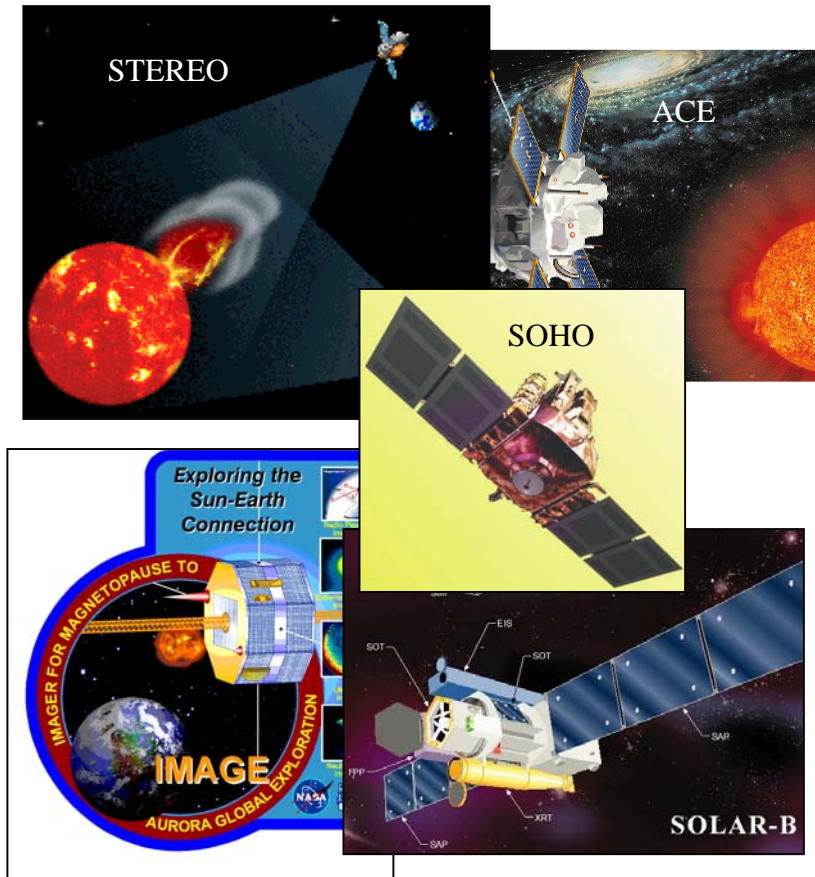
IHY Scientific Goals

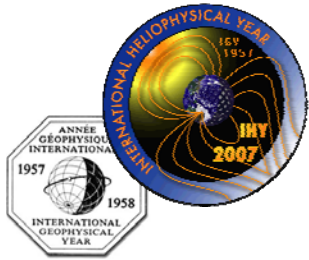
- Provide benchmark measurements of the response of the magnetosphere, the ionosphere, the lower atmosphere and Earth surface to identify global processes and drivers which affect the terrestrial environment and climate
- Global study of the Sun-heliosphere system outward to the heliopause to explore 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

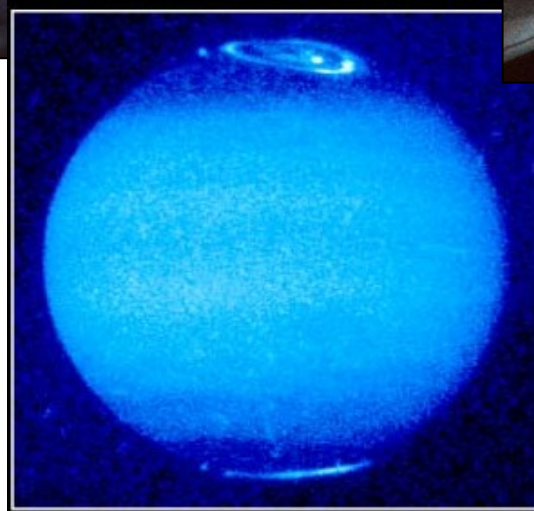


True-color image of Earth's aurora taken from Space Shuttle

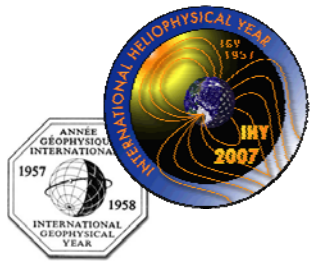
- **Similar physical processes are evident in vastly different environments**



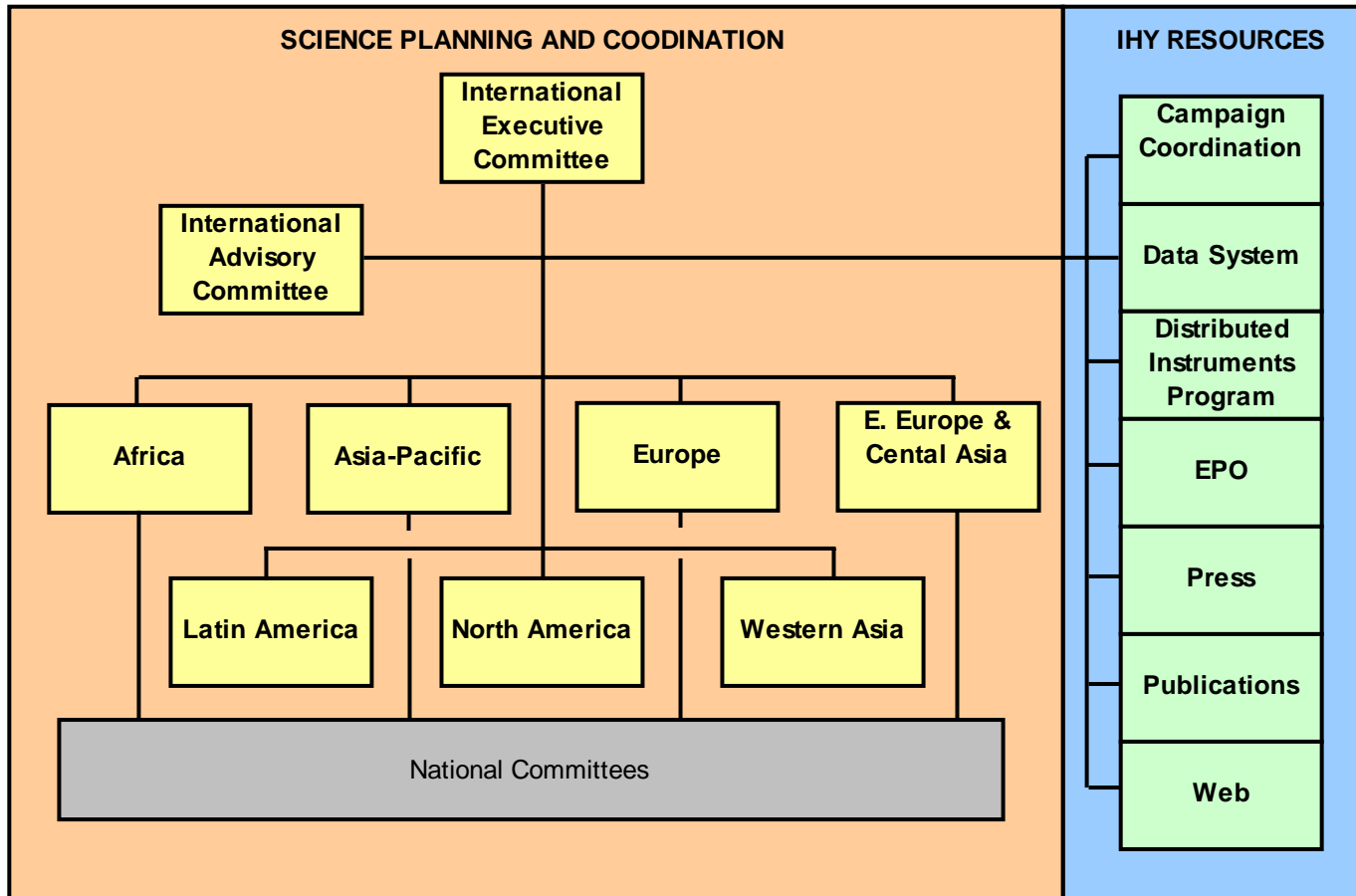
Aurora at Saturn's poles

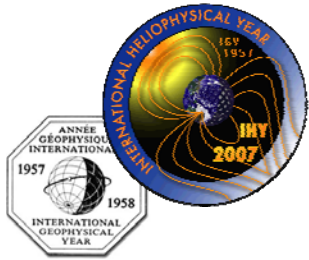


Jupiter's aurora imaged with HST



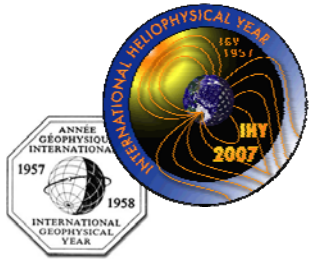
Grass-roots Planning Process





Elements of IHY Plan

- 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

- 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)*
- 1st 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)*
- UNBSS Planning Workshop
 - *United Arab Emirates, November 2005*
 - *Contact Nat Gopalswamy (gopals@fugee.gsfc.nasa.gov)*