



IHY in the United States

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US IHY National Coordinator

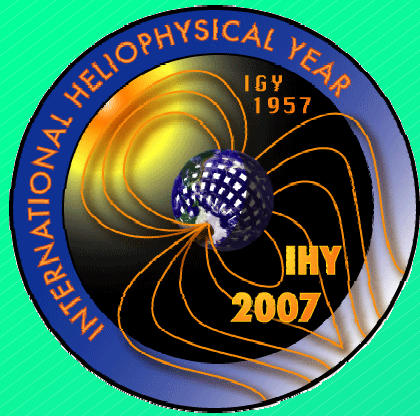
Second UN/NASA Workshop on IHY and Basic Space Science
Bangalore, India, Nov 27-Dec 01 2006

Talk plan

- Statement of purpose
- Summary of present status
- Survey of Cooperative Programs
- Next steps

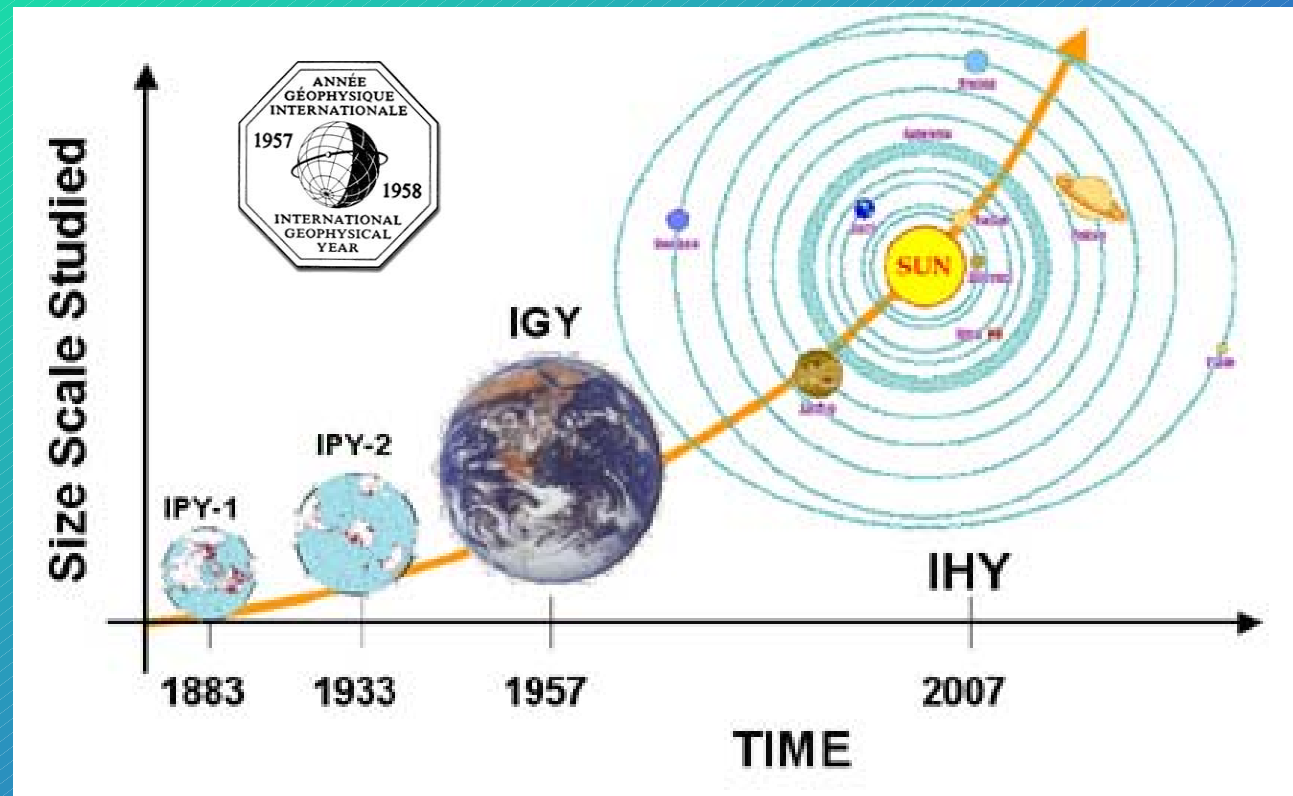
Statement of Purpose

- Leadership in synthesis of observations and theory for the study of universal processes.
- Expansion of the concept of Geophysics to the new level of Heliophysics.
- Outreach and education to inform the public, schools and universities of this new dimension in research.
- Teaching through undergraduate/graduate level schools to build a new generation of scientists.
- Preservation of the history of the International Geophysical Year



Evolution of Heliophysics

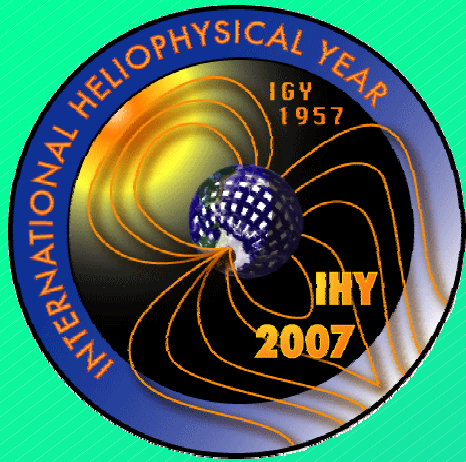
Heliophysical: A broadening of the concept "geophysical," extending the connections from the Earth to the Sun & interplanetary space.





Heliophysics defined by Universal Processes

- Evolution and Generation of Magnetic Structures and Transients
- Energy Transfer and Coupling Processes
- Flows and Circulations
- Boundaries and Interfaces
- Synoptic Studies of the 3-D Coupled Solar-Planetary-Heliospheric System



Contributing Disciplines

- Solar Physics
- Planetary Magnetospheres
- Heliosphere and Cosmic Rays
- Planetary Ionospheres,
Thermospheres and
Mesospheres
- Climate Studies
- Heliobiology

IHY success depends upon people

- IHY will pioneer international heliophysical science by the addition explicit consideration of universal processes to current and new studies.
- Heliophysics provides opportunities for cutting edge science leading to new discovery through the application of universal process results.
- Public, school and university outreach will lead to a more educated public and new students focusing on heliophysics building new scientific endeavors.

Current Status

- CIPs
- Collaborating Observatories
- Outreach
- New instrumentation

CIP status

• CIP TOPIC	All	USA
•		
• Solar	16	7
• Heliosphere/CR	17	7
• Planetary Magn	18	1
• Ionized Atmos	21	1
• Neutral Atmos	9	0
• Climate	2	0
• Astrobiology/Spc Meds	0	0
• Other	9	0
•		
• Totals	92	16

Cooperating Observatories

- ACE instruments
- Arecibo Radio and Optical Observatory
- AMISR Radio and Optical Observatory at Poker Flat
- Big Bear Solar Observatory H-alpha imager
- Bruny Island Radio Spectrometer
- Cassini instruments
- Chandra X-Ray observatory
- Cluster instruments
- GEOS Solar X-Ray Imager
- Hubble Space Telescope
- Improved Solar Observing Optical Network
- John J. McCarthy Observatory

More Cooperating Observatories

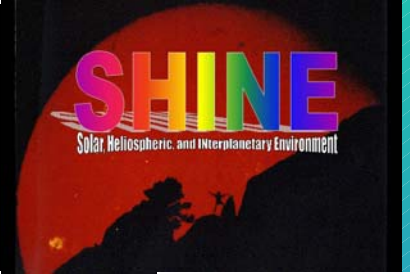
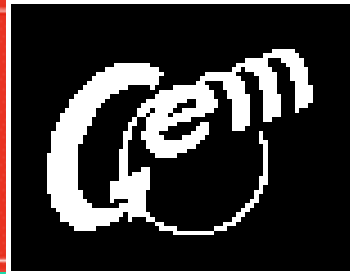
- Mauna-Loa Observatory
- Millstone Hill Ionospheric Observatory
- Mt Wilson Observatory
- NSO Global Oscillations Network Group (GONG)
- National Solar Observatory, Kitt Peak
- NSO Sacramento Peak
- Polar Satellite Instruments
- RHESSI instruments
- SOHO instruments
- Solar Dynamics Observatory
- Solar Mass Ejection Imager
- Solar Stereo Mission
- Sondrestromfjord Radar and Optical Observatory

More Cooperating Observatories

- SuperDARN radar
- TIMED satellite instruments
- TRACE instruments
- Ulysses instruments
- Voyager instruments
- Wilcox solar observatory
- WIND spacecraft instruments

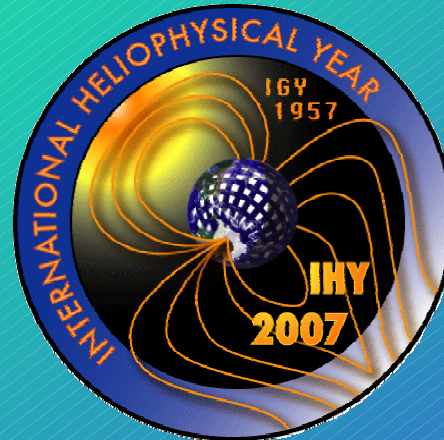
New Instrumentation

- Atmospheric Weather Electromagnetic System for Observation, Modeling and Education. (AWESOME) (Cohen, Inan and Scherrer)
- Coherent Ionospheric Doppler Receivers (CIDR) (Bust, Garner, Gaussiran, Calfas)
- Low-Frequency Radio Antenna Arrays (Kasper)
- Remote Equatorial Nighttime Observatory for Ionospheric Regions (RENOIR) (Makela)
- Scintillation Network Decision Aid (SCINDA) (Groves)



Cooperating Programs

- SCOSTEP
 - CAWSES
- National Science Foundation
 - CEDAR
 - GEM
 - SHINE
- National Aeronautics and Space Administration
 - Living with a Star
- International Polar Year
- Electronic Geophysical Year



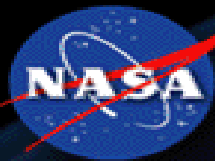
Living With a Star

Summer Schools

- Common curriculum, 2-week schools with a high ratio of faculty mentors to students.
- Summer School in Boulder Colorado.
- Polar Aeronomy and Radio Science Summer School in Fairbanks Alaska
- Others to be announced.

K-12 Schools Program

- Coordination of activities organized concurrently for I*Y with the aim of making a continuum of curriculum.
- IPY, eGY, IHY and IYPE have parallel objectives of education about forms of the environment.



- Living With a Star 
- Solar Terrestrial Probes 
- Site Map 

Heliophysics

THE NEW SCIENCE OF THE SUN-SOLAR SYSTEM CONNECTION

SCIENCE

MISSIONS

ROADMAP

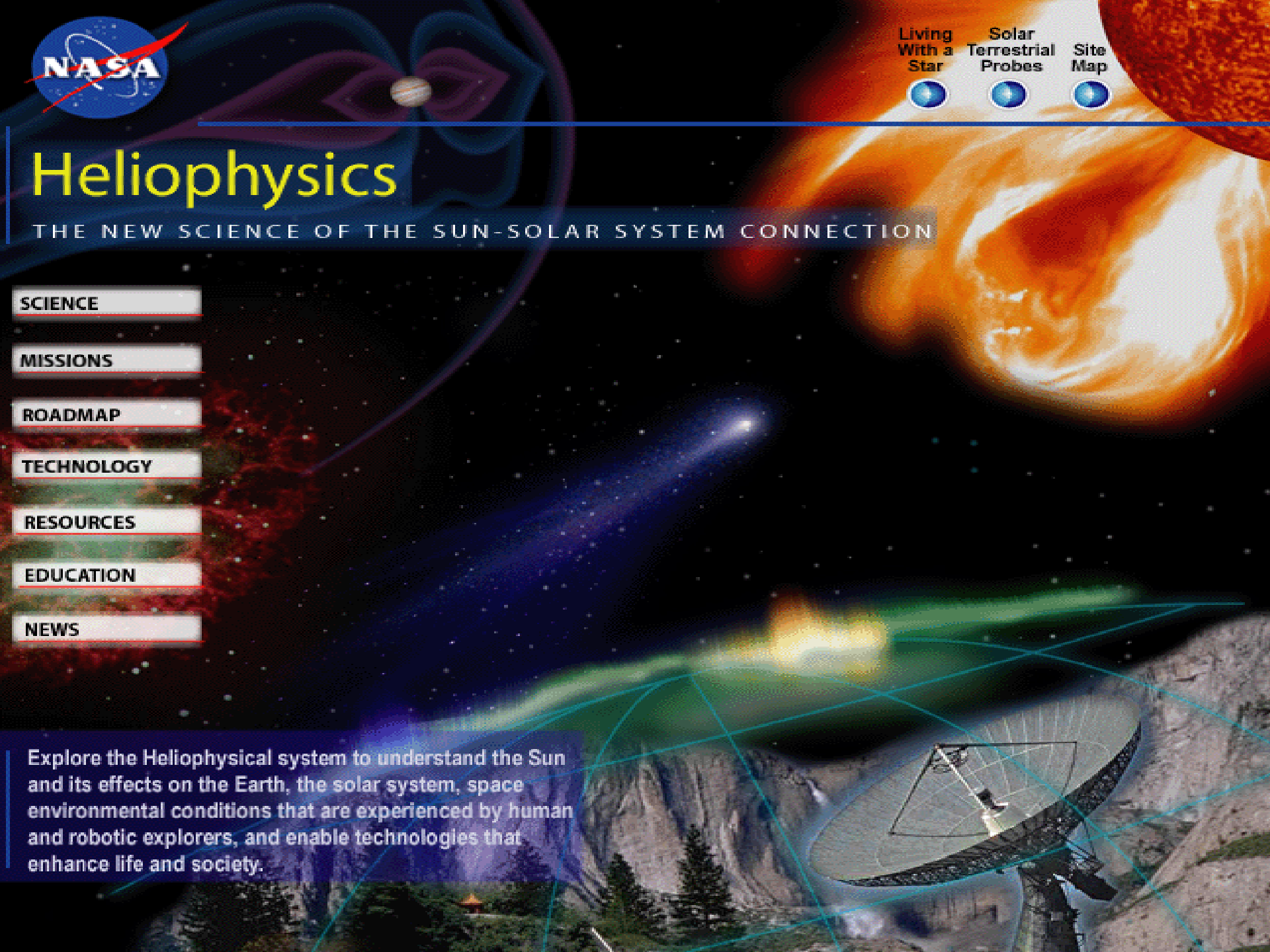
TECHNOLOGY

RESOURCES

EDUCATION

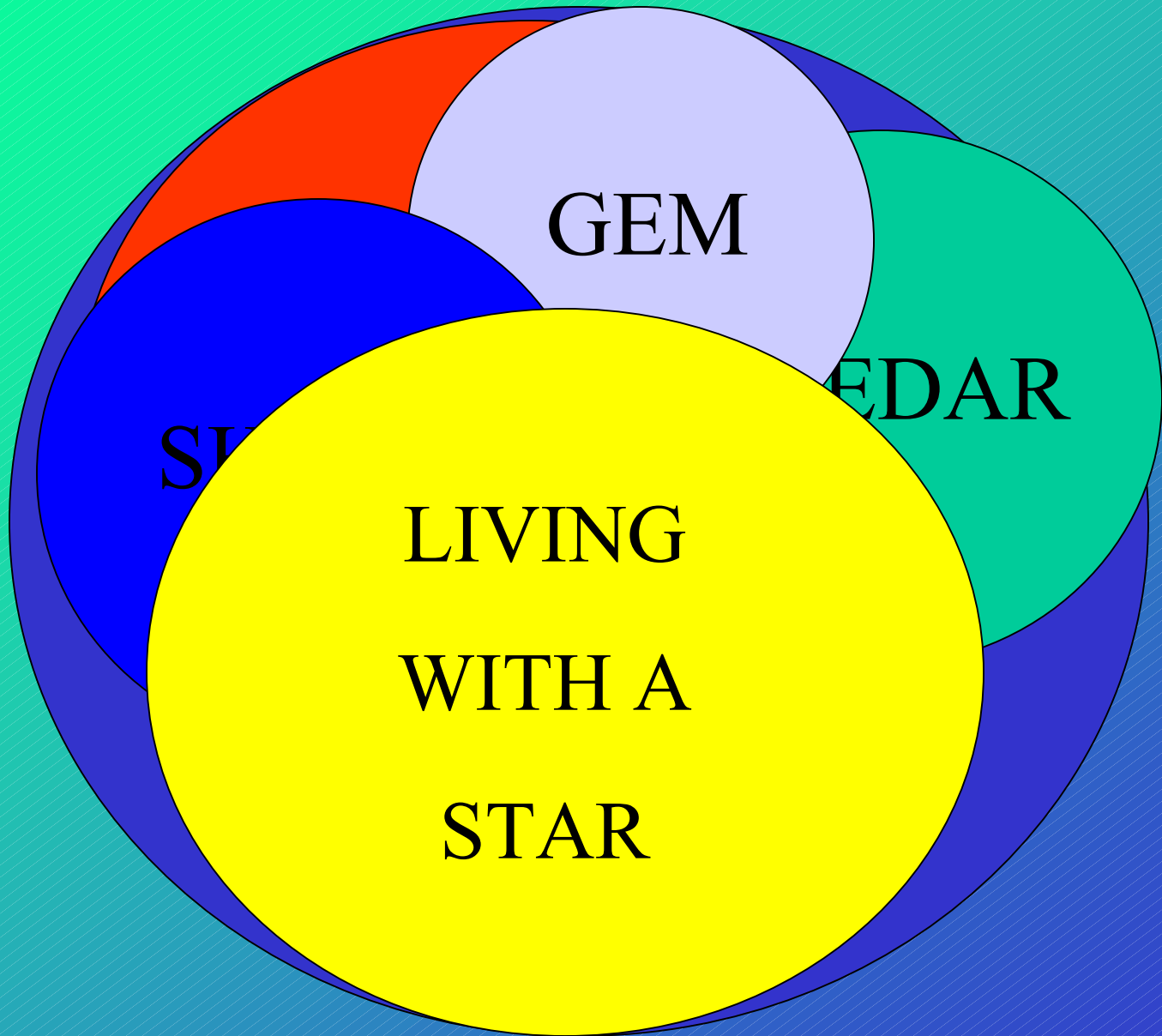
NEWS

Explore the Heliophysical system to understand the Sun and its effects on the Earth, the solar system, space environmental conditions that are experienced by human and robotic explorers, and enable technologies that enhance life and society.



NASA Heliophysics

- Explore the Sun-Earth system to understand the Sun and its effects on Earth, the solar system, and the space environmental conditions that will be experienced by explorers, and to demonstrate technologies that can improve future operational systems.
 - Open the Frontier to Space Weather Prediction: Understand the fundamental physical processes of the space environment – from the Sun to Earth, to other planets, and beyond to the interstellar medium.
 - Understand the Nature of Our Home in Space: Understand how human society, technological systems, and the habitability of planets are affected by solar variability interacting with planetary magnetic fields and atmospheres.
 - Safeguard the Journey of Exploration: Maximize the safety and productivity of human and robotic explorers by developing the capability to predict the extreme and dynamic conditions in space.

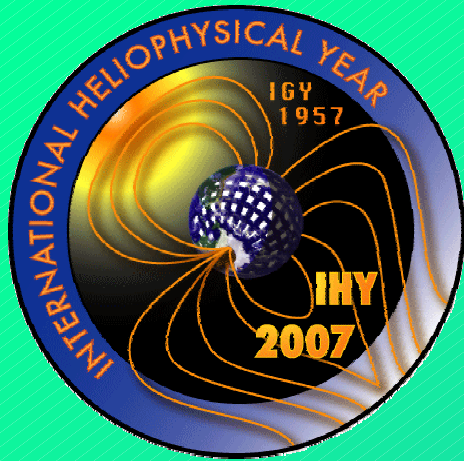


GEM

SUN

CEDAR

LIVING
WITH A
STAR



Conclusions

- USA has activities in progress in all areas of interest to IHY.
- Many programs closely associated with IHY.
- The science community heavily cross-affiliated between them, but not substantially funded specifically for IHY.
- Sufficient momentum exists in funded projects of relevance to IHY to enable the acquisition of needed data.
- IHY will bring the focus on universal processes when interpreting the data and synthesizing results.