

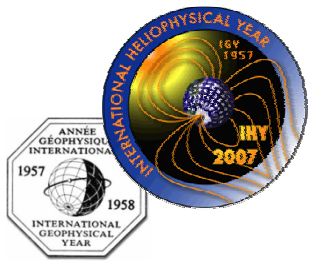
THE INTERNATIONAL HELIOPHYSICAL YEAR (IHY)

March 2007-2009

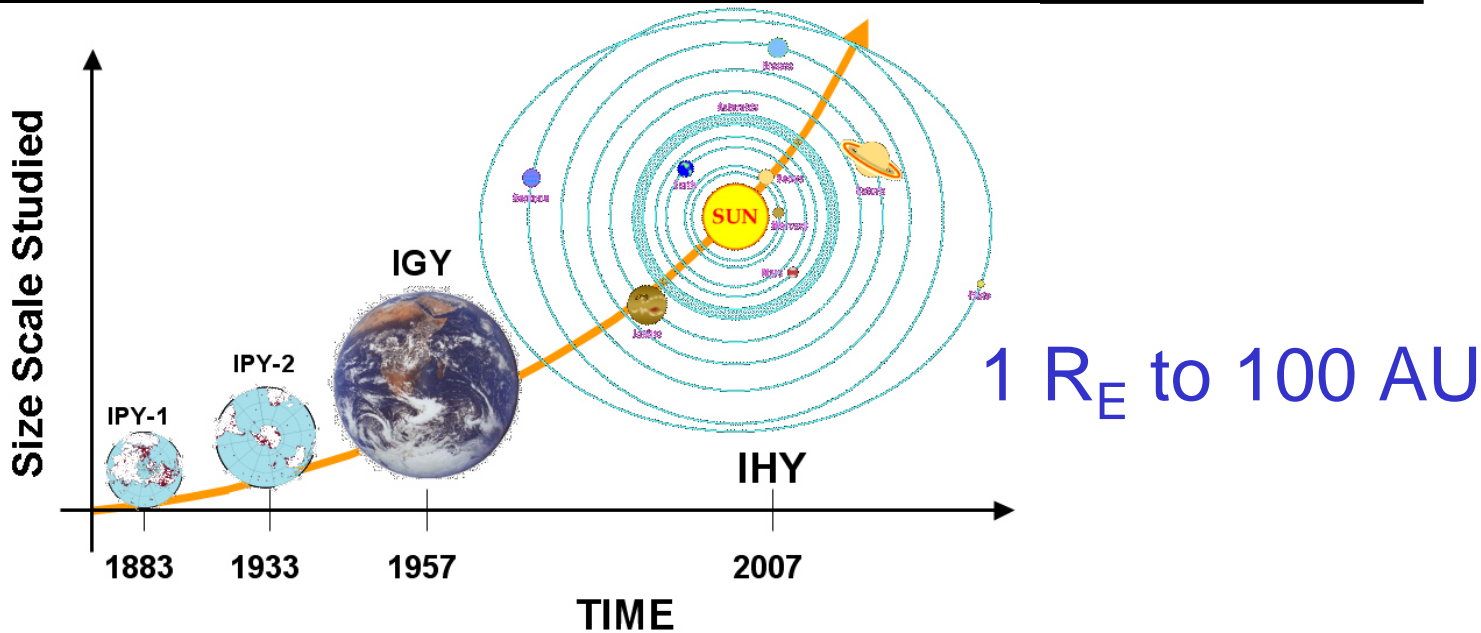
*Nat Gopalswamy , Joseph M. Davila, Barbara J. Thompson
Hans Haubold, Cristina Rabello-Soares, Richard Stamper
K. S. Balasubramaniam, David Webb*

www.ihy2007.org

September 24, 2007

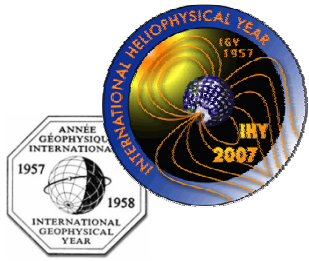


“What is heliophysical?”



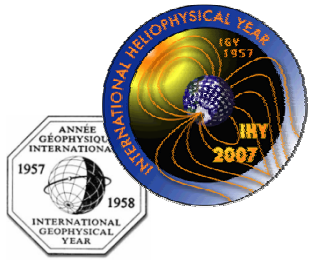
Heliophysical: A broadening of the concept "geophysical," extending the connections from the Earth to the Sun & interplanetary space.

On the 50th anniversary of the International Geophysical Year, the 2007 IHY activities will build on the success of IGY 1957 by continuing its legacy of system-wide studies of the extended heliophysical domain.



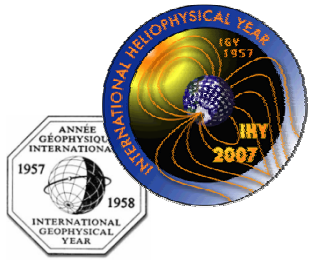
What is IHY?

- IHY will run for two years: March 2007-March 2009
- The IHY Opening Ceremony was held February 2007 at the United Nations in Vienna.
- IHY is an official United Nations program, proclaimed by a U.N. General Assembly Resolution.
- The IHY Secretariat, which is in charge of the basic management of IHY, is staffed by several organizations.
- Currently, 76 nations have IHY organizing committees, and there are IHY activities in most U.N. member states



Why IHY?

- IHY celebrates the 50th anniversary of IGY and humanity's entry into space.
- International coordination has never been easier, nor (arguably) more essential.
- We are at an extremely important time in for heliophysics:
 - *The Heliophysics “Great Observatory”*
 - *Voyagers 1 & 2 reaching the heliospheric termination shock*
 - *Out-of-the-ecliptic view from Ulysses*
 - *Virgin Galactic will begin flying commercial space passengers during IHY: thousands of tickets have already been sold !*



I*Y Synergy

- I*Y's are daughters of the same mother IGY
- There are IHY proposals in IPY program
- There is an IPY project as a CIP in IHY
- IHY has embraced eGY for Data-related activities

Dawn of Space Exploration

→ IHY

Global Geological Campaigns

→ IYPE

Third International Polar Year

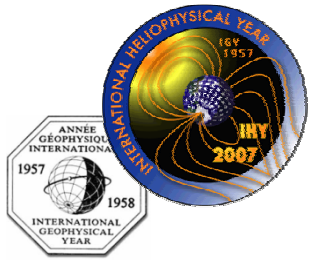
→ IPY

World Data Centers

→ eGY

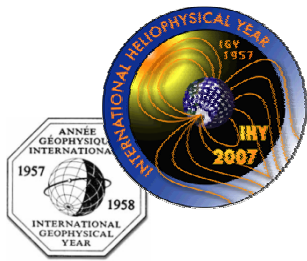
History & 50th Anniversary

→ IGY+50, IGY Gold



IHY Participation

- Over countries with National committees
- UN “Basic Space Science” instrument development program
 - *17 Distributed instrument observatory programs*
 - *7 New data analysis programs for space data*
- 200 Observatories
- 69 Coordinated Investigation Plans (CIPs)
- Thousands of scientists from more than 80 countries
- There is still time to participate!



Organizational Elements

IHY Secretariat: Serves as a contact and organizational point, maintains website

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U.N. Member States.

Working Groups and Committees: For activities such as E/PO, history, observatory coordinators, publications

IHY's "Grassroots" Structure:

- Individual autonomous national programs
- Secretariat provides support for national and regional programs
- Coordinated international activities
- Coordination of information
- *Do what you want and let us know about it*

mittees,

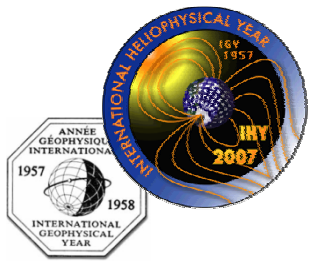
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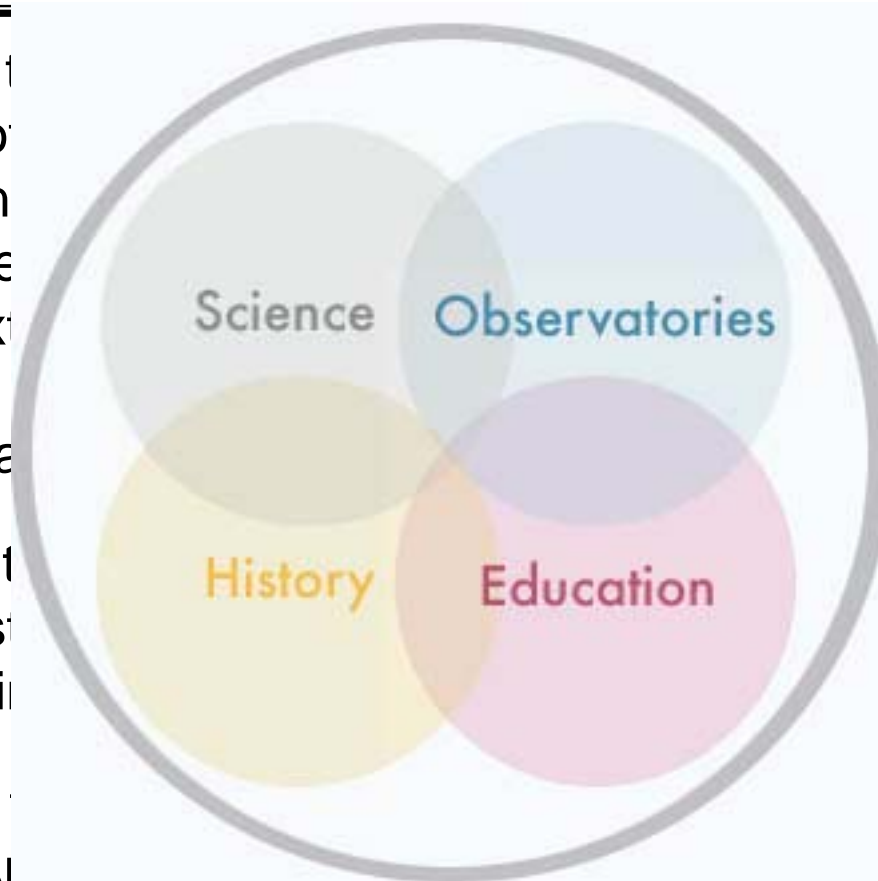
activities.

191(2)



IHY has the following goals:

- Develop studies of
- Determine plane to extend
- Promote interstellar
- Foster international science and
- Preserve its 50th Anniversary
- Demonstrate the Beauty, Relevance and Significance of Space and Earth Science to the World and Inspire our Future Explorers



ugh cross-disciplinary

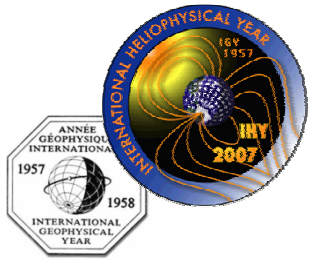
e. **SCIENCE**

em outward to the local

OBSERVATORY DEVELOPMENT

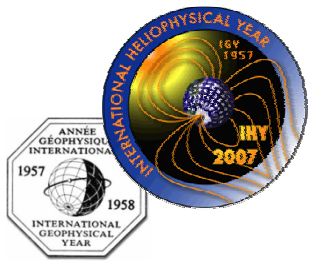
HISTORY

EDUCATION



SCIENCE

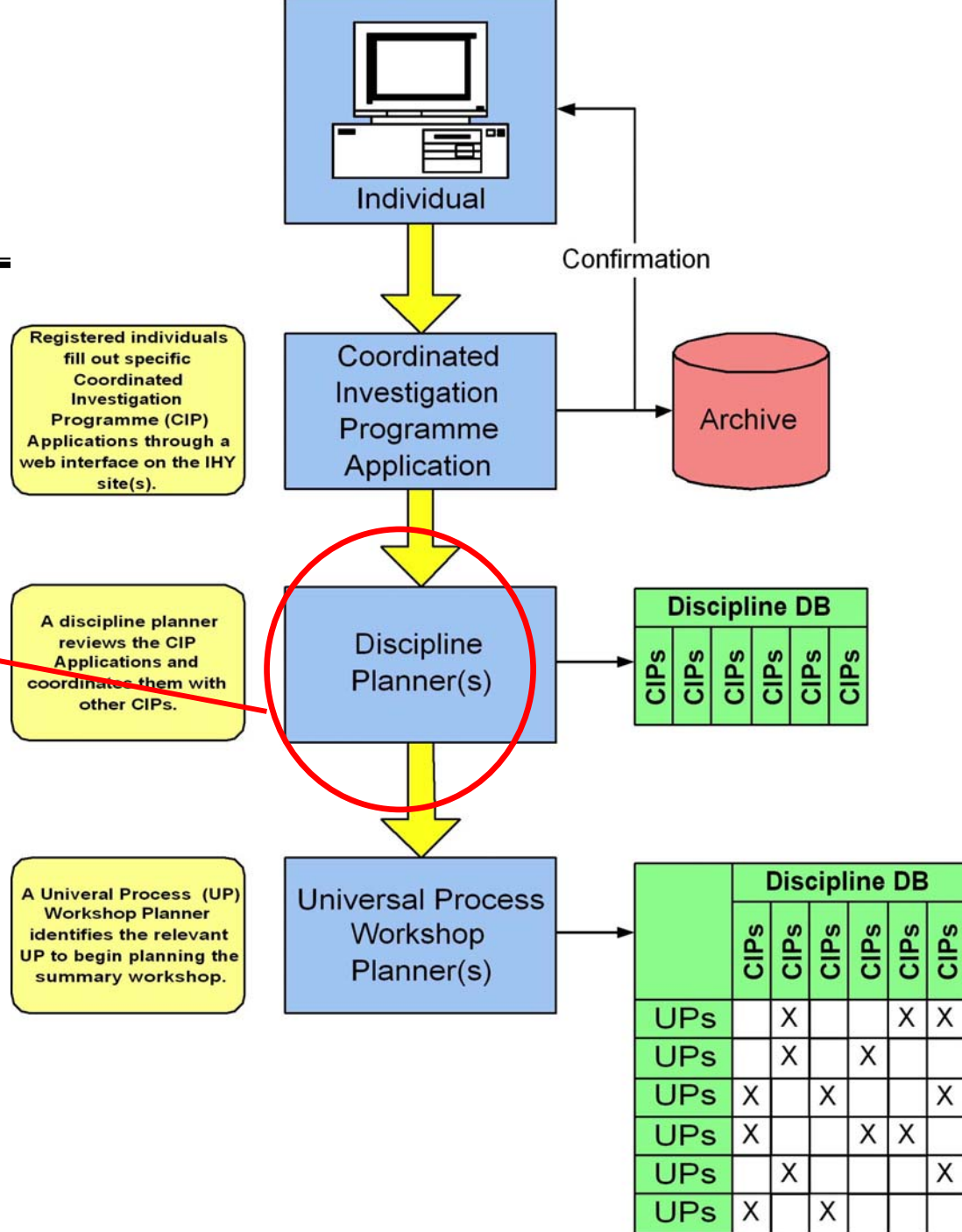
- Coordinated Investigation Programs (CIPs): Basic unit of scientific research within IHY
 - *Will combine observation and modeling to address an observational objective*
- Grass-Roots Driven, originated by researcher using web form
 - *CIP site online and accepting proposals*
- Many examples identified in planning workshops
 - *Comparative Planetary Aeronomy*
 - *Whole Heliosphere Intervals*
 - *Reconnection, Shock acceleration, ... etc*
- CIPs organized into Universal Processes by coordinators
- Cross-cutting scientific data analysis workshops organized by corresponding Universal Process

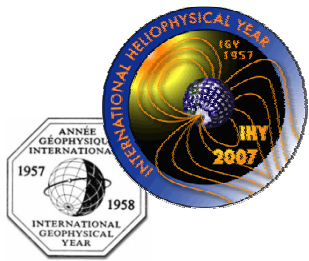


• Discipline planners in following categories receive CIPs:

- Solar
- Heliosphere
- ITM
- Magnetosphere
- Climate
- Heliobiology

- CIPs executed throughout IHY
- Results of CIPs are used in Universal Processes Workshops
- CIPs are available [online](http://ihy2007.org)





Whole Heliosphere Interval

INTERNATIONAL HELIOSPHERICAL YEAR

SCIENCE • OBSERVATORY DEVELOPMENT • OUTREACH • HISTORY

[about](#) | [organization](#) | [get involved](#) | [newsroom](#) | [events](#) | [resources](#)

• • • [CONTACT US](#) • [SITE MAP](#) • [HOME](#)

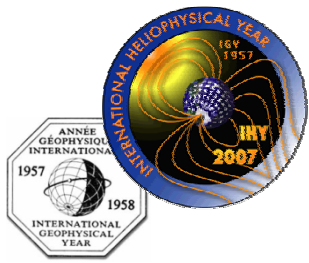
WHI Home	WHI Master Calendar
WHI Overview	Participating Instruments
WHI Science Goals	Participating Modelers
Synoptic Observing Plans	WHI: The People
Targeted Observing Plans	Join the WHI Coordination Team

Whole Heliosphere Interval

Originating from Carrington Rotation 2068: March 20 - April 16, 2008

The **Whole Heliosphere Interval** is an international coordinated observing and modeling effort to characterize the 3-dimensional interconnected solar-heliospheric-planetary system.

<http://ihy2007.org/WHI/WHI.shtml>



OBSERVATORY DEVELOPMENT

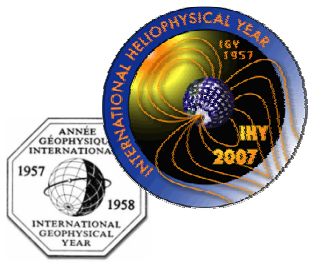


The IHY U.N. Basic Space Sciences Initiative Small Instrument Array Deployment Opportunity

Instrumentation Requirements:

- Scientifically significant and publishable results pertaining to the objectives of the IHY activities,
- Activities that can be performed in developing nations (many of which are near the equator),
- Cost and technical compatibility with host sites

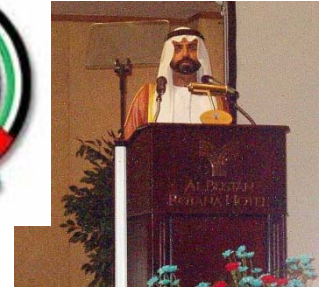
Of primary consideration is how participation in this program will change the viability of space scientists in developing nations, particularly those seeking to develop undergraduate or graduate programs.



UN IHY Workshop Series

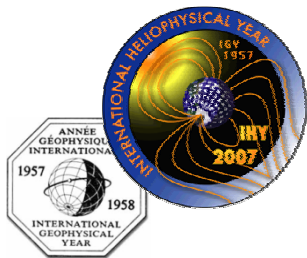
- **First Workshop**
 - *Al Ain, UAE: November 20-23, 2005*
 - *UN, ESA, NASA, and UAE Government sponsored*
 - *Approximately 120 participants from 27 countries*
- **Second Workshop**
 - *Bangalore, India: November 27-December 1, 2006*
 - *UN, NASA and Indian Government sponsored*
 - *Approximately 120 participants from 30 countries*
- **Third Workshop**
 - *Tokyo, Japan: June 18-22, 2007*
 - *UN, NASA and Japanese Government sponsored*
 - *Focused on data issues*

Fourth Workshop: Sozopol, Bulgaria 6/08

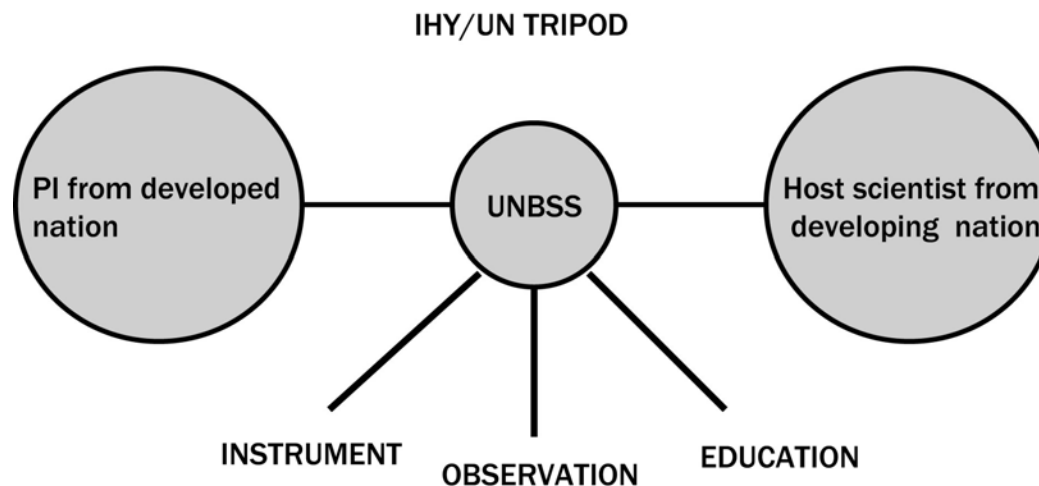


These Workshops have been highly successful at establishing new collaborations between instrument providers and hosts



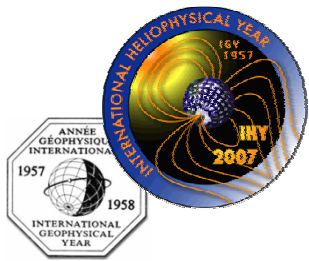


OBSERVATORY DEVELOPMENT



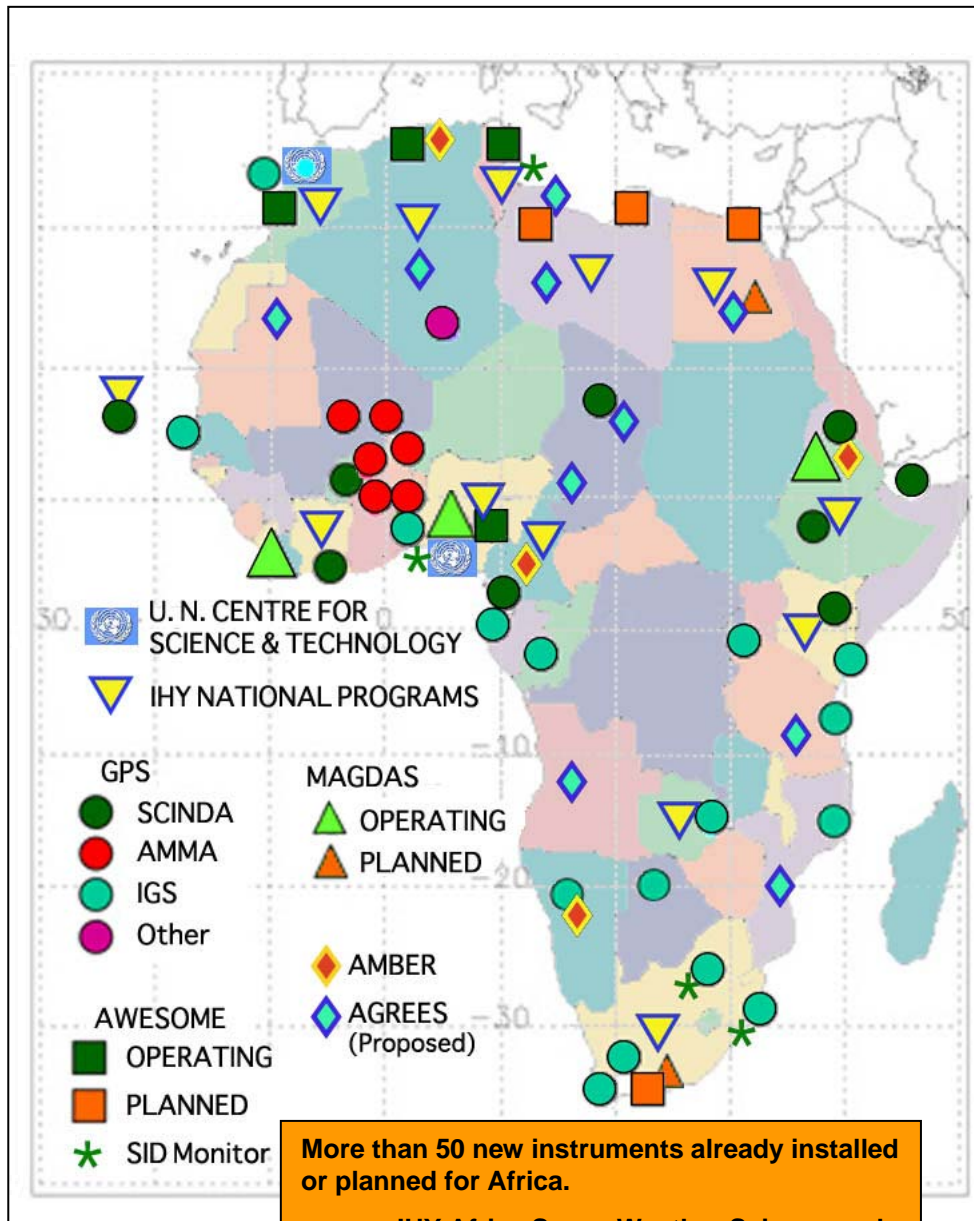
The objective is to help facilitate the deployment of distributed instrument arrays

- Extension of existing arrays, or new arrays
 - Fills data gaps in existing observation networks
 - Provides meaningful participation for developing nations
 - **Instrument providers are united with university groups from potential host nations**
 - Potential Instruments, GPS, radio telescopes, magnetometers, all-sky cameras, additional neutron monitors, etc.
 - **Implemented jointly with United Nations Basic Space Science Program**
 - UNBSS program devoted to this effort through 2009
 - Three-year work plan approved by COPUOS and Gen Assembly
- IHY (<http://ihy2007.org>)

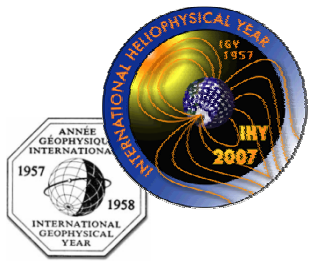


OBSERVATORY DEVELOPMENT

	INSTRUMENT	CONTACT	STATUS
1	CALLISTO	C. Monstein (Switzerland)	Operating in India, others in progress
2	H-alpha Telescope	K. Shibata, S. Ueno (Japan)	First observatory operating in Chile
3	MAGDAS Magnetometers	K. Yumoto (Japan)	Deployed in globally, including Malaysia, Ethiopia, Nigeria, Ivory Coast
4	GPS Scintillations	C. Amory-Mazaudier (France), and T. Rowell (USA)	More than 25 new installations across Africa (see map)
5	SCINDA GPS	K. Groves (USA)	Deployed at 7 sites in Africa, including Cape Verde, Nigeria
6	CIDR	T. Garner (USA)	4-instrument chain planned for Egypt
7	VLF Radio	U. Inan (USA)	Installed in Morocco, Algeria, Tunisia
8	RENOIR	J. Makela (USA)	Instrument funding obtained, instrument development in progress
9	SEVAN Particle Detectors	A. Chillingarian (Armenia)	Instrument for Croatia and Bulgaria being deployed
10	AMBER-AGREES	E. Yizengaw (USA)	In progress for deployment in Africa
11	SAVNET	J.-P. Raulin (Brazil)	Instrument funding obtained, deployment underway
12	Low-cost Ionosonde	J. Bradford (UK)	Seeking instrument funding
13	IHY Mag	I. Mann (Canada)	Seeking instrument funding
14	Low-frequency Radio Array	J. Kasper (USA)	In progress
15	Muon Network	K. Munakata (Japan)	In progress
16	Liulin	T. Dachev (Bulgaria)	Instruments available, seeking sites for deployment
17	SAMA	J. H. Fernandez (Brazil)	Seeking funding for instruments



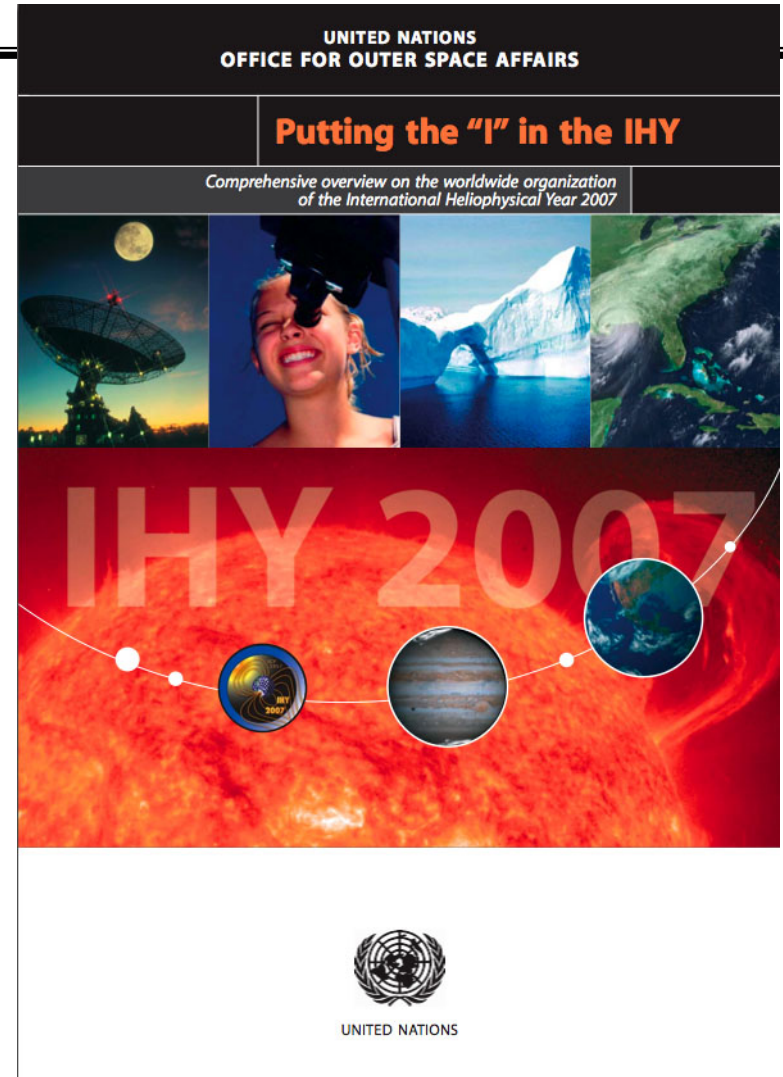
- AWESOME space weather monitors in Tunisia Oct 2005. Instruments were installed in Algeria and Morocco in summer 2006, upcoming sites will be in Libya, Egypt and South Africa, with the goal of widespread instrumentation activities taking place in 2007-2008.
- IHY-Japan has made significant progress towards the completion of its 51-magnetometer MAGDAS global network with a new installation site on MacQuarie Island, Ethiopia, Ivory Coast, Nigeria, and Malaysia.
- The RENOIR ionospheric observing station program has received support for development, and will be making plans for instrument host sites later this year (e.g. Cape Verde).
- The deployment Latin-American SAVNET VLF receiver chain began in 2006 with the target of being operational this year.
- The SCINDA scintillation network will double the size of their equatorial network, instrumenter's meetings July 2006 in (Cape Verde) and November 2007 (Ethiopia) in preparation for new deployments.
- CALLISTO Radio spectrometer network deployment in Japan, India, US, Switzerland, Mexico (in progress). First light in India February 2007!
- Armenian SEVAN space environment monitor is being deployed in Croatia & Bulgaria.
- AMBER Magnetometer network funded, AGREES pending.

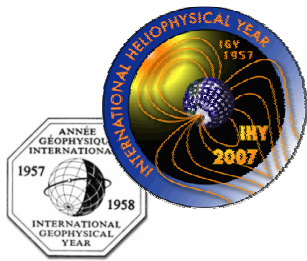


EDUCATION

The IHY Education and Public Outreach Program focuses on:

- a. developing new and exciting outreach programs that provide unique opportunities for the global community;
- b. increasing the visibility and accessibility of existing outreach programs;
- c. developing partnerships between existing programs and activities to broaden their scope and impact;
- d. determining the need for multi-lingual adaptations of educational resources and facilitating their translation





IHY Education Partners

IHY (<http://ihy2007.org>)



Classroom activity



Hands-on activity



Web-based activity

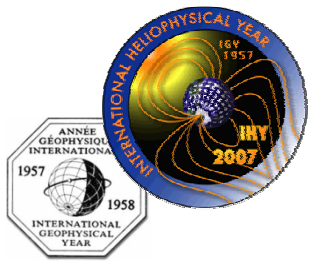


Human space flight component

Target age group:

K-12 = School Age, **K-6** = Elementary School (5-11 yrs.), **MS** = Middle School (10-14 yrs.),
HS = High School (13-18 yrs.), **UG** = University Undergraduate, **GS** = Grad Student,
ALL = All Ages

- ALL**
Radio Jove: Planetary Radio Astronomy for Schools: An exciting program where students and amateur scientists observe and analyze natural radio emissions of Jupiter and the Sun. Build your own radio receiver!
[Activity Details](#)
- ALL**
European Planetarium Network: The stars are shining at your local planetarium, and it's a great way to learn about heliophysics!
[Activity Details](#)
- ALL**
[Canadian IPY Youth Steering Committee](#) Informing the world's youth about the Poles and involving them in the International Polar Year
- ALL** **NASA's Sun-Earth Day:** An annual educational event featuring this year's total solar eclipse on March 29 2006. View the eclipse webcast from Turkey and learn about the Sun and solar eclipses! In collaboration with the **San Francisco Exploratorium**.
[Watch the ARCHIVED Eclipse Webcast](#)
- ALL**
IHY Activities for the Total Solar Eclipse on March 29 2006: Special viewing stations will be set up all along the path of the eclipse. [Photos of the viewing stations](#)
[Event Details](#)
- ALL**
Yuri's Night World Space Party: Celebrating the 45th Anniversary of the first human in space! April 12 of every year.
[Event Details](#)
- UG, GS**
Geophysical Information for Teachers (GIFT) Workshop: "Sun-Earth Relationships and the International Heliophysical Year" - sponsored by the American Geophysical Union.
 Baltimore, Maryland, USA
[Event Details](#)
Deadline: April 28, 2006.
 Contact: [Ms. Ines Cifuentes](#)
- UG, GS**
UNIVERSAT-2006 : "Space Education and University Satellites" - on the new initiatives in space science education and students satellites construction and development.
 Moscow, RUSSIA
[Event Details](#)
Deadline: April 10, 2006.
 Contacts: [Dr. Serge Krasotkin](#) & [Dr. Ekaterina Sigaevea](#)



EDUCATION: IHY Schools

IHY Schools are being coordinated worldwide, to educate students about universal heliophysical processes and to allow them to view their research in a new context. Curriculum materials will be made publicly for broader use.

North America: 30 July - 7 August 2007, in Boulder CO, USA

Contacts: Don Hassler and David Webb

This school was coordinated with the NASA Living With a Star program.

Europe and Africa: 6 - 17 October in Trieste, Italy in 2008

Contact: David Webb

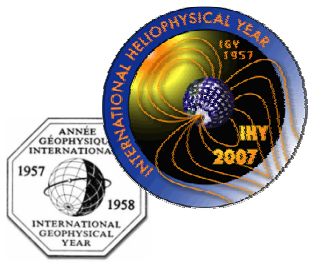
Latin America: in Sao Paulo, Brazil in 2008

Contacts: Alisson Dal Lago, Jean-Pierre Raulin and Cristina Mandrini

Asia-Pacific: 10-22 December 2007 at Kodaikanal Observatory, India

Contacts: Ashok Ambastha and Nat Gopalswamy

2008 in China, 2009 in Malaysia



EDUCATION

IHY “Open Doors Day:” June 10, 2007

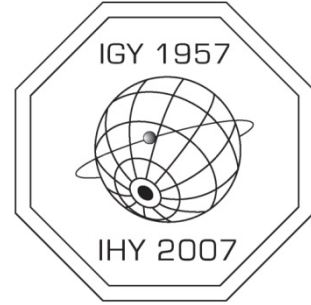
- Over 70 observatories, science museums and planetaria
- Initiated by IHY-Europe, became a global event
- Activities, presentations, and video linkups with scientists worldwide





HISTORY

The “IGY Gold” Program: IGY Gold Club and IGY History



Preserving the legacy and history of the IGY while capitalizing on the unique E/PO opportunities

IGY Gold Certificates to recognize the contribution of IGY participants (joint with eGY, IPY, IYPE, SEG)

- Open to all participants in IGY
- Recipients provide historical material from IGY
- Nomination and criteria available at IHY website



Prof. Akasofu and Prof. Van Allen receive “IGY Gold” awards from their university departments

IHY will strive to identify as many IGYers as possible. Hundreds of IGY Gold certificates have been awarded!



IGY Gold Club Nomination Form

The "IGY Gold" commemorative lapel pin and certificate of recognition have been specially designed for the 50th anniversary of IGY, and only members of the IGY Gold club will be issued this pin and certificate of recognition. Please review the three IGY Gold Club requirements shown above before you proceed with the nomination.

Nominee Name (Required!)

Your Name (if different from above)

Your Email Address

Nominee Email Address (if available)

If preferable, we can contact the nominee by phone. If this is the case, please enter the contact phone number:

Nominee Institute or Affiliation (if applicable)

Nominee Mailing Address (for shipping of the certificate and pin.)

Have you notified the nominee about this nomination? Yes No

If the answer to the above question is "No", do you wish for your identity to remain anonymous? Yes No

The certificate of recognition can feature several organizations. The [IUGG](#) (International Union of Geodesy and Geophysics) is the host organization for this program. Additional geophysical societies are participating in this activity:



[AGU: American Geophysical Union](#)

[EGU: European Geosciences Union](#)

[IAGA: Int'l Assoc. of Geomagnetism and Aeronomy](#)

Nominee name as it should appear on certificate

Select applicable geophysical organization(s) to appear on certificate:
 AGU: American Geophysical Union
 EGU: European Geophysical Union
 IAGA: Int'l Assoc of Geomagnetism and Aeronomy

Select applicable sponsoring activity(ies):
 IHY: International Heliophysical Year (2007-8)
 eGY: Electronic Geophysical Year (2007-8)
 IPY: International Polar Year (2007-8)
 The Year: International Year of Planet Earth (2007-8)

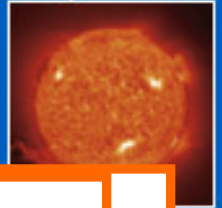
Nominating Individuals and Submitting Materials:

Go to the "History" section of the IHY website:

ihy2007.org

INTERNATIONAL HELIOPHYSICAL YEAR

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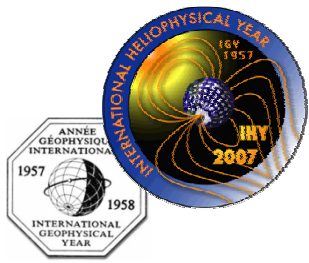


IHY Goals	IHY Mail	Recent events	Scientific Publications	Scientific Committee
IHY Plans	IHY Activities	Newsletter		
IHY Organizations	Databases	"News Notes"		
Community	Connect to National and Regional Organizers	Working Groups coordinators		
"How It Works"		photos!!!!!!		
FAQ				

Inter
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of 1957

Have you submitted your CIP idea yet?

- SCIENCE
 - OBSERVATORY DEVELOPMENT
 - HISTORY
 - OUTREACH
-
- About
 - Get Involved
 - Newsroom
 - Events
 - Resources
 - Contact



Summary

The four main components of IHY are: Science, Observatory Development, Outreach and Education

IHY is celebrating successes in each of these areas: your participation has been and will continue to be vital for our successes.

Most of the key strategies of IHY deal with new collaborations and contexts: international coordination, universal processes

Each of the IHY activities has been planned with legacy potential in mind. Participation in current activities may have fruitful results for many years to come.