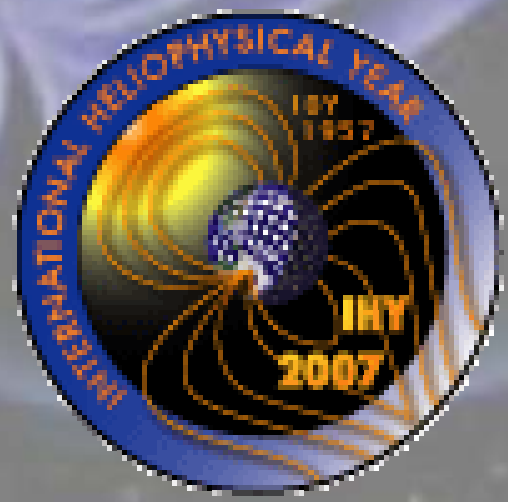
INTERNATIONAL HELIOPHYSICAL YEAR

SESSION OBJECTIVES

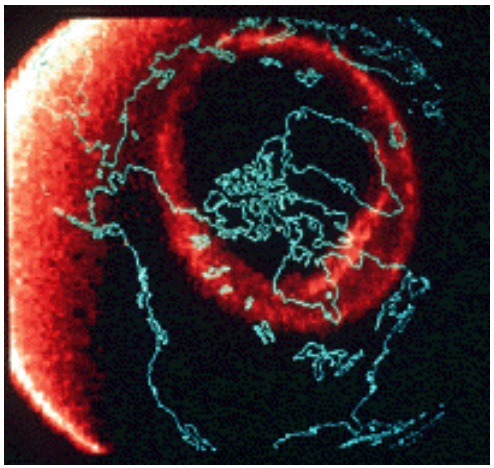
- Introduce the IHY
- The impact of IGY
- Plans for running IHY



INTERNATIONAL HELIOPHYSICAL YEAR (IHY)

Joseph M. Davila, Arthur I. Poland
Goddard Space Flight Center
and
Richard A. Harrison
Rutherford Appleton Laboratory

INTERNATIONAL HELIOPHYSICAL YEAR



In 1957 a program of international research, inspired by the previous International Polar Years of 1882-83 and 1932-33, was organized as the International Geophysical Year (IGY) to study global phenomena of the Earth and geospace.

We propose an international program of scientific collaboration, the International Heliophysical Year (IHY), to commence on the fiftieth anniversary of the International Geophysical Year in 2007 to facilitate global study of the heliosphere and the Sun-Earth system.

FIRST INTERNATIONAL POLAR YEAR

- Col Carl Weyprecht suggested a coordinated study of the north polar region in January 1875 at the Academy of Sciences in Vienna
- Observations commenced on Aug 1, 1882 and concluded Sep 1, 1883
- Weyprecht died before the observations began

SECOND INTERNATIONAL POLAR YEAR

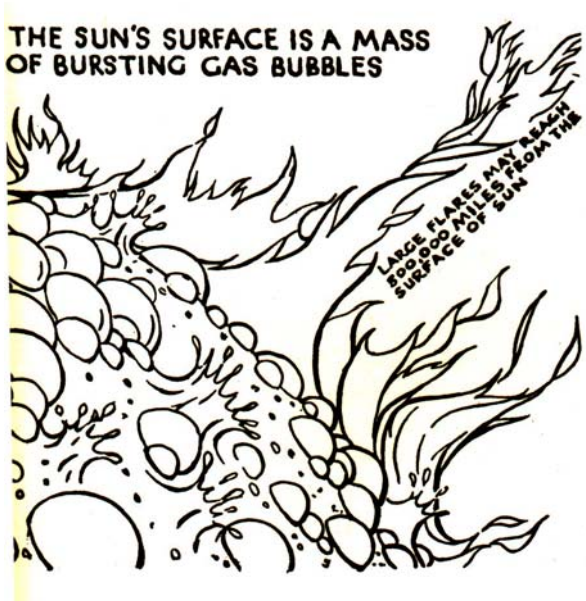
- Proposal first put forth by Dr. J. Georgi in Hamburg on Nov 23, 1927
- Observations to be made in 1932-1933, fifty years after the first IPY
- Scientific activities were significantly limited by the world-wide economic depression

Beginnings of the IGY

- Proposed by Dr. L.V. Berkner Apr 5, 1950
- Observations to be taken 1957-1958 during 25th anniversary of 2nd Polar Year

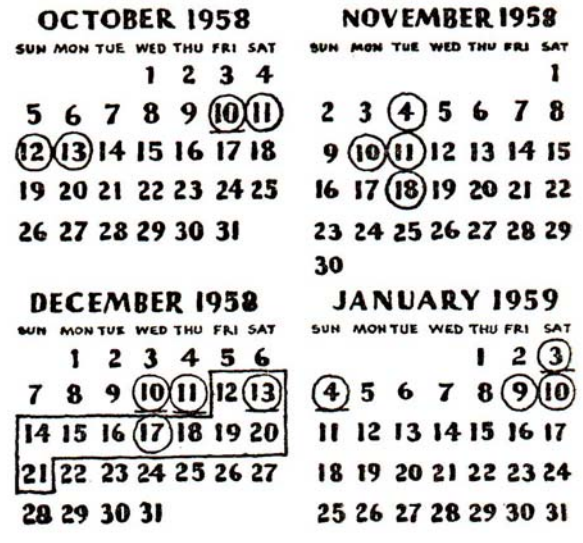
INTERNATIONAL GEOPHYSICAL YEAR (IGY)

- The IGY involved about 60,000 scientists
- From 66 nations
- Thousands of stations,
- from pole to pole
- To obtain simultaneous, global observations on Earth and in space



Scientific Observing Plans

- Synoptic observations
- World Meteorological Intervals – more intense observations planned



OCTOBER 1958

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	(10)	(11)
(12)	(13)	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER 1958

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	(4)	5	6	7	8
9	(10)	(11)	12	13	14	15
16	17	(18)	19	20	21	22
23	24	25	26	27	28	29
30						

DECEMBER 1958

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	(10)	(11)	12	(13)
14	15	16	(17)	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JANUARY 1959

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	(3)
(4)	5	6	7	8	(9)	(10)
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

- Regular World Days – plans focus on short time-scale, or special events (meteors, eclipses)
- Alerts/Special World Intervals – called with 8 hr notice in response to unforeseen natural events (flares, CMEs)

THE CASE FOR THE IHY

- A large armada of spacecraft allow significant global study of the Sun-Earth system and beyond – not so for IGY!!!!
- No single country has sufficient resources to address all issues
- International collaboration is easier with electronic communication available
- Time is ripe to renew these studies.

IHY Objectives

- Global study of the Sun and the heliosphere outward to the heliopause
- Measure the response of the magnetosphere, the ionosphere, the lower atmosphere and Earth surface to identify global processes and drivers which affect the terrestrial environment
- Foster international 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 all peoples of Earth

Space Missions Operating in the IHY Timeframe

Mission	Sponsoring Agency	Launch Date	Remarks
Solar and Heliospheric Observatory (SOHO)	ESA/NASA	1995	Full time solar observations from L1
Cluster	ESA	2000	Multipoint measurements of magnetospheric phenomena from 4 spacecraft formation
Solar Orbiter	ESA	2010	Imaging and spectral observations close to the Sun and out of the ecliptic
Solar Terrestrial Relationships Observatory (STEREO)	NASA	2004	Stereo view of solar events from two identical spacecraft in heliocentric orbit
High Energy Solar Spectroscopic Imager(HESSI)	NASA	2001	Imaged spectra of flare emission from the Sun
Advanced Composition Explorer (ACE)	NASA	1997	Particle distribution functions and composition, and magnetic field from L1
IMAGE	NASA	2000	Global imaging of Earth's magnetosphere
WIND	NASA/ESA	1994	Measurement of particle and fields in the IPM from L1
Solar Dynamics Observatory (SDO)	NASA	2006	Active region formation from subsurface to corona, and irradiance measurements
Pioneer	NASA	197x	Heliopause and outer heliosphere
Voyager 1 and 2	NASA	197x	Heliopause and outer heliosphere
Solar-B	ISAS	2005	High resolution magnetograms of the Sun, coronal imaging and spectra
Triana	NASA	200x	Global Earth monitoring, and particle and magnetic field observations from L1

- What the IHY is NOT
  - *NASA program*
  - *Primarily focused on space observations*
  - *Limited to space weather alone*
  - *A red tape activity!!!! – has to be driven by grass-roots*
- What the IHY is
  - *Science driven study of significant global processes of Earth, Sun-Earth system, and heliosphere*
  - *Driven by a number scientific questions*

CHALLENGES FOR NEAR FUTURE

- Need community input to develop science questions and tentative observational plan
- Need a “Sydney Chapman” to lead effort
- Need to secure participation of as many ICSU committees and member organizations as possible to support observational program
- Need clear definition of IHY objectives in a sea of similar programs
  - *ILWS, CAWSES, …*

Other Discussions

- 2002 World Space Congress, Houston
- 2002 Fall AGU Meeting, San Francisco California
- 2003 EGS/AGU Meeting, Nice France

CONCLUSION

- The IGY took 5 years to plan
- We are only 3 years from the beginning of 2007
- Planning for the IHY must begin in earnest now if the community wants it
- Do we want an IHY?
- What do we want out of it?
- Influence it from the start…