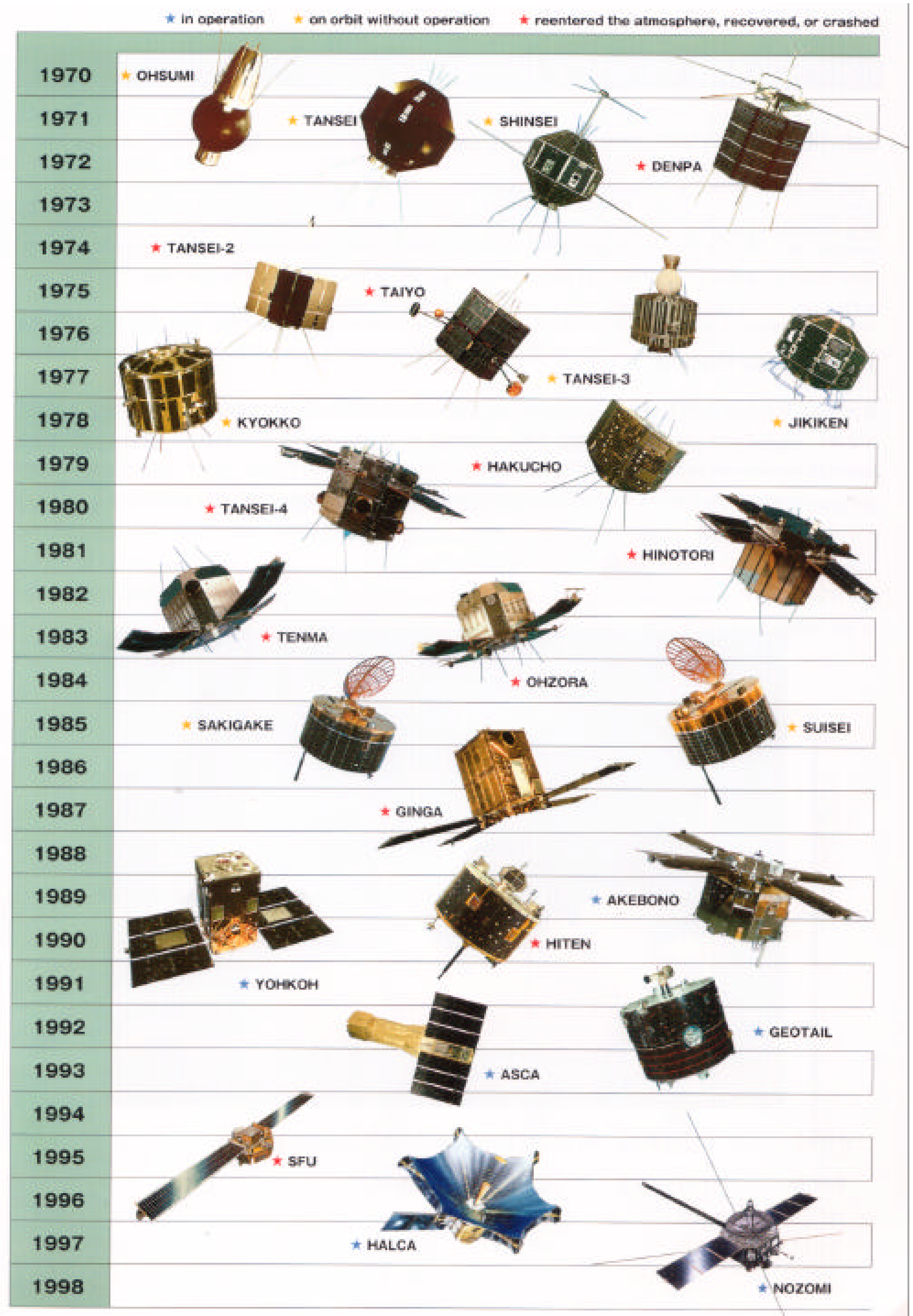
ILWS Kickoff Meeting; 4 Sep. 2002

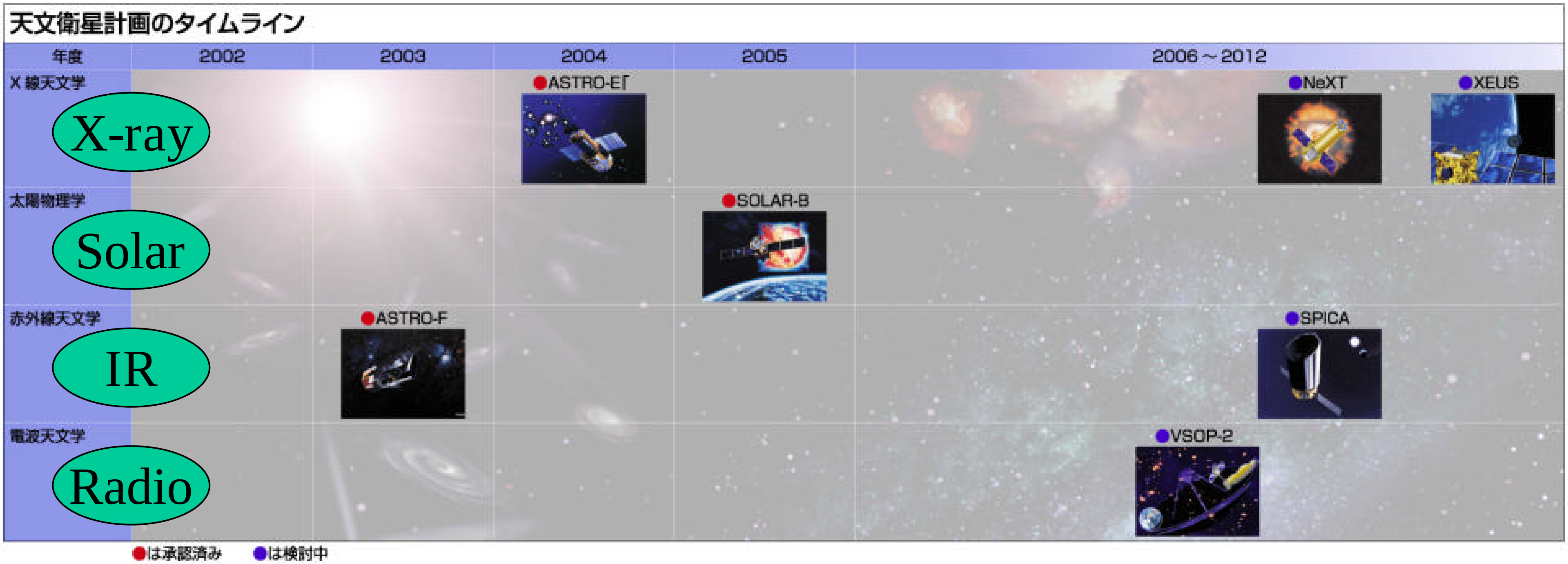
Solar-B and other ILWS-related Space Programs in Japan

T. Kosugi & K. Maezawa, ISAS, Japan

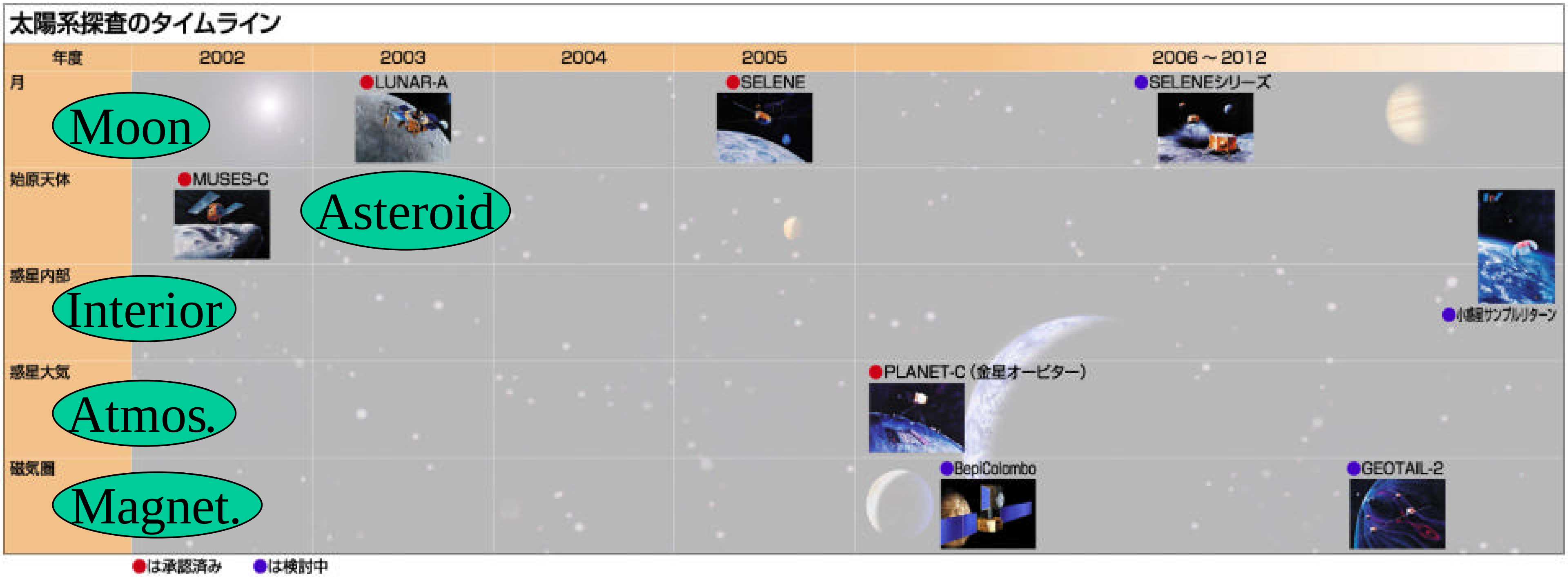
ISAS SATELLITES AND SPACECRAFT



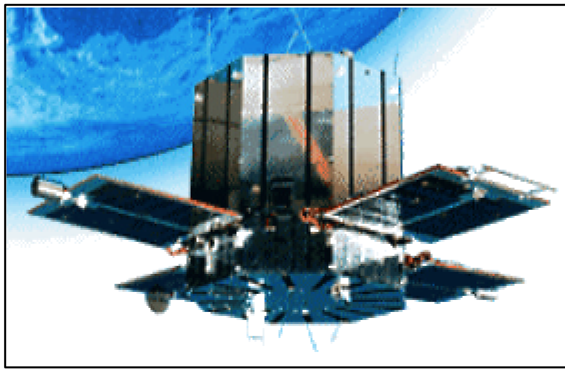
SPACE ASTRONOMY PROGRAMS



SOLAR SYSTEM EXPLORATION

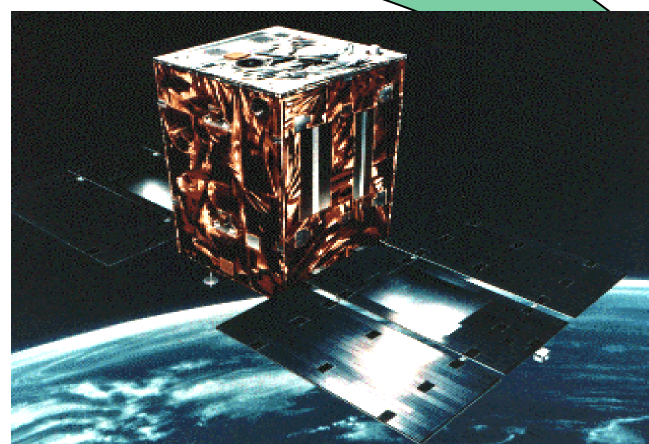


ISAS Solar Physics

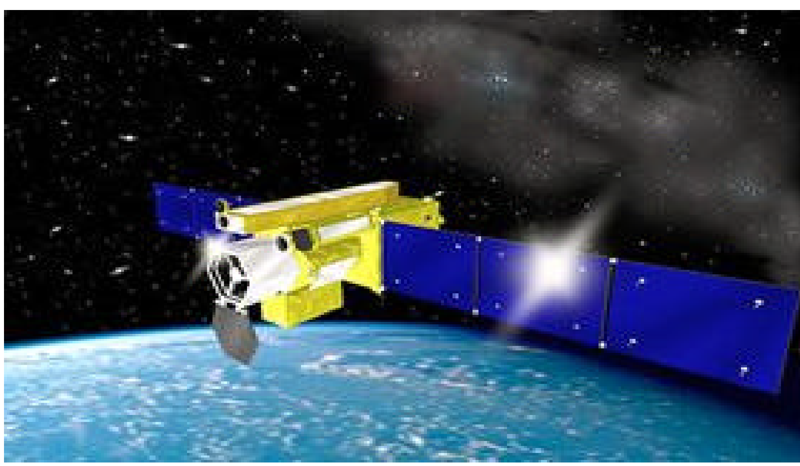


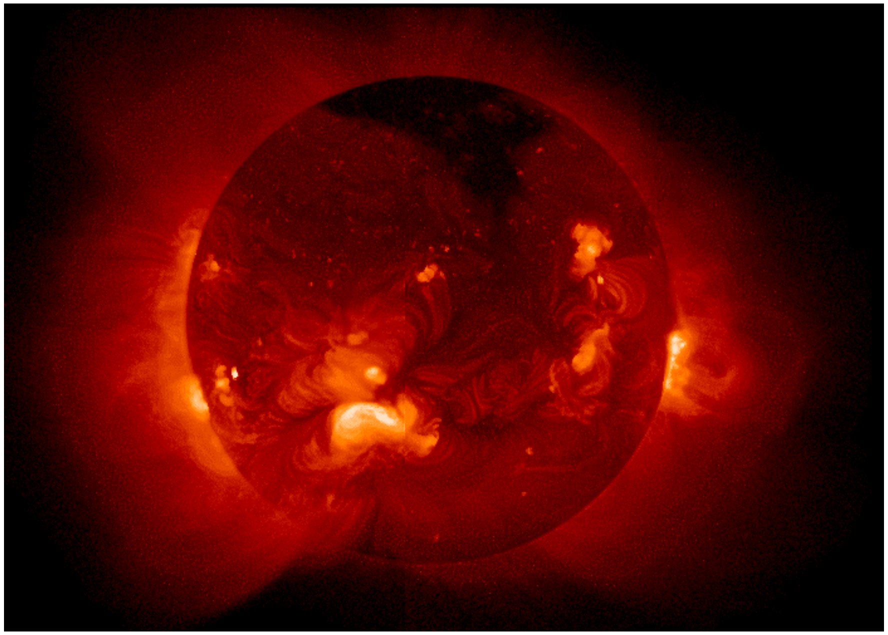
Hionotori (1981-1982)

Yohkoh (1991-2001)

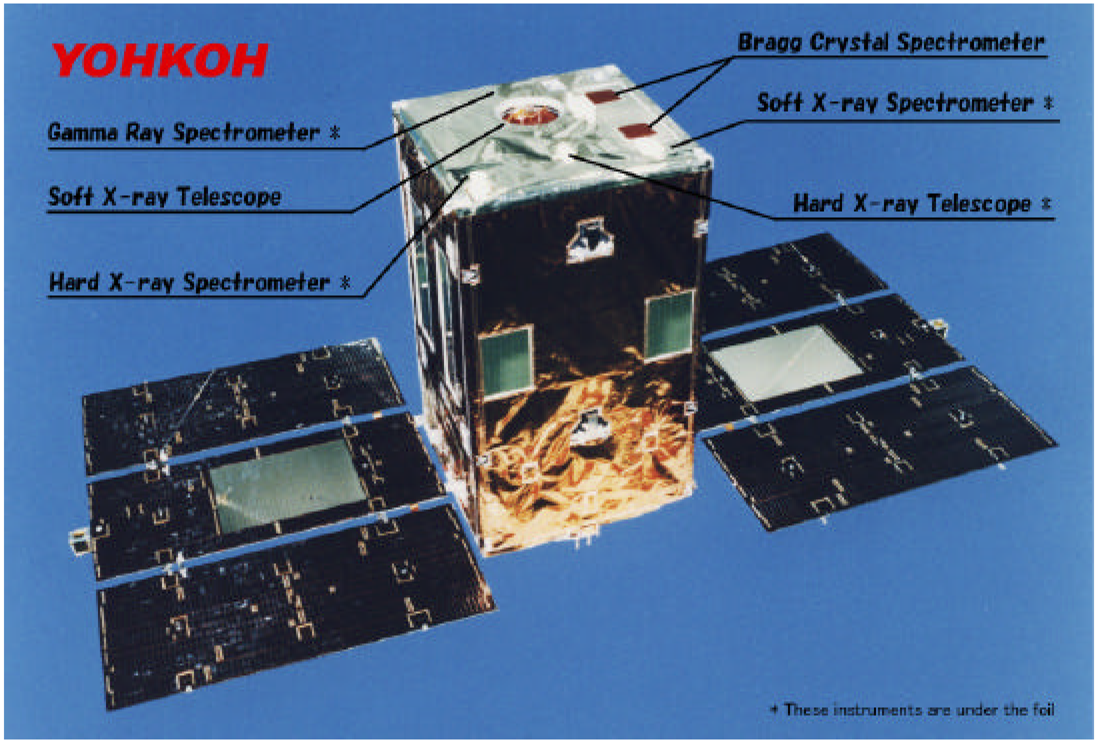


SOLAR-B (2005)

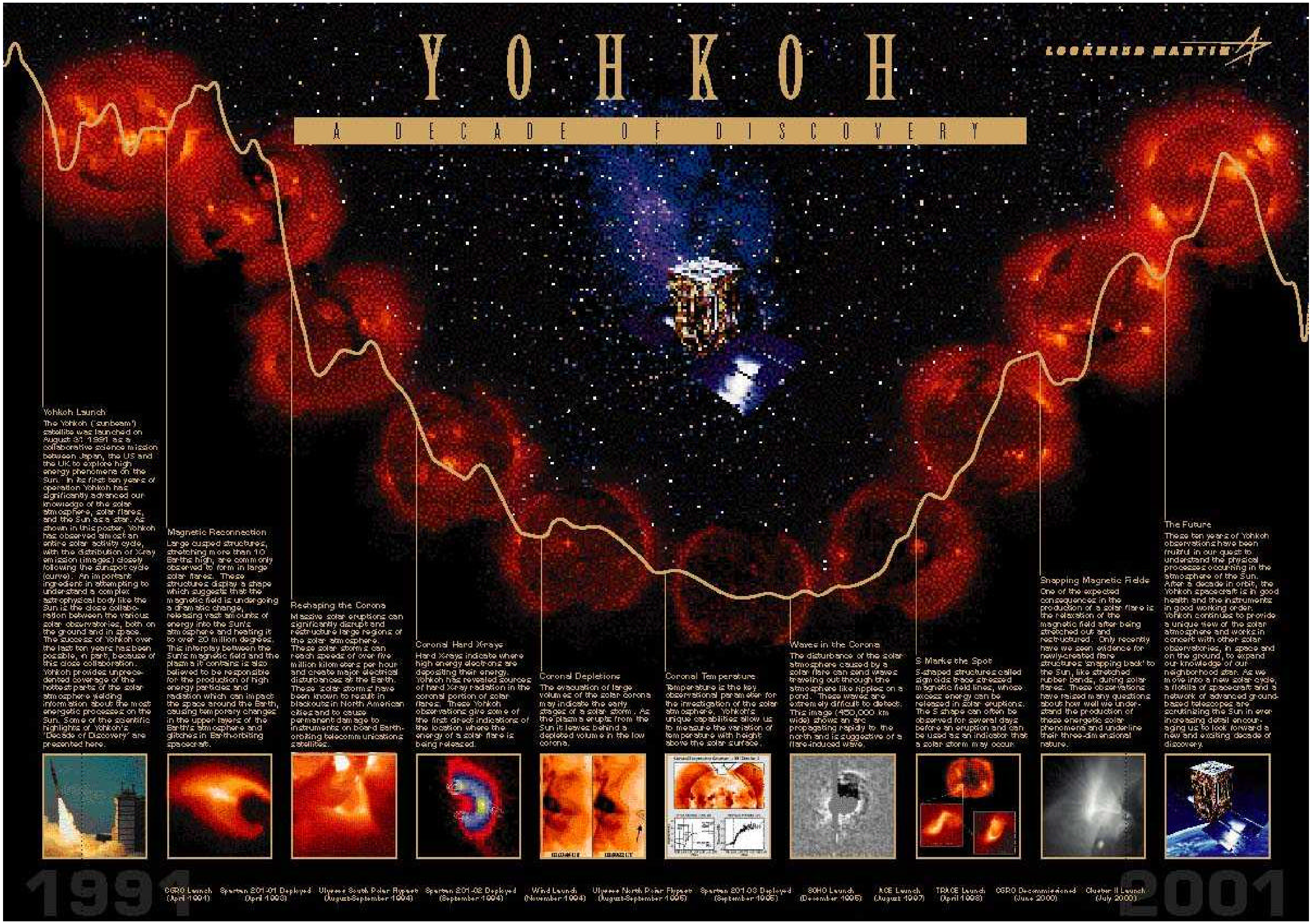




Yohkoh
(1991-2001)



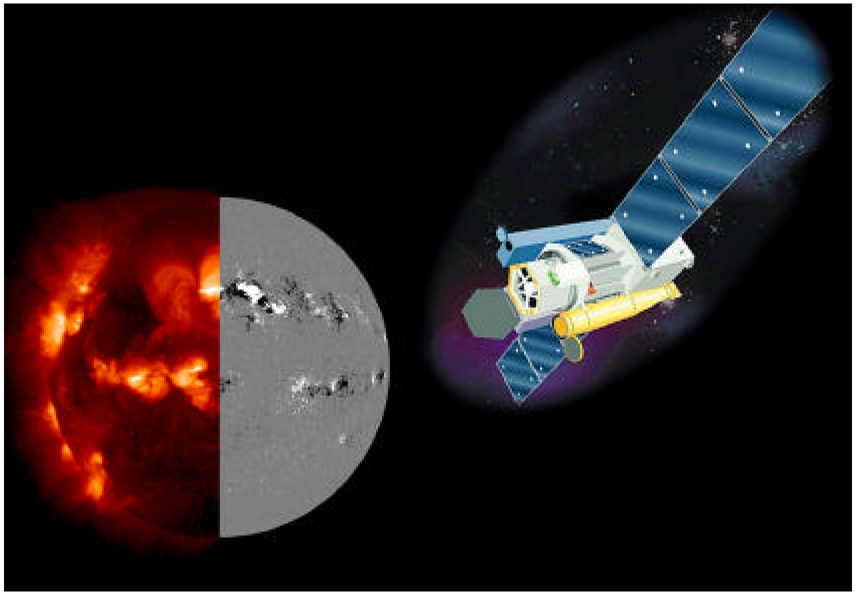
Yohkoh (1991-2001)



Science

- Coronal heating
- Coronal structure / dynamics
- Elementary processes in Magnetic Reconnection

SOLAR-B



Launch Date:
Summer 2005,
with ISAS M-V-7

Orbit:
Sun synchronous
altitude ~ 600 km

Weight: ~ 900 kg

Mission instruments

- Optical Telescope / Vector Magnetograph (**SOT**)
- X-ray Telescope (**XRT**)
- EUV Imaging Spectrometer (**EIS**)

SOLAR-B

Solar Optical Telescope (SOT)
X-ray Telescope (XRT)
EUV Imaging Spectrometer (EIS)

SOLAR-B

A Coordinated Set of Mission Instruments

- ***Solar Optical Telescope (SOT)***
  - 50-cm diameter telescope for the vector magnetic-field observations:
    - Optical Telescope Assembly (OTA) [J]
    - Focal Plane Package (FPP) [US]
- ***X-Ray Telescope (XRT)***
  - Grazing-incidence X-ray telescope with a 2Kx2K CCD camera covering the full Sun
- ***EUV Imaging Spectrometer (EIS)***
  - Grating spectrometer for coronal velocity and temperature diagnostics

Structure of the solar atmosphere

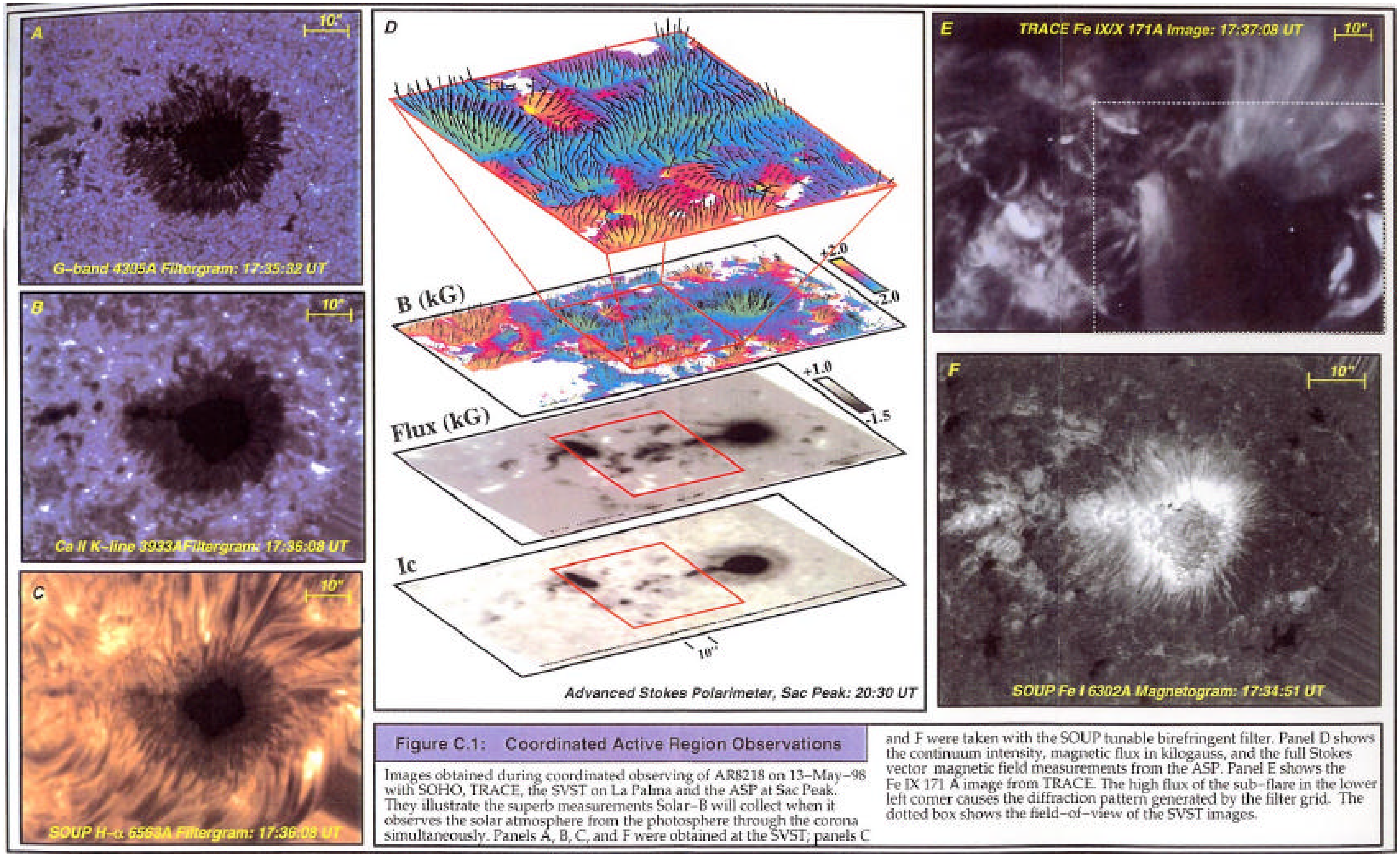


Figure C.1: Coordinated Active Region Observations

Images obtained during coordinated observing of AR8218 on 13–May–98 with SOHO, TRACE, the SVST on La Palma and the ASP at Sac Peak. They illustrate the superb measurements Solar–B will collect when it observes the solar atmosphere from the photosphere through the corona simultaneously. Panels A, B, C, and F were obtained at the SVST; panels C and F were taken with the SOUP tunable birefringent filter. Panel D shows the continuum intensity, magnetic flux in kilogauss, and the full Stokes vector magnetic field measurements from the ASP. Panel E shows the Fe IX 171 Å image from TRACE. The high flux of the sub–flare in the lower left corner causes the diffraction pattern generated by the filter grid. The dotted box shows the field–of–view of the SVST images.

Lower atmosphere (Photosphere/Chromosphere) governs the dynamics of the upper atmosphere (Corona) via magnetic field lines

International Collaboration

SOLAR-B

ISAS (Japan): Integration of S/C; Launch & Operation

Mission Instruments:

SOT (optics), XRT (camera), EIS (I/f to S/C)

NASA (US):

SOT (focal plane package), XRT (optics / mech.),

EIS (optics components), NASA polar station(s)

PPARC (UK): EIS (structure, detectors & electronics)

ESA: Polar station(s) for data downlink

Joint Operations and Data Analysis

SOLAR-B

System Schedule

2001 : PM Electric I/F Test

Subsystem MTM/TTM Fabr. & Test

2002 : System MTM Test

System TTM Test

2003 : Subsystem Flight Model Fabrication

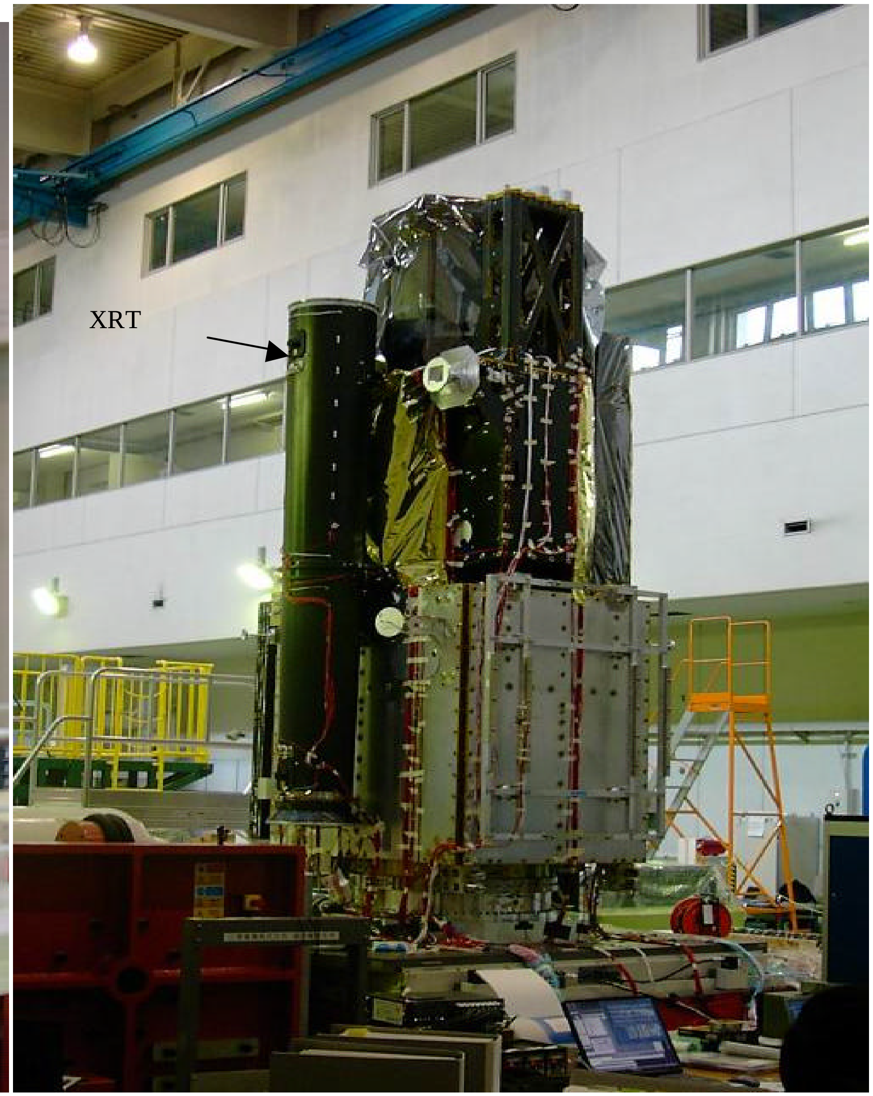
2004 : System Integration & I/F Test

System Final Checking

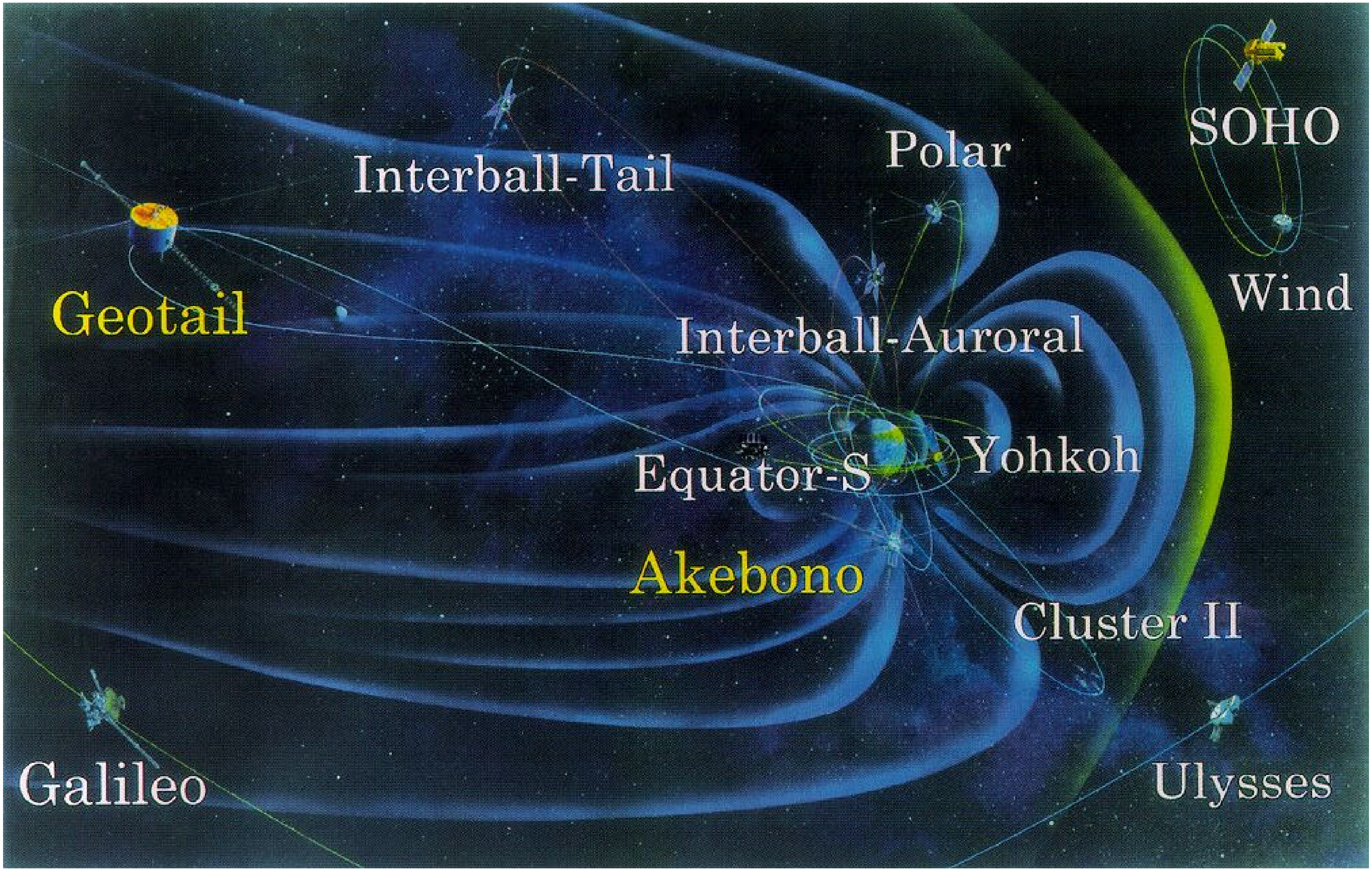
2005 Aug / Sep : Launch Operation

MTM Test (2002 May)

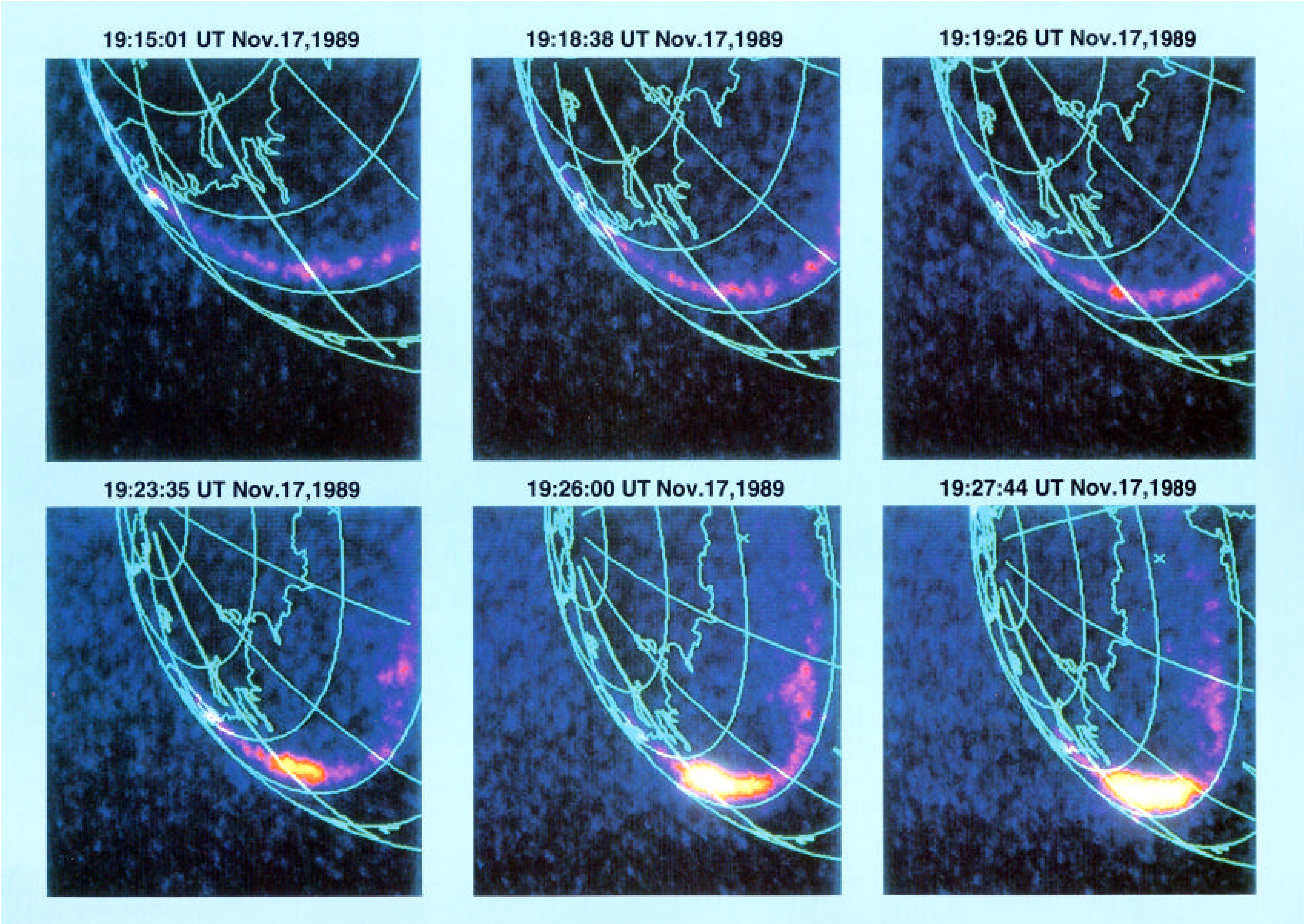
SOLAR-B



Solar Terrestrial Plasma



Aurora observe by AKEBONO



Nozomi (Mars Orbiter)

Science targets

- Upper atmosphere
  - Solar wind interaction
  - Atmosphere escape
  - Magnetic field
- Moons and dust
- Surface and sub surface

Launched :	July, 1998
Mars Orbit Insert :	January, 2004

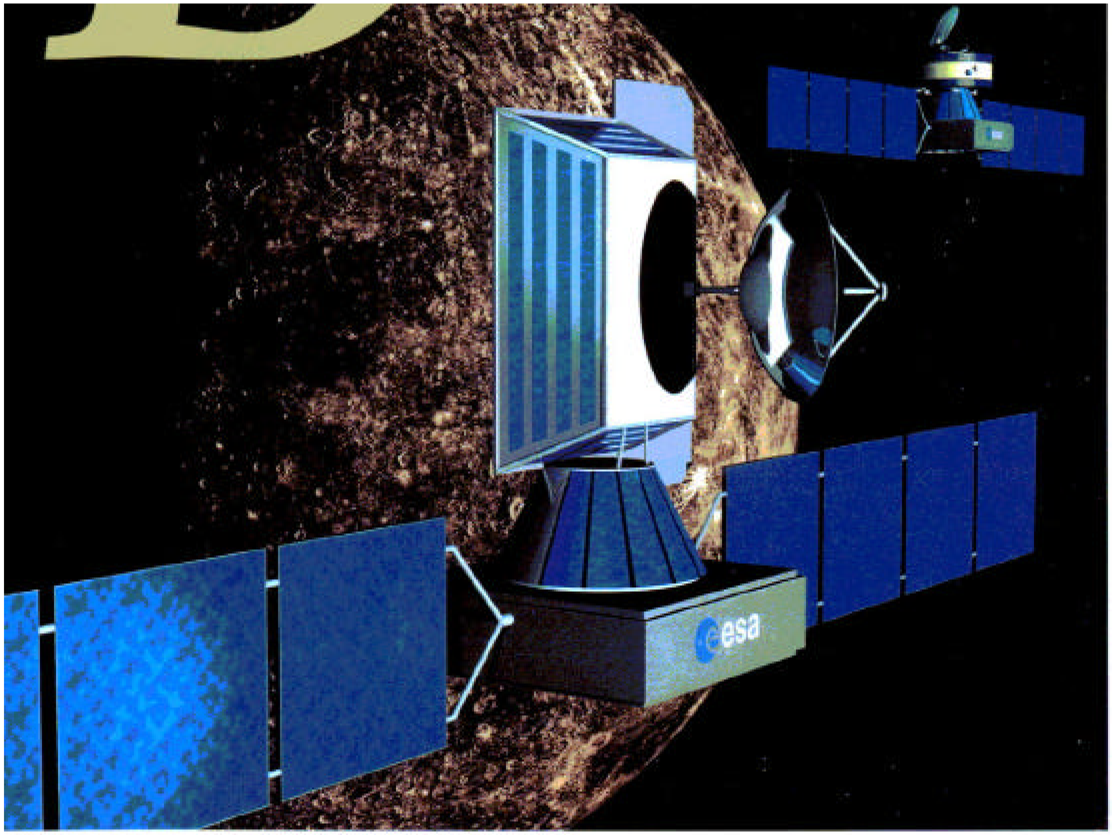
•Future mission: Bepi Colombo Mission (Mercury Exploration)

Comprehensive study of Mercury

global mapping
magnetism
atmosphere
magnetosphere

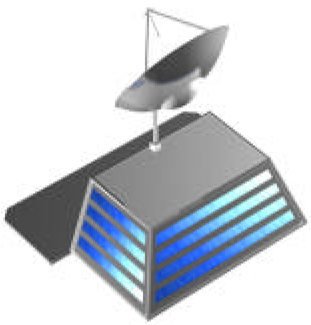
Under study in WG

collaboration with ESA

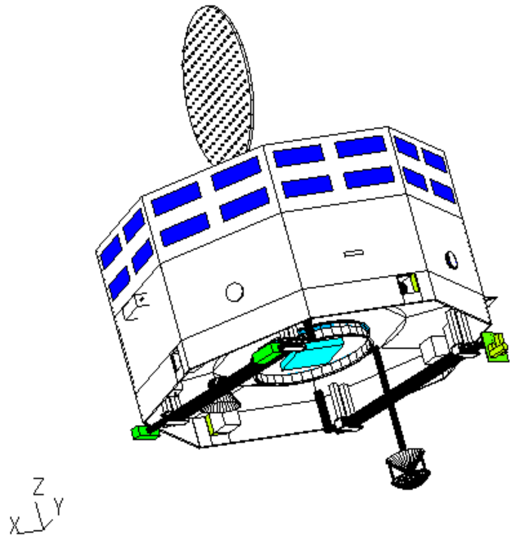


Launch : 2009
Arrival : 2012

Collaboration with ESA

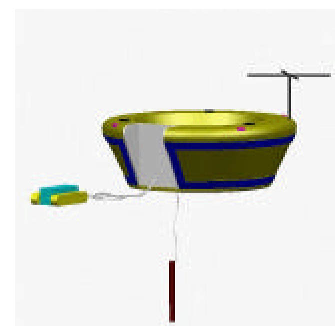


MPO(ESA)
400km x 1500km



ISAS

MMO(ISAS)
400km x 12000km



MSE (ESA)
Lander at 85 ° lat.