Agency's Report from ISAS/JAXA to ILWS WG meeting

2006 July 23 @Beijing; Takeo Kosugi / Masaki Fujimoto

Since successful launches of "Suzaku" (X-ray astronomy; 2005 July) and "Akari" (IR astronomy; 2006 Feb.), efforts to establish JAXA's 2nd term (FY2008 – 2012) plan have already started both inside and outside JAXA.

- "Solar-B" ready for launch in September.
- "SELENE" (lunar mission) is to be launched in summer 2007.

- The 25th Scientific Satellite "Astro-G" (VLBI astronomy) was proposed to the Government for Phase-B start in FY2007.

- JAXA will establish the "Lunar-Solar System Exploration Center" as an inter-division section (i.e., independently of ISAS) in a few months. "Hayabusa-2" is the first to come, followed by "SELENE-2."

Agency's Report from ISAS/JAXA (continued)

- ISAS will start, in addition to the on-going M-V spacecraft series (up to 1.7 ton S/C for LEO), a new program named "Small Scientific Satellite Series" in FY2007.

  This program is to have less than ~400 kg S/C's (@LEO) in a short preparation period of ~3 years, within the costcap of several tens of M$.

- ISAS has started "payloads on foreign spacecraft" program this fiscal year, though small in budget size.

  JAXA's participation to Canadian ePOP is supported from this budget.

Agency's Report from ISAS/JAXA (continued)

- In STE-Planetary field, near future ISAS plans are as follows.

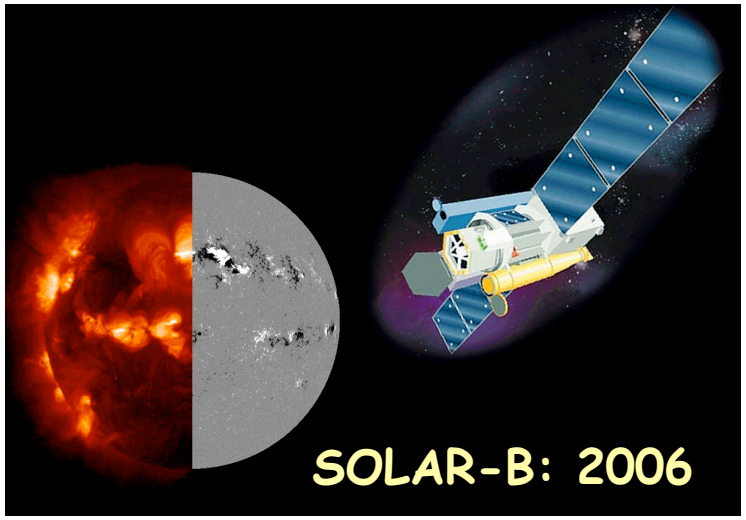
  under development
  - Planet-C (Venus Climate Orbiter; launch 2010)
  - BepiColombo MMO (with ESA; launch 2013)

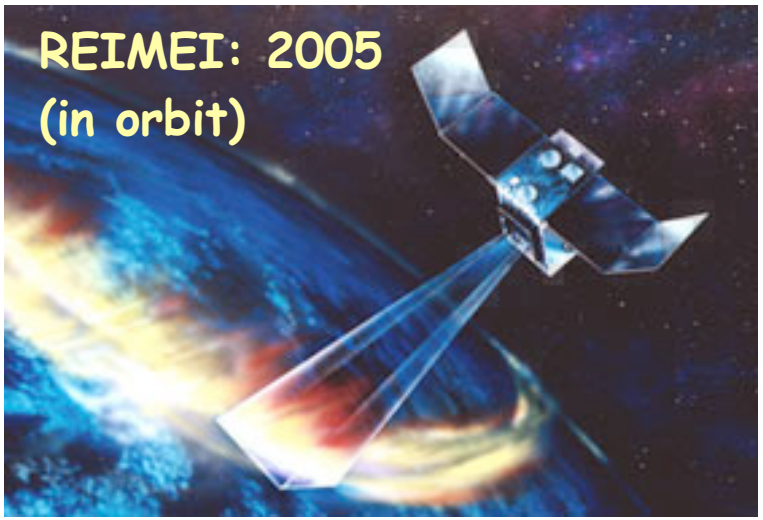
  under pre-Phase A study
  - SCOPE (becoming a part of XSCALE with ESA)

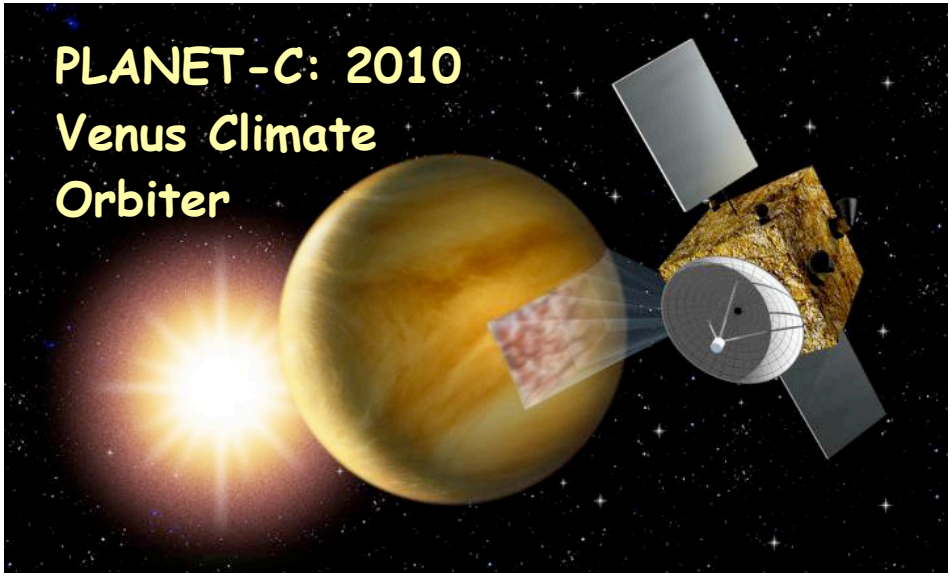
  under study by a voluntary group
  - ERG (Inner Magnetosphere Mission; small S/C)

- Outside JAXA, NiCT (former CRL) has continued to develop the "L-5 mini" project.

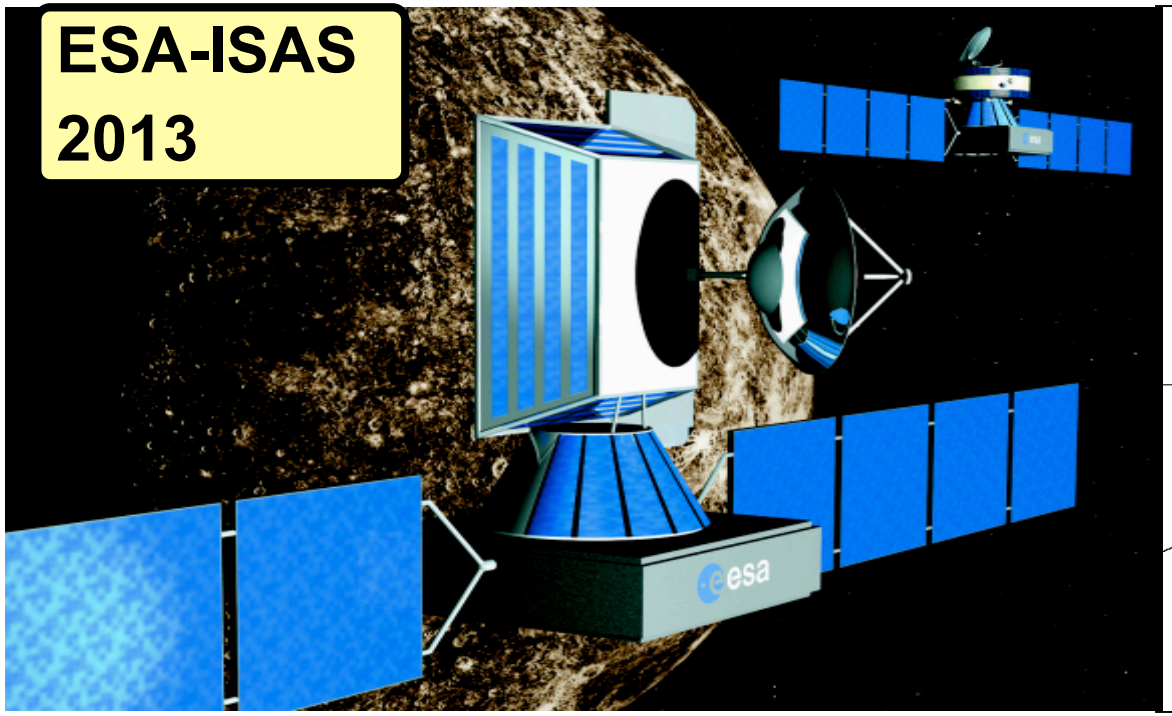
JAXA's Contribution to ILWS (& IHY, CAWSES)

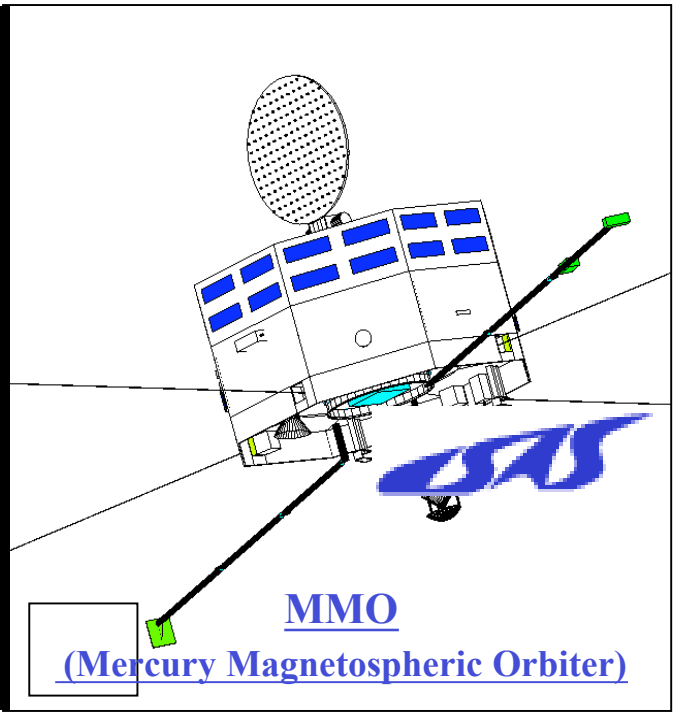






JAXA's Contribution to ILWS (& IHY, CAWSES) cont.



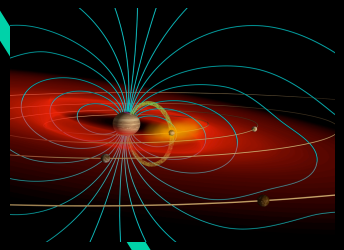


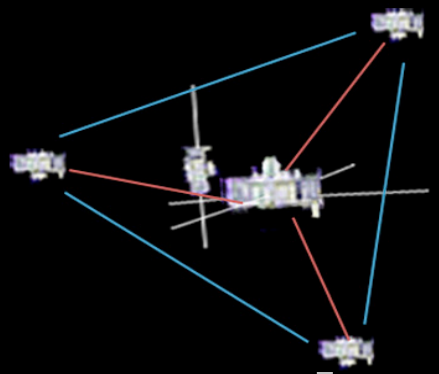
Other Contribution from Japan to ILWS (& IHY, CAWSES)

- Ground-based observations (Sun, IPS, CR, ….)
- International collaborations (CR, EISCAT, MAGDAS, …)
- Capacity buildings

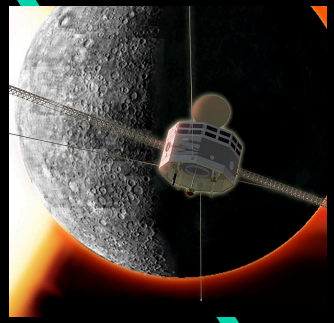
Future Space Plasma Missions at JAXA ~2020's

Planetary Magnetospheres | **The Plasma Universe** | **Geospace Exploration**



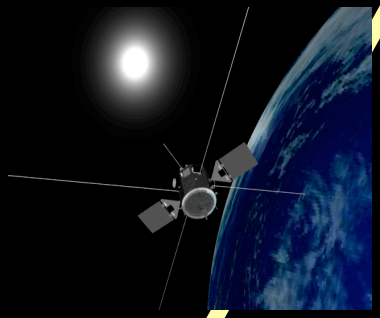


ESA/JAXA mission to Jupiter in 2020's
(to be proposed to ESA CosmicVision)



BepiColmbo L2013
ESA/JAXA mission to Mercury

SCOPE/CrossScale ESA/JAXA
Multiscale at the same time in Earth magnetosphere ~2016
(to be proposed to ESA CosmicVision)



ERG
A small explorer into the inner-magnetosphere and relativistic particle acceleration processes ~2011

SCOPE/CrossScale

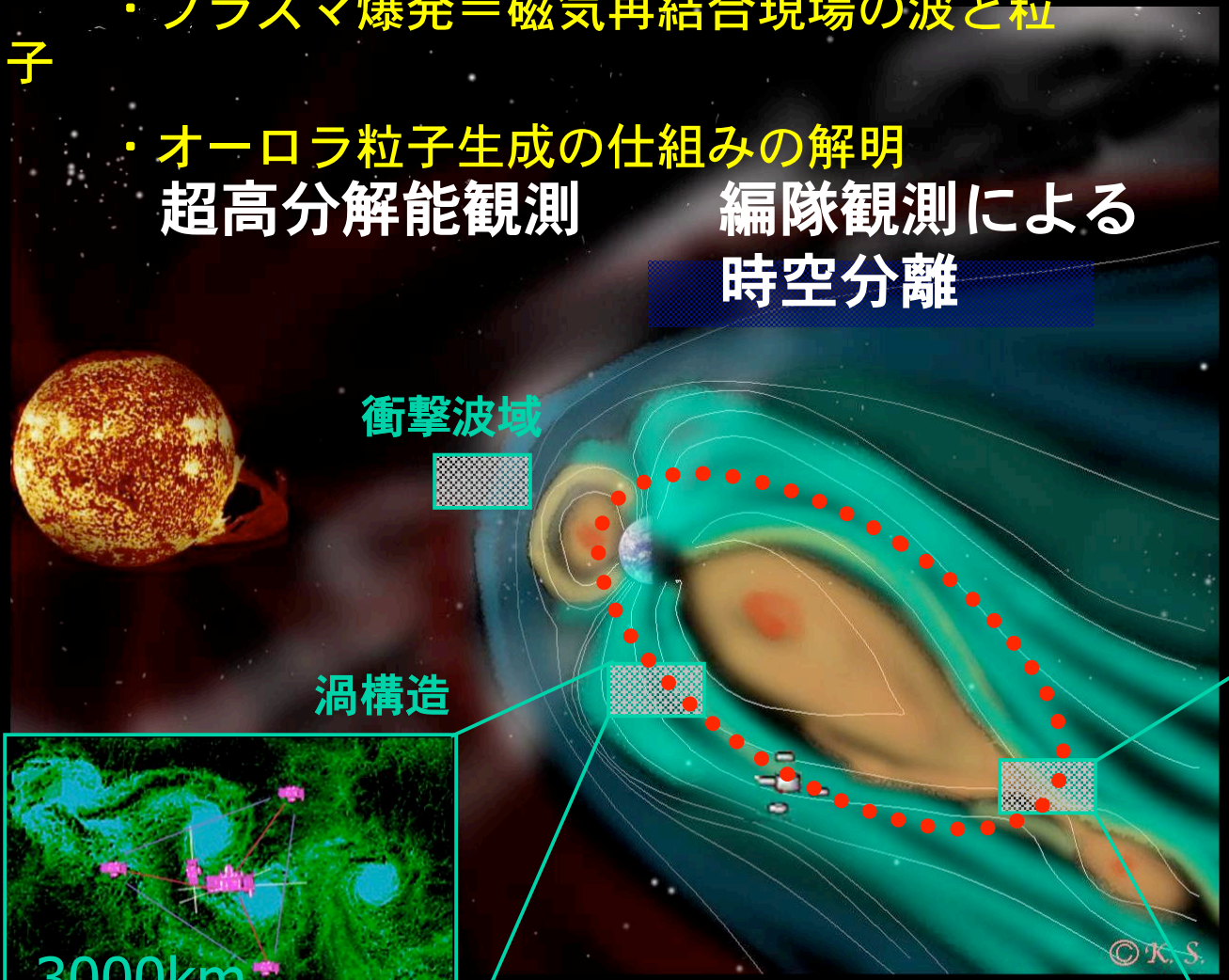
SCOPE

地球磁気圏プラズマ爆発の謎を解明する

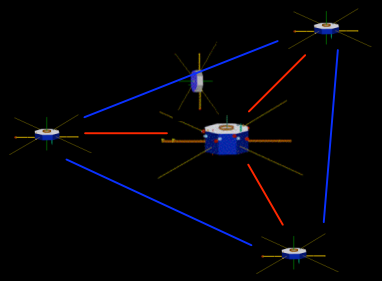
・プラズマ爆発＝磁気再結合現場の波と粒子

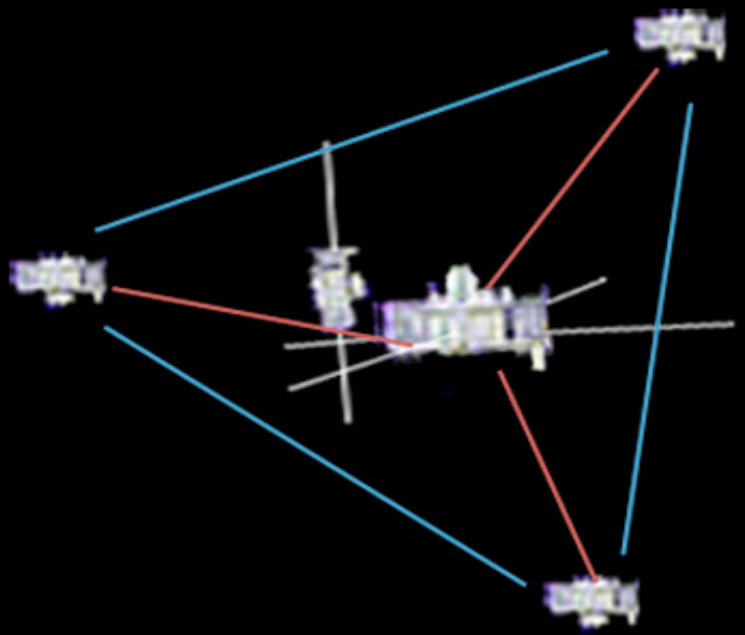
・オーロラ粒子生成の仕組みの解明

超高分解能観測　　編隊観測による時空分離



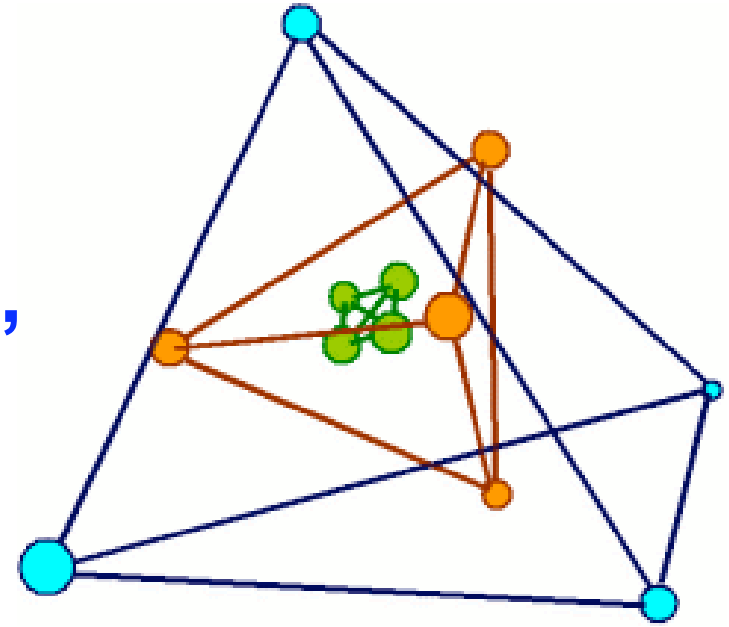
親・子の5機編隊

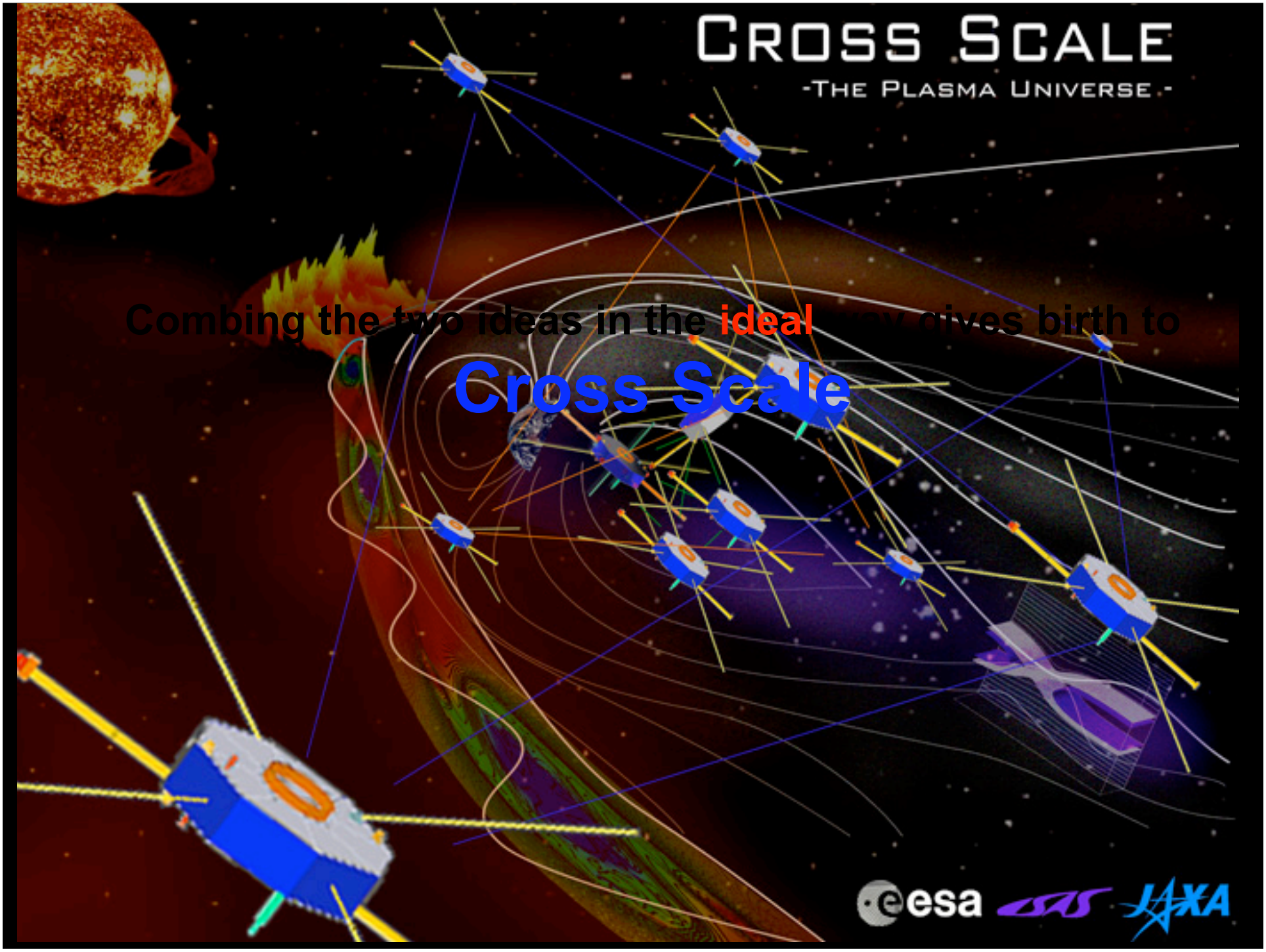




JAXA SCOPE
A big mothership
(P/L ~90kg)

ESA M-Cube
Tetrahedra at 3-scales,
with each s/c being
rather simple




CROSS SCALE
-THE PLASMA UNIVERSE-
Combing the two ideas in the ideal
gives birth to
Cross Scale
esa
JAXA

CrossScale

- The “Plasma Universe” mission
- 12 spacecraft forming three-tetrahedra to measure three-scales (electron, ion, and MHD) at the same time
- Measurement of unprecedented quality by the mothership at the core of the formation

To be proposed to
ESA CosmicVision 2015-25, ~L2016.

ERG

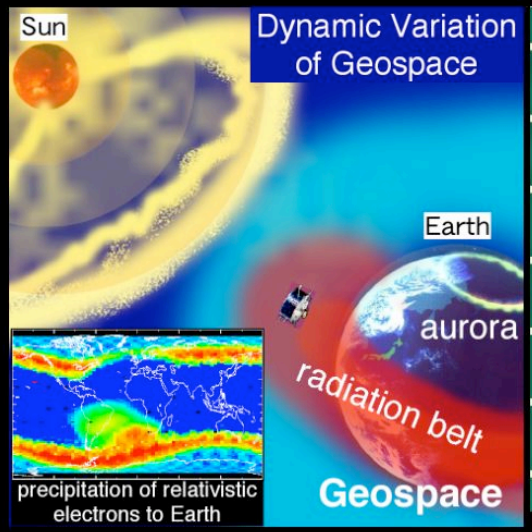
ERG ---Energization and Radiation in Geospace

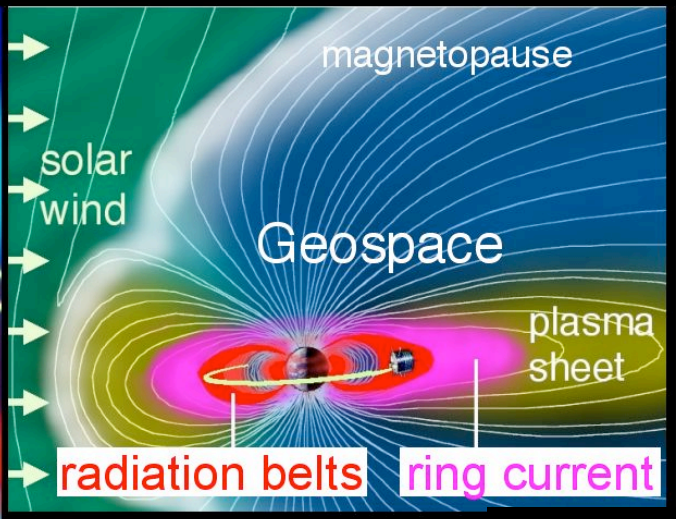
Small satellite mission to Geospace

A mission to elucidate acceleration and loss mechanisms of relativistic particles around Earth during space storms.

During space storms, the circum-Earth space (Geospace) acts as an effective accelerator of electrons and ions, and dynamic variation of Geospace causes various "space weather" phenomena including aurora.

ERG mission will
- achieve comprehensive plasma observations with magnetic & electric field, wave, and particle detectors with a wide energy coverage (10^0-10^7 eV) to capture acceleration and loss of charged particles in Geospace, and
- establish inexpensive plasma observation technique under high radiation dose.

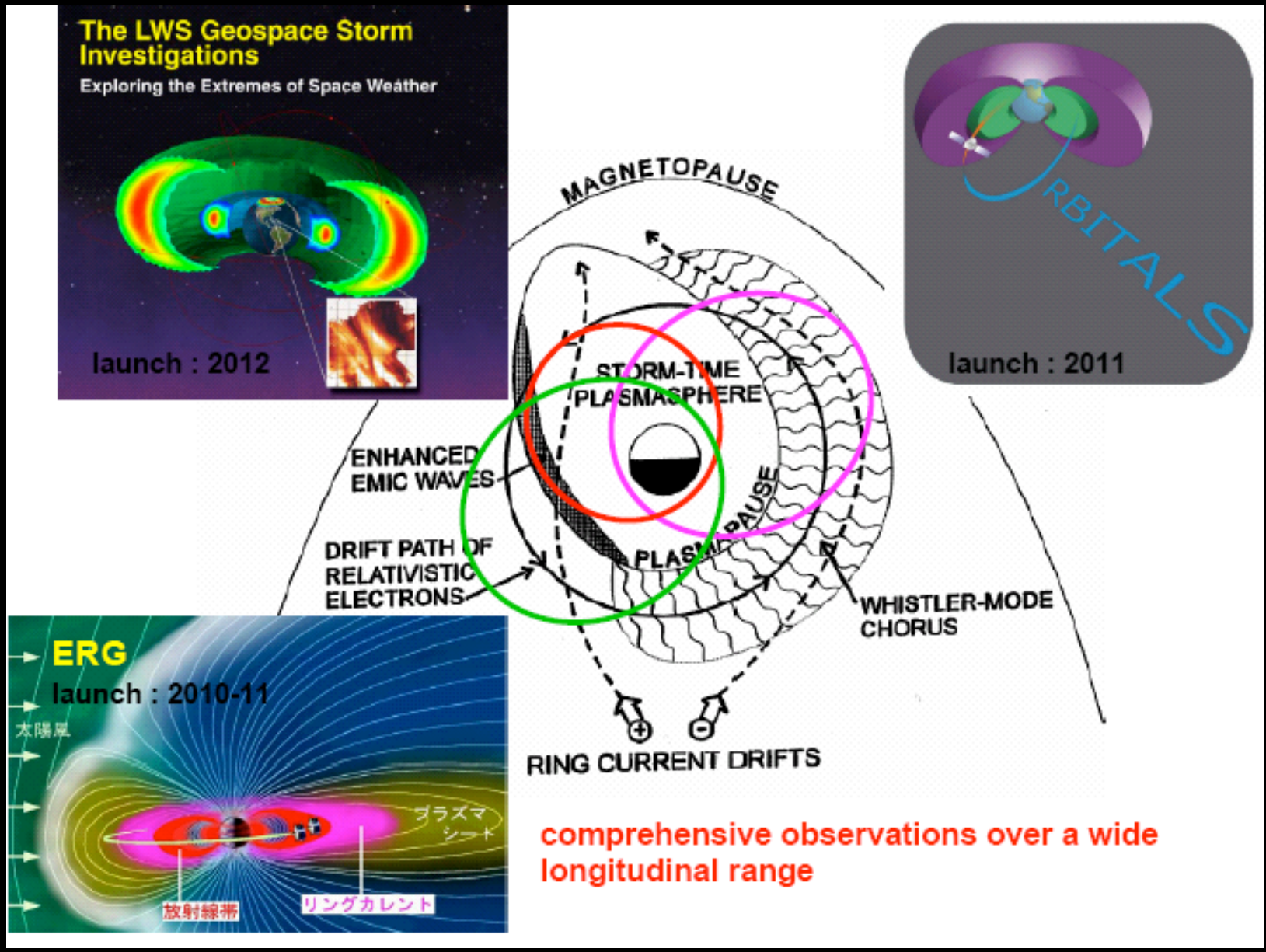




- Launch: 2011 (next solar max.)
- apogee: 6.6Re, perigee: 250km
- inclination : ≦10° (equatorial)
- spin-axis stabilized (sun oriented)
- wet mass: 150kg x 1 (or 80kg x 2)
- Science Instruments:
  - DC/AC magnetic & electric fields
  - 4 ion detectors with mass discrimination (1eV-1MeV)
  - 3 electrons detectors (10-10MeV)

URL: http://www2.nict.go.jp/y/y223/IM/index.html

A proper launch schedule will make ERG a part of the international effort towards understanding of the storm-time geospace environment.



ERG

- A small geospace explorer
- Elucidates particle acceleration processes by measuring particles at all energy ranges, eV~MeV.
- Has the aspect of precursor to CrossScale (A new particle detector at 20-200 keV range on both missions)

To be proposed to
ISAS/JAXA small spacecraft program, ~L2011

A Few Remarks on Future Collaborations

Takeo Kosugi (ISAS/JAXA)

There are no international collaborations for the sake of collaborations themselves.

- Scientists are motivated by questions and stimulated by possibilities of new findings. Questions should be

- Any campaigns should have clearly defined questions, as well as enlarge possibilities of new findings.

- The communities' role is to define the questions, while the Agencies' role is to lead in extending the possibilities by providing either newly developed scientific instruments or new frameworks of collaborations.

- Scientists are also motivated by needs from societies.