Message from SELENE Project Manager

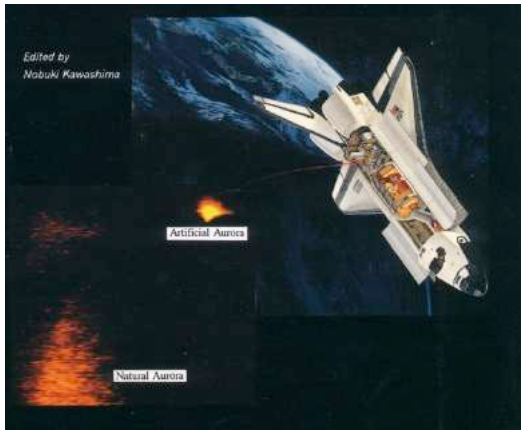
– Why SELENE Mission was so successful ?(subjective view)–

Selene Symposium 2017

Sep.13, 2017

Presenter's Background and Personal View

SEPAC



Space Experiment with Particle Accelerators to generate artificial aurora in space

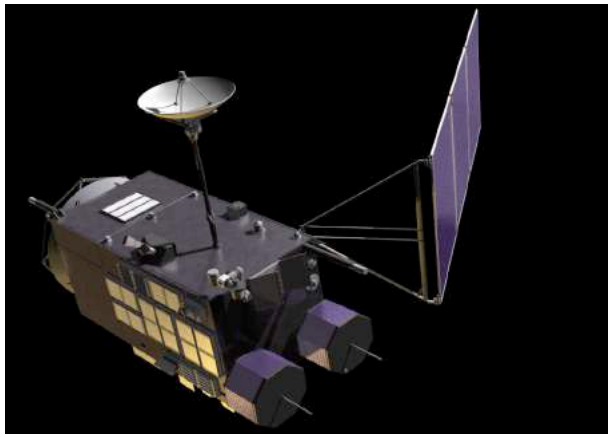
Most Exciting

SFU

Science and technology experiments using retrievable Space Platform SFU

Most Impressive

SELENE



Selenological and Engineering Explorer for lunar science

Most Successful !
Why・・・?

SELENE Science Mission Summary

Objectives:

1. *Study of origin and evolution of the Moon*
2. *In-situ measurement of lunar environment*
3. *Observation of solar-terrestrial plasma environment*
4. *Technology development for future lunar exploration*

Mission Instruments: 15 (300 kg approx.)

Orbit: Circular, 100 km altitude typical

Mission:

Launch: Sep.14 2007

Observation: Oct.2007-June 2009 (20 months)

Completion: June 11 2009

Why so successful ?
Point 1: Young and Active Researchers Involved






SELENE was Born in Early Stage of Planetary Science in Japan

Lunar-A Project accepted

The Japanese Society for Planetary Sciences established.

SELENE Project WG Started.

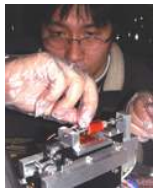
Rising phase

1990

1995



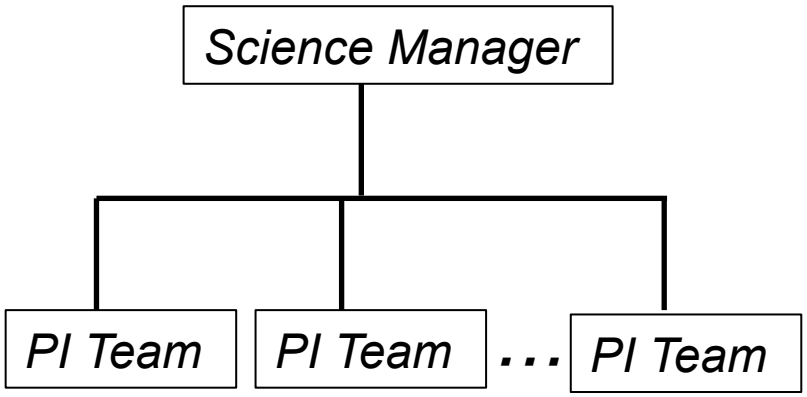


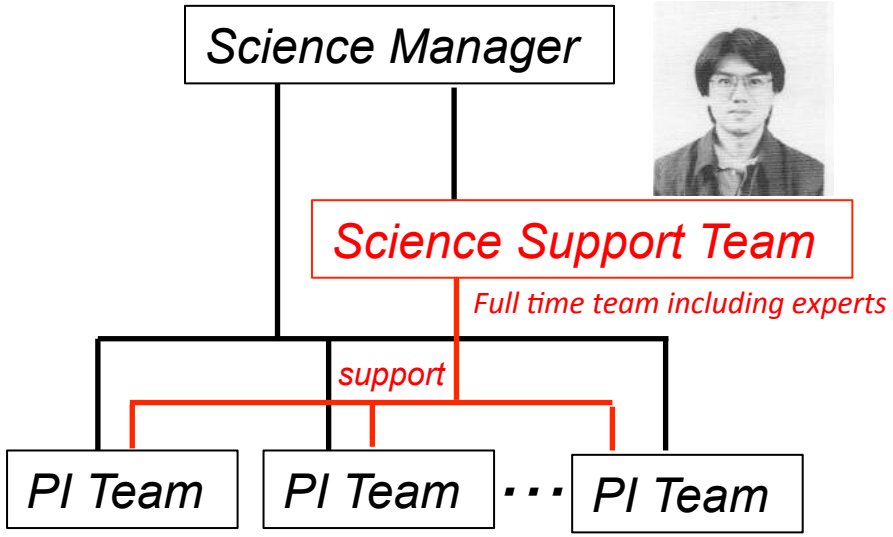

PIs and PI team members (15 PIs and more than 200 researchers) were mostly new comers to space project, and mostly young, so they were highly passionate and motivated.

Why so successful ?
Point 2. Science Support Team was effectively organized

Young researchers・・・On the flip side, most of PIs and PI members were inexperienced in space project. A special team was organized to support PI teams and it worked very effectively.



Standard Organization for ISAS Scientific Satellite Team



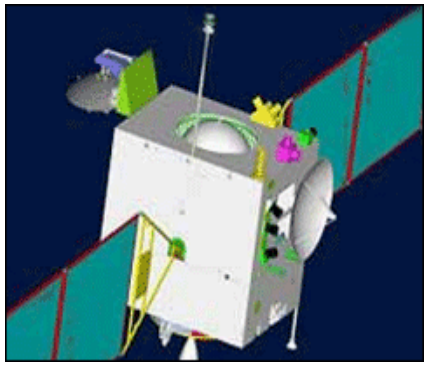
SELENE Organization

Activities of Science Support Team
- *joint efforts with PIs to overcome technical difficulties*
- *development of instruments commonly used for PIs*
- *Electromagnetic Compatibility Control, etc.*

Why so successful ?

Point 3. International Pressure (Competition and Collaboration)

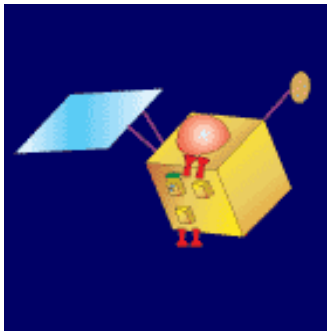
Pressure gave constructive stimulation to the SELENE science team.



Chinese Chang'e

SELENE Project Team

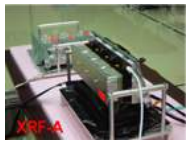
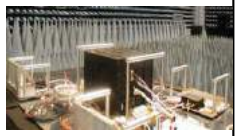
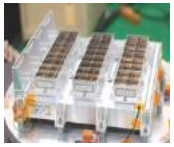
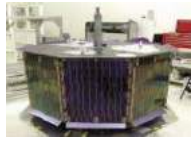
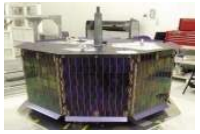
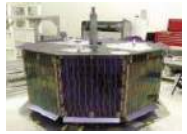
United States LRO



Indian Chandrayaan-1

15 Mission Instruments Developed
300 Scientists and Engineers Involved

SELENE was called "omatsuri" or "festival" mission (in a positive and negative sense). Too much dispersed or unfocused?
"Omatsuri" has resulted in a significant contribution to follow-on science projects.

X-ray Spectrometer 	***Lunar Radar Sounder*** 	***Plasma Energy Angle and Com-position Experiment*** 
Gamma-ray Spectrometer 	***Laser Altimeter*** 	***Charged Particle Spectrometer*** 
Multi-band Imager 	***Relay Satellite*** 	***Radio Science*** 
Spectral Profiler 	***Differential VLBI Radio Source*** 	***Upper-Atmosphere and Plasma Imager*** 
Terrain Camera 	***Lunar Magnetometer*** 	***High Definition TV Camera*** 

Significant Contribution to Current and Future Science Mission

Point 1. Measurement technologies transferred to other scientific projects

Variety of measurement technologies developed for space science.

SELENE 15 Mission Instruments

Measurement Technologies
- *High energy particle detector*
- *Plasma wave receiver*
- *Spectroscopic imager*
- *Laser altimeter etc.*

ARASE (Exploration of energization and radiation in Geospace)

SLIM (Smart Lander for Investigating Moon)

JUICE (Jupiter Icy Moons Explorer)

MMX (Martian Moons eXploration)

Already Flown

Planned

Significant Contribution to Current and Future Science Mission
Point 2. Human Resources Supplied to Current and Future Projects

Human Resources
(scientists, engineers)

SELENE Project Team Members
dissolved in 2009

- HAYABUSA2 (Second Asteroid Explorer)
- ARASE (Exploration of energization and radiation in Geospace)
- MMO (Mercury Magnetospheric Orbiter)
- SLIM (Smart Lander for Investigation Moon)
- JUICE (Jupiter Icy Moons Explorer Ganymede Orbiter)
- MMX (Martian Moons eXploration)
- XARM (X-ray Astronomy Recovery Mission)







Already Flown

Planned

Concluding Remarks

There are three major reasons for SELENE mission success;

- *highly- motivated PI team members,*
- *a powerful support team for PI teams, and*
- *a constructive stimulation from competing projects.*

SELENE greatly contributes to JAXA scientific missions in terms of measurement technologies and human resources.

My personal view focusing on bright side to encourage new lunar missions in future.