2nd Space Exploration Conference

International Exploration Perspective

Moon and Planetary Exploration in JAXA

Dec 5, 2006
Kohtaro Matsumoto
Lunar & Planetary Exploration Team
JAXA
Moon & Planetary Exploration -- Past Results

- Lunar Exploration
  - Two satellites into moon orbit
  - Hiten impacted on the moon

- Solar System Exploration
  - Sakigake/Suisei: International Halley fleet
  - Nozomi: Technology for planetary exploration


Sakigake / Suisei  1985  Nozomi  1998  Moon far side image
Giordano Bruno crater
Moon & Planetary Exploration
-- Latest & On-Going Activities

- Solar System Exploration
  - Hayabusa 2003
  - Landing on and taking off from other planet

- Lunar Exploration
  - SELENE 2007
  - Largest lunar exploration mission since Apollo
  - In-depth study of the entire moon

JAXA 2025 Long Term Vision
*Solar System Exploration
*Moon Exploration & Utilization
Lunar and Planetary Exploration Team

Implementation of JAXA-2025 Long Term Vision

Lunar and Planetary Exploration Team
(Executive Director Kiyoshi Higuchi)

Lunar and Planetary Exploration Office
Team Director Junichiro Kawaguchi

(Sub Teams)

Manned Lunar activity investigation
Takahiro Abe / OSFO

SELENE follow-on
Tatsuaki Hashimoto / ISAS

Solar system exploration
Makoto Yoshikawa / ISAS

- Studying Post-SELENE spacecraft
- Exploring the field of lunar science (including the possibility of an moon observatory
- Investigating the possibility of establishing an operational base on the surface of the moon and manned lunar space missions
- Looking into solar system exploration
- Examining policies relating to international coordination on space exploration
  - Investigating basic space exploration technology
To the Moon

Hagoromo/Hiten 1990

SELENE 2007
- Orbiter
- Hard Landing
- Remote Sensing

SELENE-2 201X
- Lander & Rover

SELENE-3 201X
- Landing Mission

Int’l Explo. 20XX
- Human Moon Exp.

SELENE 2007

Elemental Composition
Mineralogy
Gravity
Global Mapping

Landing
Surface Mobility
Initial Moon Science
Moon Utilization Studies

International

National
To the Solar System

2016(TBD)

- Planetary Exploration

JAXA provides Venus and Mercury Exploration with international collaboration.

- JAXA focuses and concentrates its activity on
  1) Primitive Bodies exploration,
  2) Planeto-Magnetospheric exploration

With the advantage in its advanced capabilities.
Basic Concept Behind
JAXA’s Lunar and Planetary Exploration Strategy

• The scope of human activity is expanding
  – Vision of Space Exploration
  – New era of space exploration
  – from the Moon & Mars
    ✓ the nearest body to Earth
    ✓ to distant bodies within the solar system

• Findings from asteroid explorer Hayabusa
  – Increasing public interest in space exploration

• International space activities
  – Dawn of an new era of full-scale solar system discovery
  – Expectation for human space exploration
Basic Recognition for International Exploration

- Space exploration is intrinsically linked to:
  - International competition
  - International cooperation.

- For our space activities: Parallel to international
  - Independent space exploration unique to Japan
  - Study as much as possible about asteroids and moon
  - Get actively involved in international cooperation.

- For the benefits of international cooperation
  - For manned missions to the moon
  - Will share a reasonable responsibility with the United States and other countries.
Basic Position of Lunar & Planetary Exploration

• Contributory technology development for space exploration of Moon & Mars
  – for Science, Utilization, and Human frontier
  – for International Space Exploration
  – Exam:
    • Robotics/Roving vehicle, Space suits, Un-manned logistics, Energy, . . .

• Integration of human & scientific exploration
  – Supporting communities for JAXA, . . .
  – Robotic explorer for Moon and solar system as present plan

• Peaceful, creative, and robust international space exploration
  – Program of Programs?
  – Who & how of cooperation for human Moon&Mars exploration
Several international coordination mechanisms for the space exploration:

- NASA lead Strategy Building Activity
  - Strategic Framework for Sustainable Global Space Exploration
- SPINETO WSs
- ISEF proposal@COSPAR
- ILD proposal@COSPAR & ILEWG
- Lunar & Mars Spectrum Coordination
- ‘Program of Programs’ Approach

For effective and advanced international cooperation:

- Tie organically or consolidate these activities

Japan will host:

- WS in Mar. 6 – 9 at Kyoto as kick-off
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