Findings from Japan's Lunar Explorer "KAGUYA"

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Why did we name Japan’s lunar explorer “KAGUYA”? 

Among all the varied suggested nicknames, about 24 percent suggested names related to “Princess Kaguya” from the old classic Japanese story “Taketori Monogatari (or the story of a bamboo cutter and the princess from the Moon).” From among these names, “KAGUYA” accounted for almost 70 percent. It appears that SELENE, which travels to the Moon, reminds many people of “Princess Kaguya,” who returned to the Moon.
KAGUYA Characteristics

Main Orbiter: KAGUYA
- Weight: 3 ton (at launch)
  (including sub-satellites: 50kg × 2)
- Dimension: 2.1m × 2.1m × 4.8m
- Mission Period: 1 Year
- Orbit: 100km Altitude / Inclination 90deg.

Sub-satellites
- Rstar (Relay satellite): OKINA
- Vstar (VLBI Radio satellite): OUNA

- Weight: 50kg
- Dimension: 0.99m × 0.99m × 0.65m
  (Octagonal column shape)

- Mission Period: 1 Year
- Orbit (at Separation):
  (Rstar: OKINA) 100km × 2400km
  (Vstar: OUNA) 100km × 800km

Mission
- (1) Chemical elements distribution: XRS, GRS
- (2) Mineralogical distribution: SP, MI
- (3) Surface structure: TC, LALT, LRS
- (4) Surface & Space environment: Lmag, PACE, CPS, RS, UPI
- (5) Gravitational field distribution: VRAD, RSAT
- (6) Public outreach: HDTV

Global survey for the lunar origin and evolution study

Data Application to Future Moon Utilization

Technology development for the lunar exploration

Public Outreach

Rstar (OKINA) separation from main orbiter

New scientific knowledge of the Moon derived by KAGUYA

1) Lunar Radar Sounder Observations of Subsurface Layers under the Nearside Maria of the Moon
2) Farside Gravity Field of the Moon from Four-way Doppler Measurements of SELENE (Kaguya)
3) Lunar Global Shape and Polar Topography Derived from Kaguya-LALT Laser Altimetry
4) Long-lived Volcanism on the Lunar Farside Revealed by SELENE Terrain Camera

-> Fill with missing half -Lunar Farside and sub-surface by KAGUYA (limited information by legacy exploration)
Earth diamond ring
Earth rise
New most precious lunar surface map - Laser Altimeter (LALT) -

Black : Highest / White : Lowest point
Dirichlet-Jackson (−158.64° E, 5.44° N, +10.75 km),
Antoniadi (−172.58° E, 70.43° S, −9.06 km)

The continuous range data of the LALT will enable us for
the first time in the world to construct an accurate and
precise global topographic map of the Moon

Farside Gravity Field of the Moon

Legacy Model by NASA

KAGUYA new gravity accurate model

The color of the figure shows
strength of the gravity field in
blue, green, yellow, and red, in
that order. Red indicates a
positive gravity anomaly related
to either a topographic high or
a dense material in the
subsurface. In contrast, blue
shows that a negative gravity
anomaly related to a
topographic low or less dense
material.
SELENE (KAGUYA) on Internet

Image Gallery: http://www.kaguya.jaxa.jp
YouTube: http://www.youtube.com/jaxasaselene
Let’s flythrough Tycho Crater produced from TC observation data

We can fly through lunar surface by using high spatial resolution (10 meter) KAGUYA Terrain Camera data