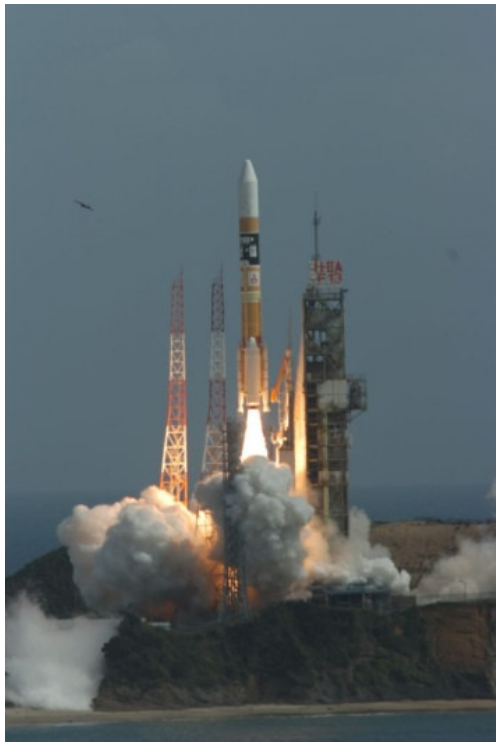
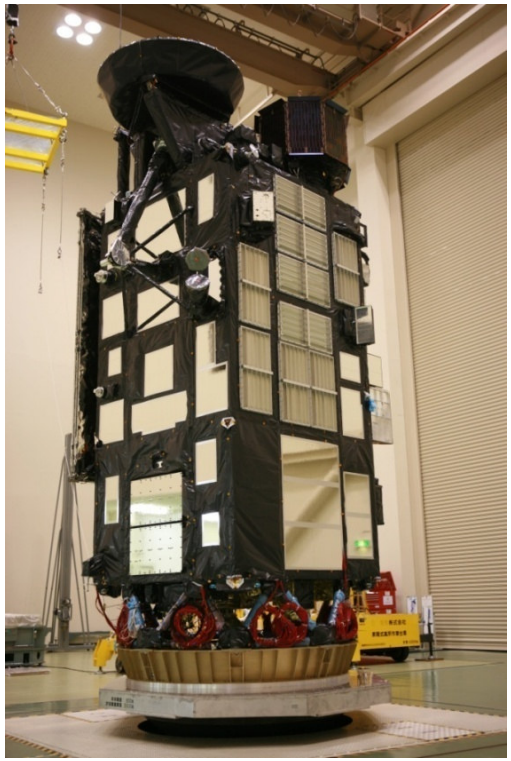
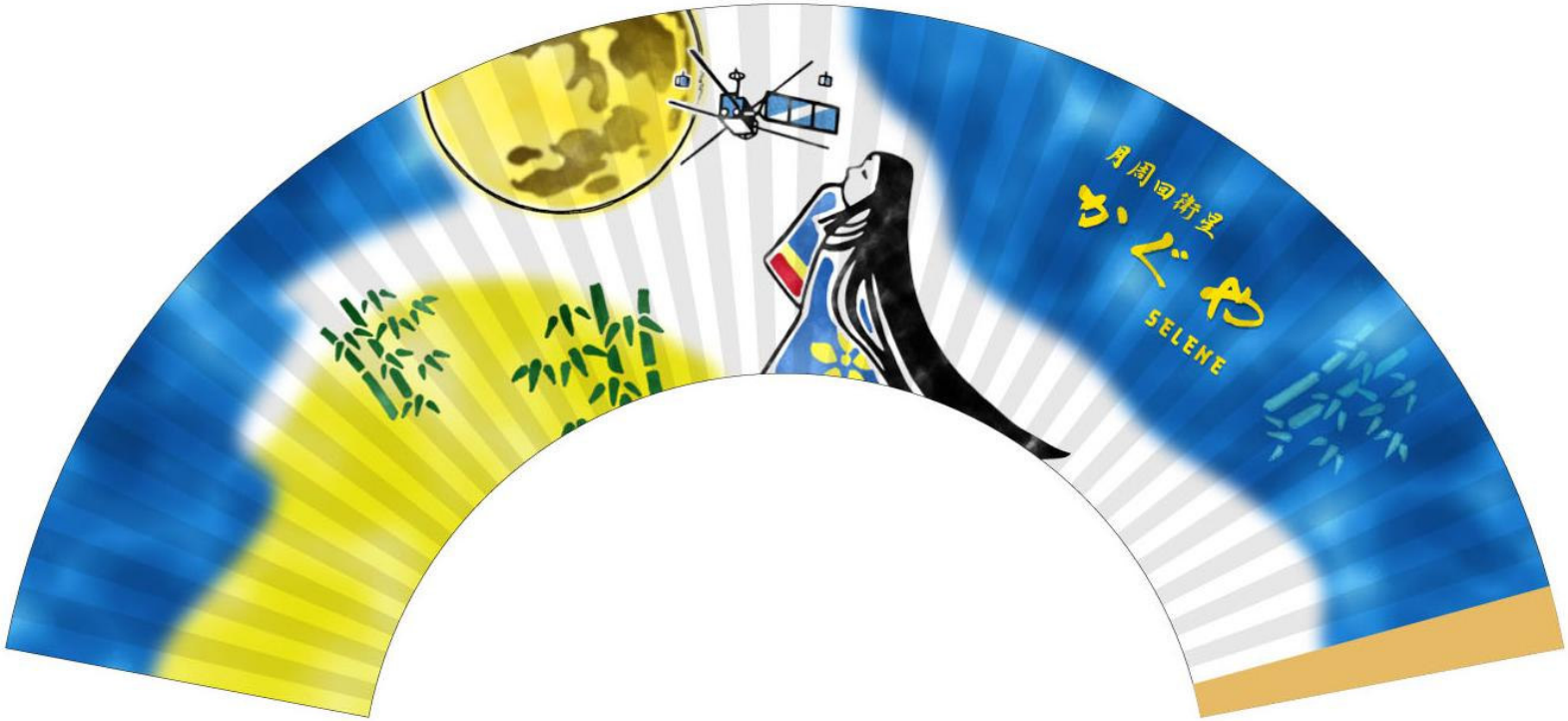
Findings from Japan's Lunar Explorer "KAGUYA"





UNCOPUOS, Legal Subcommittee, 48th Session,
Vienna, 23 March – 3 April, 2009
JAXA/Japan

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

Rstar (OKINA) separation from main orbiter

- Global survey for the lunar origin and evolution study
- Data Application to Future Moon Utilization
- Technology development for the lunar exploration
- Public Outreach

Main Orbiter : KAGUYA
- Weight : 3 t o n (at launch)
  (including sub-satellites50kg×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

X-ray Spectrometer (XRS) Gamma-ray Spectrometer (GRS) Spectral Profiler (SP) Multi-band Imager (MI) Terrain Camera (TC) Lunar Radar Sounder (LRS) Laser Altimeter (LALT) Lunar Magnetometer (LMAG) Upper-atmosphere and Plasma Imager (UPI) Charged Particle Spectrometer (CPS) Plasma energy Angle and Composition Experiment (PACE), Radio Science (RS), VLBI Radio-source (VRAD), Relay Sat. transponder (RSAT), High Definition Television ca (HDTV)

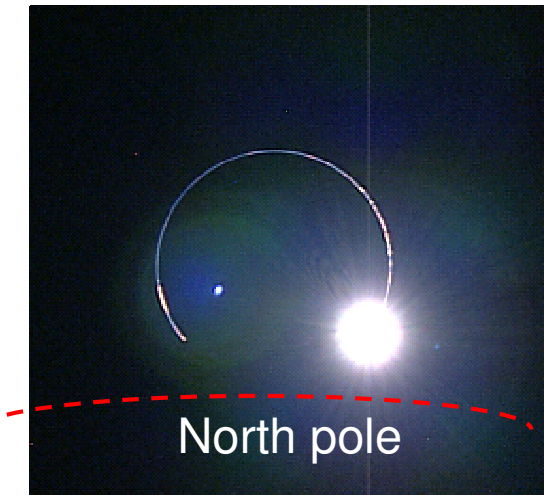
New scientific knowledge of the Moon derived by KAGUYA

Mare Moscoviense by Terrain Camera

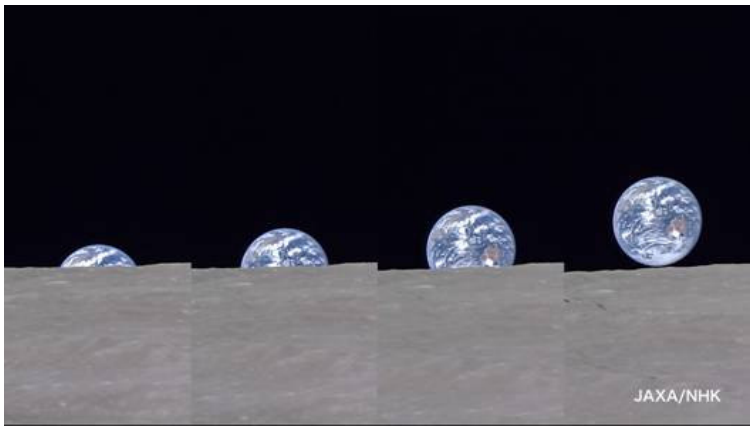
Science Magazine Cover Page
February 13th issue by AAAS

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 (eclipse)



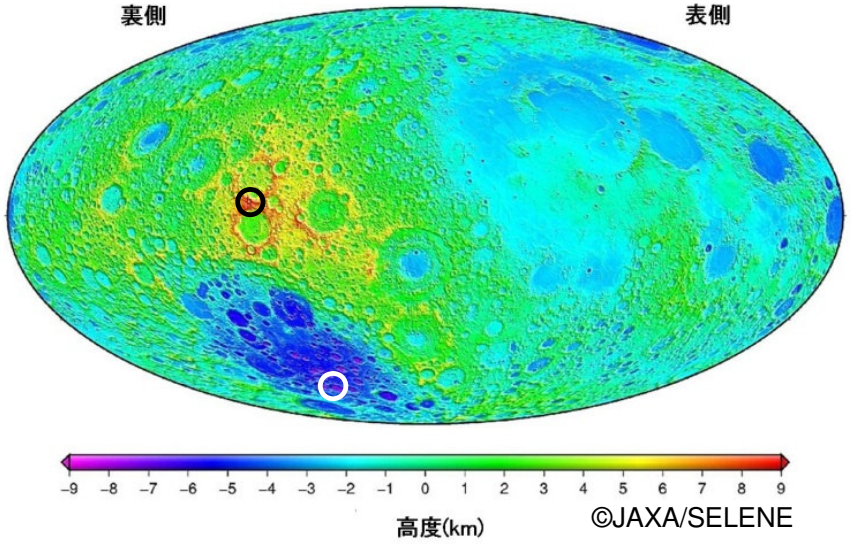
Full Earth rise over North pole

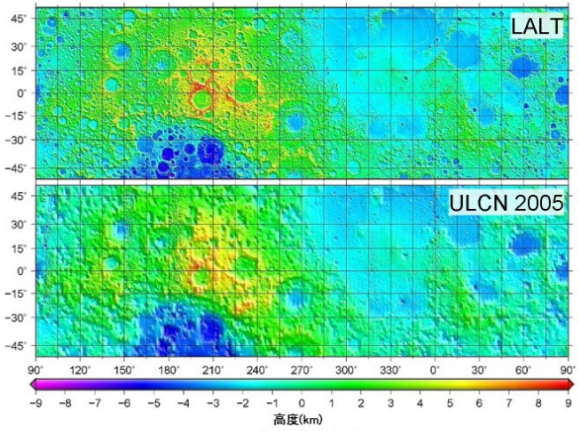
High Definition TV camera (HDTV)

Earth diamond ring

Earth rise

New most precious lunar surface map
- Laser Altimeter (LALT) -



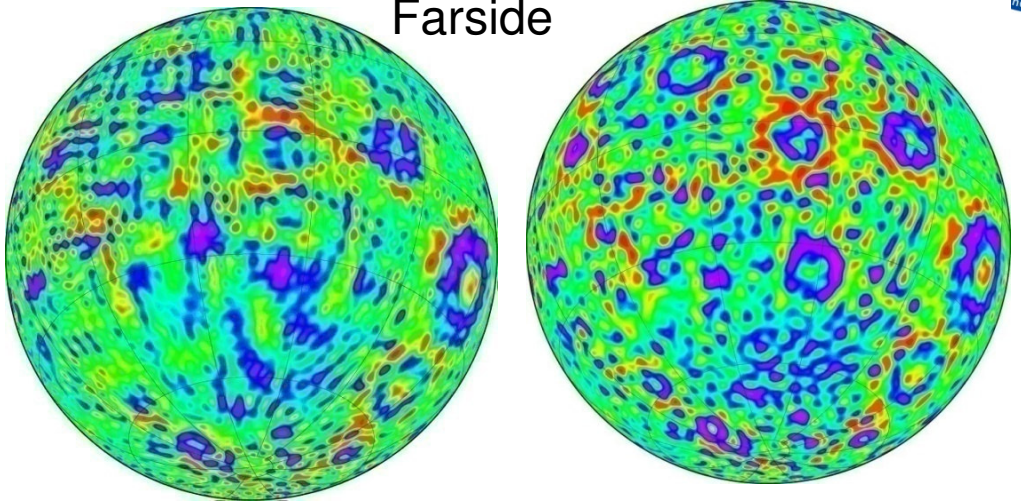


Black : Highest / White : Lowest point
Dirichlet-Jackson (–158.64° E, 5.44° N, +10.75 km),
Antoniadi（–172.58° E, 70.43° S, –9.06 km)

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

Farside

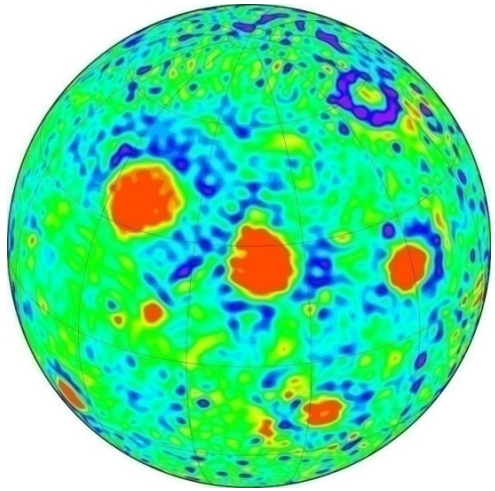


Legacy Model by NASA

KAGUYA new gravity accurate model

©JAXA/SELENE

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.



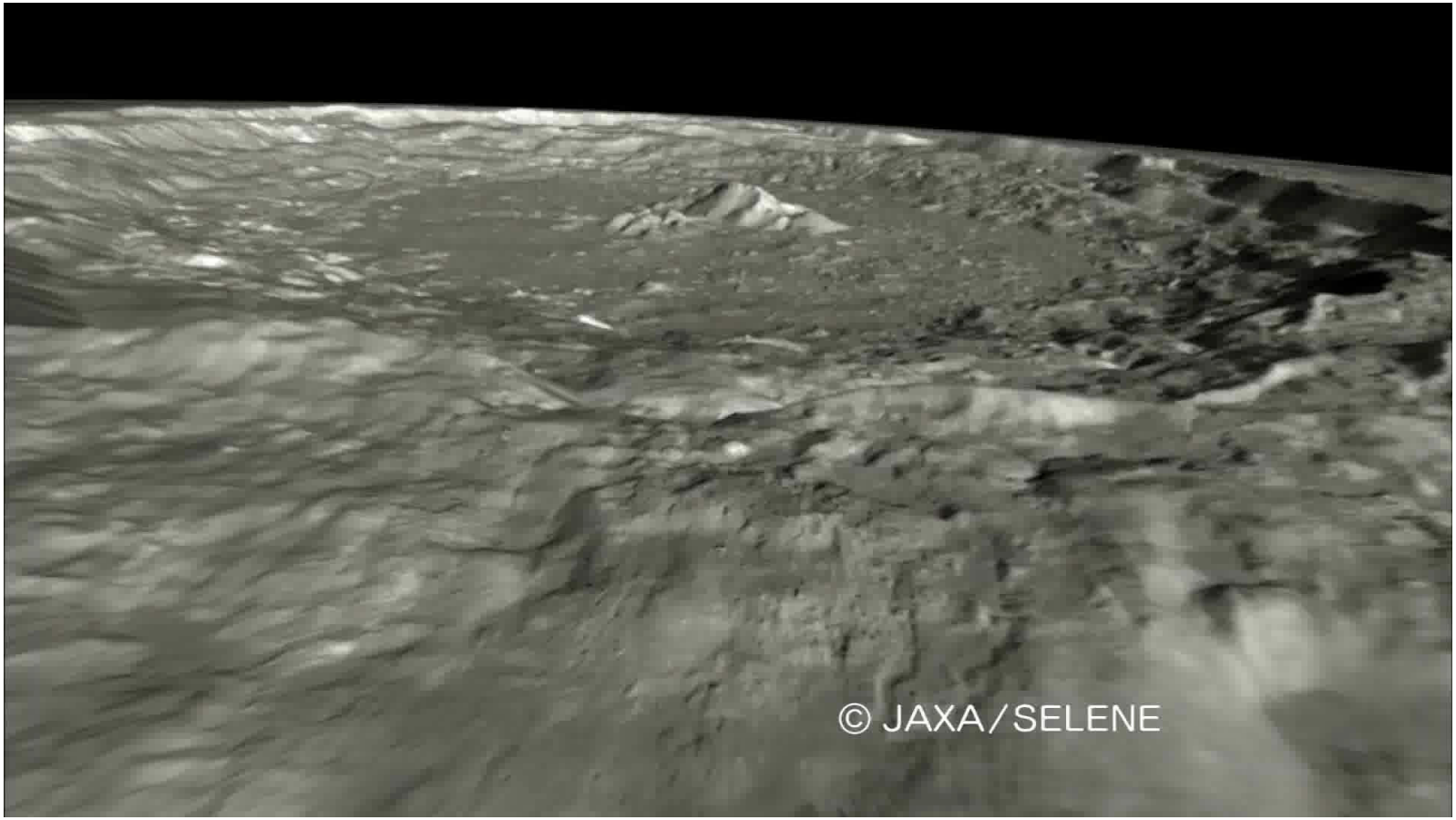
Nearside

SELENE(KAGUYA) on Internet

Image Gallery : http://www.kaguya.jaxa.jp

YouTube: http://**www.youtube.com/jaxaselene**

Let's flythrough Tycho Crater produced from TC obseration data



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