

The Kaguya (SELENE) Mission and Lunar Science

MANABU KATO

*Japan Aerospace Exploration Agency, 3-1-1 Yoshinodai, Sagami-hara, Kanagawa 229-8510,
Japan, E-mail: kato@planeta.sci.isas.jaxa.jp*

Japanese lunar orbiter Kaguya (SELENE) has been successfully launched from Tanegashima Space Center TNSC on September 14, 2007. The Kaguya mission has started in 1999 JFY as a joint mission of ISAS and NASDA, which have been merged into a space agency JAXA in October 1, 2003. On October 4 the Kaguya has been inserted into a large elliptical orbit circulating the Moon after passing the phasing orbit rounding the Earth. After lowering the apolune altitudes the Kaguya has reached the nominal observation orbit with 100 km circular and polar on October 18. On the way to nominal orbit two subsatellites Okina(Rstar) and Ouna(Vstar) have been released into the elliptical orbits of 100 km perilune, and 2400 km and 800 km apolune, respectively. After the checkout of bus system the extension of four sounder antennas with 15 m length and the 12 m mast for magnetometer, and deployment of plasma imager were successfully carried out to start checkout of science instruments.

Each instrument has received performance test in the checkout term for about 1.5 months. Most instruments showed health and excellent performance. Nominal observation term for ten months has been started on December 21, 2007. Key questions on lunar science are “What’s origin of the Moon?”, “How does the Moon have evolved?”, and “What history does the lunar environment have passed?” Science topics to be observed by using fourteen science instruments are surface composition of chemistry and mineralogy, evolution tectonics of surface including subsurface to 5 km depth, gravity field of whole moon and magnetic field distribution for the study on origin and evolution of the Moon. Lunar environment are investigated in observing charged and neutral particles impinged on the surface. High definition TV cameras onboard the Kaguya have already taken HDTV movies of Earthrise, Earth set, and stunning lunar surfaces including both pole areas and farside to broadcast for public outreach.