Innovation for the lunar and planetary sciences

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The moon is the first target to reveal the evolution of the planetary interiors. The Kaguya/SELENE mission will provide us a suite of excellent data to understand the lunar interior evolution.

The moon was geologically active during the first 10^8 years of its whole history. The style of its activity seems quite diffrent from that of the Earth characterized by plate tectonics. Therefore, the exploration of the moon is expected to provide a direct implication for the internal evolution of the planets such as Mercury and Mars and satellites having no plante tectonics. Furthermore, it would also tell us some clues for clarifying the causes that divide the tectonic style among these bodies and the Earth.

I will review the “traditional understanding” on the lunar internal evolution with particular focus on the long term thermal evolution. The understanding that is mainly developed from the data obtained by the Apollo programs appears to lack internal consistency in some crucial parts. Kaguya will bring us critical data to resolve inconsistencies and develop a new picture for the lunar thermal evolution.