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New views of the Moon: From Apollo to Kaguya

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Rock samples returned from the Moon by Apollo and Luna missions provided us with basic understandings of the origin and evolution of Moon, Earth, and other rocky planets in the solar system. Yet, the global compositional data from subsequent orbital satellites (Galileo, Clementine, and Lunar Prospector) and analyses of lunar meteorites have revealed the diversity of the lunar surface composition and the nearside-farside asymmetry of the Moon. These data suggest that the lunar crustal evolution and thermal history should be by far more complex than that inferred from the Apollo samples which only represent the central nearside. KAGUYA (SELENE) mission now provides high-spacial and high-energy resolution remote sensing data on physical and chemical properties of the global Moon. The state-of-art data set, coupled with the latest results of lunar sample analyses, enable us to demonstrate the currently proposed model for a bimodal crustal evolution, and provide clues to answer the primary issues on lunar origin and evolution.

Keywords: Moon, Apollo missions, Kaguya mission, Lunar science