

Impact of Lunar Exploration on understanding the Origin and Evolution of the Earth

Eiji Ohtani[1]

[1] Depart. Earth and Planetary Materials Science, Tohoku Univ

Lunar exploration is expected to provide large impacts on understanding of our planet Earth. Moon retains remnants of its origin and evolutionary histories which were erased in the Earth by several surface phenomena such as tectonics, volcanism, and weathering. Since Moon has been keeping in its position close to the Earth for more than 4.5 Ga, it could have recorded several extraterrestrial events, such as early meteoritic impacts which showered Moon simultaneously with the Earth. Moon may be akin to the Earth, through Giant impact. Thus we may find some critical observations which can constrain the genetic tie between the two bodies from the lunar exploration. Further, the Earth is a water planet, where water can provide large effects on geological phenomena, such as magmatism, volcanism, seismicity, and chemistry of the continental crust, whereas Moon is considered to be essentially dry in genetically. Therefore, lunar exploration could tell us detailed information on dry geological processes which were difficult to observe in wet Earth. Thus, we can expect fruitful scientific discoveries from the forthcoming lunar explorations.