

Accretion and early evolution: what should future lunar missions tell us?

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The Moon can provide a key information on accretion and differentiation of terrestrial planets, and on the chronology of bombardment in the solar system. We should review the interpretation of results from recent lunar probes relevant to the formation of the Moon and the signatures of magma ocean and early evolution. What measurements could be obtained from the lunar surface with geochemical instruments or seismic probing of the lunar interior? What information can samples from unexplored lunar areas including the far side and South Pole Aitken basin ? We shall discuss how some of these measurements could be performed with lunar landers and sample return missions, for which design concepts are currently assessed by the community (and following previous ILEWG or COSPAR science or technical recommendations [1-4]). The workshop can permit an interaction with modellers of accretion, Moon formation and thermal evolution, in order to define specific constraints that could be tested with current data and needed measurements by future lunar missions.

[1] <http://sci.esa.int/ilewg/47170-gluc-iceum11-beijing-2010lunar-declaration>

[2] <http://sci.esa.int/ilewg/43654-declaration-iceum10-leag-srr-florida-2008>

[3] Ehrenfreund P. et al (2012) Toward a global space exploration program: A stepping stone approach (COSPAR planetary exploration panel report) Adv Space Res. 49, 2-48, http://www.gwu.edu/~spi/assets/COSPAR_PEX2012.pdf

[4] Foing, B. H. Lunar landers and sample return: science and technologies, Space Exploration Technologies. Proceedings of the SPIE, Volume 6960, article id. 696009, 8 pp. (2008).