[EE] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS02]Regolith Science

convener:Koji Wada(Planetary Exploration Research Center, Chiba Institute of Technology), Akiko Nakamura(Graduate School of Science, Kobe University), Patrick Michel(共同), Kevin John Walsh (Southwest Research Institute Boulder)
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Recent planetary explorations have revealed that almost all solid bodies in the solar system are covered with small particles, called regolith. The surface geology, especially regolith behavior on the surfaces of solid bodies, becomes increasingly more important as represented by Hayabusa mission and other on-going and planned sample-return missions such as Hayabusa2 going to an asteroid Ryugu, OSIRIS-REx going to an asteroid Bennu and MMX planning to go to the martian satellites.

For fully understanding the regolith science, it is required to know and compare the regolith conditions on various celestial bodies, from asteroids to planets, with various methods.

Therefore, this session welcomes broad topics related to regolith on various celestial bodies, such as asteroids, comets, the Moon, the martian moons, Mars, etc. Papers on the formation, evolution, and alteration processes of regolith particles and regolith systems on the surface of planetary bodies, remote and in-situ observational results and techniques, analyses and results of returned samples, and laboratory, numerical, and theoretical studies on the fundamental physical and chemical processes are all welcome.

[PPS02-P08]Searching SCI craters: Results of a Hayabusa2 landing site selection dry-run

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The Hayabusa2 mission plans to create an artificial crater by **S**mall **C**arry-on **I**mpactor (SCI) onboard the Hayabusa2 spacecraft (SC) to access the interior of the C-type asteroid Ryugu. **D**eployable **CAM**era system **3** (DCAM3) onboard the SC will be separated from the SC during the SCI operation and observe in-situ crater formation. **O**ptical **N**avigation **C**amera (ONC) onboard the SC will take scanning images of the cratered area from 1.5 km altitude 2-weeks before and after the SCI operation, which enable us to find the SCI crater. **L**anding **S**ite **S**election for the third touch down nearby the **SCI** crater (LSS-SCI) will be performed within 3 days after the post SCI-crater searching operation. We carried out the LSS-SCI dry-run test by using the asteroid Ryugu analog shape model “Ryugoid”. ONC images were synthesized from the shape model by simulating observation conditions planned for the pre- and post-

SCI-crater searching operation. In the shape model for the post SCI-crater searching operation, a total of 18 or 19 SCI-craters and 2 or 3 MASCOTs (**M**obile **A**steroid surface **SCO**u**T**, a lander developed by DLR and CNES) were created on the Ryugoid surface to simulate various conditions of SCI impacts and MASCOT landings. By comparing pre- and post-impact images, it was confirmed in the first review meeting that our searching team discovered 13 craters and 2 MASCOTs. We found it difficult to identify craters less than 10 pixels in the low altitude images. We noticed the necessity of quickly recognizing artifact noises derived from image processing such as radiometric, distortion, and photometric corrections including flat-field calibration. In the dry-run test, procedures on data processing, data supply for the searching team, and band selection were also established. The presence of undiscovered craters suggests that some craters are formed in the shadow of large boulders or out of the observation area, or hard to be identified due to lack of pre-impact images. We will introduce progress and struggle of the searching team.