

형적 특성으로 인한 탐사의 한계로 지구에 분포하는 유사 지형을 통한 비교 연구가 일반적이다(Costard, et al. 2007 등).

이 연구에서는 스발바르의 주도 롱이어비엔에서 UAV를 이용하여 획득한 DEM으로 스발바르 걸리를 측량하고, 이를 화성 중위도의 테라 사이메리아, 테라 시레넴, 노아 키스 테라에 분포하는 걸리와 비교하였다. Longyearbreen 빙하 전방에 위치한 사면을 UAV로 촬영하고, 이를 SfM-MVS(Structure from Motion & MultiView Stereo) 기법으로 3차원 점군 모델과 고해상도 DEM을 제작하여 분석하였다. 화성의 경우 MRO궤도 탐사선이 촬영한 HiRise DTM을 이용하여 분석하였다. 두 걸리는 기후와 지질 조건에 차이가 있음에도 불구하고 유사한 패턴을 보였다. 특히 테라 사이메리아에 위치한 걸리와 롱이어비엔 북사면의 걸리는 기준거리, 단면적, 폭, 경사, 제방 두께 등에서 상당한 정량적 유사관계가 있었다. 이는 두 행성의 걸리가 유사한 성인 및 형성 프로세스를 거쳤을 가능성을 시사한다.

측량 기법과 UAV의 안정성을 개선시키면 지형 모델의 품질 향상 및 극지역에서의 UAV 운용이 용이해질 것으로 기대된다. 또한 스발바르의 기후 요소 및 물리량 적용은 향후 화성 지형연구에도 응용할 수 있을 것으로 사료된다.

#### [연1-P05] Impact deformation of Feldspar in Achondrite: NWA 2727, NWA 3117, NWA 856 Meteorite

Jaeyong LEE<sup>1</sup>, Timothy J. FAGAN<sup>2</sup>

<sup>1</sup>Graduate School of Frontier Sciences, The University of Tokyo, lee@csis.u-tokyo.ac.jp.

<sup>2</sup>Dept. of Earth Sciences, Waseda University.

We investigated shock history of three achondrite meteorites: NWA 3117, a howardite from asteroid Vesta, NWA 2727, a breccia from the Moon, and NWA 856, a shergottite from Mars. Shock histories were evaluated from deformation of plagioclase feldspars. Feldspar grains were classified based on observations in cross-polarized light as undulatory, mosaic, mosaic-recrystallized or maskelynite. This sequence represents increasing deformation of original feldspar crystals. Undulatory crystals have wavy extinction, mosaic crystals have patchy extinction, and mosaic-recrystallized grains appear as if they were originally coarse-grained and have recrystallized to mosaics of small equant crystals. Maskelynite grains are isotropic, indicating transformation to glass. Based on feldspar deformation, the degrees of impact processing are NWA 856 > NWA 3117 > NWA 2727. The high deformation of NWA 856 is expected because this sample is from Mars, which is a large parent body and requires a powerful impact to accelerate a rock to escape velocity. In contrast, the parent body of NWA 3117 (Vesta) is smaller than that of NWA 2727 (the Moon), yet NWA 3117 appears more highly deformed than

NWA 2727. One possible explanation is that NWA 2727 is from a relatively young part of the Moon, which has not been exposed to impacts as long as the surface of Vesta.

#### [연1-P06] Regional Variations in Spectra of (25143) Itokawa taken with Hayabusa/AMICA

Sunho Jin, Masateru Ishiguro  
Seoul National University

The Hayabusa remote-sensing images of near-Earth asteroid (25143) Itokawa exhibited large diversity in spectral properties. The evidence suggests a various degrees of space weathering on the surface. It is known that the space weathering changes the spectra of S-type asteroids redder and reduces the depths of absorption around 1 $\mu$ m. It is therefore possible to determine the surface ages through the investigation of the degree of space weathering. It is, however, reported that the scattered light components severely degrade the Asteroid Multiband Imaging Camera (AMICA) images, especially at the wavelengths >0.86  $\mu$ m. Our team came up with a technique for subtracting the scattered light components (Ishiguro 2014). Here, we upgraded the technique by applying simplex algorithm to correct the artifacts for all AMICA bands. This new technique enables to apply for the longest channel (i.e., zs-band at 1.01  $\mu$ m) images, which was not studied so far. With the AMICA all bands data, we estimated the surface ages at the different location to be 0.6-2 Myr. Based on this data together with the geological information (e.g. gravitational potentials and local), we will discuss about the evolution of surface materials on the asteroid.