



## P52B-01: A Mobile Asteroid Surface Scout (MASCOT) on board the Hayabusa 2 Mission to the near Earth asteroid (162173) Ryugu (Invited)

**Friday, 16 December 2016**

**10:20 - 10:35**

📍 Moscone West - 2009

MASCOT is part of JAXA's Hayabusa 2 asteroid sample return mission that has been launched to asteroid (162173) Ryugu (1,2,3) on Dec 3rd, 2014. It is scheduled to arrive at Ryugu in 2018, and return samples to Earth in 2020. The German Aerospace Center (DLR) developed the lander MASCOT with contributions from CNES (France) (2,3). Ryugu has been classified as a Cg-type (4), believed to be a primitive volatile-rich remnant from the early solar system. Its visible geometric albedo is  $0.07 \pm 0.01$  with a diameter of  $0.87 \pm 0.03$  km (5). The thermal inertia indicates thick dust with a cm-sized, gravel-dominated surface layer (5,6). Ryugu shows a retrograde rotation with a period of  $7.63 \pm 0.01$  h. Spectral observations indicate iron-bearing phyllosilicates (1) on parts of the surface, suggesting compositional heterogeneity. MASCOT will enable to in-situ map the asteroid's geomorphology, the intimate structure, texture and composition of the regolith (dust, soil and rocks), and its thermal, mechanical, and magnetic properties in order to provide ground truth for the orbiter remote measurements, support the selection of sampling sites, and provide context information for the returned samples (2,3). MASCOT comprises a payload of four scientific instruments: camera, radiometer, magnetometer and hyperspectral microscope (2,3). Characterizing the properties of asteroid regolith in-situ will deliver important ground truth for further understanding telescopic and orbital observations as well as samples of asteroids. MASCOT will descend and land on the asteroid and will change its position by hopping (3).

(1) Vilas, F., *Astro. J.* 1101-1105, 2008; (2) Jaumann, R., et al., *SSR*, DOI 10.1007/s11214-016-0263-2, 2016; (3) Ho, T.-M. et al., *SSR*, DOI 10.1007/s11214-016-0251-6, 2016; (4) Bus, S.J., Binzel, R.P. *Icarus* 158, 2002; (5) Hasegawa, T.G., et al., *Astron. Soc. Japan* 60, 2008; (6) T.G. Müller, T.G., et al., doi 10.1051/0004-6361/201015599, 2011.

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