

CASE STUDIES ON SMALL-TO-MEDIUM SIZED MARS CRATERS BASED ON MULTI-CAMERA SATELLITE IMAGERY. M. Al Amiri¹, R. Al Beshr¹, C. Gebhardt², and A. Abuelgasim³, ¹(Department of Physics, College of Science, United Arab Emirates University, Alain 15551, UAE, 201705722@uaeu.ac.ae, 201700281@uaeu.ac.ae) ²(National Space Science and Technology Center, United Arab Emirates University, Alain 1551, UAE, claus.gebhardt@uaeu.ac.ae) ³(Geography and Urban Planning Department, College of Humanities and Social Sciences, United Arab Emirates University, Alain 1551, UAE, a.abuelgasim@uaeu.ac.ae)

Introduction: The Mars surface is heavily cratered. As to that, catalogues provide statistically complete descriptions of impact craters down to ca. 1 km in diameter [1]. This includes a detailed specification of crater characteristics such as position, geometry, morphology, and degradation. In total, a number of several hundred thousand craters is cataloged to date.

Impact craters are a key proxy used for age-dating the Mars surface in a global sense. Also, they hold crucial implications for the geologic history of Mars regarding volcanism and erosion processes. In addition, Mars craters are promising for searching evidence of ancient life on Mars. That is because related impact-induced hydrothermal systems may have sustained habitable conditions for tens to hundreds of thousands of years. Compliant with that, Mars craters are a favorable field of study for Mars rovers. Craters are selected as landing sites for rovers, such as the Gale crater for the Curiosity rover and the Jezero crater for the upcoming Mars2020 rover. In addition, the Opportunity rover visited several craters such as the Eagle crater, Endurance crater, Victoria crater, and Endeavour crater.

This work is a student research project inspired by the discovery of the so-far-largest fresh impact crater during routine weather inspection of camera imagery from MARCI/MRO [2]. We perform case study by identifying small to medium sized craters from camera imagery from MRO/MARCI and MGS/MOC. This is followed by a detailed analysis of the crater characteristics by using available high-resolution camera imagery of the crater area. The latter involves products from other satellite missions/instruments such as MRO (HiRISE and CTX camera), Mars Express (HRSC camera), and the ExoMars TGO (CaSSIS).

References:

- [1] S. J. Robbins and B. M. Hynek, *JGR*, 2012, 117, E06001.
- [2] <https://mars.nasa.gov/news/nasa-mars-weather-cam-helps-find-big-new-crater/>