GEOLOGIC MAPPING OF MAWRTH VALLIS, MARS.

J. Wright¹, M. R. Balme¹, J. M. Davis², P. Fawdon¹, and D. A. Rothery¹, ¹School of Physical Sciences, The Open University, Milton Keynes, MK7 6AA, UK (jack.wright@open.ac.uk), ²Department of Earth Sciences, Natural History Museum, Cromwell Road, Kensington, London, SW7 5BD.

ABSTRACT

Introduction: Mawrth Vallis, generally counted among Mars’ giant outflow channels, has an atypical geomorphology that is less well-studied than its coinciding, thick (> 150 m) clay-bearing deposits [e.g. 1]. Here, we present ongoing work as part of the PLANMAP project [2] to map the geomorphic features along the length of Mawrth Vallis in addition to a detailed map of the channel adjacent to the ExoMars 2018 landing ellipse (Figure) to establish its history of erosion and deposition and relationship with the clay-bearing deposits.

Data and Methods:

Basemaps: CTX (6 m/pixel), with additional insight from HiRISE (25–50 m/pixel), color CaSSIS (~4 m/pixel), and DEMs/hillshades from CTX (~20 m/pixel) and HiRISE (1–2 m/pixel).

Map projection and scale: Mawrth Vallis spans 340°E–347°E and 18°N–26°N. We are using a stereographic projection centered on 343°E, 22.4°N. We are digitizing at 1:20k (full CTX resolution), with an intended publication scale of ~1:100k. The geomorphic feature map will be displayed alongside the detailed map at a smaller scale.


Acknowledgments: All CTX/HiRISE/THEMIS image data used are publicly available on the PDS. This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 776276.

Figure: In-progress CTX-scale geologic map of Mawrth Vallis. Shapefiles overlain on 100 m/pixel THEMIS daytime IR.