VOLCANISM ON THE ARISTARCHUS PLATEAU: DETAILS FROM THE LUNAR RECONNAISSANCE ORBITER CAMERA. W. B. Garry[1], B. R. Hawke[2], M. S. Robinson[3], and the LROC Team. [1]Center for Earth and Planetary Studies, National Air and Space Museum, Smithsonian Institution, Washington, D.C., garryw@si.edu, [2]Hawaii Institute of Geophysics and Planetology, Univ. of Hawaii, Honolulu, HI, [3]School of Earth and Space Exploration, Arizona State University, Tempe, AZ.

Introduction: The Aristarchus Plateau has a variety of volcanic features including sinuous rilles, extensive pyroclastic deposits, mare deposits that embay the perimeter, and domes (Fig. 1) [1, 2]. While previous data sets have been used to gain an overall understanding of the volcanic history of the region [3-7], high resolution images from the Lunar Reconnaissance Orbiter Camera (LROC) provide new details about the formation and emplacement of these features (Fig. 2).

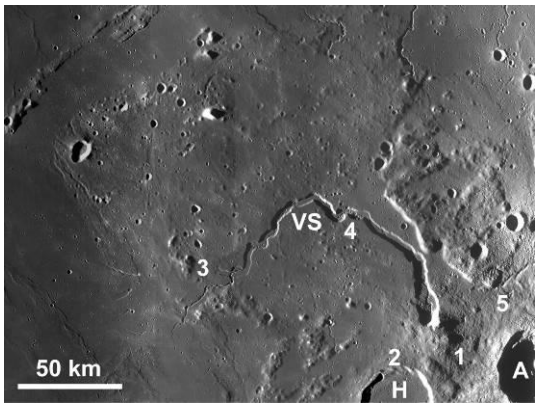

Figure 1. LROC Wide Angle Camera (WAC) mosaic of the Aristarchus Plateau. A: crater Aristarchus. H: crater Herodotus. VS: Vallis Schröteri. 1. Mounds on the Cobra Head. 2. Lava Fan. 3. Distal end of Vallis Schröteri. 4. Outcrops along rille wall. 5. Impact melt from crater Aristarchus.

Volcanism on Aristarchus Plateau: Vallis Schröteri is a large sinuous rille that cuts through the center of the Aristarchus Plateau. Topographic mounds observed on the Cobra Head in LROC images and Digital Terrain Models [8] are interpreted as either rootless vents or are constructed from individual sources (Fig. 2a). Lava from the Cobra Head is interpreted to have flowed into crater Herodotus and formed a lava fan (Fig. 2b). At the distal end of the Primary Rille, a potential flow margin is observed which could indicate that the lava stalled when it encountered a topographic high and a crater rim then backed up and overflowed [7] to the south to form Inner Rille (Fig. 2c). Outcrops, stratigraphic layers, and boulders are observed at several locations along the walls of both the Primary and Inner Rilles (Fig. 2d). Pristine impact melt sheets that are preserved on the flank of crater Aristarchus exhibit morphologies similar to lava flows (Fig. 2e).

Exploration: The Aristarchus Plateau offers access to several volcanic features for both human and robotic missions [9]. LROC images reveal new details of these volcanic and impact events that can be used to prioritize science objectives and develop mission scenarios. Detailed plans can be made for specific sites regarding potential features, outcrops, and boulders to survey, as well as, hazards to avoid using the NAC images.

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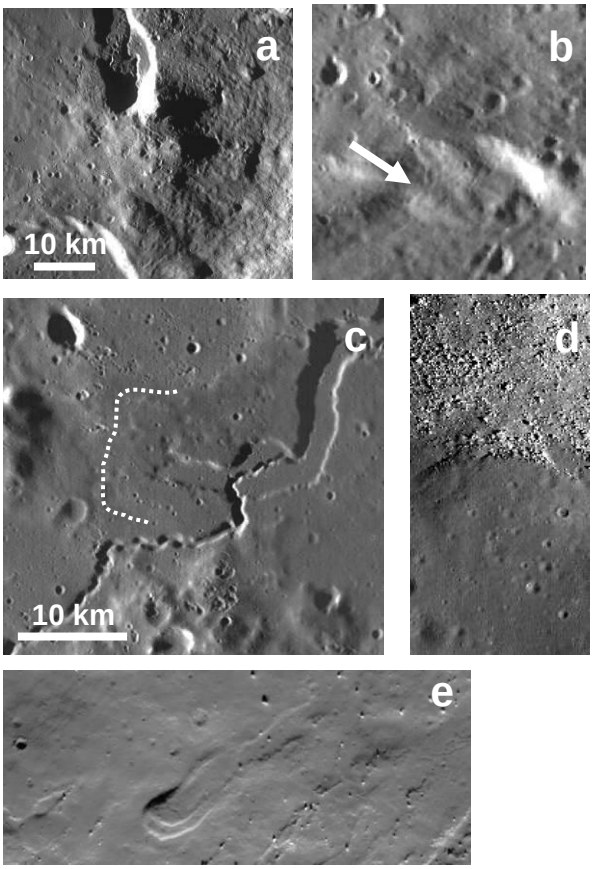

Figure 2. a) Mounds on the Cobra Head of Vallis Schröteri (1 in Fig. 1). b) Fan on interior wall of crater Herodotus (white arrow) formed by lava flows from the Cobra Head (WAC). Base of fan is ~4 km across (2 in Fig. 1). c) Flow margin (dotted line) observed at end of the Primary Rille (WAC) (3 in Fig. 1). d) Outcrops and boulders along the wall of the Primary Rille (NAC) (FOV = 250 m across). (4 in Fig. 1). e) Impact melt from crater Aristarchus (NAC) (FOV = ~1 km across) (5 in Fig. 1).