**PLUTO'S PUTATIVE CYROVOLCANIC CONSTRUCTS.**

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**Overview:** New Horizons imaged two large mounds with deep central depressions on Pluto, informally called Wright Mons and Piccard Mons [1]. Wright Mons (Fig. 1) stands ~4 km high and the main mound spans ~150 km. Piccard Mons was past the terminator but visible in haze-light, and is ~6 km high and 225 km wide. Both features appear constructional, and have relatively young surfaces (few craters). We focus on Wright Mons here, but Piccard displays many similar features. This mapping is part of effort to characterize and assess the age and origin of the mounds. These mounds are unique among the potential cryovolcanic features in the solar system.

**Image dataset:** The Ralph Multispectral Visual Imaging Camera (MVIC) performed a high resolution scan of Pluto near the time of closest approach, resulting in an ~320 m $px^{-1}$ panchromatic mosaic. This dataset forms the base mosaic (Fig. 1a). Stereo topography over the mons is available from several combinations of MVIC and Long Range Reconnaissance Imager (LORRI) observations (Fig. 1b; [1]). All feature names used in this abstract are informal.

**Terrains:** Initial mapping was conducted on the basis of morphology and topography. The main Wright Mons mound consists of several different surface textures. The very deep (~4 km) central depression (cavus; ca) is surrounded by wrinkly material, which may be ~concentric with the cavus in some areas. The material on the lower flanks and extending away from the mons has a hummocky texture with a typical wavelength of ~8 km (hem). There are several accumulations of dark material on the mound (dma) and surroundings, and one potential flow-like feature extends from a large cavus on the SW flank (ff). One possible large tectonic feature cuts the mound.

Wright Mons abuts the chaotic mountain region named Norgay Montes to the east, and an extension of Sputnik Planum to the north. Rubbly material (rm; coined in [2]) to the north displays several craters and may represent an older, more degraded cryovolcanic flow. The region west of Wright Mons is distinct but also a potentially cryovolcanic terrain (ctz, kp, rpm). Most of the depressions (ca, sca, sd, md) found there are sub-circular and lack rims or ejecta. Although a few of these pits may be craters, most appear either collapse- or caldera-like. A good portion of the western plains are relatively flat, with either 1-2 km-scale knobs (kp) or a few large scarps (ctz). Many transitions between units are gradual, but some have distinct contacts.

**Age:** One possible 5.5-km-diameter crater sits in the wrinkly terrain near the Wright Mons cavus. If this is indeed a crater, it would yield an age of less than 1 Ga [3] for the "knee" model from [4]. The possible crater has no obvious ejecta and is not perfectly circular, although it could be degraded or deformed. The wrinkly material around the cavus is made up of ridged structures that can tend to look arcuate on small scales, and the ridges are emphasized in ~the E-W direction by the oblique lighting (Wright Mons lies near the terminator). Thus, it is not clear if this feature is an impact crater.

**Composition:** The mons were potentially formed through viscous effusion/flow, but the material must also be able to sustain topography. The highest resolution color data from MVIC (~650 m $px^{-1}$; Fig. 1c) highlights the dark material on and around Wright Mons as redder, consistent with other dark areas on Pluto, but no other color features stand out. Preliminary analysis of the highest resolution Linear Etalon Imaging Spectral Array (LEISA) cube (~3 km $px^{-1}$) suggests solid methane deposited from the atmosphere coats much of the mons and surrounding region [5-8]. This methane signature masks any information about the material making up the units.

**Future work** will include modeling of material compositions and cryovolcanic processes, mapping of Piccard Mons, and correlation of features with topography.

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**References:**

[1] Moore J.M. et al. (2016) *Science,* 351**,** 1284-1293. [2] White O. L. et al. (2016) *LPSC abs.* #2479. [3] Singer K.N. et al. (2016) *LPSC abs.* #2310. [4] Greenstreet S. et al. (2015) *Icarus* 258**,** 267-288 (and erratum). [5] Cook J.C. et al. (2016) *LPSC abs.* #2296. [6] Grundy W.M. et al. (2016) *LPSC abs.* #s 2284 & 1737. [7] Protopappa S. et al. (2016) *LPSC abs.* #2815. [8] Cruikshank D.P. et al. (2016) *LPSC abs.* #s 1676 & 1700.

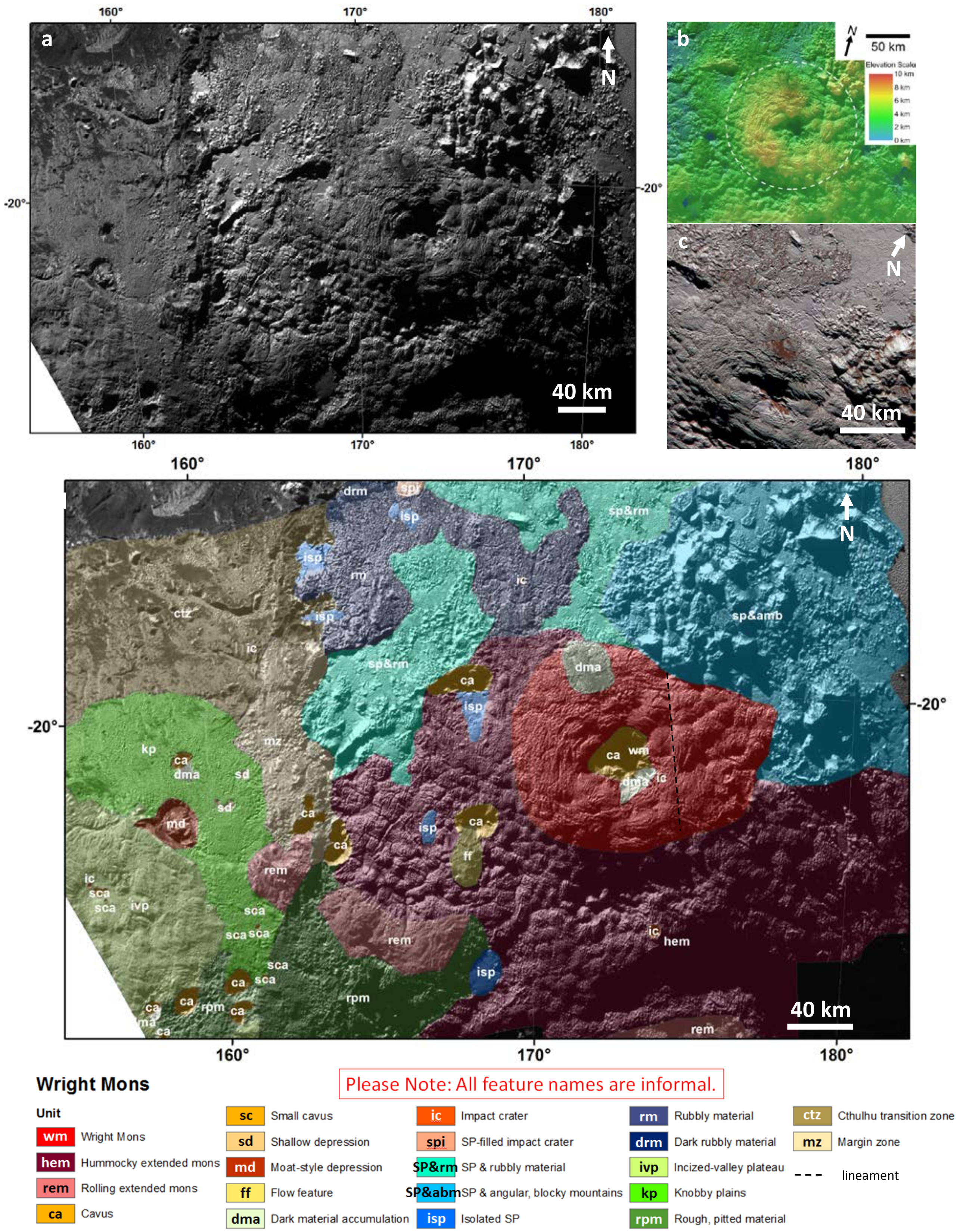


**Figure 1.** a) MVIC base mosaic**,** b) topography from [1], c) MVIC enhanced color over LORRI image, and d) initial mapping of cryovolcanic zone, showing extensive areas of younger terrain around the main Wright Mons mound and many depressions (ca, sca, sd, md) of varying sizes, depths, and morphologies. Other terrains are described in the text.