CYROVOLCANISM ON PLUTO FROM THE NEW HORIZONS FLYBY. K. N. Singer[1], P. M. Schenk[2], O. L. White[3], J. M. Moore[3], W. B. McKinnon[4], R. A. Beyer[3], J. R. Spencer[1], A. D. Howard[5], B. Schmitt[6], S. A. Stern[1], J. C. Cook[1], W. M. Grundy[7], D. P Cruikshank[3], O. Umurhan[3], S. Protopapa[1], T. R. Lauer[8], H. A. Weaver[9], L. A. Young[1], C. B. Olkin[1], K. Ennico[2], The New Horizons Geology, Geophysics and Imaging Science Theme Team, The New Horizons Surface Composition Science Theme Team. [1]Southwest Research Inst., Boulder, CO (ksinger@boulder.swri.edu), [2]Lunar and Planetary Inst., [3]NASA Ames, [4]Washington U. in St. Louis, [5]U. Virginia, UniversitéGrenoble Alpes[6], [7]Lowell Observatory, [8]NOAO, [9]JHU Applied Physics Lab.

Introduction: Pluto's surface has experienced considerable resurfacing through both endogenic and exogenic processes [1]. The terrains on Pluto span a variety of ages, from seemingly ancient to very young surfaces with no observable impact craters [1]. Volatile ices on the surface of Pluto (N_2, CO, CH_4) play a large role in resurfacing: atmosphere-surface interactions (sublimation and condensation cycles), glacial flow of N2-rich ice, and convection of N2-rich ice in Sputnik Planitia [2] are examples of volatile ice resurfacing mechanisms. But Pluto also has several examples of more recent activity (terrains with few-to-no superimposed craters), that appear to be primarily constructed from non-volatile water ice. Please note some geologic features names used here are informal.

Cyrovolcanic Constructs on Pluto: The most prominent examples of potential cryovolcanism on Pluto are two enormous, broad mountains with very large, deep central depressions [1,3]. The informally named Wright Mons (Fig. 1) stands ~4 km high and the main mound spans ~150 km. The informally named Piccard Mons is ~7 km high and 225 km wide [4]. Only a few potential distinct flow features are evident, but the morphology of the areas surrounding Wright and Piccard indicates there may have been multiple episodes of terrain emplacement. The hummocky flanks of Wright Mons (consisting of semi-regular hills ~8-10 km in size) are suggestive of viscous flow, but there are no distinct flow fronts or margins. These hummocks and the smaller scale boulders or ridges superimposed on them bear a resemblance to the funiscular terrain on Enceladus' south polar region. These two mounds are located SW of the tip of Pluto's Sputnik Planitia, but there is some suggestion that the cryovolcanic terrain my continue to the south and east of these features. There is also an extensive plateau to the west of Wright Mons with a relatively flat surface. This plateau exhibits many large depressions with various morphologies, most of which do not appear to have an impact origin.

Each potential example of cryovolcanism found in the outer solar system is unique, and Pluto and Charon's features expand the information we have to understand this enigmatic process. We will present image, topographic, and composition data for these feature along with geologic mapping results. We will discuss potential formation mechanisms in light of available empirical and model constraints.

References: [1] Moore J.M. et al. (2016) *Science 351*, 1284-1293. [2] McKinnon W.B. et al. (2016) *Nature 534*, 82-85. [3] Singer K.N. et al. (2016) *Planetary Mappers Meeting, 1920*, #7017, [4] Schenk P.M. et al. (2018) *Icarus in revision*.

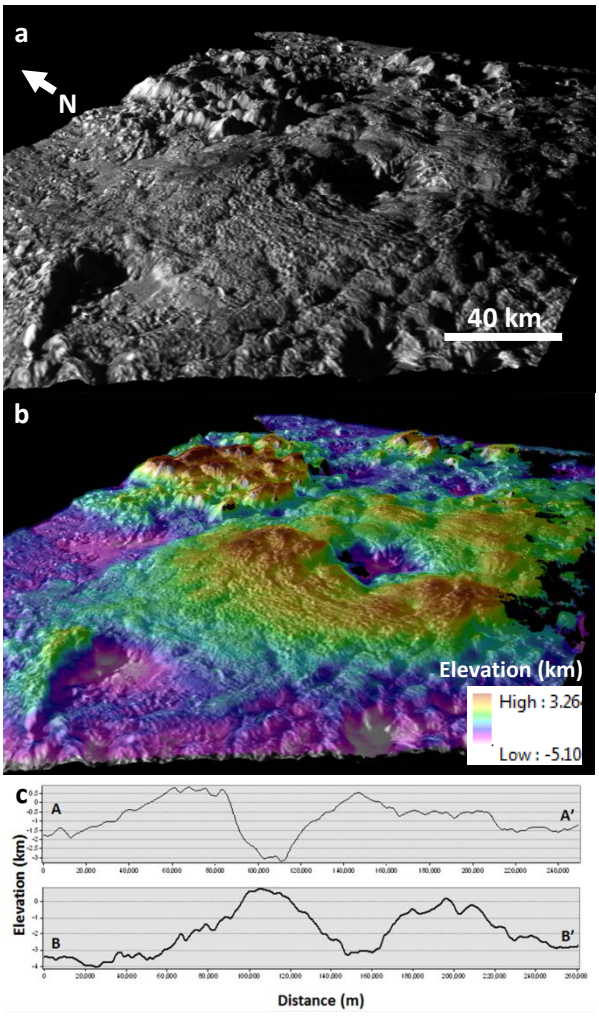

Figure 1. (a-b) Perspective views of Pluto's Wright Mons with two times vertical exaggeration. (c) Topographic profiles over Wright Mons taken from approximately NW to SE (A to A′) and NE to SW (B to B′). These profiles indicate the large width and depth of the central depression.