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After nearly a decade en route, New Horizons flew through the Pluto system in July 2015. The encounter hemisphere of Pluto shows ongoing surface geological activity centered on a vast basin (Sputnik Planum [SP]\*) containing a thick layer of volatile ices with a crater retention age no greater than ~10 Ma. Surrounding terrains show active glacial flow, apparent transport and rotation of large buoyant water-ice crustal blocks, and pitting, likely by sublimation erosion and/or collapse. Also seen are constructional mounds with central depressions, and ridges with complex bladed textures. Pluto has ancient cratered terrains up to ~4 Ga old that are fractured and mantled, and perhaps eroded by glacial processes [1]. Charon does not appear to be currently active, but experienced major tectonism and resurfacing nearly 4 Ga ago. Imaging spectrometer observations of Pluto reveal the encounter hemisphere to be dominated by volatile ices of N<sub>2</sub>, CO, and CH<sub>4</sub>, along with non-volatile components that include H<sub>2</sub>O and tholins [4]. The most volatile of Pluto's ices (N<sub>2</sub> and CO) are especially prevalent in the western half of Tombaugh Regio (TR), and the strikingly flat Sputnik Planum basin, which lies a few km below surrounding elevations. The high mobility of N<sub>2</sub> and CO ices enables SP's surface to refresh itself sufficiently rapidly that no impact craters are seen there [5]. This likely occurs through a combination of solid state convective overturning and sublimation/ condensation that produces regular patterns of pits and ridges on scales of 10<sup>2</sup> to 10<sup>3</sup> m. In many areas, CH<sub>4</sub> appears to favor topographically high regions. Its propensity to condense on ridges could play a role in forming the bladed terrain seen in Tartarus Dorsa. H<sub>2</sub>O can be discerned across much of Cthulhu Regio, and also in a few isolated spots. In many regions, H<sub>2</sub>O ice is associated with reddish tholin coloration. Pluto's atmosphere was probed with the radio science experiment (REX) and the Alice UV spectrometer, as well as imaging at high phase angles. The surface pressure, due mostly to N<sub>2</sub>, is ~11 μbar. Extensive multiple haze layers are seen in the images. Alice has detected hydrocarbons in addition to CH<sub>4</sub> in the atmosphere. Since both are inert, H<sub>2</sub>O ice and tholin could have similar geological behaviors on Pluto, possibly including aeolian transport or mobilization by volatile ice glaciation. While Pluto's H<sub>2</sub>O ice is sculpted and at least partially veiled by more volatile ices, Charon's heavily cratered H<sub>2</sub>O ice is exposed globally. H<sub>2</sub>O ice spectral bands characteristic of crystalline ice are seen everywhere on the encounter hemisphere. Charon's north polar region is strikingly red, possibly the result of the unique thermal environment of Charon's poles, which become exceptionally cold during the long, dark winters. Extremely cold regions on Charon' could cold trap gases expanding outward from Pluto as ices, and thereby subject them to rapid radiolytic processing [4,5]. Charon also exhibits a weak NH<sub>3</sub> absorption band over most or all of its surface, with small local concentrations. Detailed results of the radio science [6], small satellite [7], particles and plasma [8], and atmosphere [9] investigations are in press. *\*All place names throughout this abstract and the associated talk are informal.*