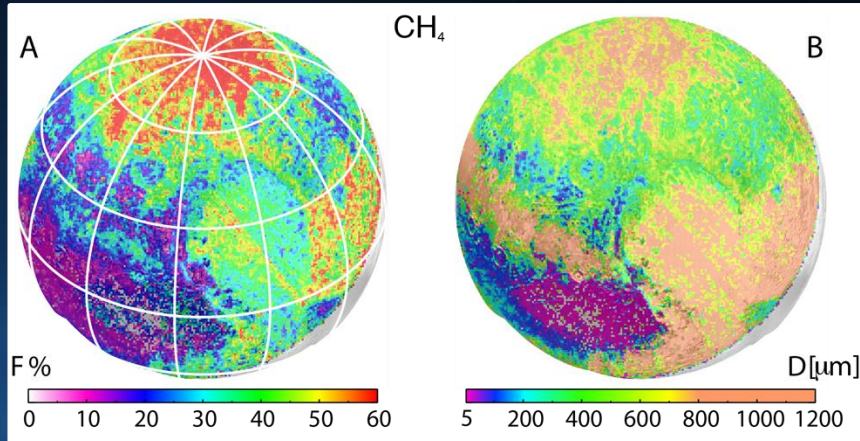
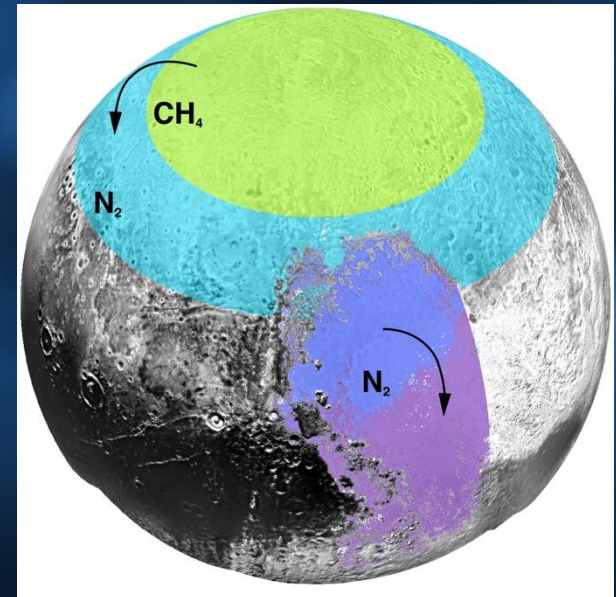


# Pluto's Global Surface Composition



Abundance (left) and grain size (right) of methane ( $\text{CH}_4$ ) on Pluto.

Compositional maps of volatile and non-volatile components of Pluto's surface have been made using advanced spectral modeling and radiative transfer tools applied to data from the Ralph/LEISA infrared imaging spectrograph on *New Horizons*.



Schematic view of the large scale variations identified across the surface of Pluto. The arrows indicate the direction of the nitrogen ( $\text{N}_2$ ) sublimation transport.

- **Latitudinal variations of methane ( $\text{CH}_4$ , above) and nitrogen ( $\text{N}_2$ ) ices are driven by differences in insolation.** Over the past few decades, increased insolation at Pluto's north pole (green area on the right) has sublimated most of volatile  $\text{N}_2$  into the atmosphere, where it is transported and recondensed at points southward (cyan).
- **Possible sublimation transport of  $\text{N}_2$  ice within Sputnik Planitia.** The latitudinal pattern is broken by Sputnik Planitia (purple and blue regions in the figure on the right), a large reservoir of volatiles, with  $\text{N}_2$  playing the most important role. Sublimation of  $\text{N}_2$  in the northern regions of Sputnik Planitia (blue) reduces the abundance of  $\text{N}_2$  in that area and redeposits to the south (purple).