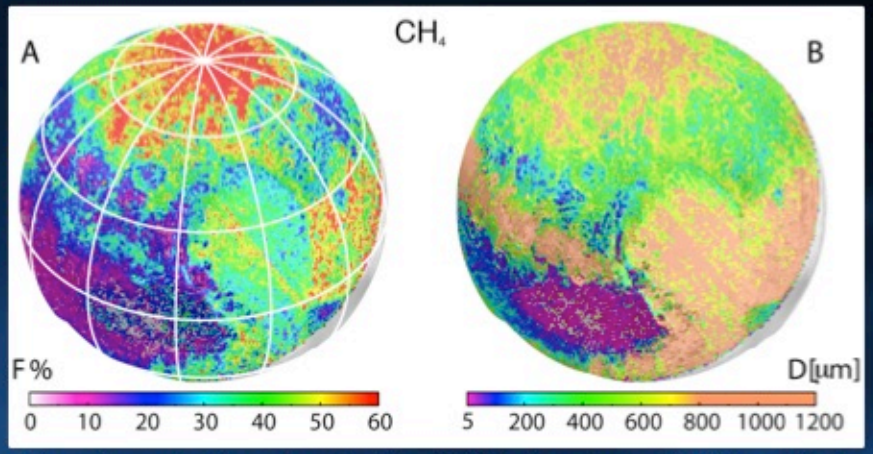
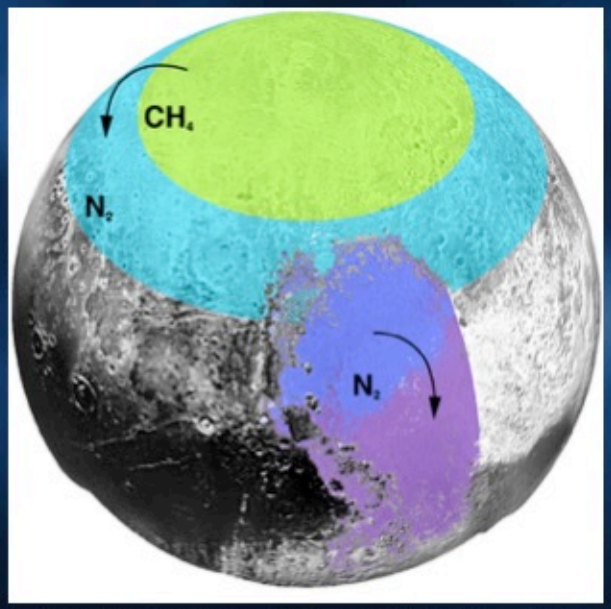
Pluto's Global Surface Composition



Abundance (left) and grain size (right) of methane (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*.

- Latitudinal variations of methane (CH_4, above) and nitrogen (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 N_2 into the atmosphere, where it is transported and recondensed at points southward (cyan).
- Possible sublimation transport of 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 N_2 playing the most important role. Sublimation of N_2 in the northern regions of Sputnik Planitia (blue) reduces the abundance of N_2 in that area and redeposits to the south (purple).



Schematic view of the large scale variations identified across the surface of Pluto. The arrows indicate the direction of the nitrogen (N_2) sublimation transport.

Protopapa et al., ***Icarus***, in press