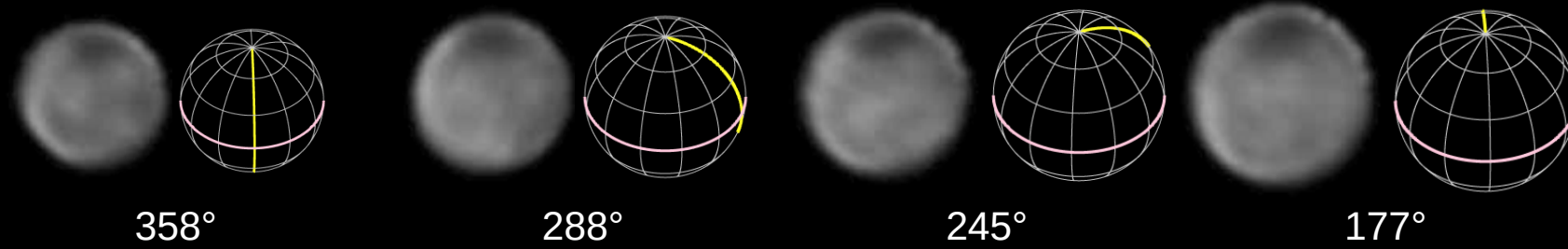
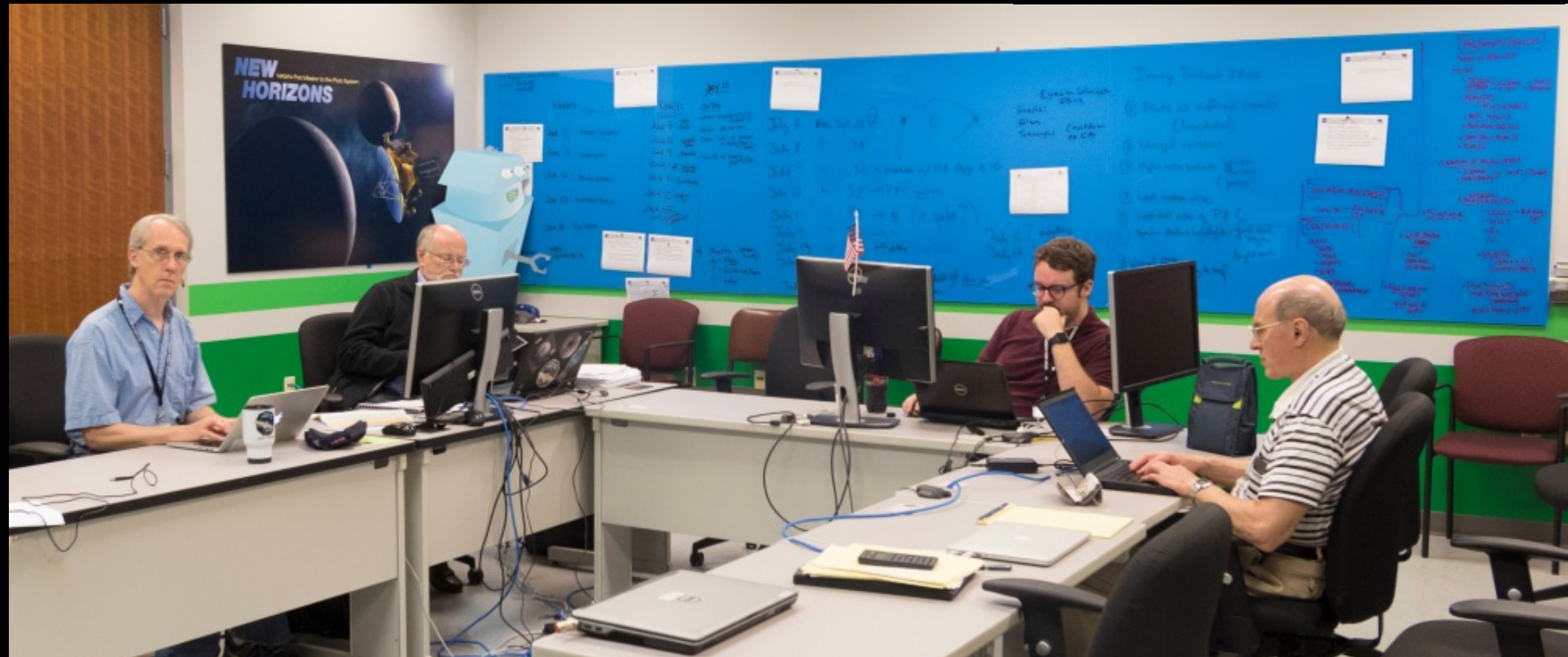
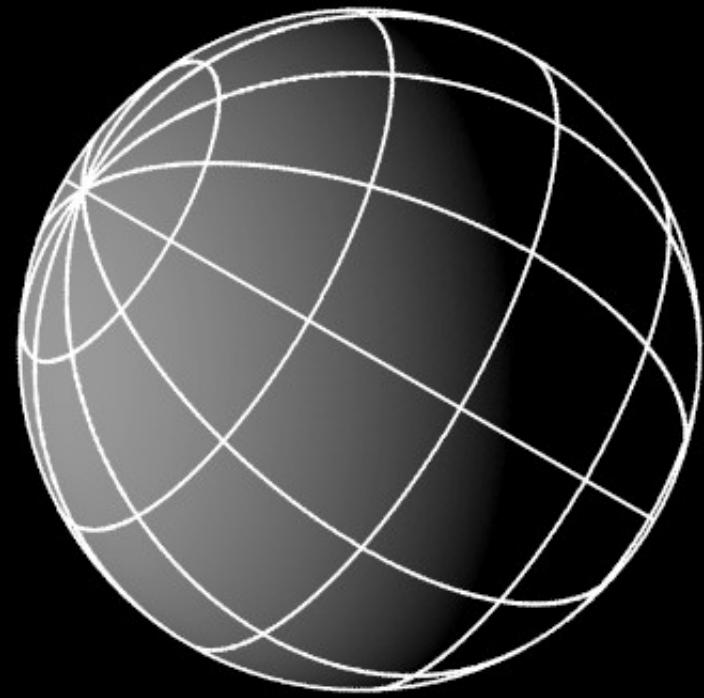


Formation of Charon's Red Polar Caps

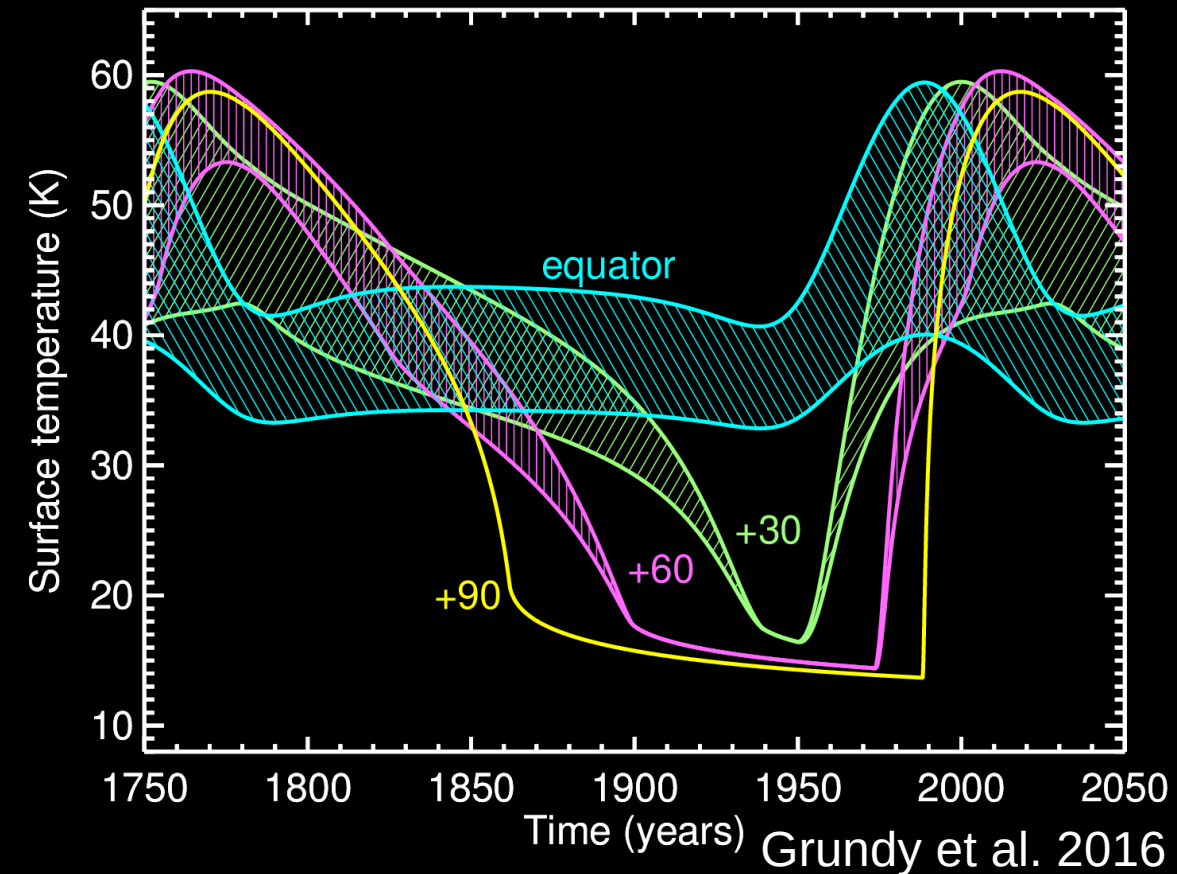
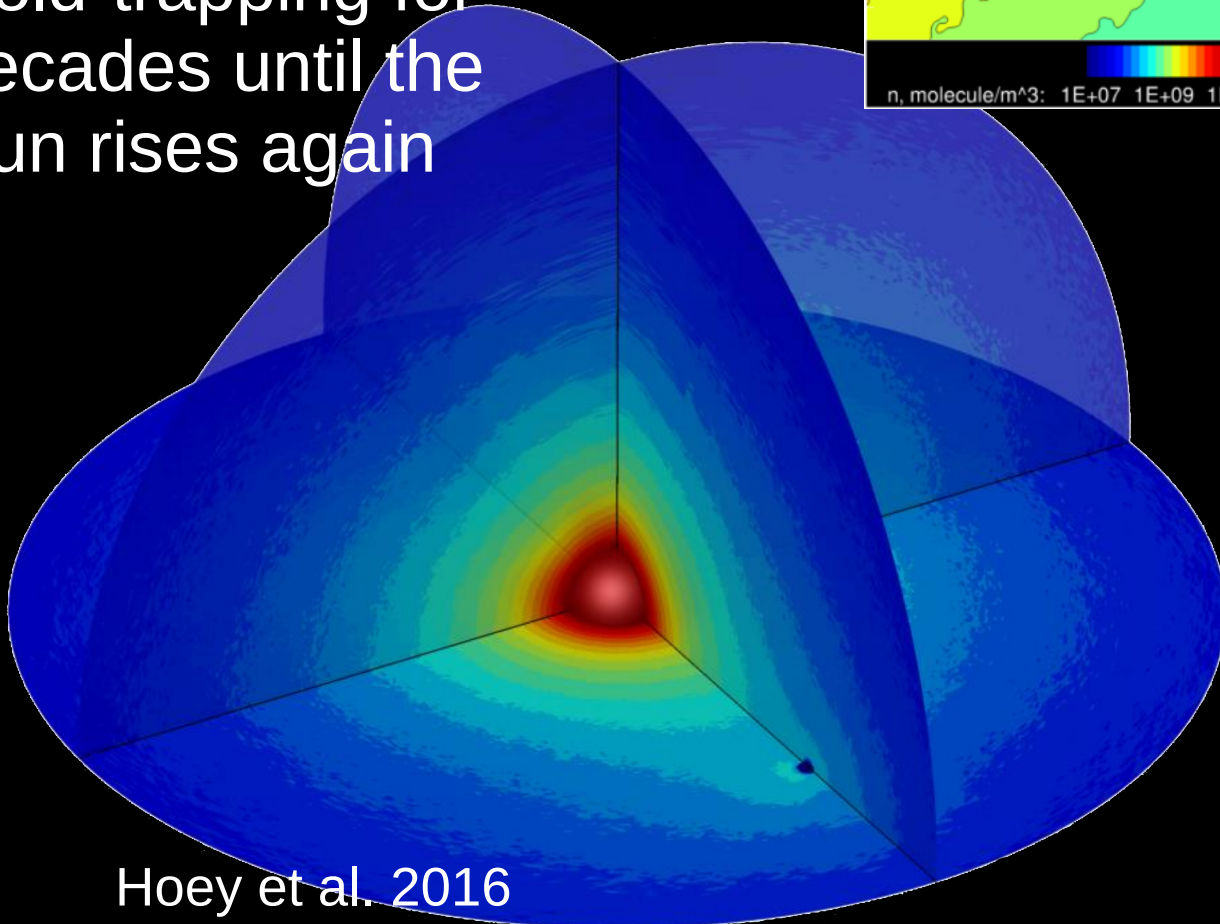
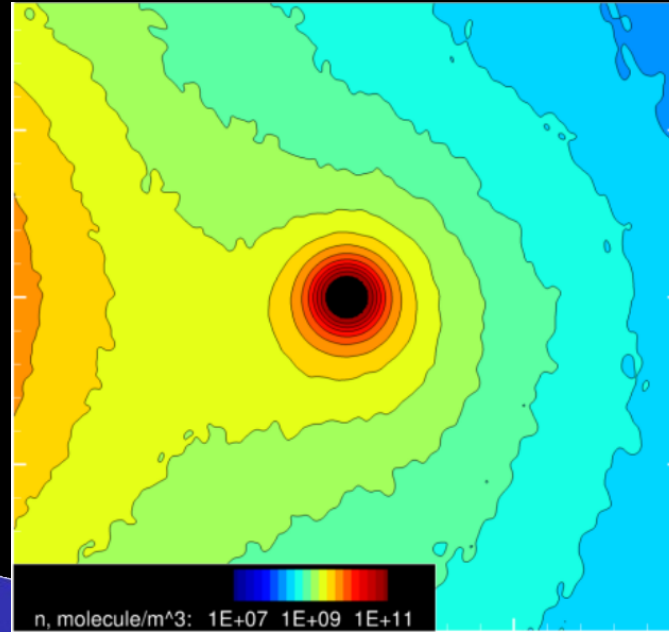


A Planetary Whodunnit



- Pluto's escaping atmosphere (CH_4)
- Influence of Charon's gravity
- Long, dark, winters
- Cold-trapping for decades until the Sun rises again

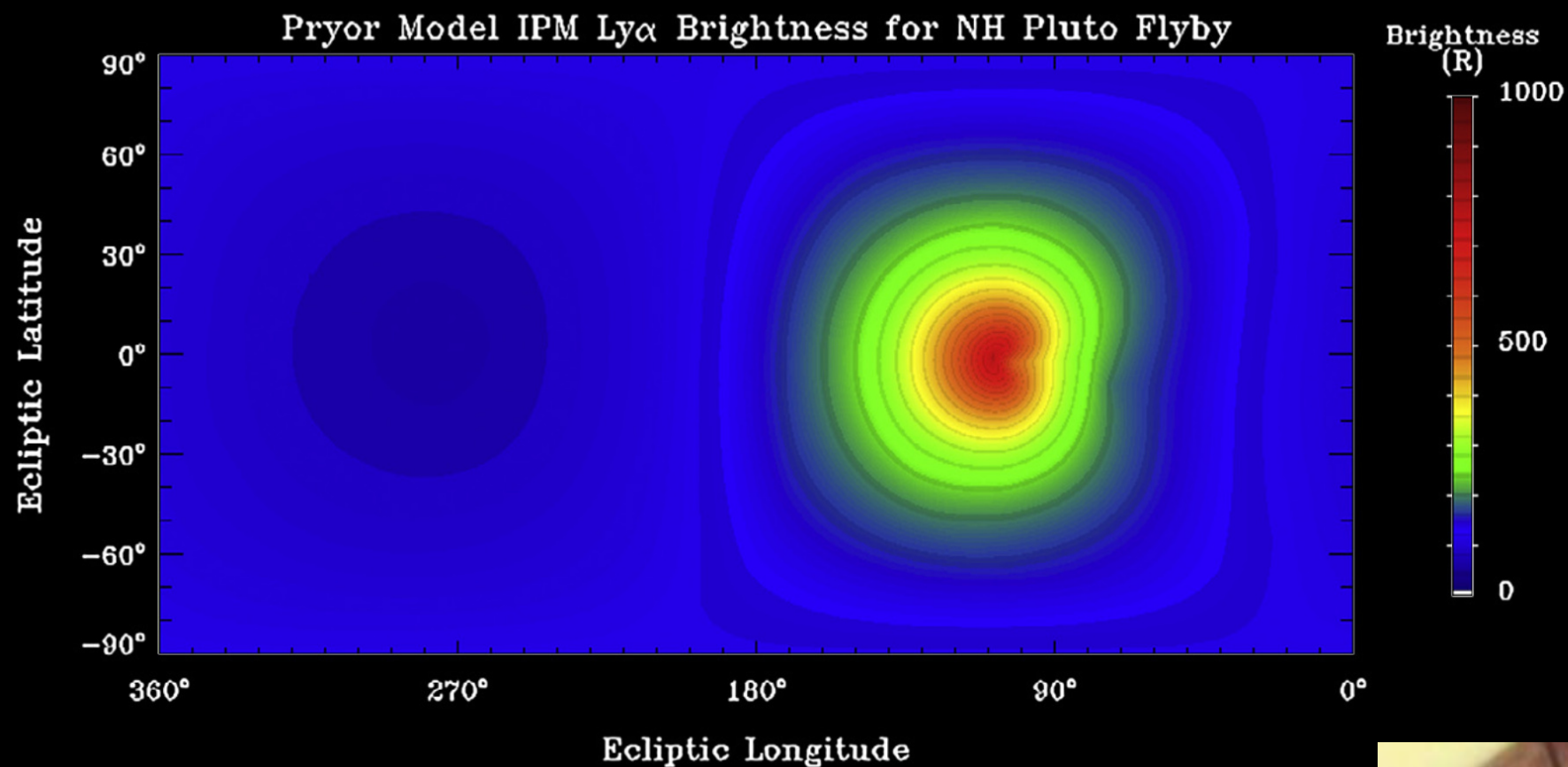
Hypothesized Mechanism



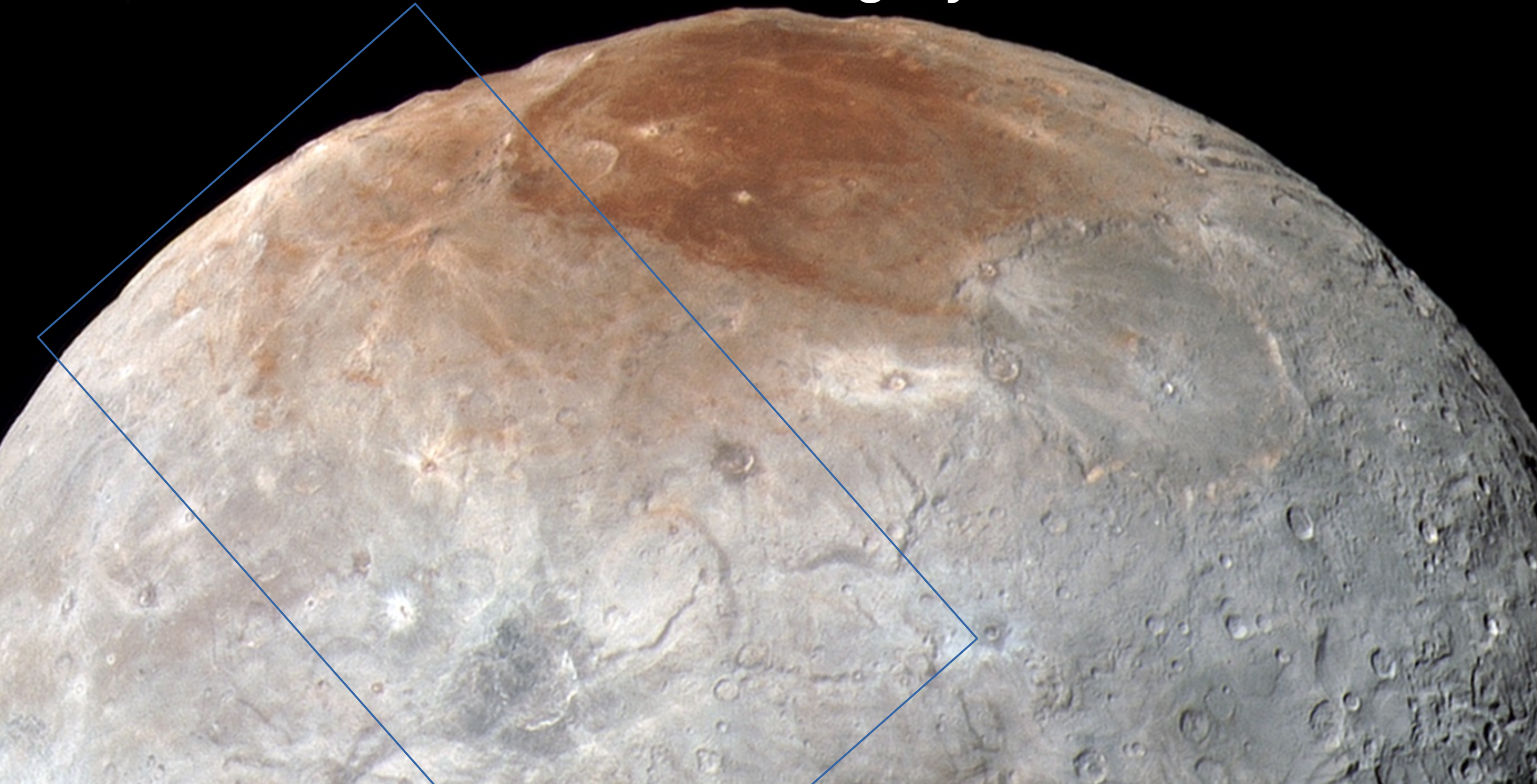
Hypothesized Mechanism

G. Randall Gladstone et al. / Icarus 246 (2015) 279–284

- Irradiated by scattered Ly α
- Production of heavier, less volatile species
- These remain when methane sublimates away in spring
- Feedstock for subsequent tholin production
- Accumulation rate of order mm per million years
- Faster than satellite dust infall, but comparable to impact gardening



Better Imagery

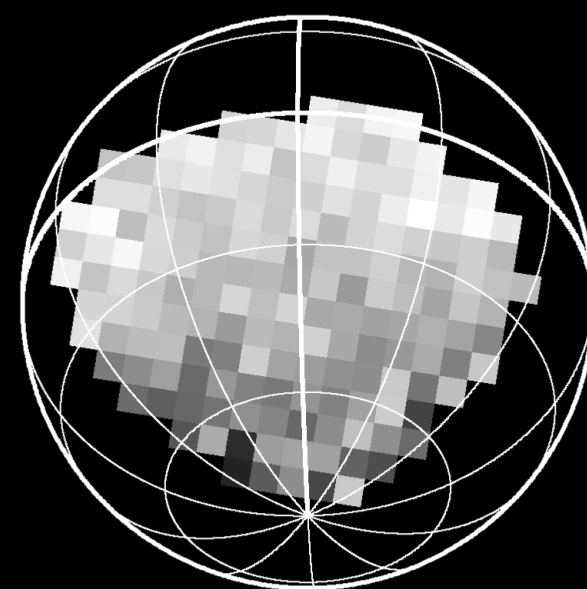
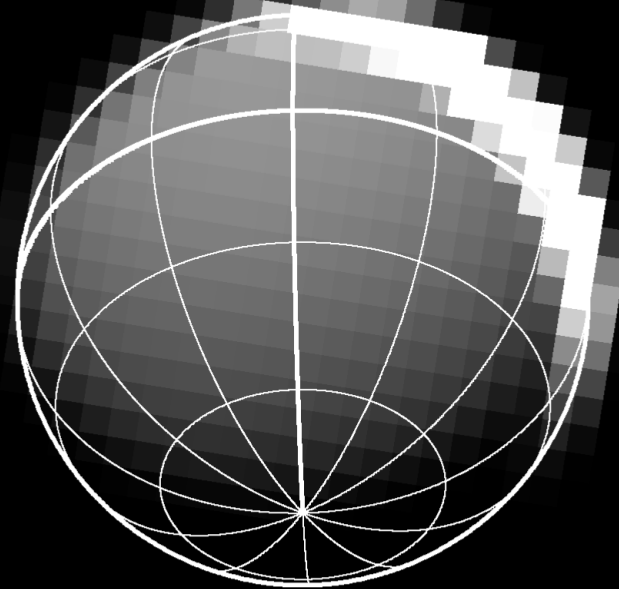
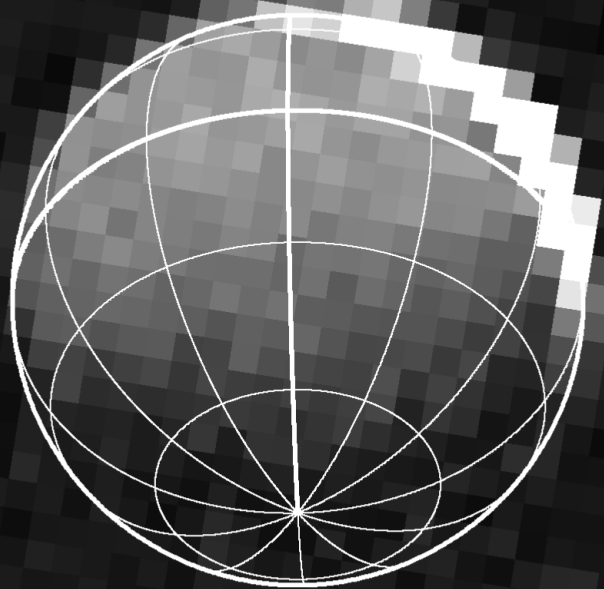


Highest Resolution Imagery

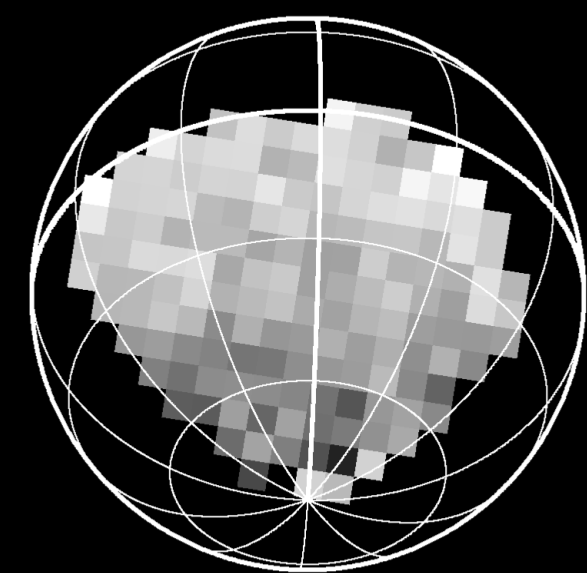
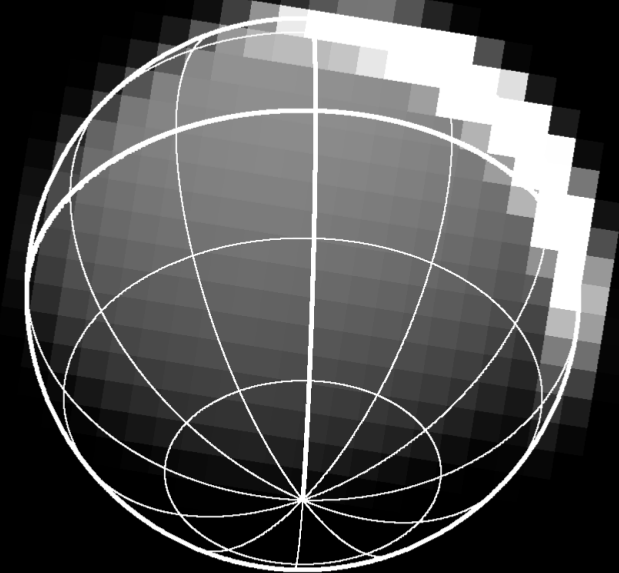
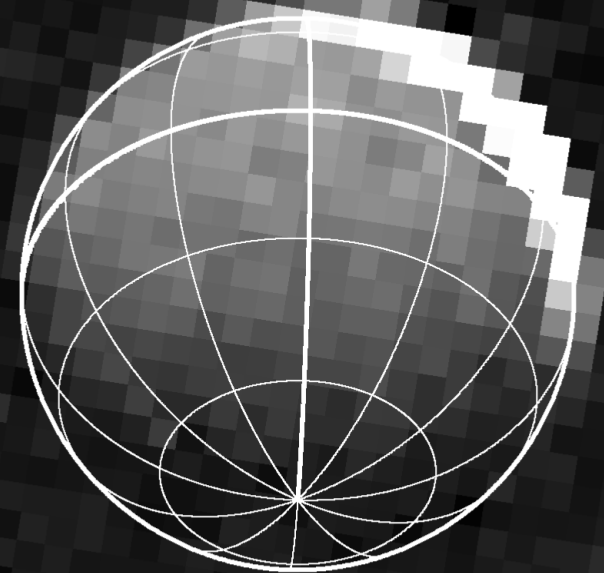


Winter Pole in Pluto-Shine

Stack
1



Stack
2

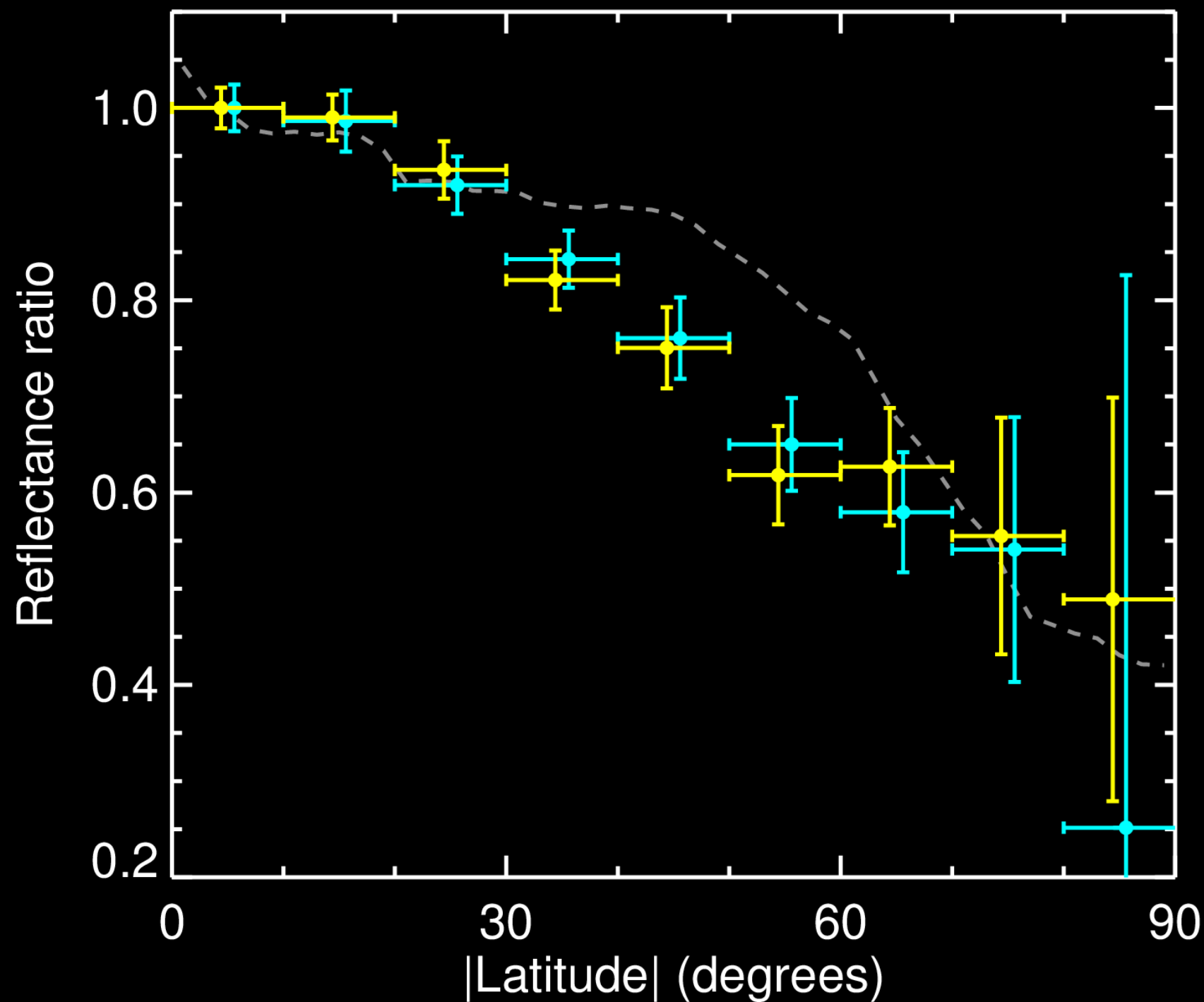
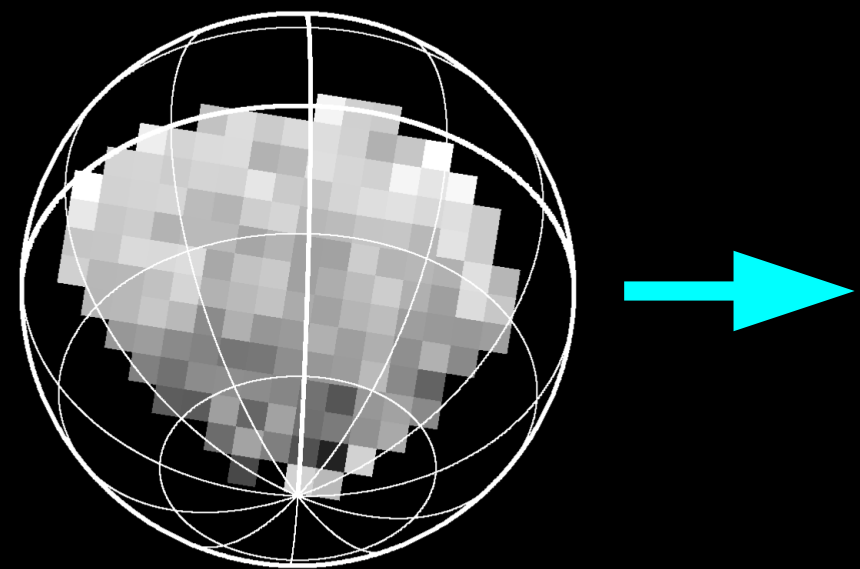
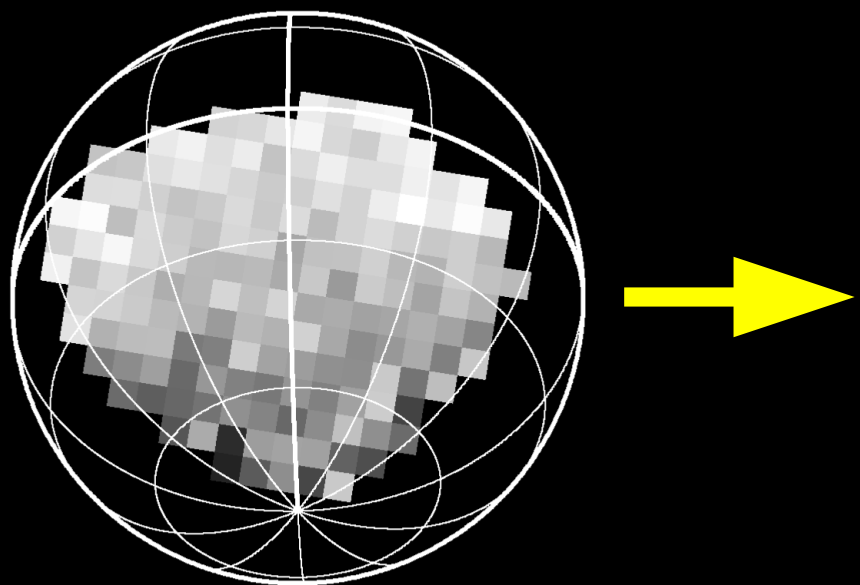


data

model

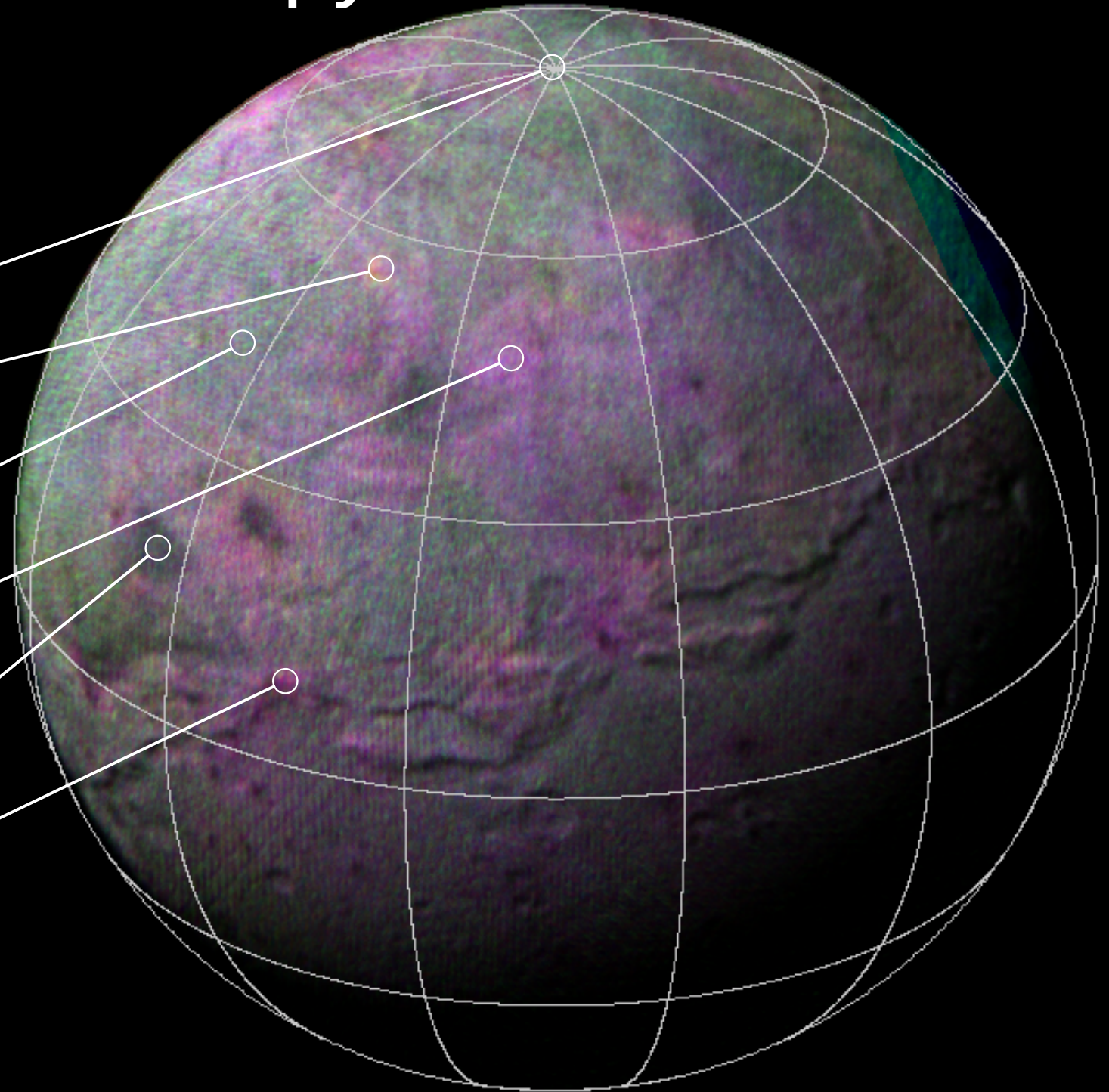
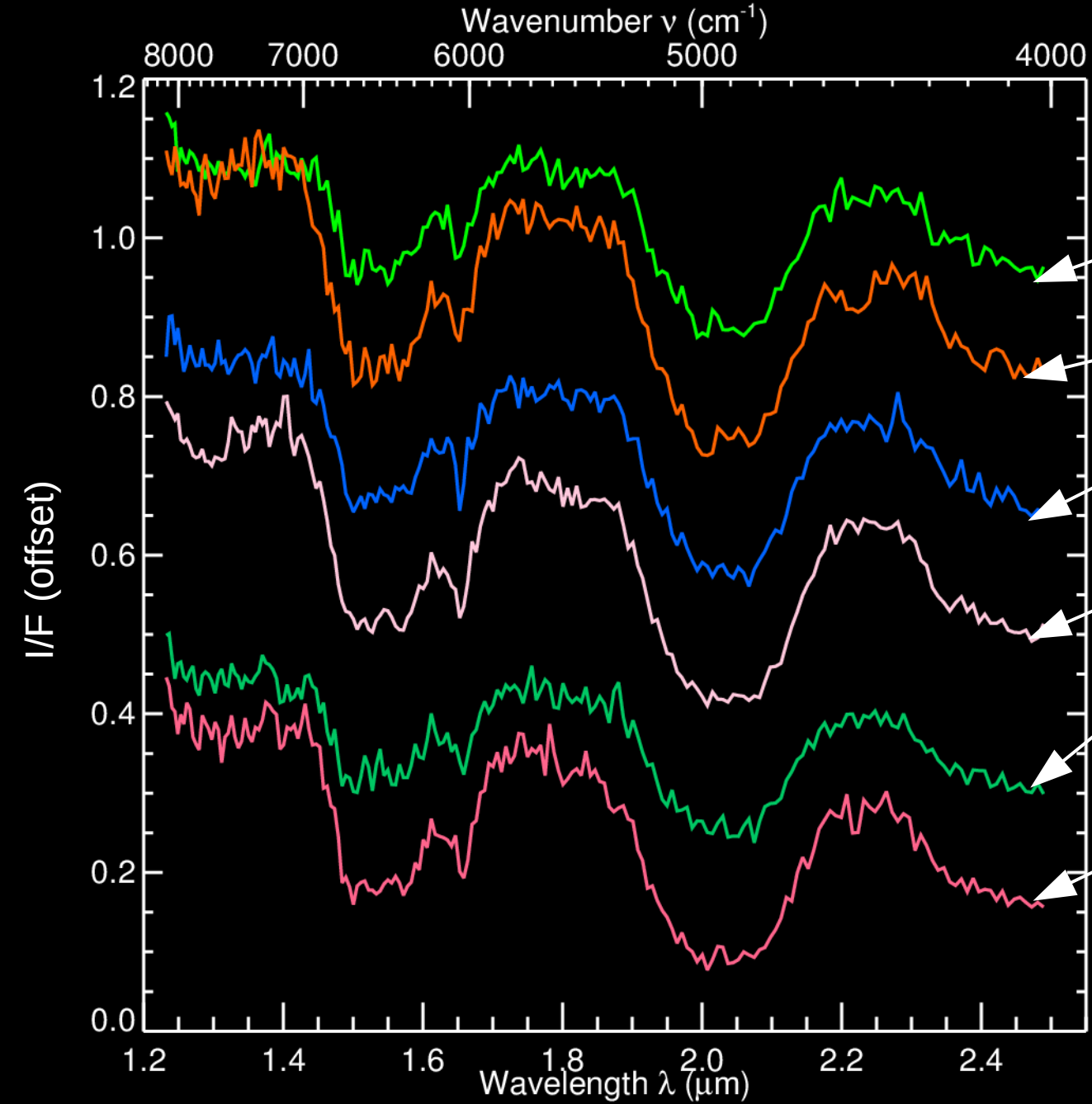
ratio

Comparison of S and N Hemispheres

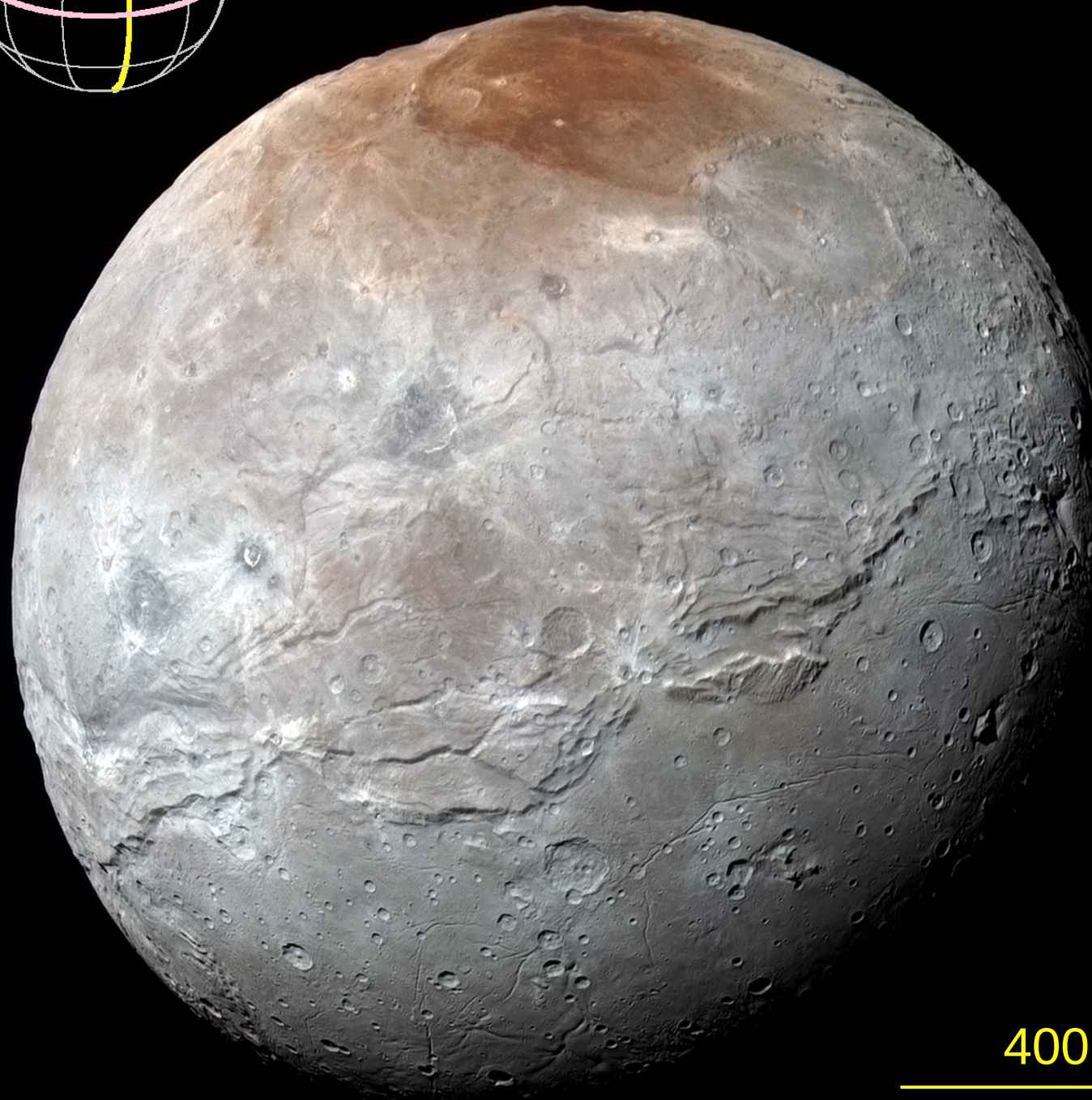
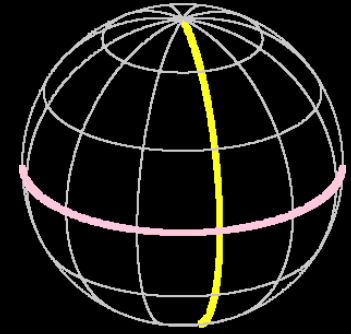


Backup Slides

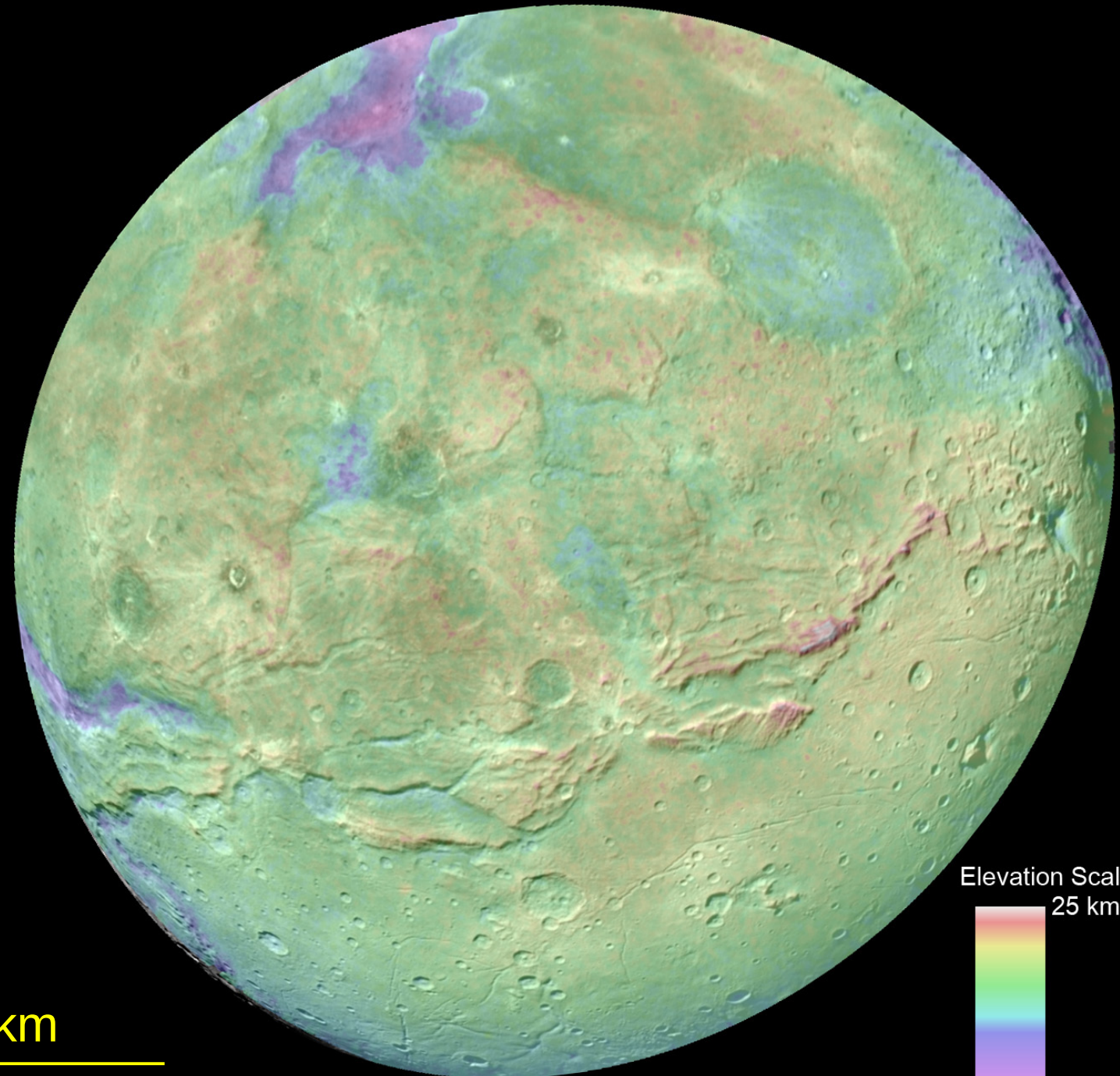
IR Spectroscopy



Color and Topography



400 km

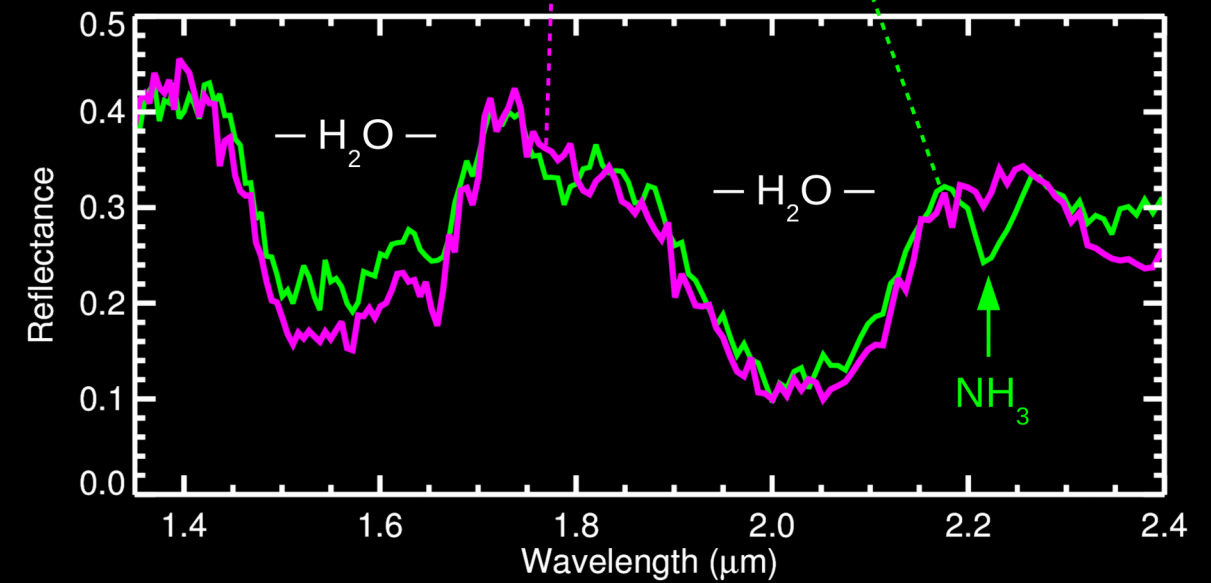
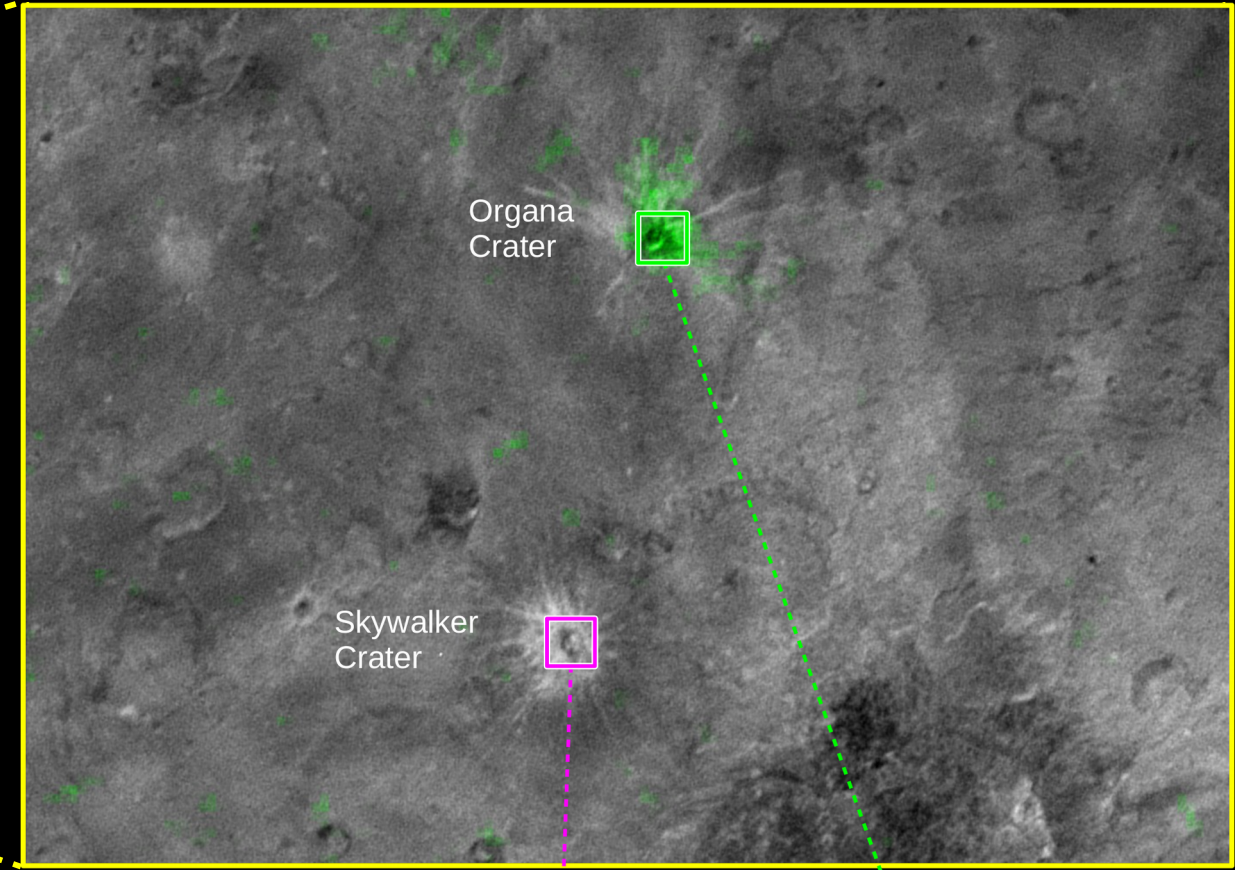
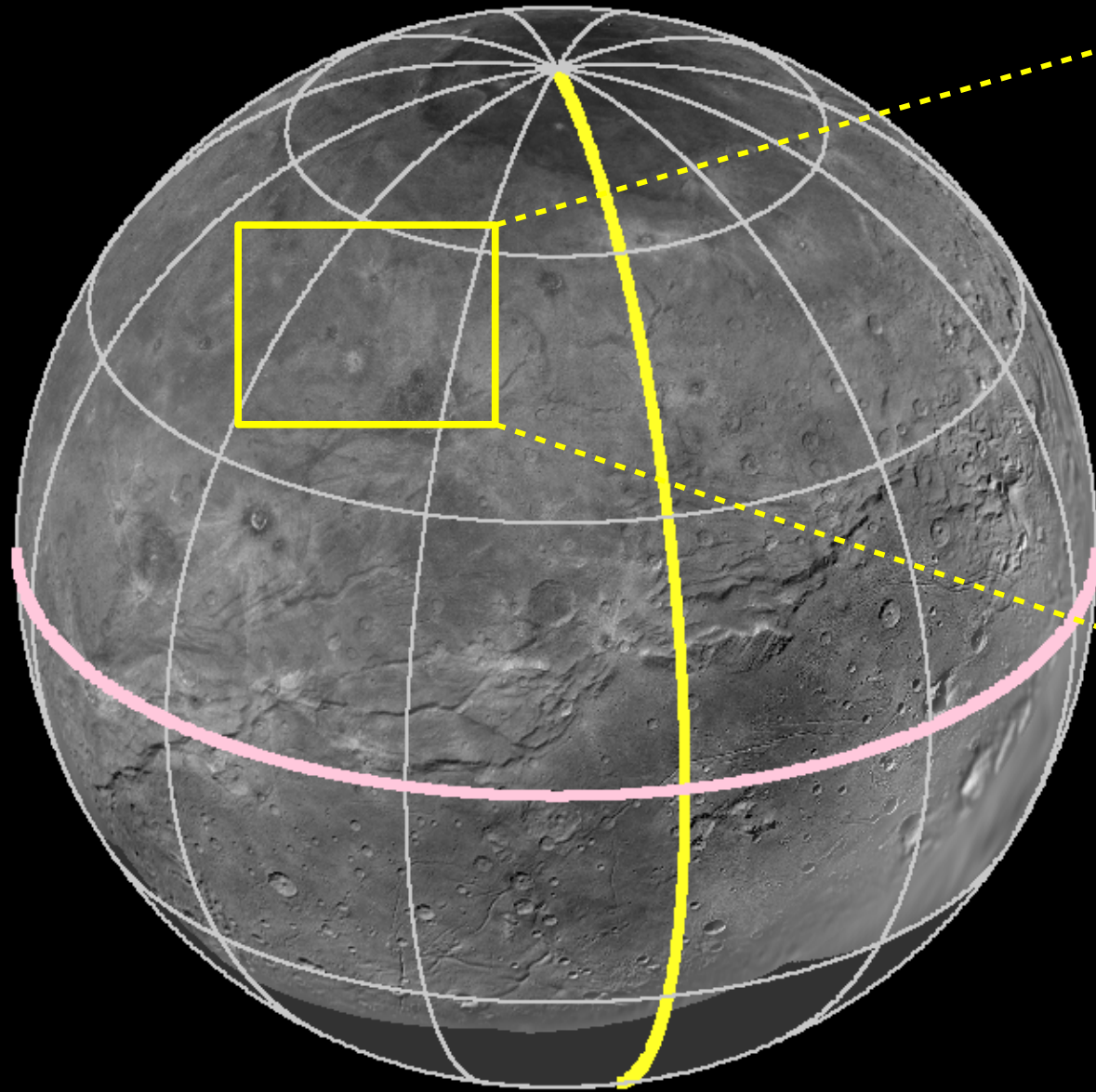


Elevation Scale
25 km

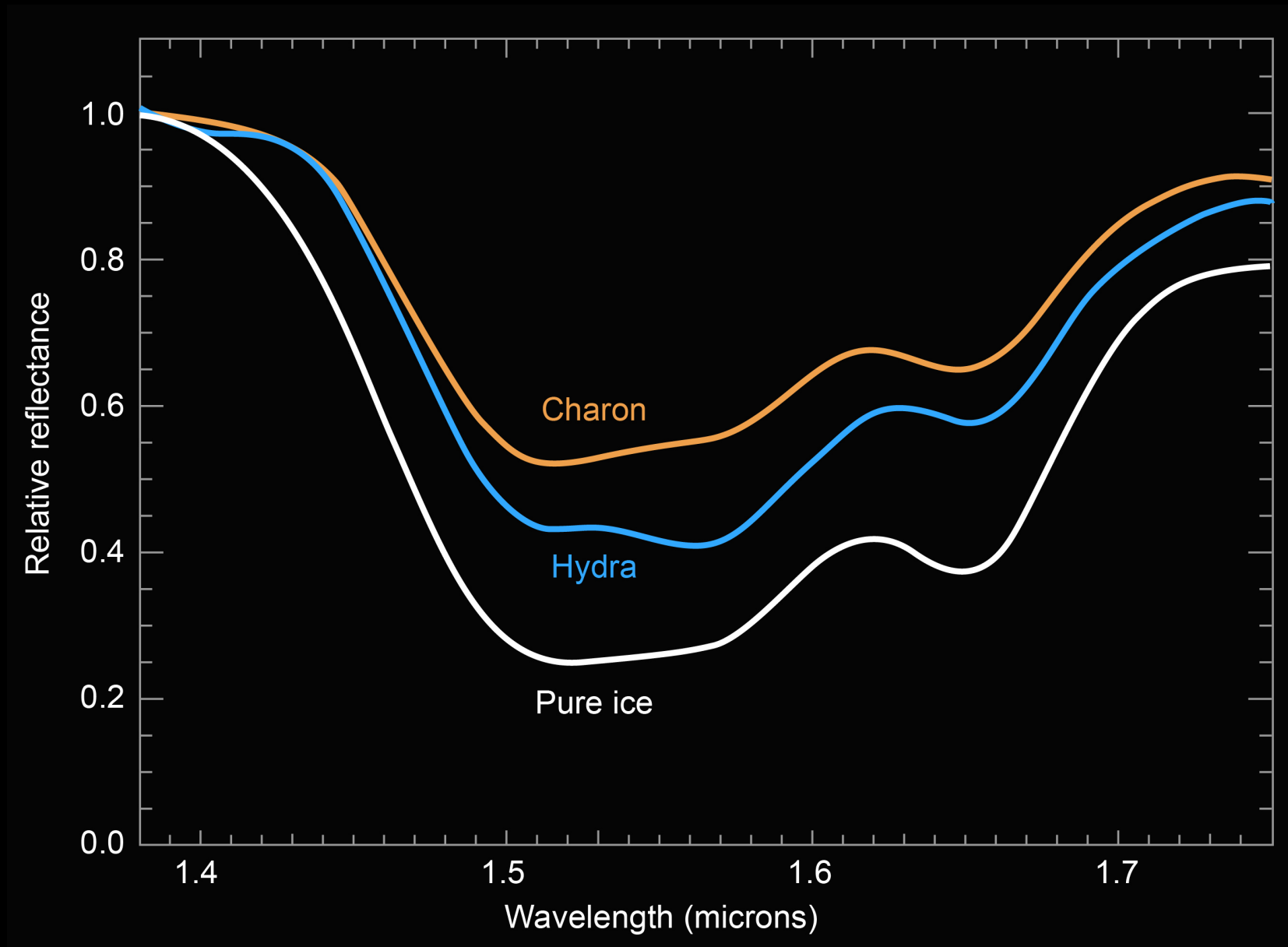


0 km

Isolated NH_3 -Rich Outcrops



Bright, Clean H₂O Ice



Charon
752 miles (1,210 km)
diameter



Hydra
~31 miles (~50 km)
long dimension