

New Horizons Encounter with Pluto: Coming in 2015!



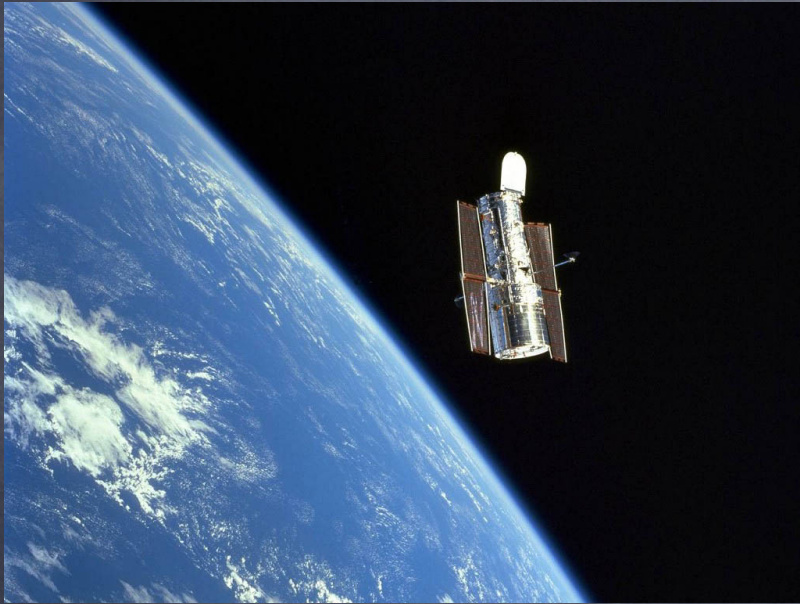
Dr. Christopher Palma
Penn State Astronomy & Astrophysics

Why did I plan this talk for this audience?



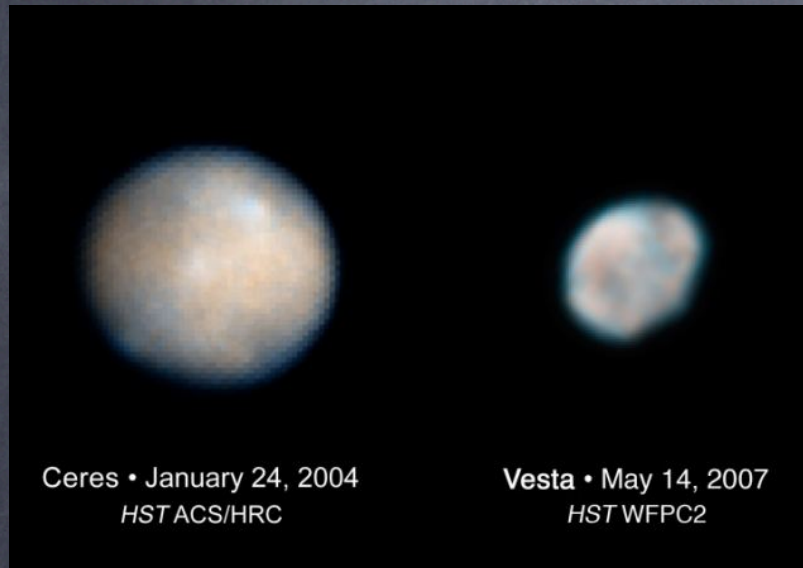
- ★ The space part of “Earth & Space”
- ★ Our research tells us that students don’t know how scientists know about the planets and their properties
- ★ The evidence part of Claim, Evidence, Reasoning
- ★ Pluto remains the biggest question astronomers are asked almost 10 years later!

The Hubble (and others) and satellites are our instruments.

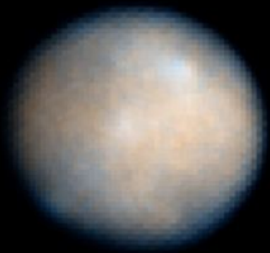


- ★ Students believe that if we know a planet's composition, density, or other property, that astronauts must have visited and brought back a sample

Hubble provides great data, but can't beat going there.



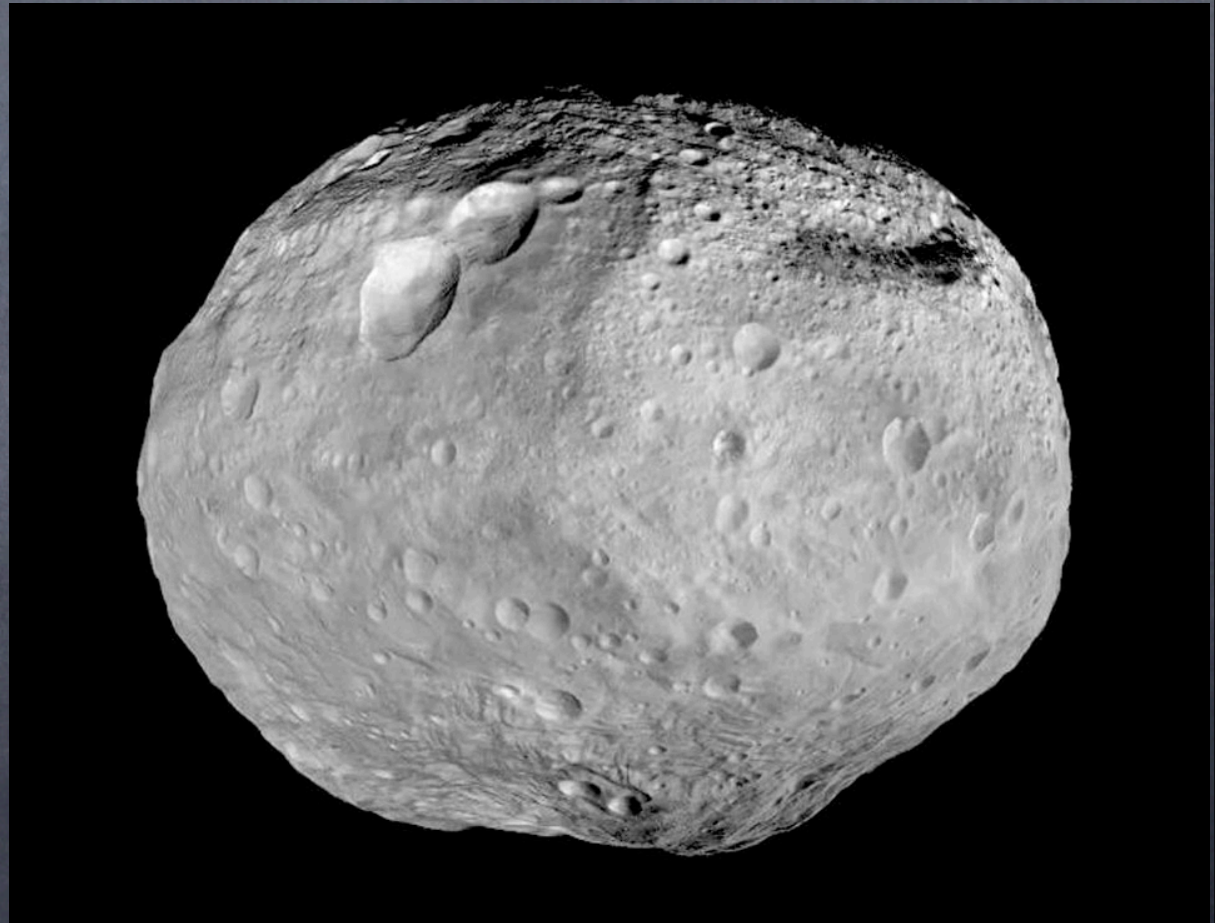
Hubble provides great data, but can't beat going there. (by robot)



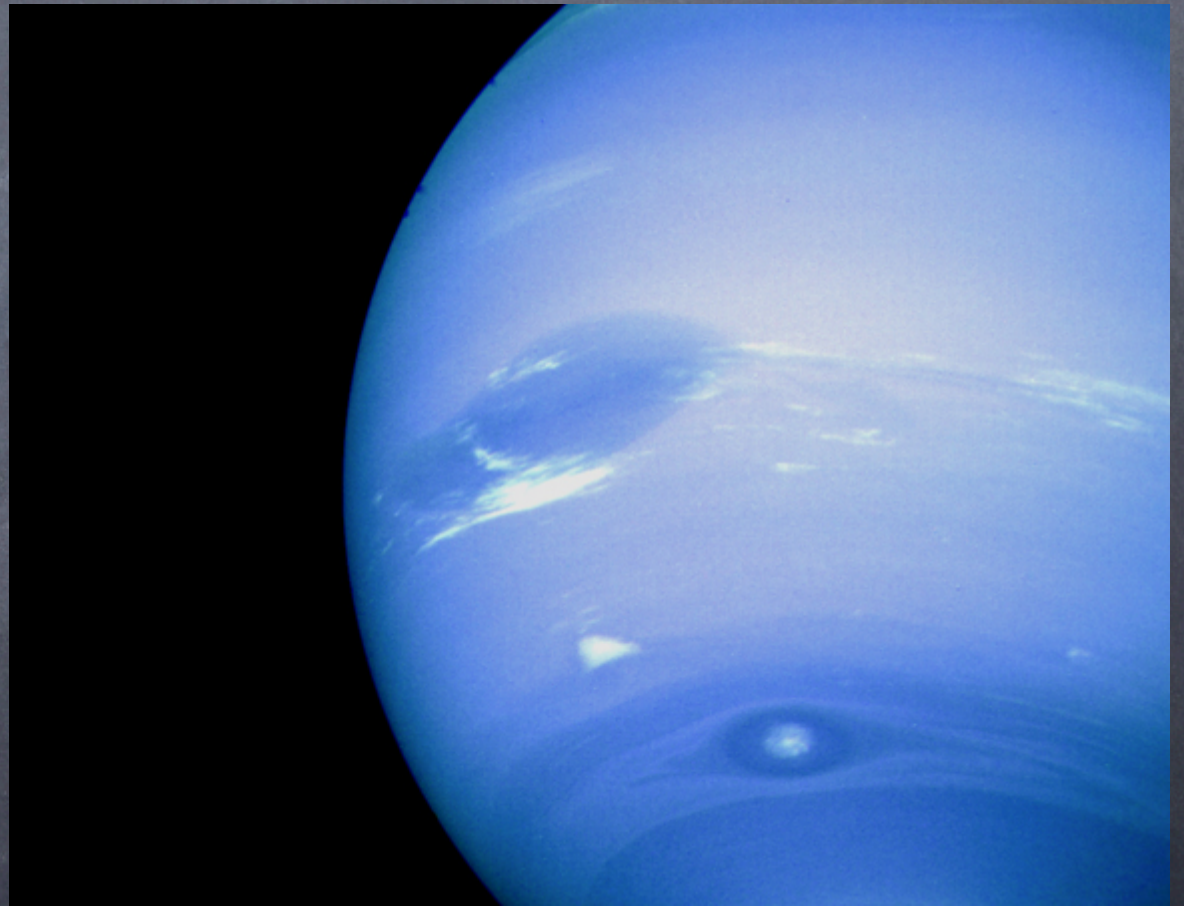
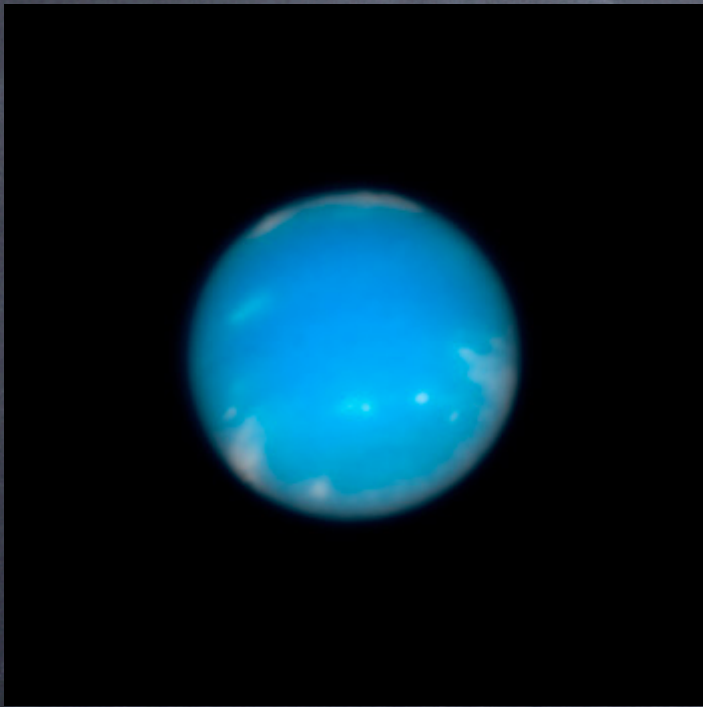
Ceres • January 24, 2004
HST ACS/HRC



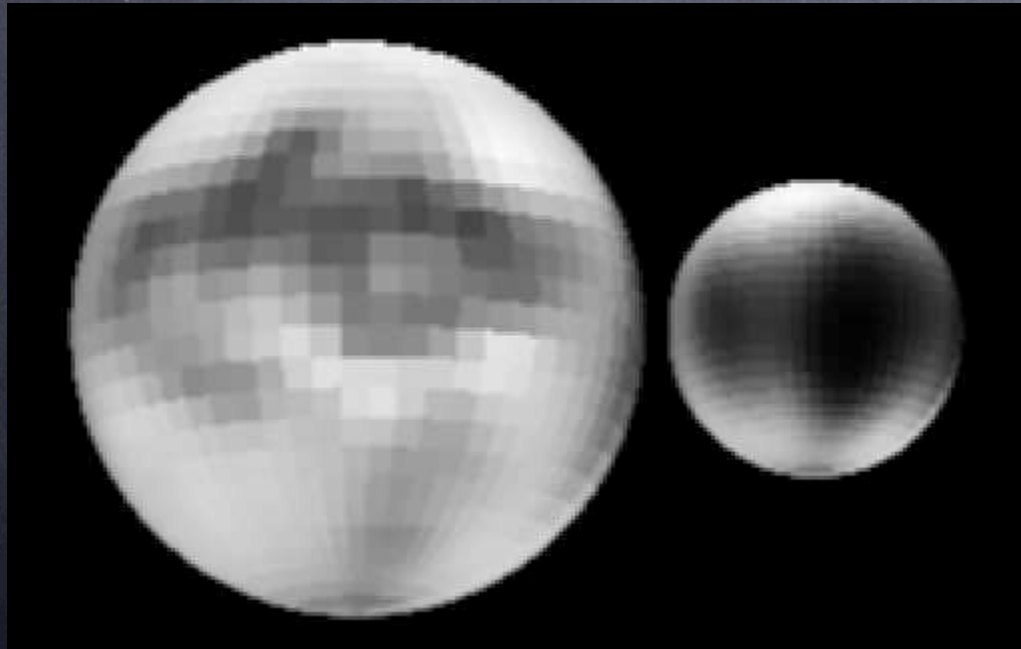
Vesta • May 14, 2007
HST WFPC2



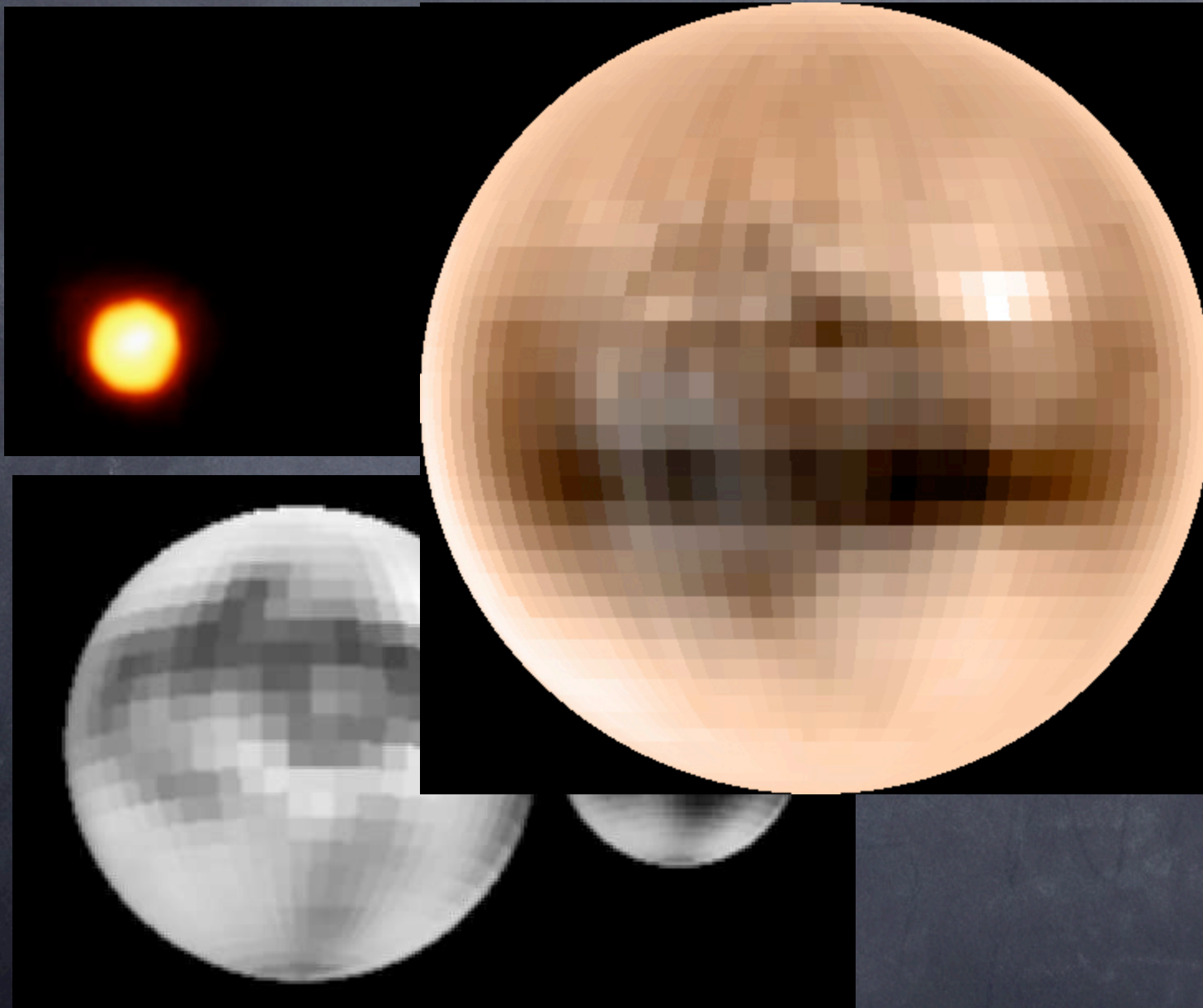
Vesta is in the Asteroid Belt, more than 10 times closer than Neptune.



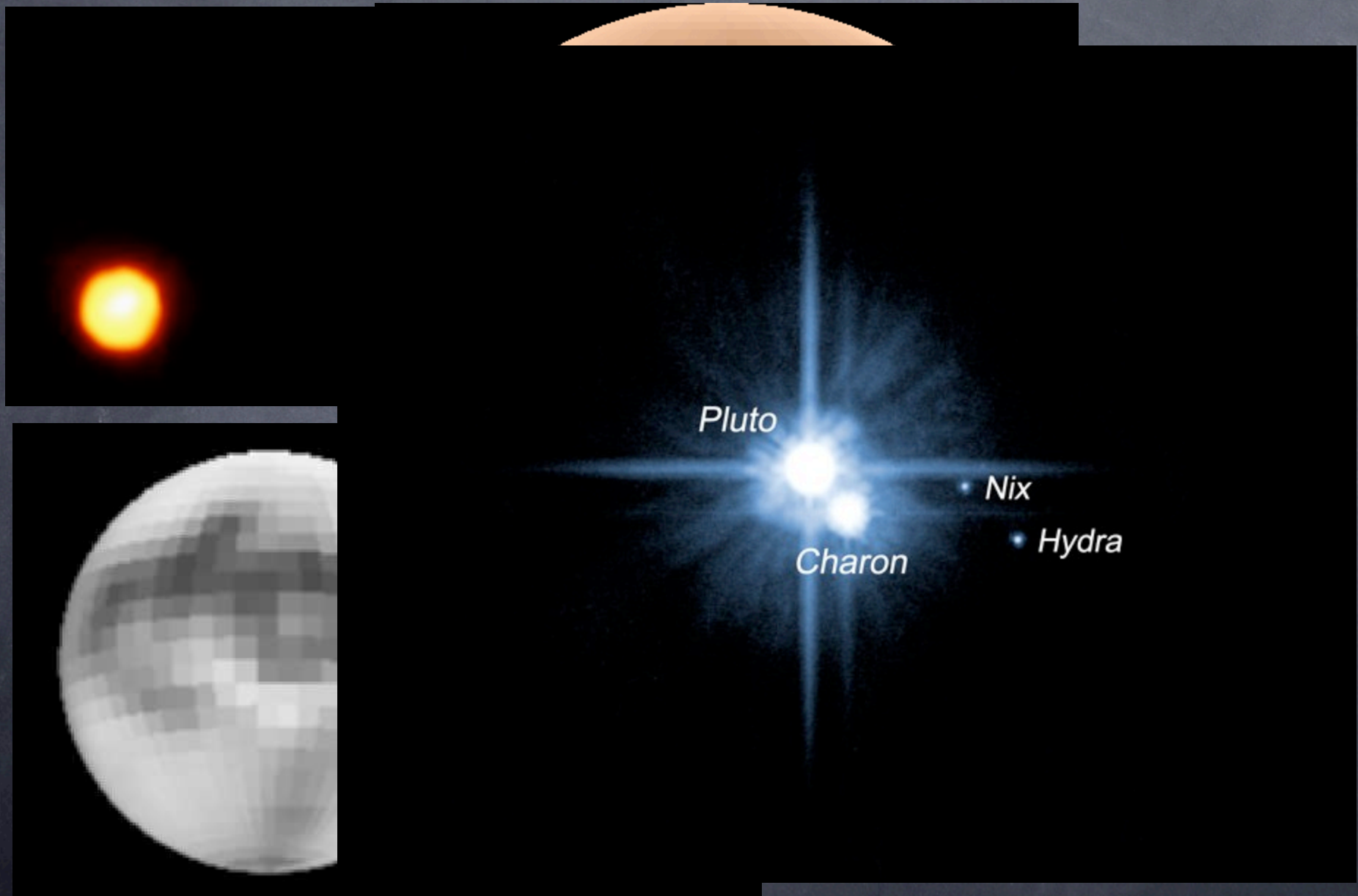
These are our best views of Pluto.



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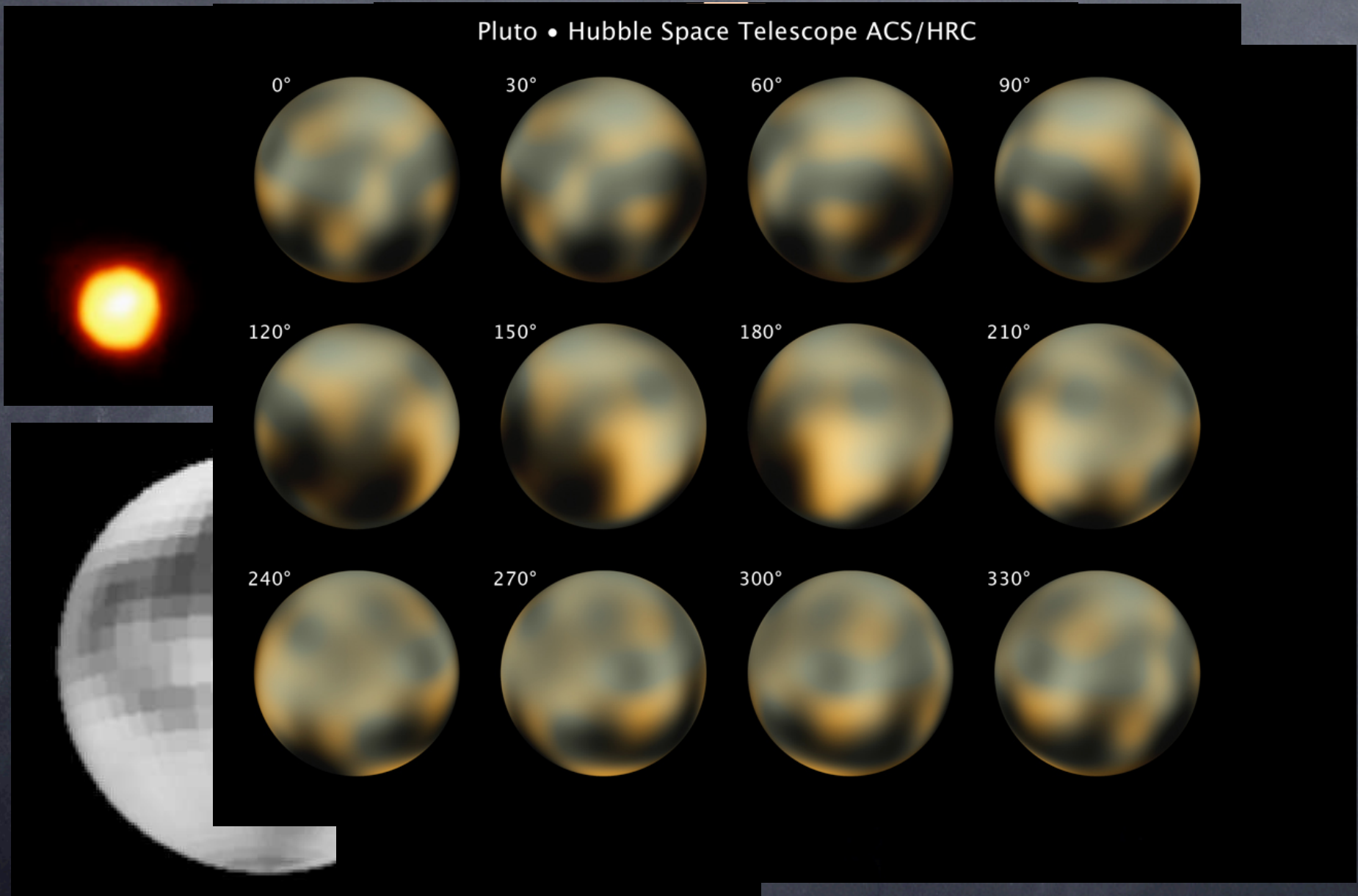


These are our best views of Pluto.



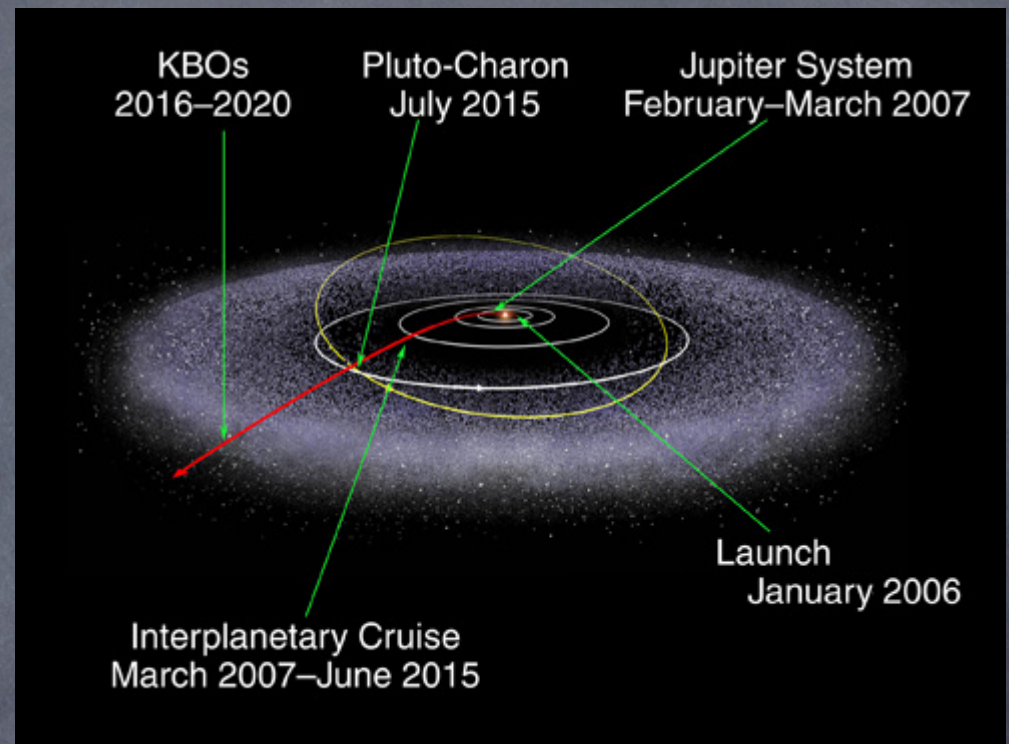
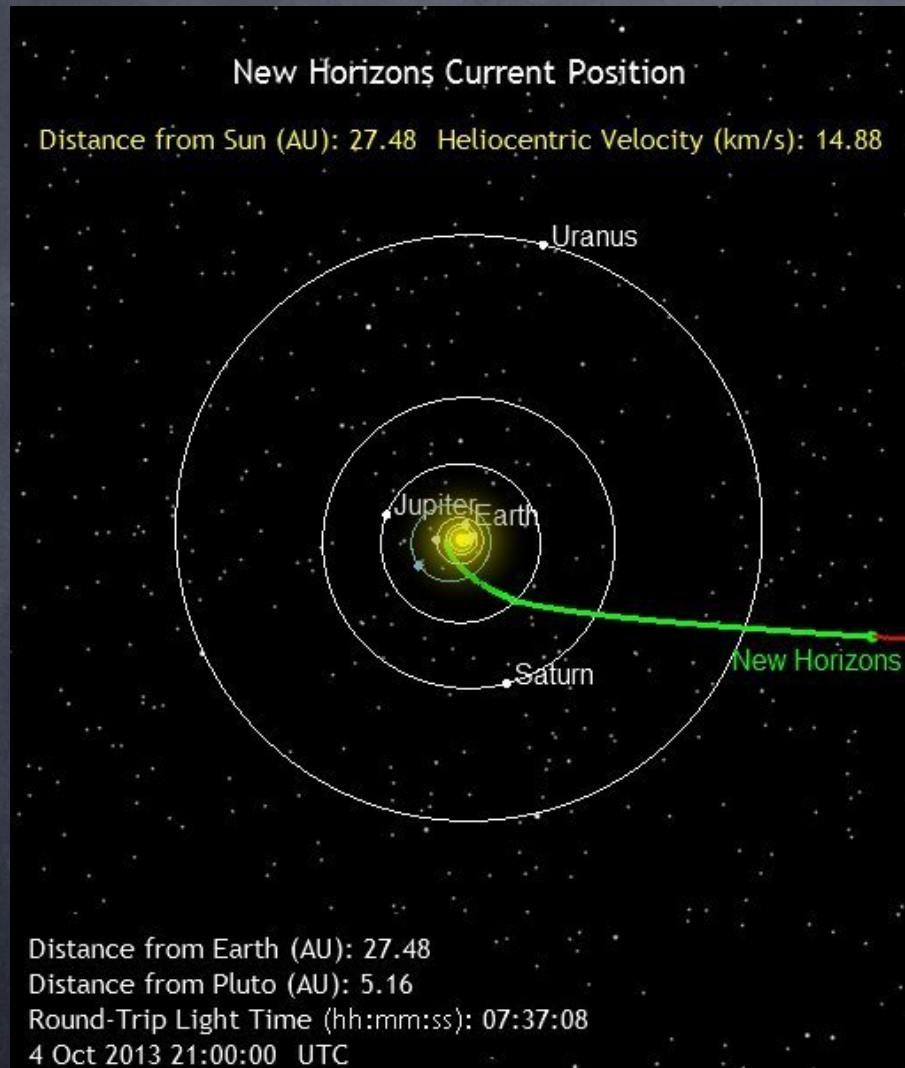
These are our best views of Pluto.

Pluto • Hubble Space Telescope ACS/HRC

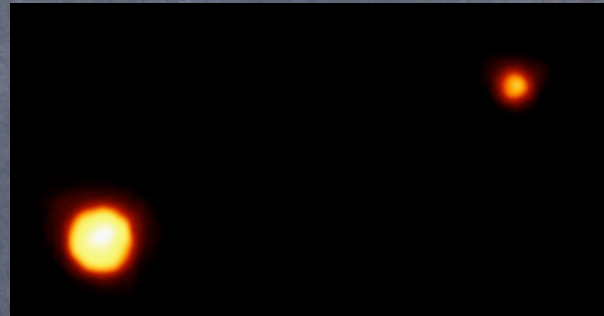




Launched in January of 2006!

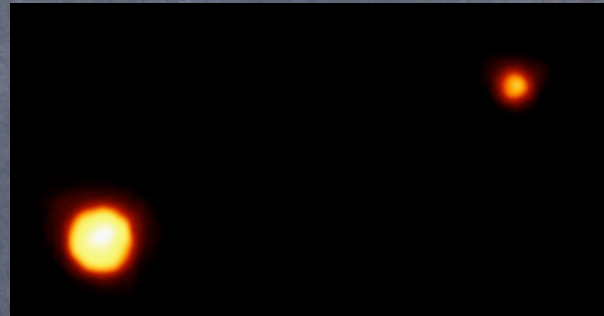


The science goals for New Horizons came from the community of planetary scientists.



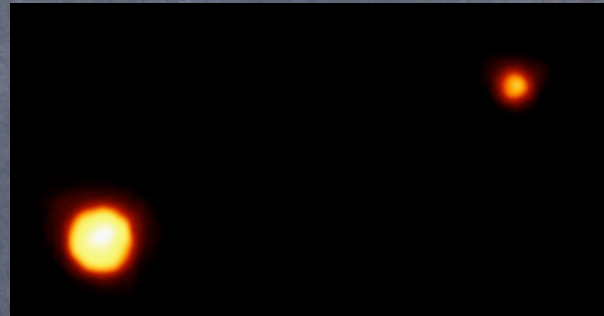
- ★ What does it look like? Does it have interesting geologic features? (I can't wait to see, personally!)

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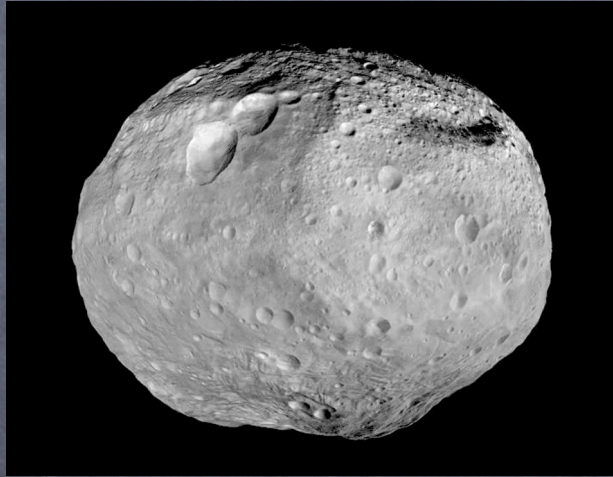
- ★ We think Pluto's atmosphere "freezes out" when it is at its coldest. What is it made of, and how does it behave?

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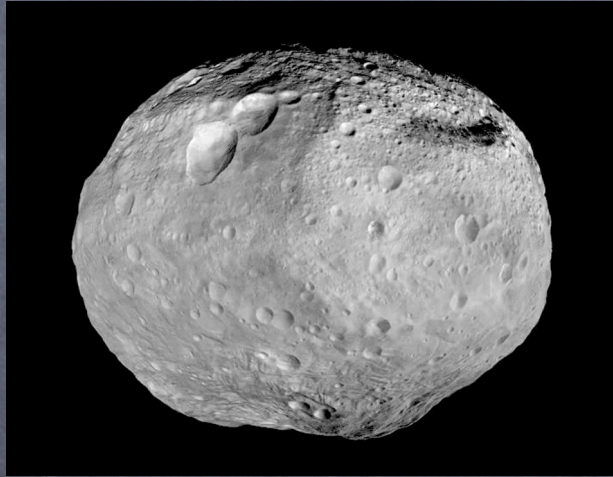
- ★ What is the solar wind like at Pluto's distance, and how does it interact with Pluto and its atmosphere?

These specific investigations are interesting because they do address big ideas in astronomy.



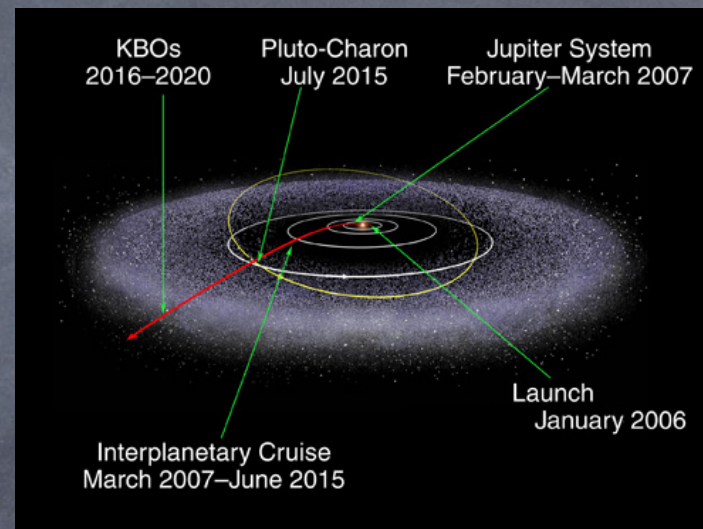
- ★ We only really know a lot about 2/3 of our Solar System, understanding the last 1/3 may completely change our whole picture

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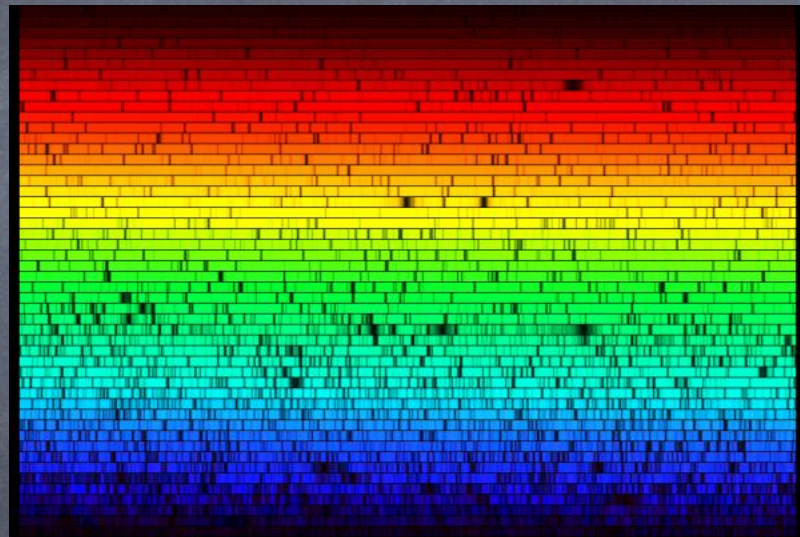
- ★ Although the Kuiper Belt is so far away, it is the source of impactors, which may have helped create life, and may one day end it

New Horizons' visit to Pluto gives us a great opportunity to focus on science practices in astronomy.



- ★ Astronomy is really exploration science: we take what we can get from nature, rather than designing experiments and conducting them in a lab setting

New Horizons' visit to Pluto gives us a great opportunity to focus on science practices in astronomy.



- ★ We make only a few types of observations: images & spectra, and infer almost everything we know about the Universe from those

New Horizons' visit to Pluto gives us a great opportunity to focus on science practices in astronomy.



- ★ Without missions like New Horizons, we don't have evidence to support our astronomical claims, so this is why we push so hard for funding of Solar System exploration

**We only have to wait about 1.5
more years, but maybe not...**

