

The Solar System

10/23/2009

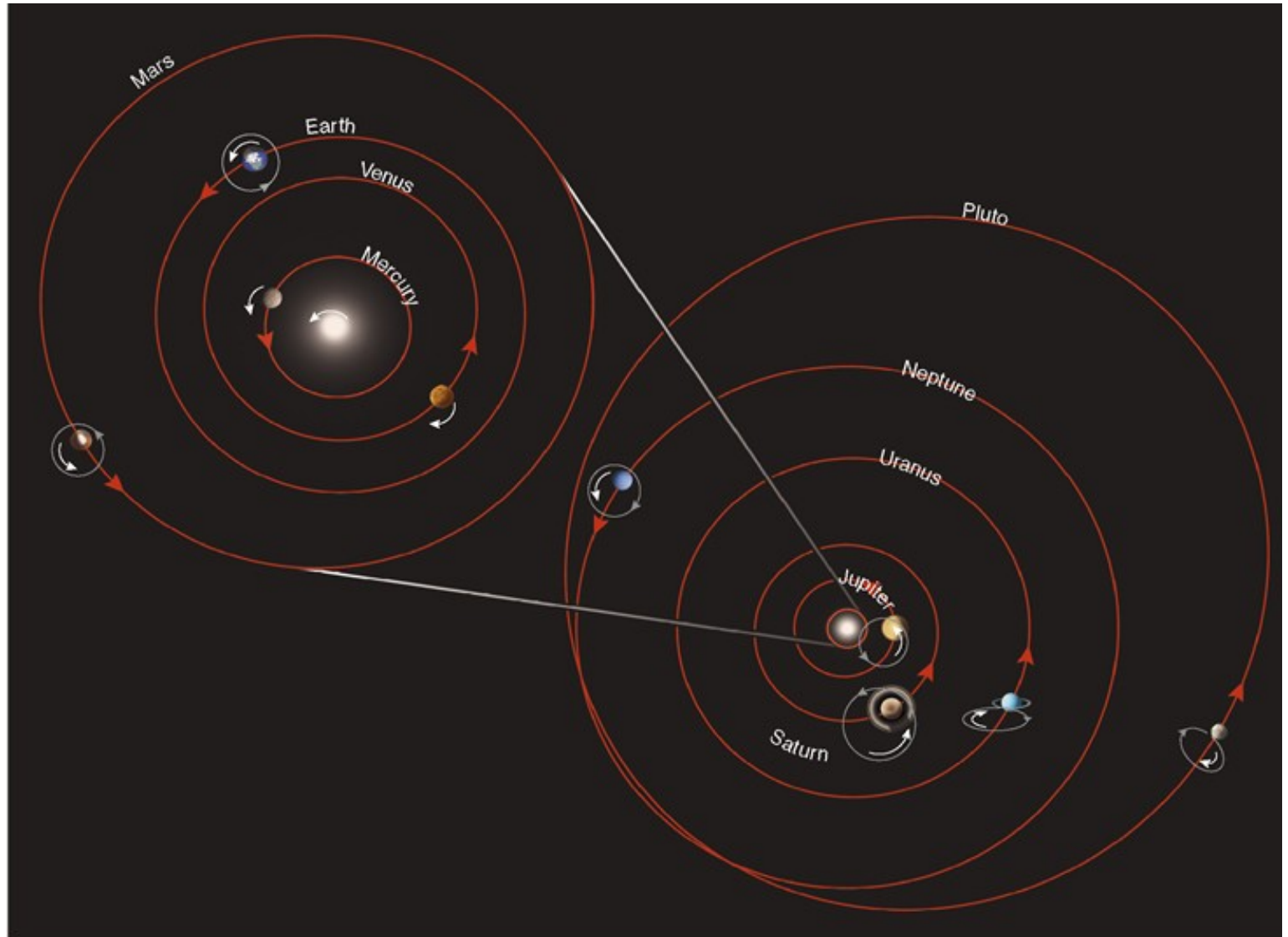
Opening Discussion

- Have you seen anything interesting in the news?
- Why I write hard tests. Why I want you to be able to do the harder problems.

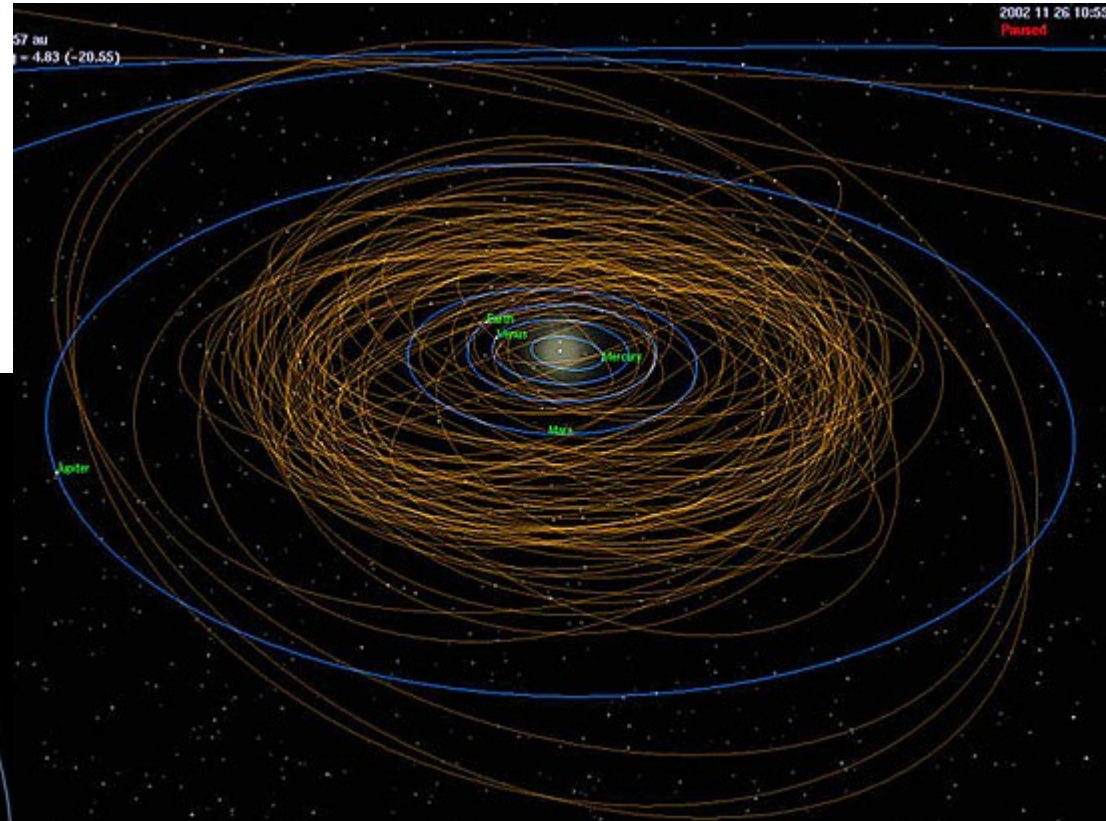
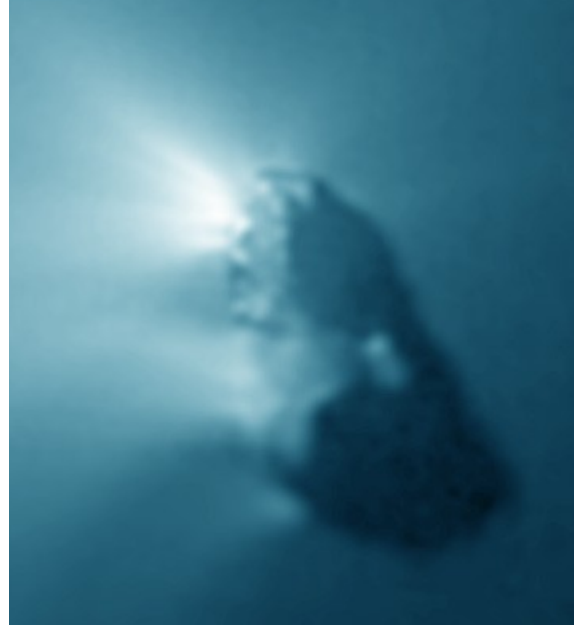
Introduction to the Solar System

- Most of the rest of the semester will be spent doing comparative planetology. That is where we compare the features of planets to gain a deeper understanding of them. Today and next class though we will familiarize ourselves with the basics of our Solar System.
- Our Solar System has 4 terrestrial planets (Mercury, Venus, Earth, and Mars) and 4 jovian planets (Jupiter, Saturn, Uranus, and Neptune).

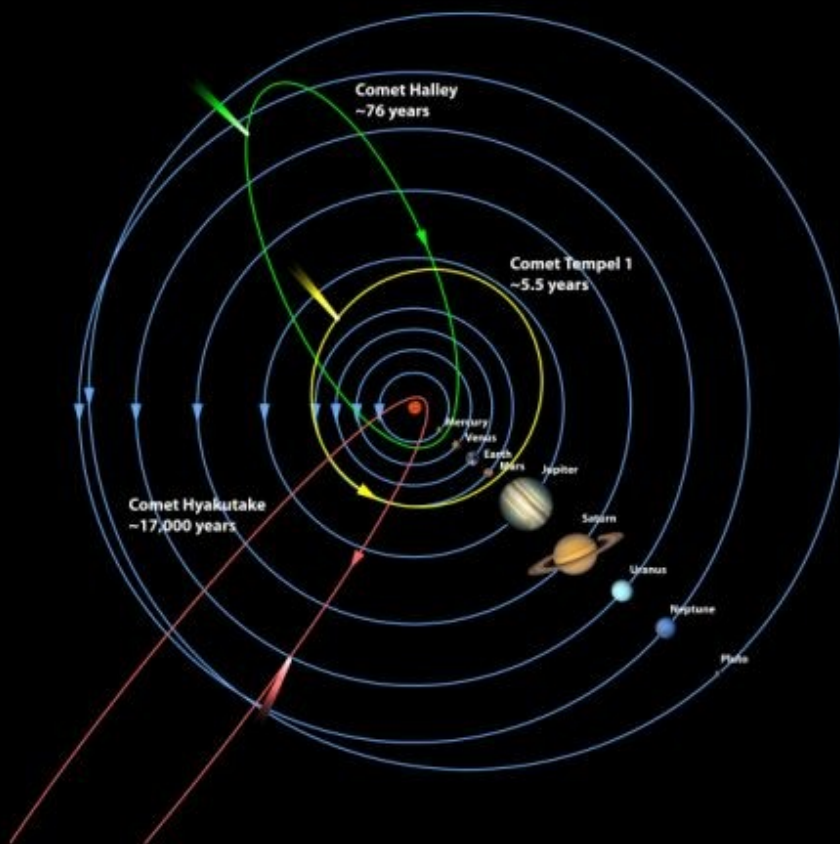
Patterns in Motion



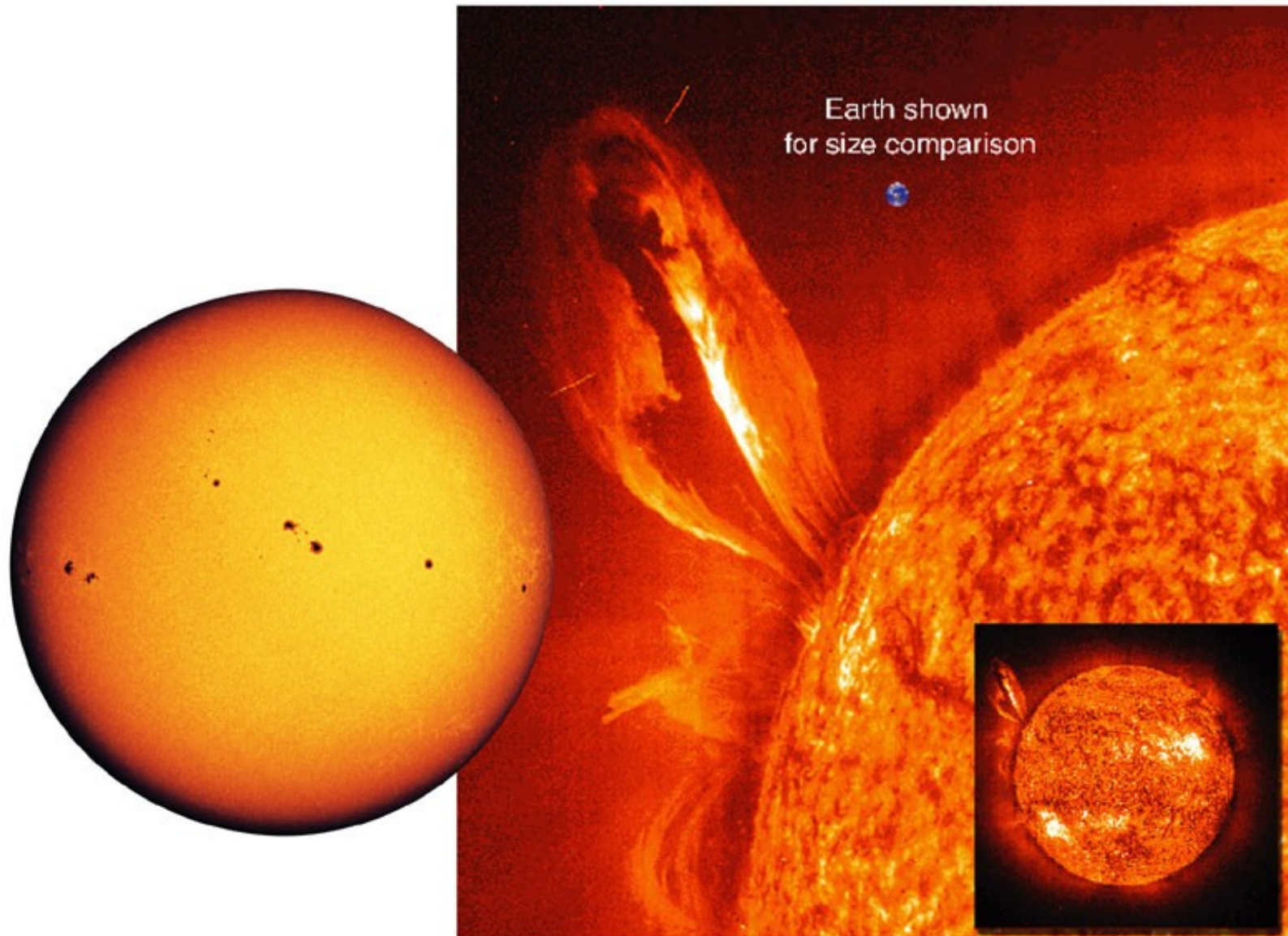
Small Bodies



Comets Follow Different Orbits



The Sun



Mercury (0.39 AU, 2440 km, $0.055M_E$)

Smallest of the terrestrial planets,
is also the one we know the least
MESSENGER currently moving into

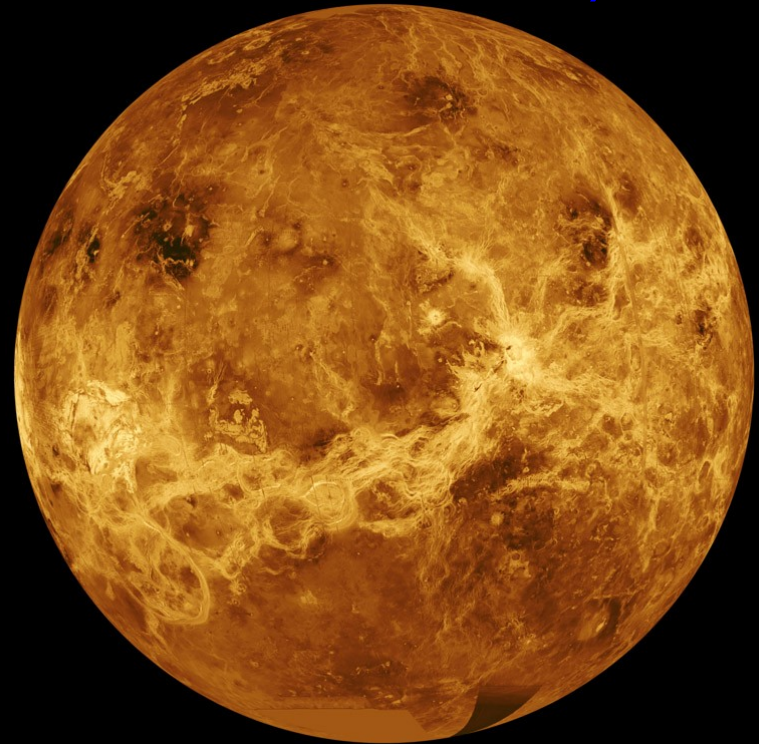
Says it is like our Moon, heavily
cratered with no atmosphere.

3:2 spin-orbit resonance with the
Sun. Days and nights each last about
two Earth days. This leads to huge temperature
variations. The day side would roast you
while the night side will freeze you

Dense, lots of iron.

Venus (0.72 AU, 6051 km, $0.815M_E$)

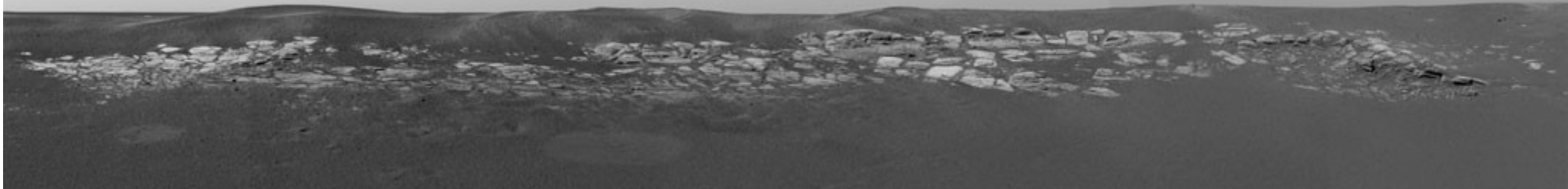
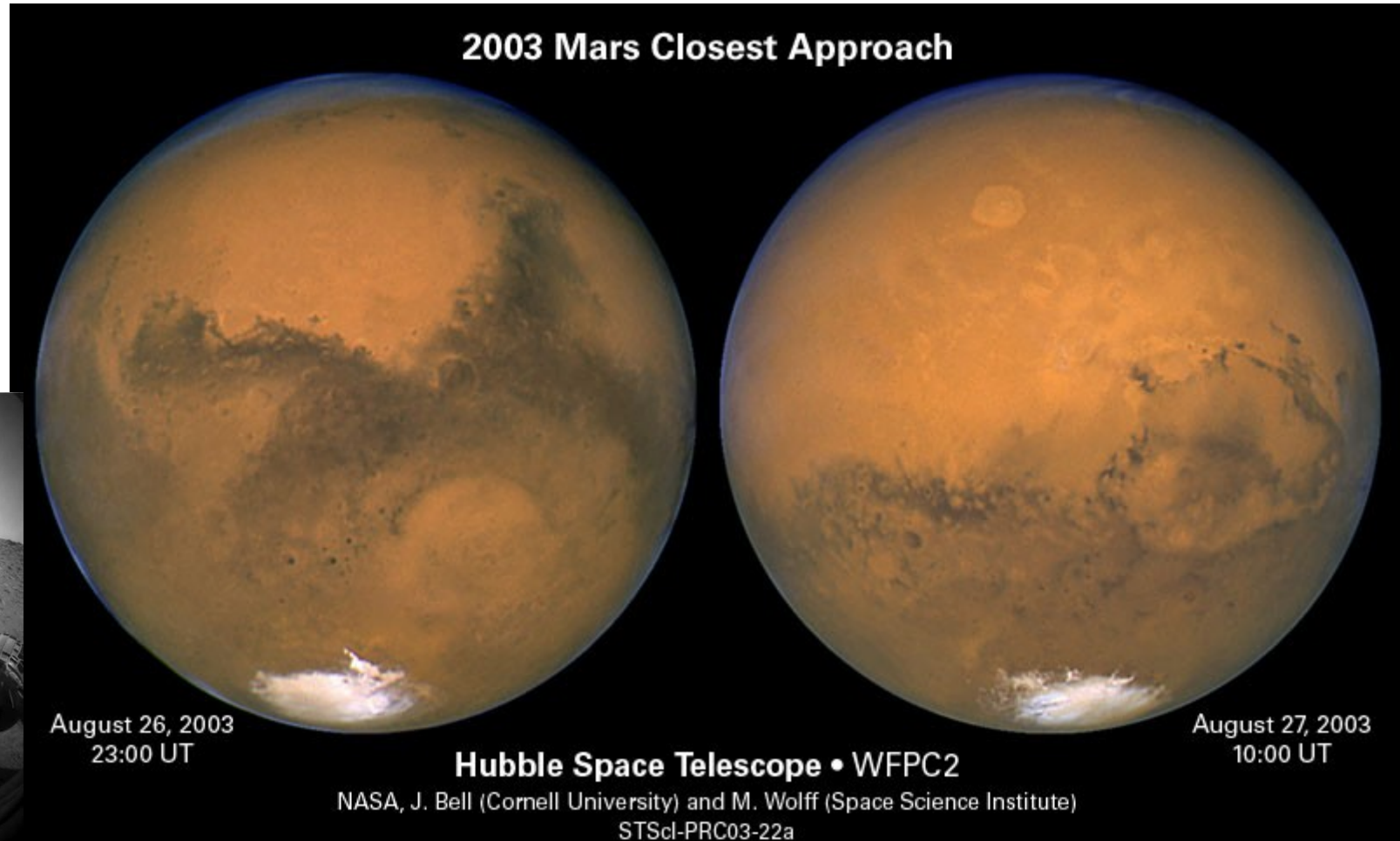
- Hottest planet in Solar System (425°C) thanks to extremely thick CO_2 atmosphere. Days and night extremely long, but both equally hot.
- Surface hard to see through clouds and haze, requires radar imaging.



Earth (1 AU, 6378 km, $1M_E$)

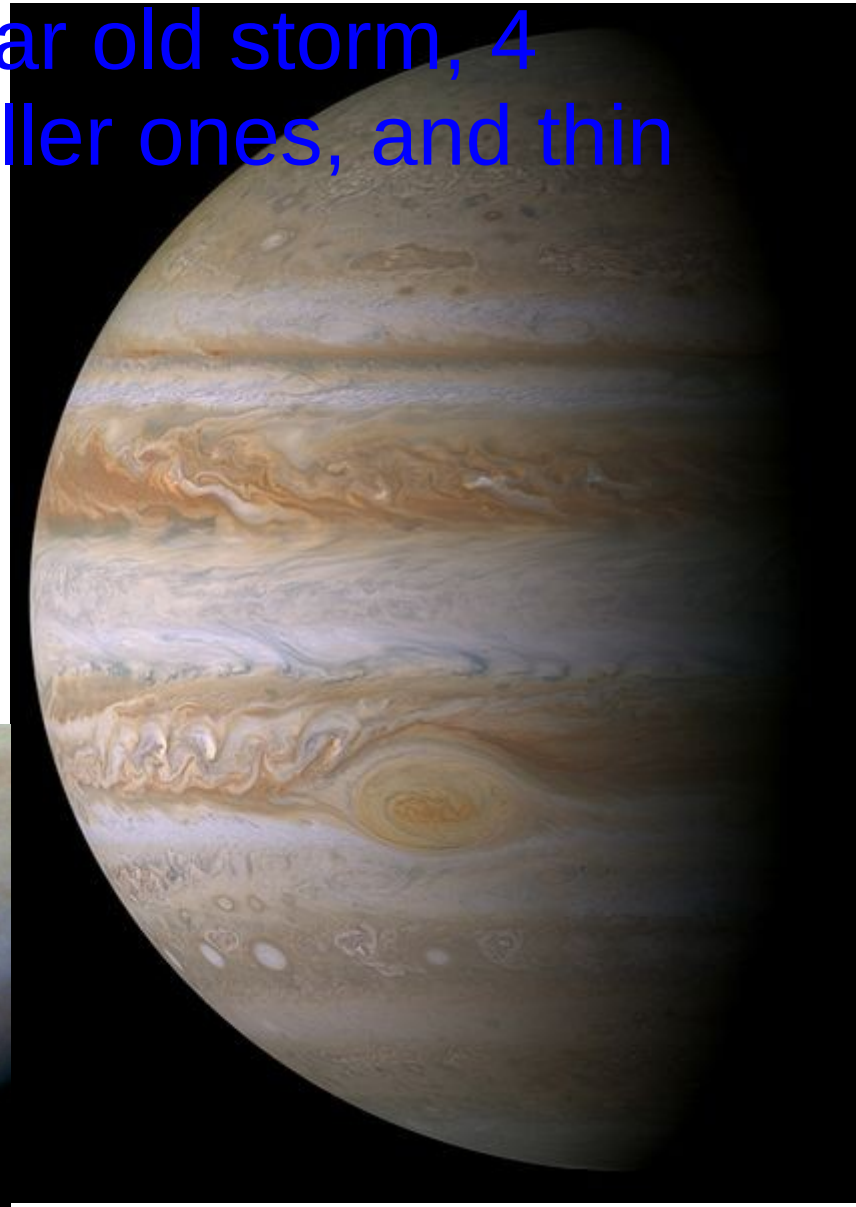
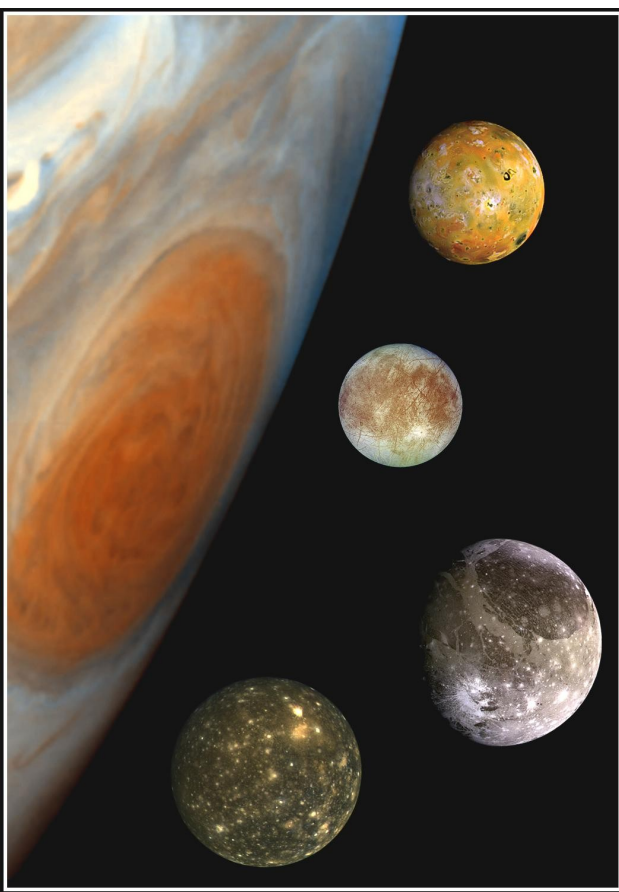


Mars (1.52 AU, 3397 km, $0.107M_E$)



Jupiter (5.2 AU, 71492 km, 317.9M_E)

- Largest planet has a 300 year old storm, 4 large moons with many smaller ones, and thin rings.



Saturn (9.54 AU, 60268 km,
95.18M_E)







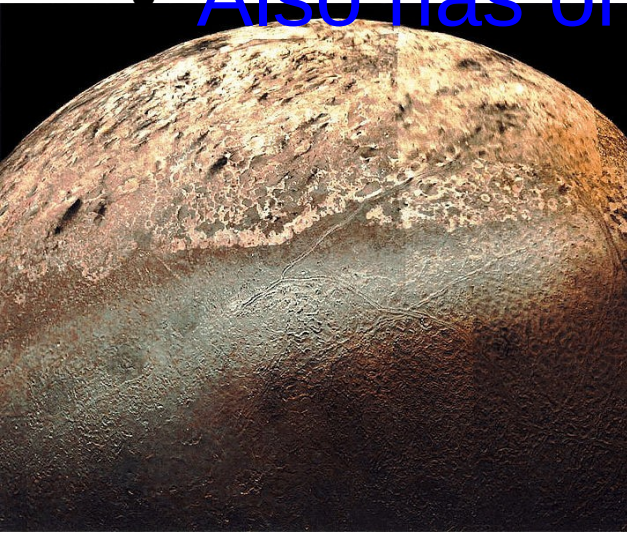
Uranus (19.19 AU, 25559 km, 14.54M_E)

- Uranus is tipped on its side.
- It has a collection of narrow rings.
- The blue-green color comes from significant amounts of methane in the atmosphere.
- Has only been visited by Voyager 2.



Neptune (30.06 AU, 24764 km, 17.13M_E)

- Twin to Uranus, including color from methane in atmosphere.
- Has a large storm called the great dark spot.
- Largest moon, Triton, orbits backwards.
- Has ring arcs.
- Also has only been visited by Voyager 2.



Minute Essay

- Tell me one fact about the planets we discussed today that you hadn't previously known.