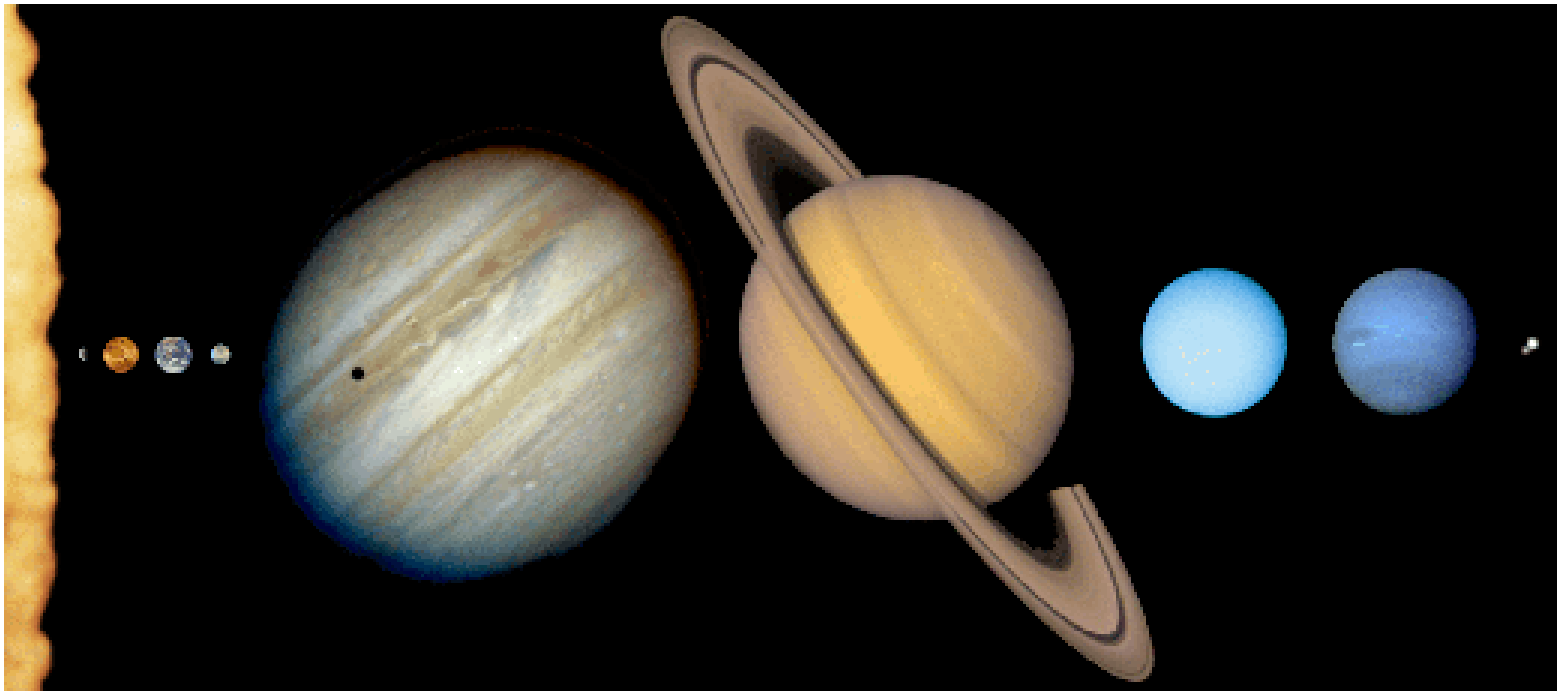
The Solar System



Presentation for SRS 5th Grade

Prof. David Cohen, Swarthmore College

What is astronomy?

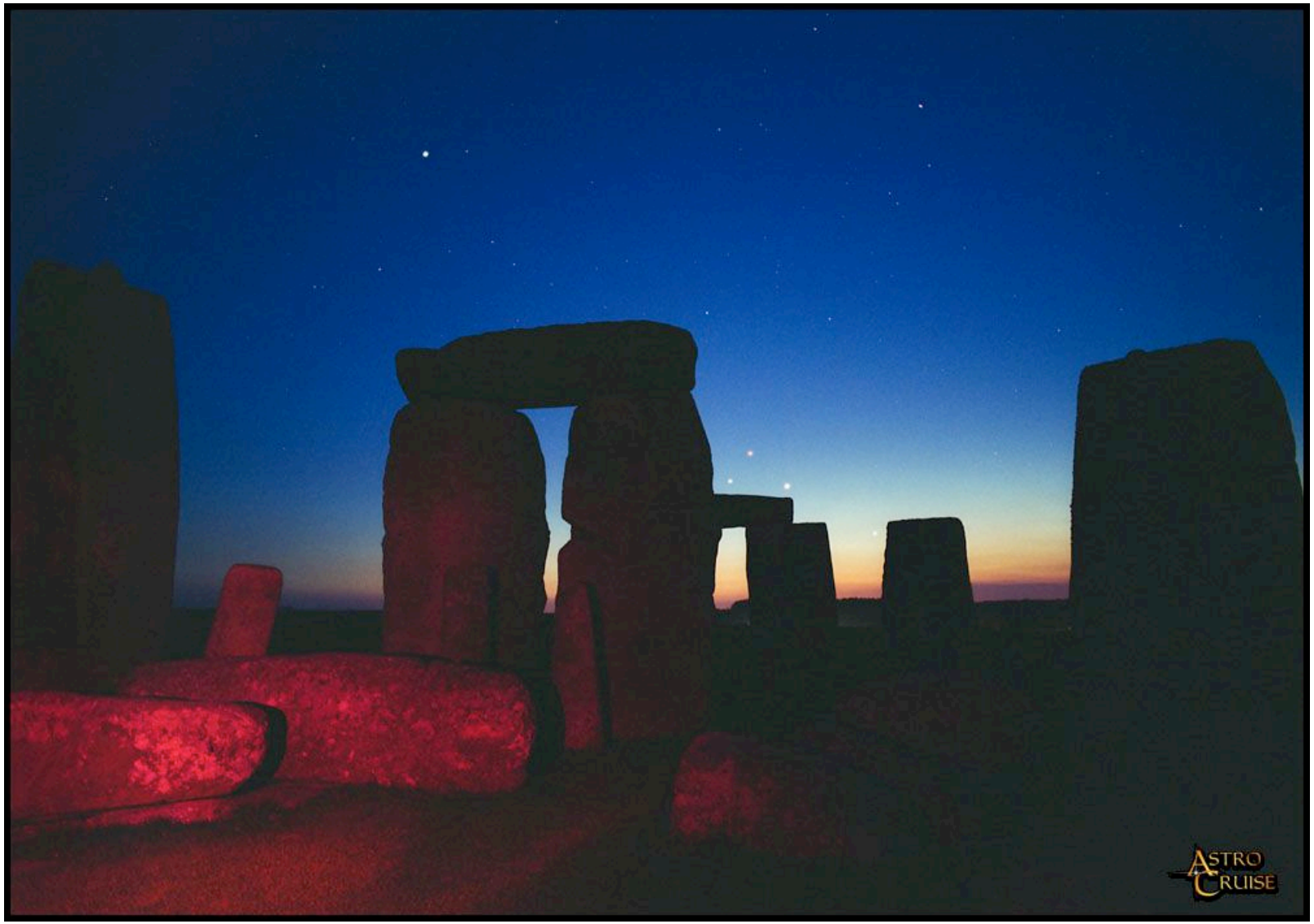
Study of the stars, moon, planets, sun & everything else in outer space

Some big questions astronomers try to answer:

- What are the things in the solar system like? Planets, moons, comets, asteroids, the Sun…
- Are there good conditions for **life** anywhere in the solar system?
- How did the solar system form and what will happen to it in the future?
- What are other solar systems (star systems) like?
- How common is (intelligent) life in the universe?

Ansel Adams photograph of the moon over New Mexico

Stonehenge in England: over the years, people have built monuments to the sky, and observatories for watching it



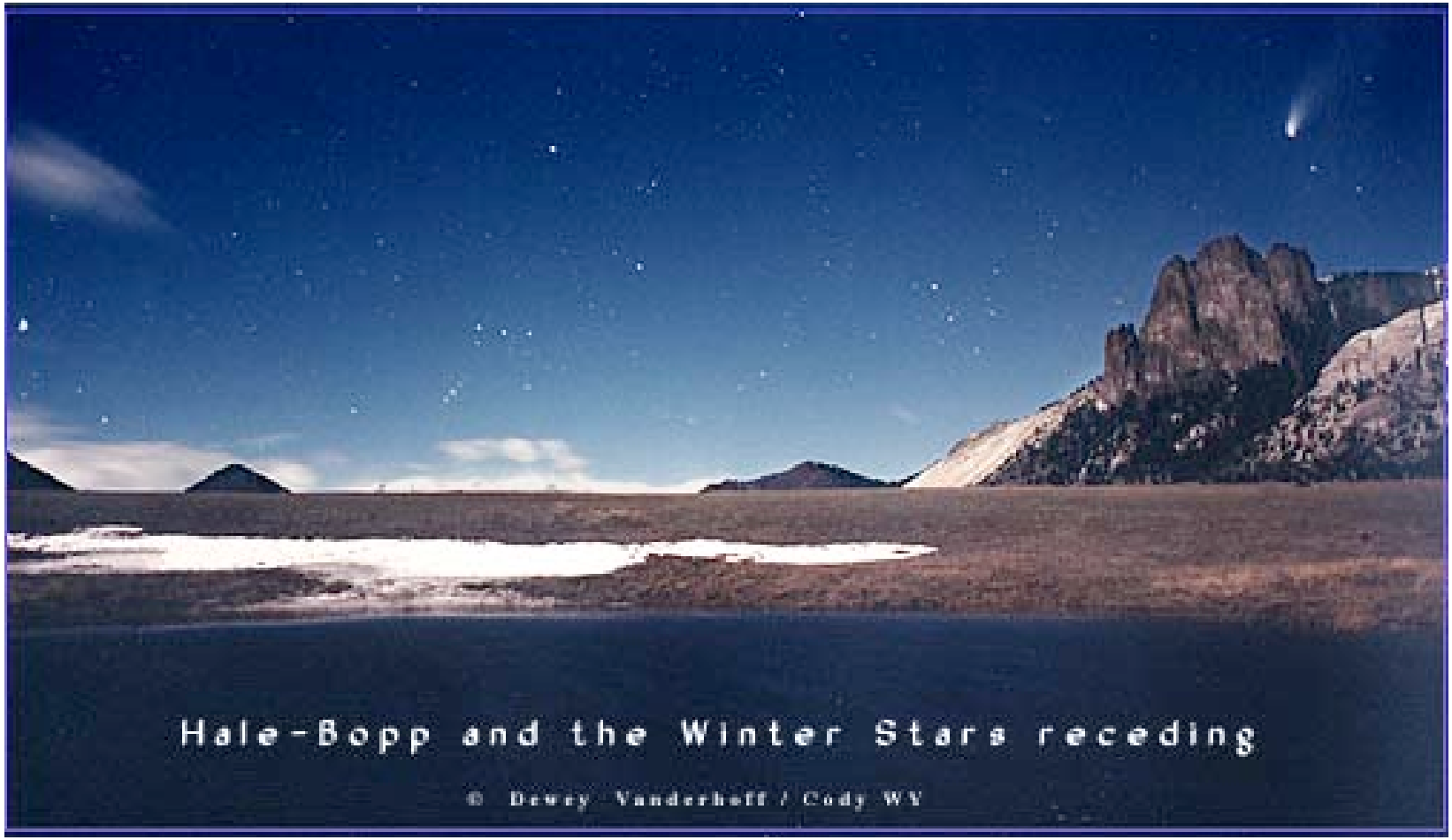
Today's observatories are big telescopes on mountaintops

The constellation **Orion**: you can see it in the south all winter

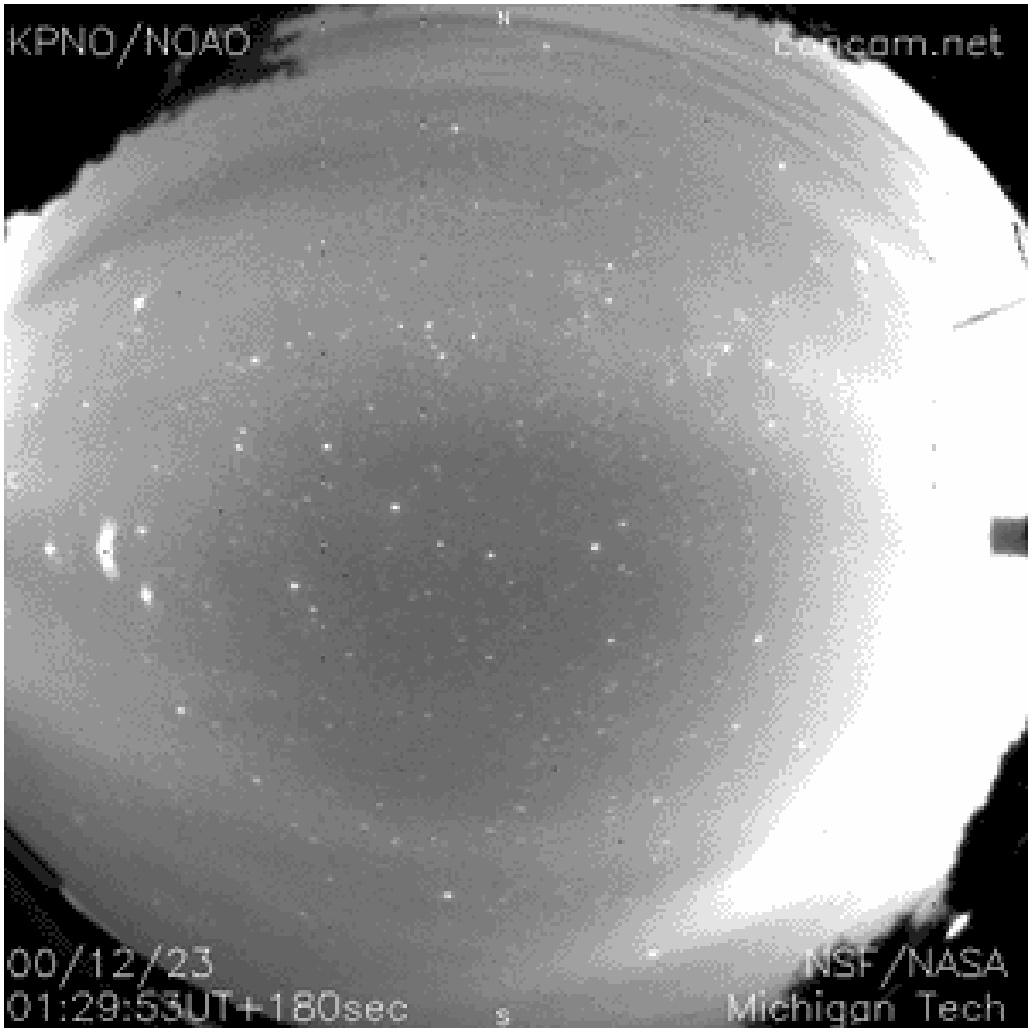
The crescent moon

And planet Venus

Occasionally there are unusual things in the sky, like **comets**: next month, there is a comet that might be visible to the naked eye



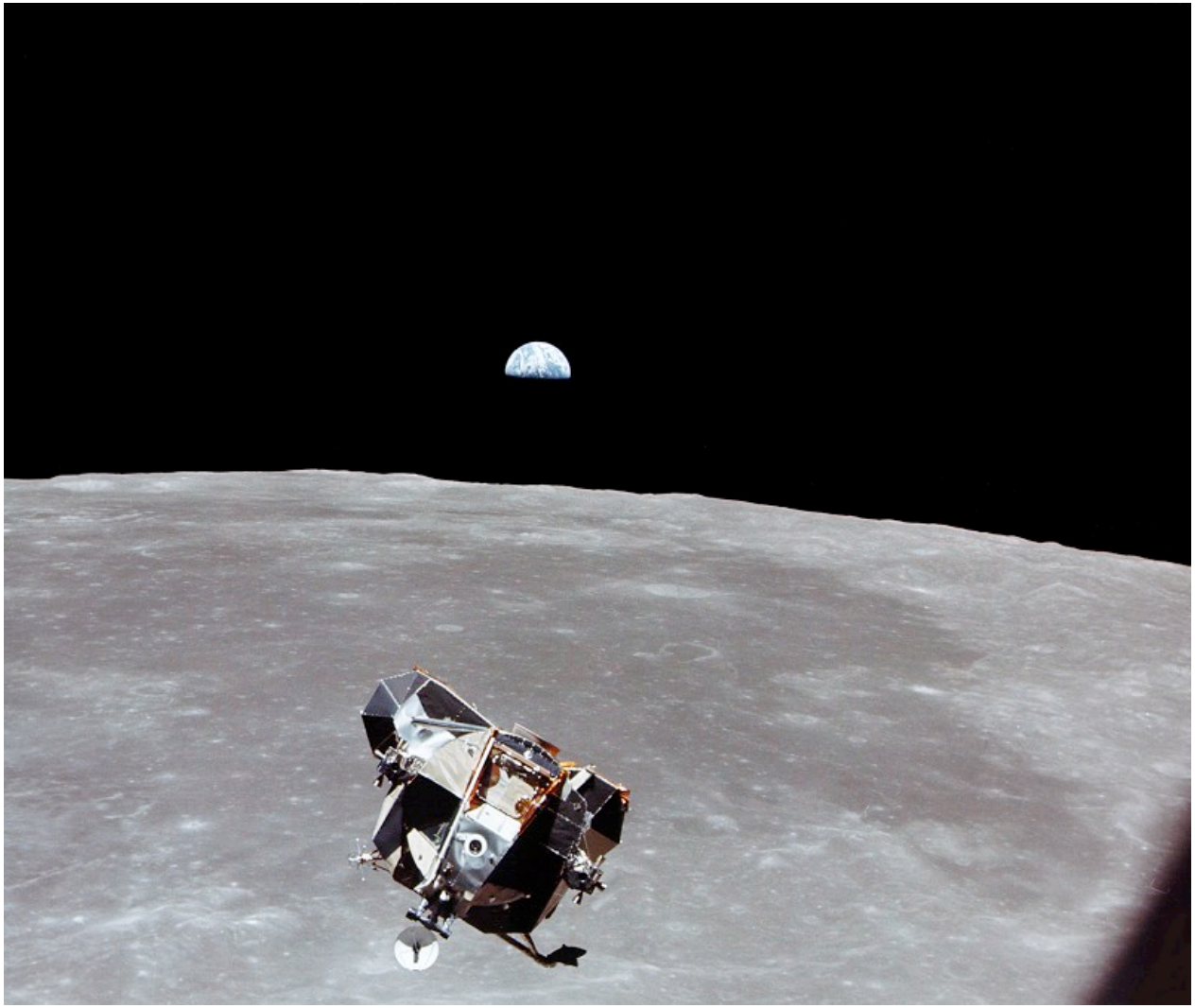
The sky appears to move over the course of a night….



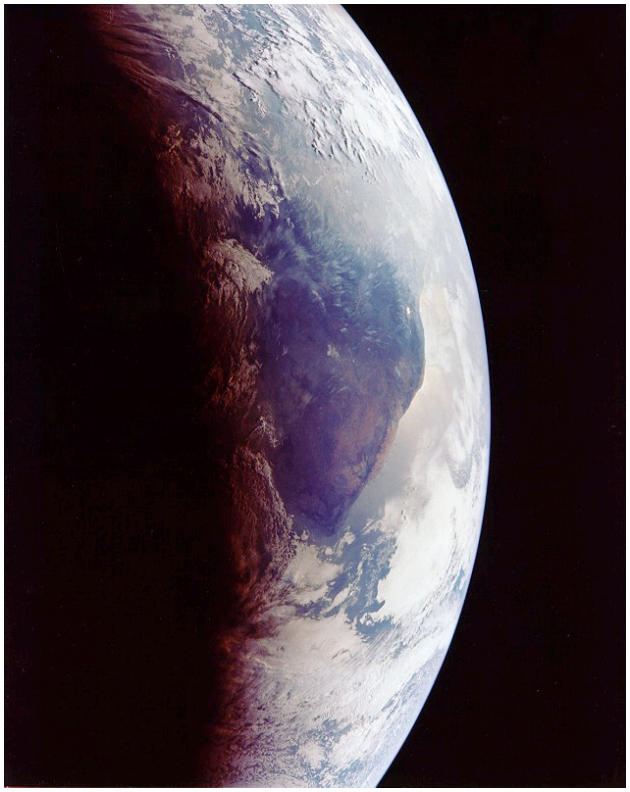
Watching the sky is the ancient basis for telling time and keeping a calendar.

…the **Earth** is a planet too, and spins around, giving us night and day.

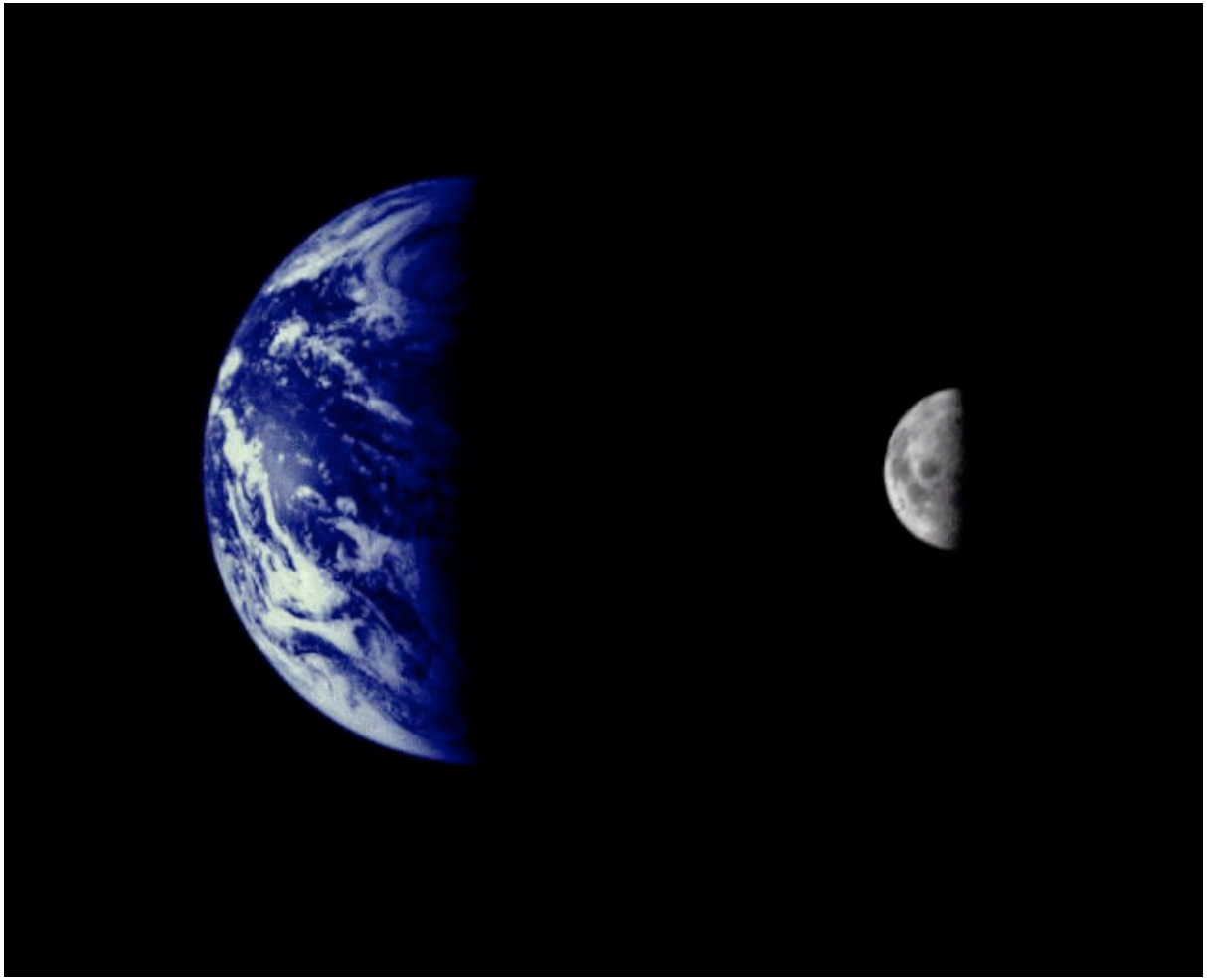
Where was this photo taken?

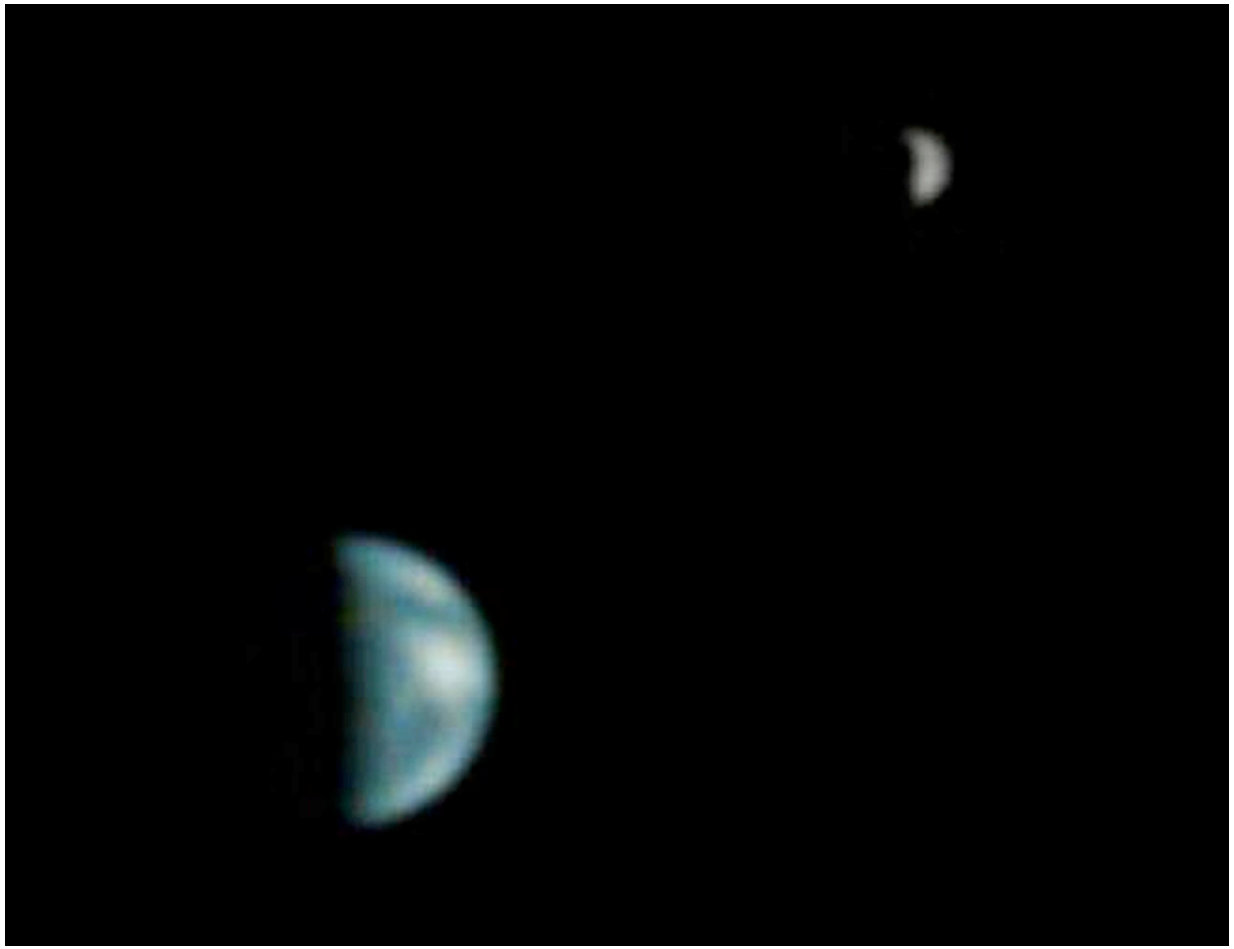


This is the Earth seen from outer space

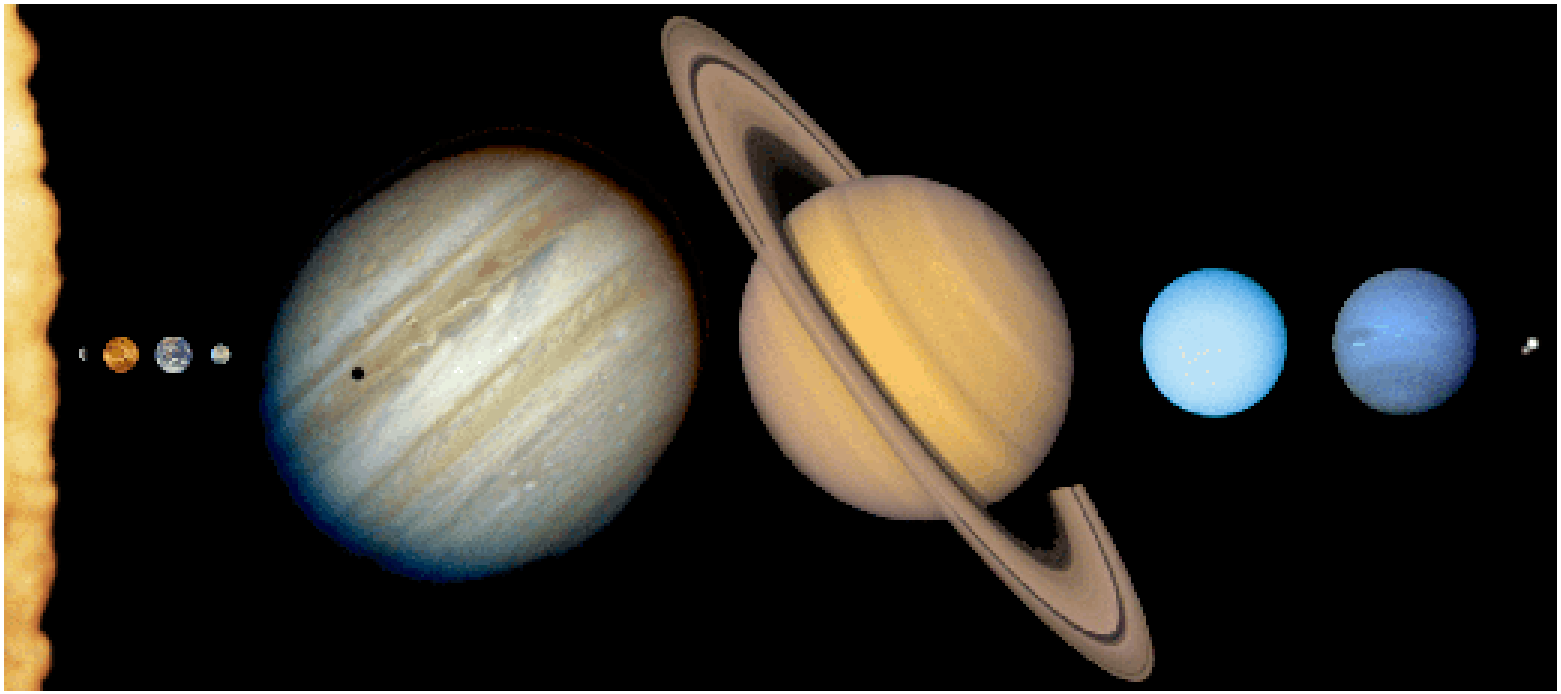


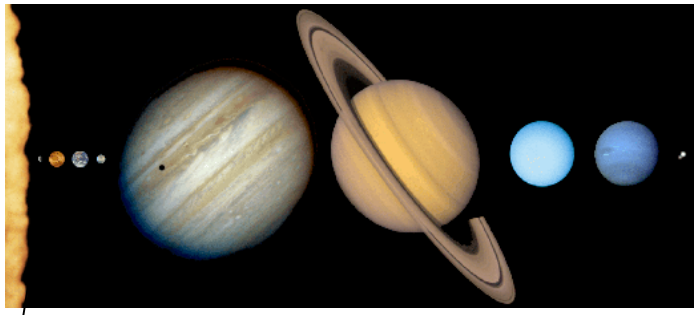
Earth has a sunlit part and a dark part. What are our names for these two parts of the Earth?



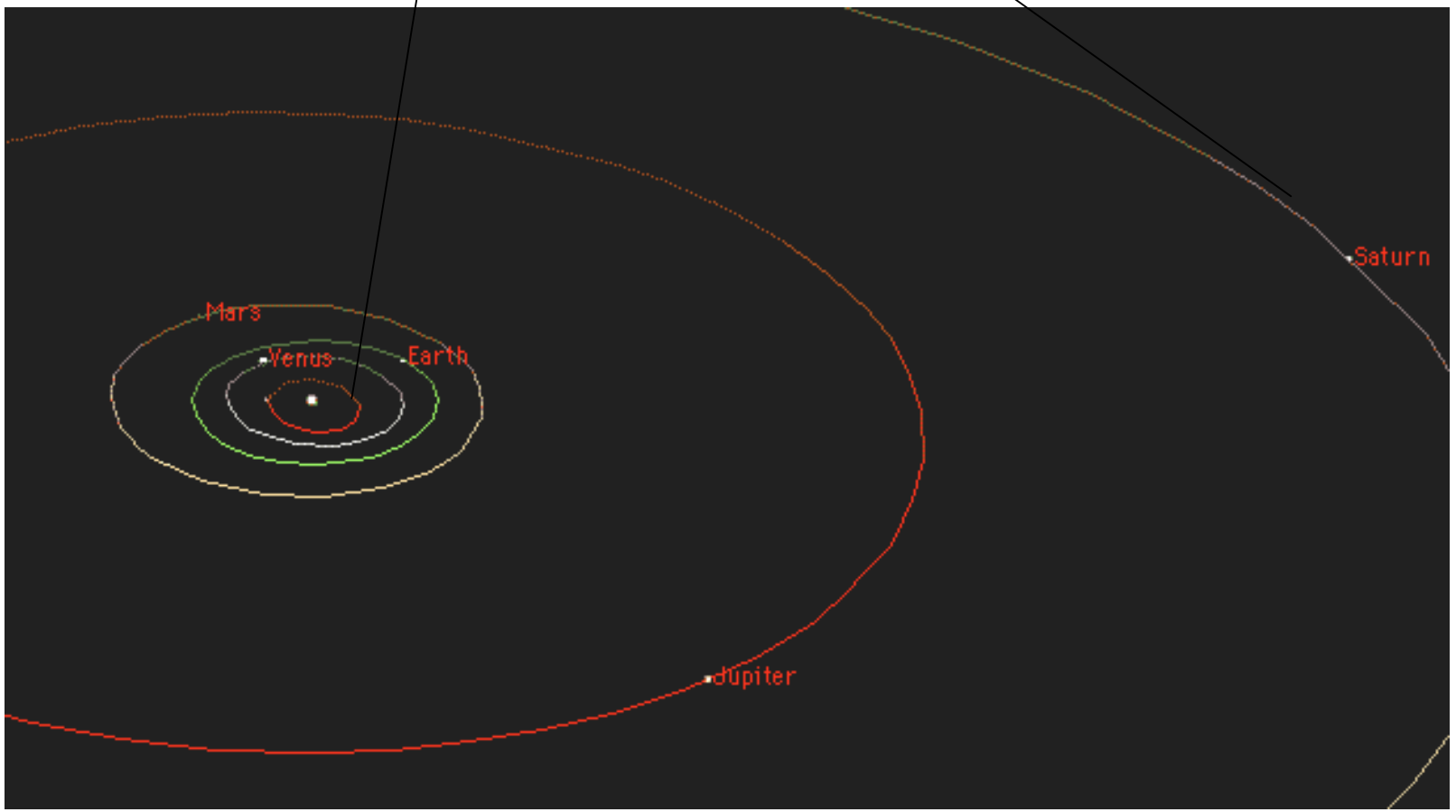


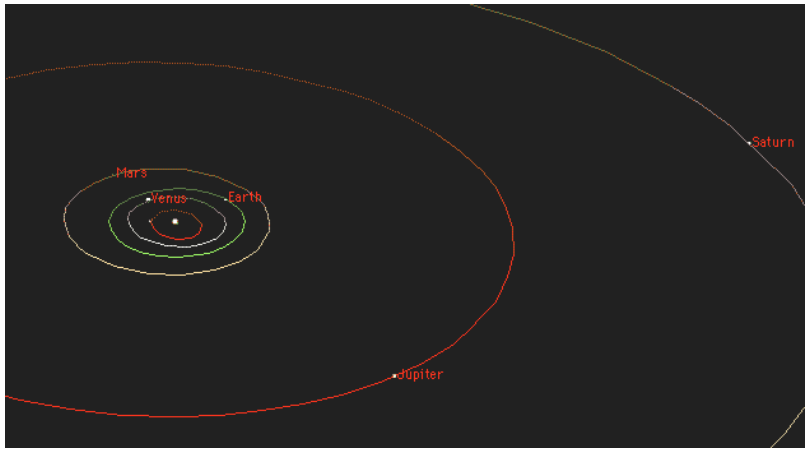
The Earth is just one of nine planets in the solar system

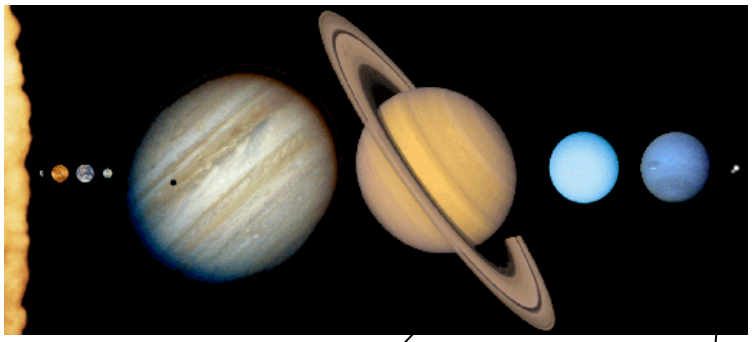


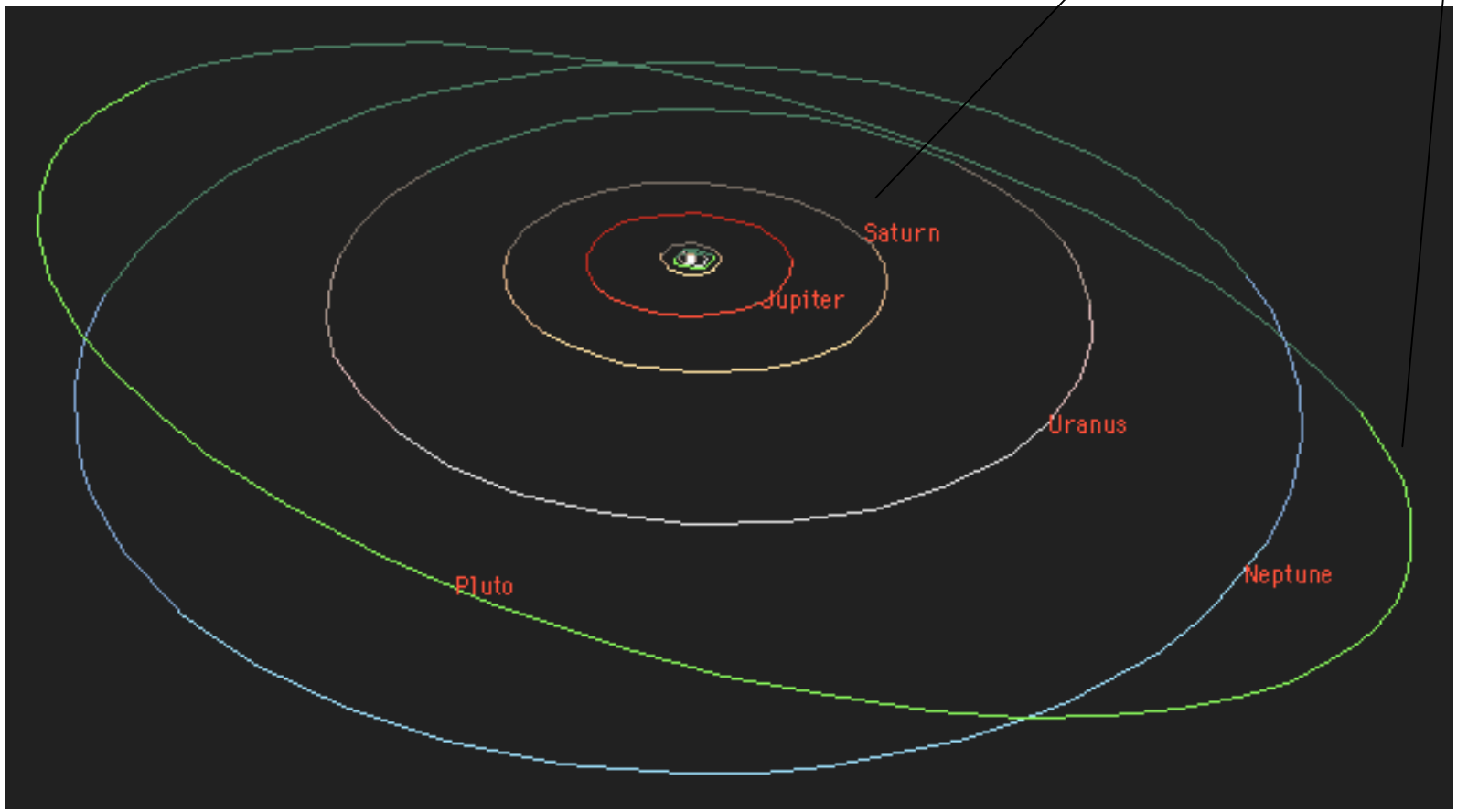


The solar system is big, and the planets are spread out




Saturn
Mars
Venus
Earth
Jupiter




Saturn
Jupiter
Uranus
Neptune
Pluto

The solar system is **so big**…what if we made a *scale model* of it?

The Sun (a million miles across) could be the size of a basketball.

The Earth (10,000 miles across) would be the size of a small marble.

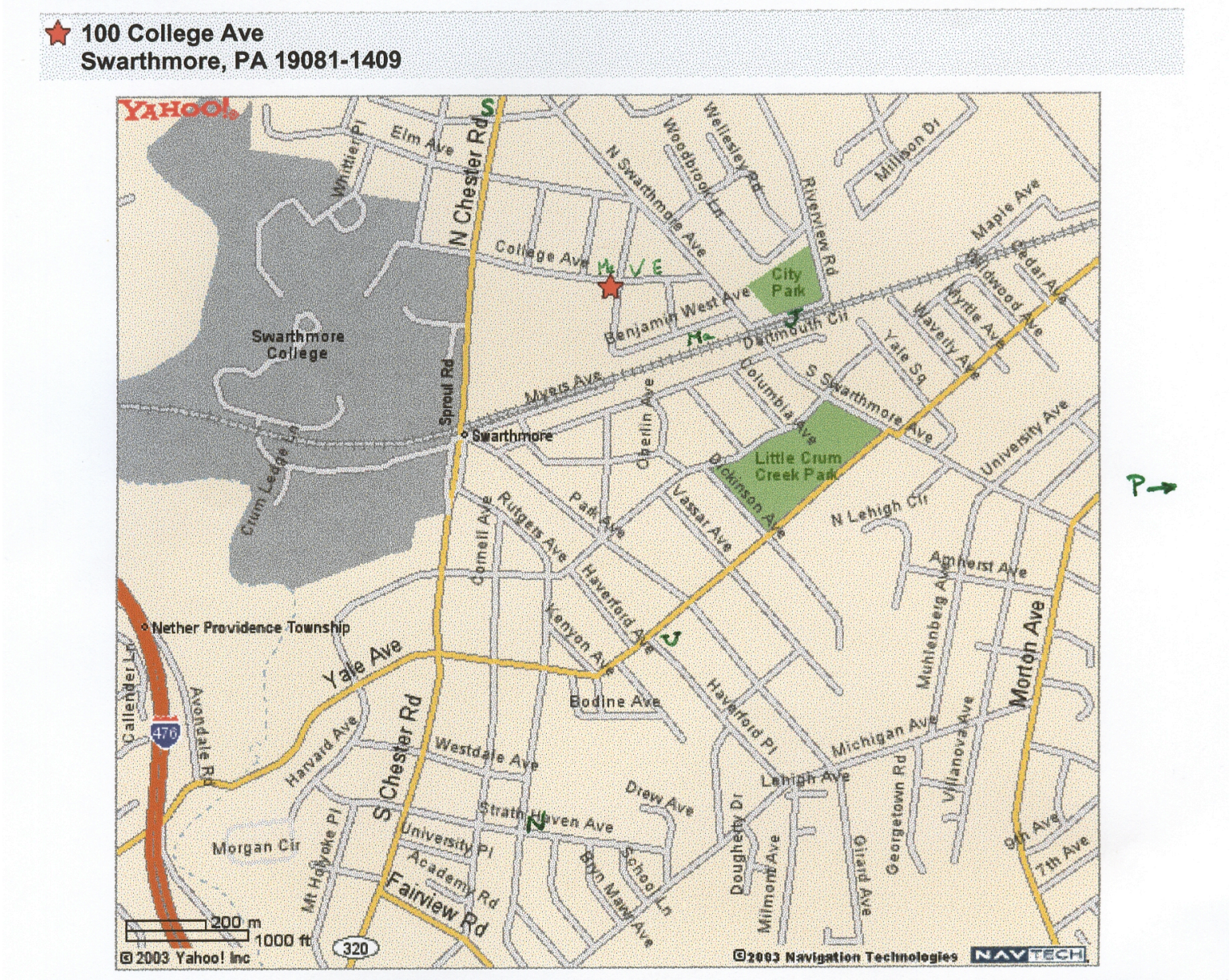
The Moon (half as big as the Earth) would be an even smaller marble.

How far apart would the Earth and Moon be on this scale?

How far from the Sun would they be?

How big would the solar system be?

We can put our basketball Sun in front of SRS, and the solar system will pretty much cover the entire town



The Sun had been painted in front of the school about ten years ago by Sue Larson's class

Watch this movie…in which I search for Mercury under the snow

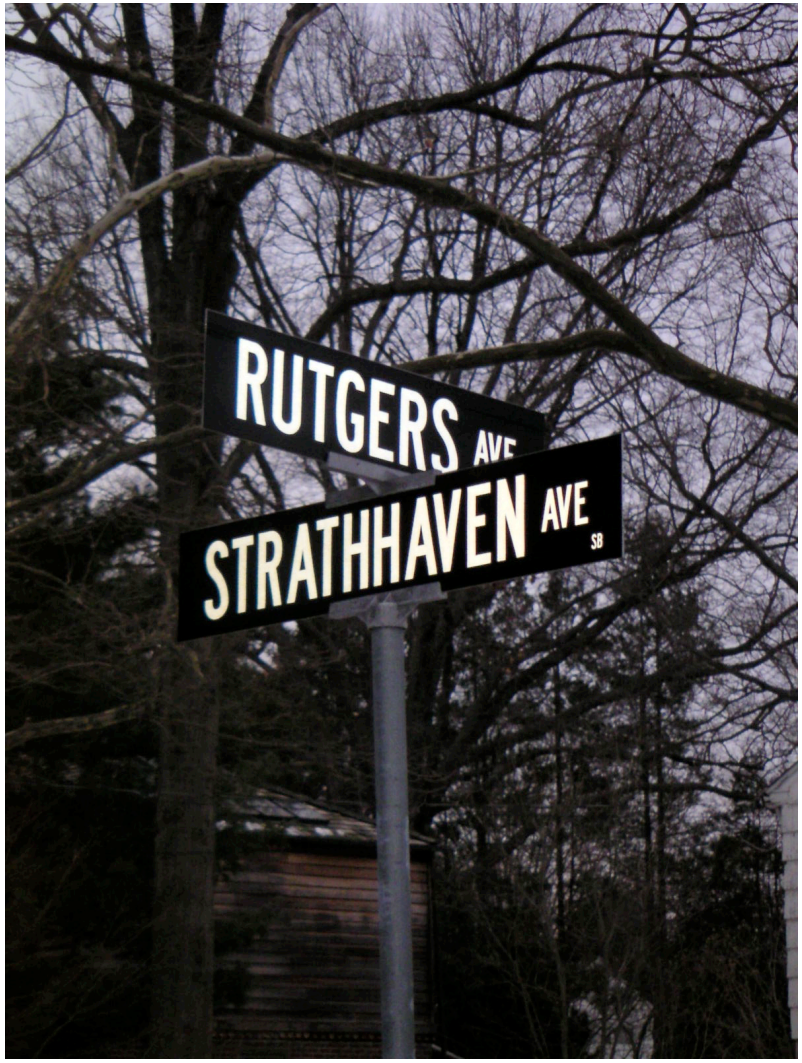
astro.swarthmore.edu/~cohen/public/srs/sun_srs.mov

On this scale, Venus is only about 100 feet away

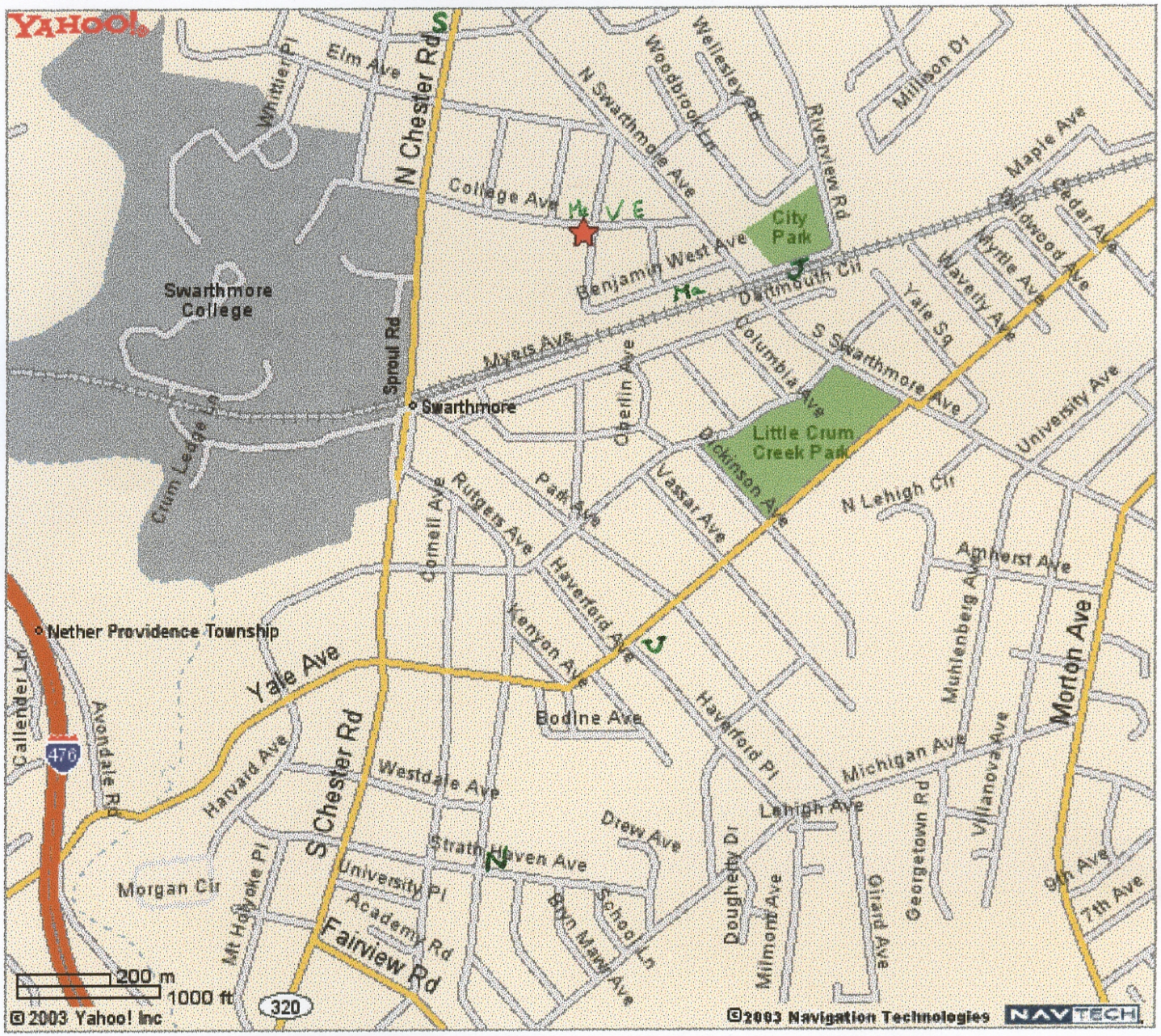
astro.swarthmore.edu/~cohen/public/srs/venus_srs.mov

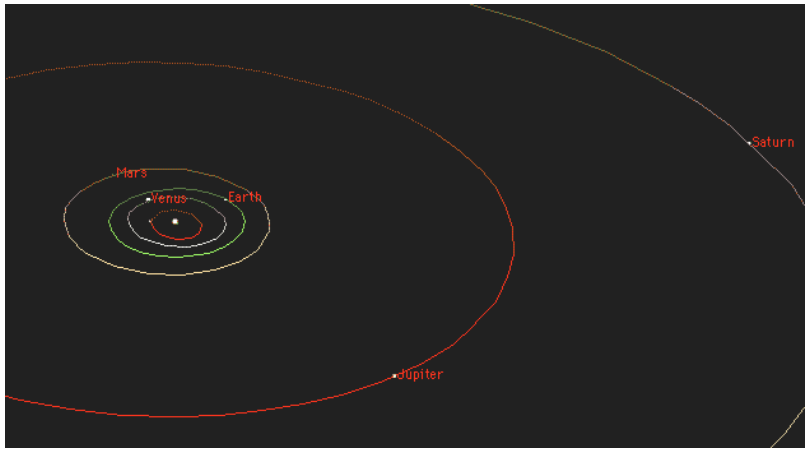
Jupiter is about 2/10 mile away

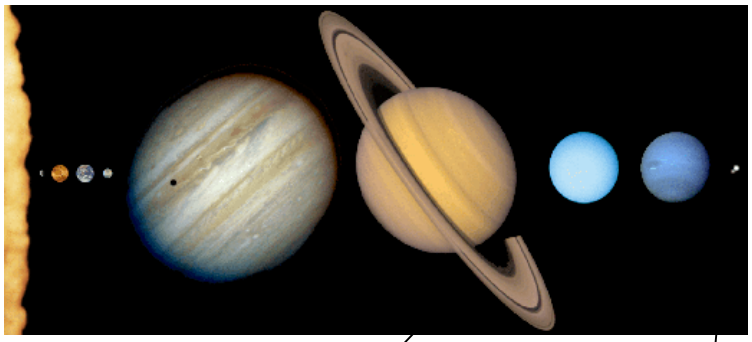
And Neptune is more than 1/2 mile, and as big as a half-dollar

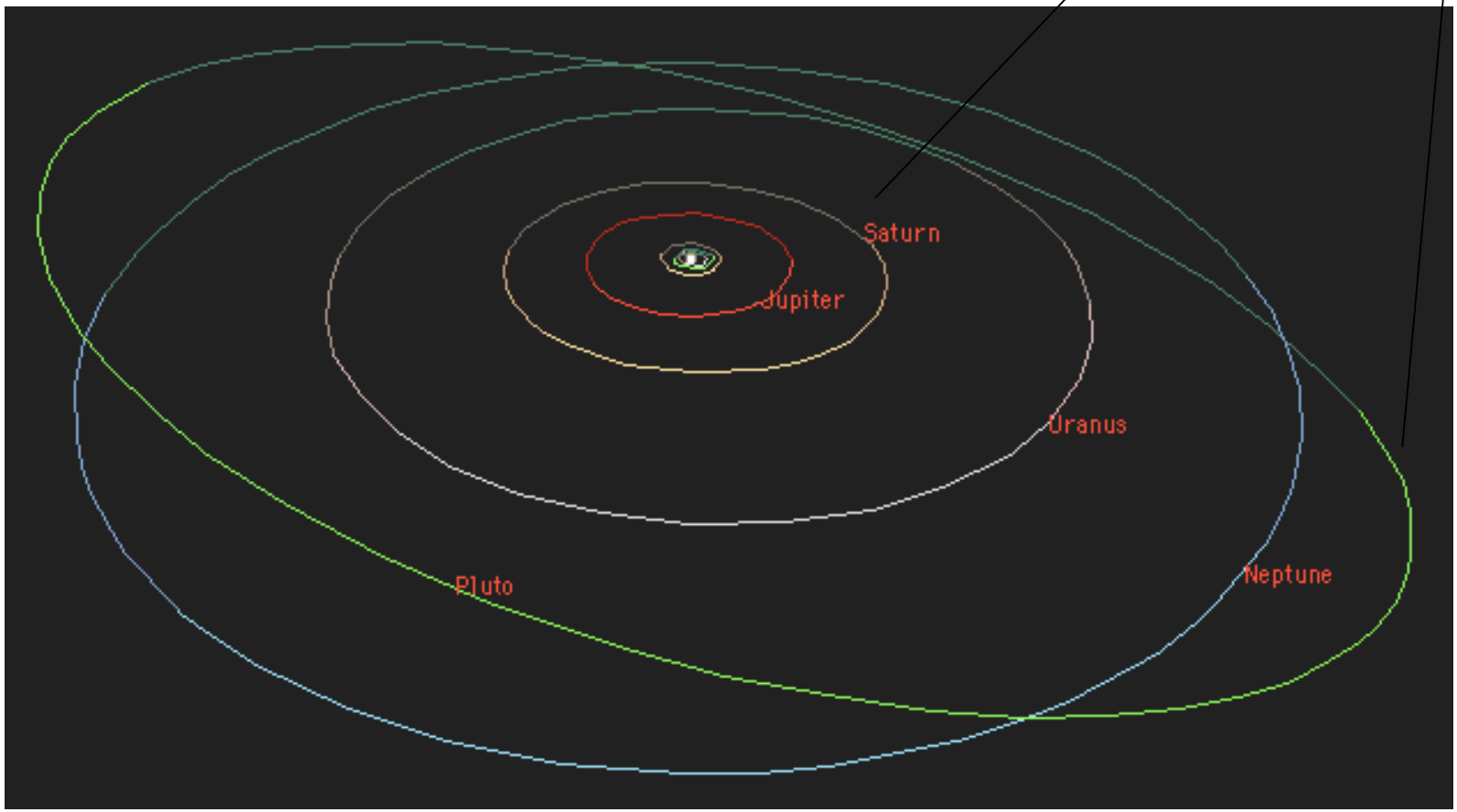


100 College Ave
Swarthmore, PA 19081-1409

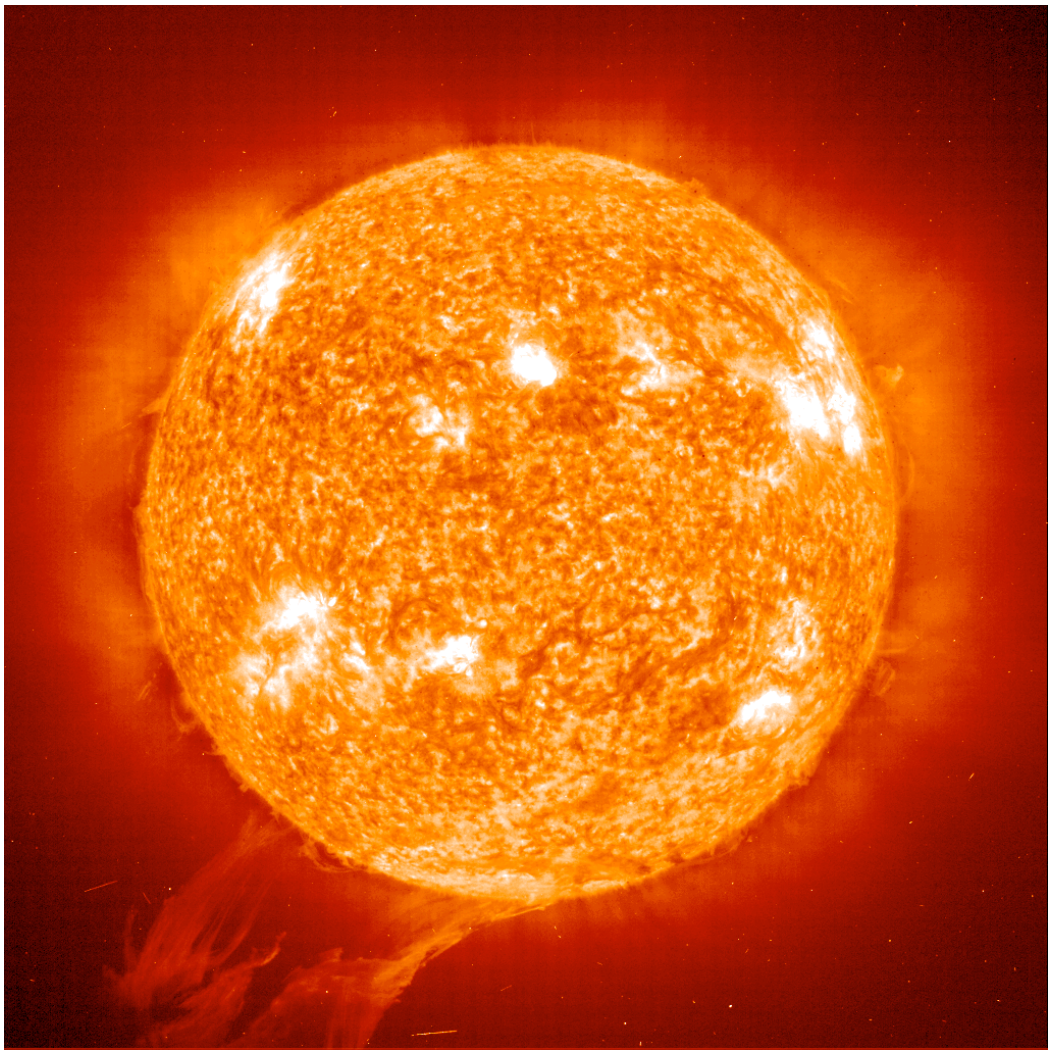


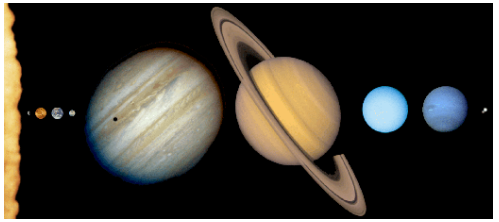

Saturn
Mars
Venus
Earth
Jupiter

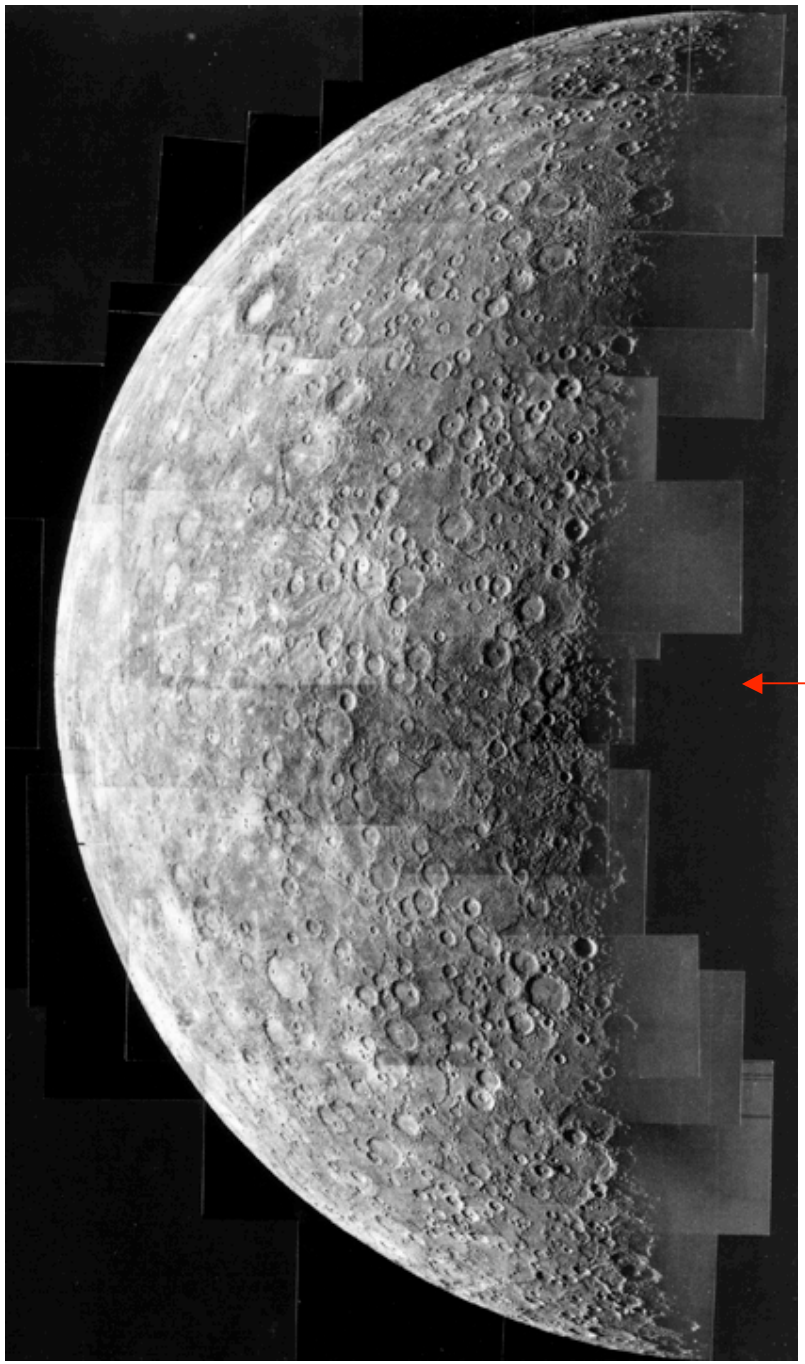


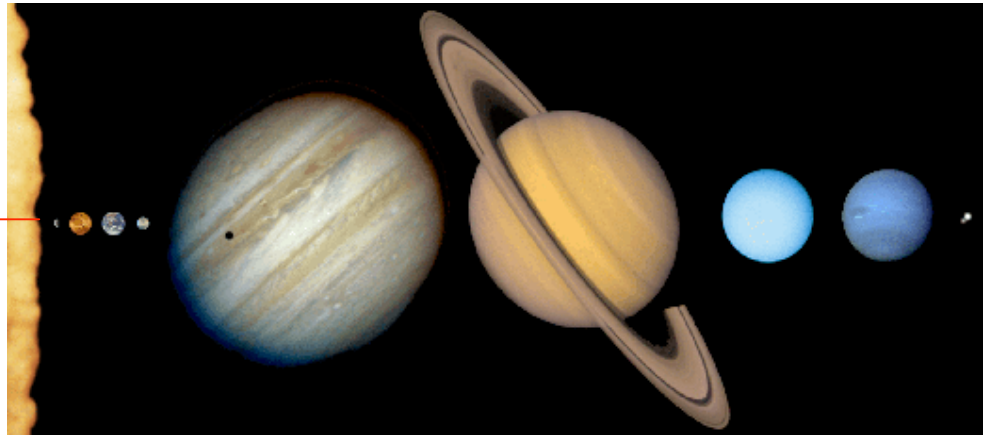

Saturn
Jupiter
Uranus
Neptune
Pluto

The **Sun** is huge, hot, and makes its own light - it is a *star*

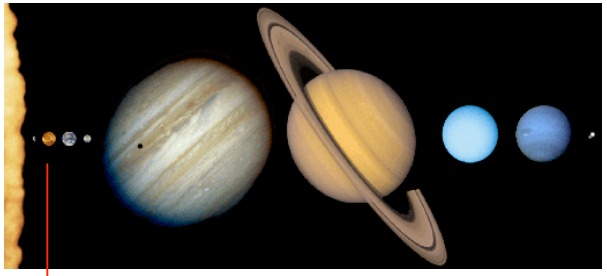


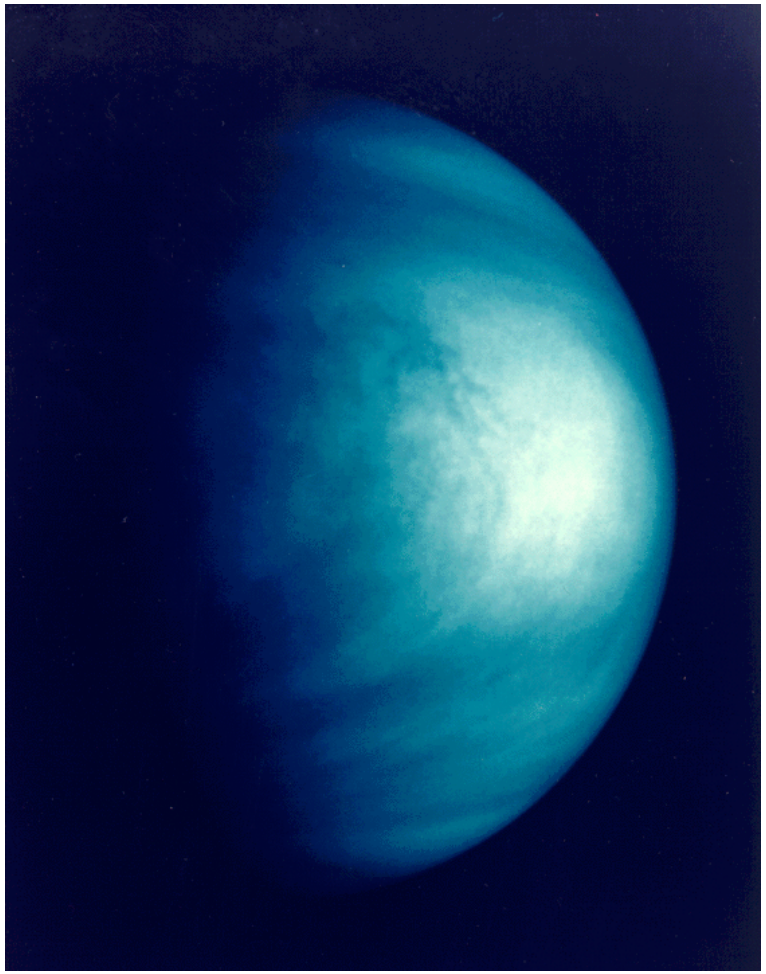


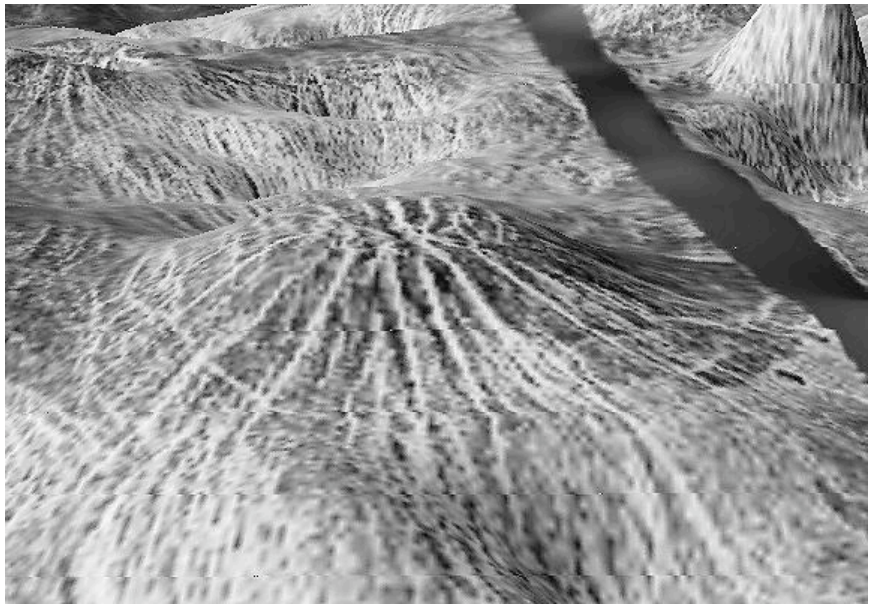




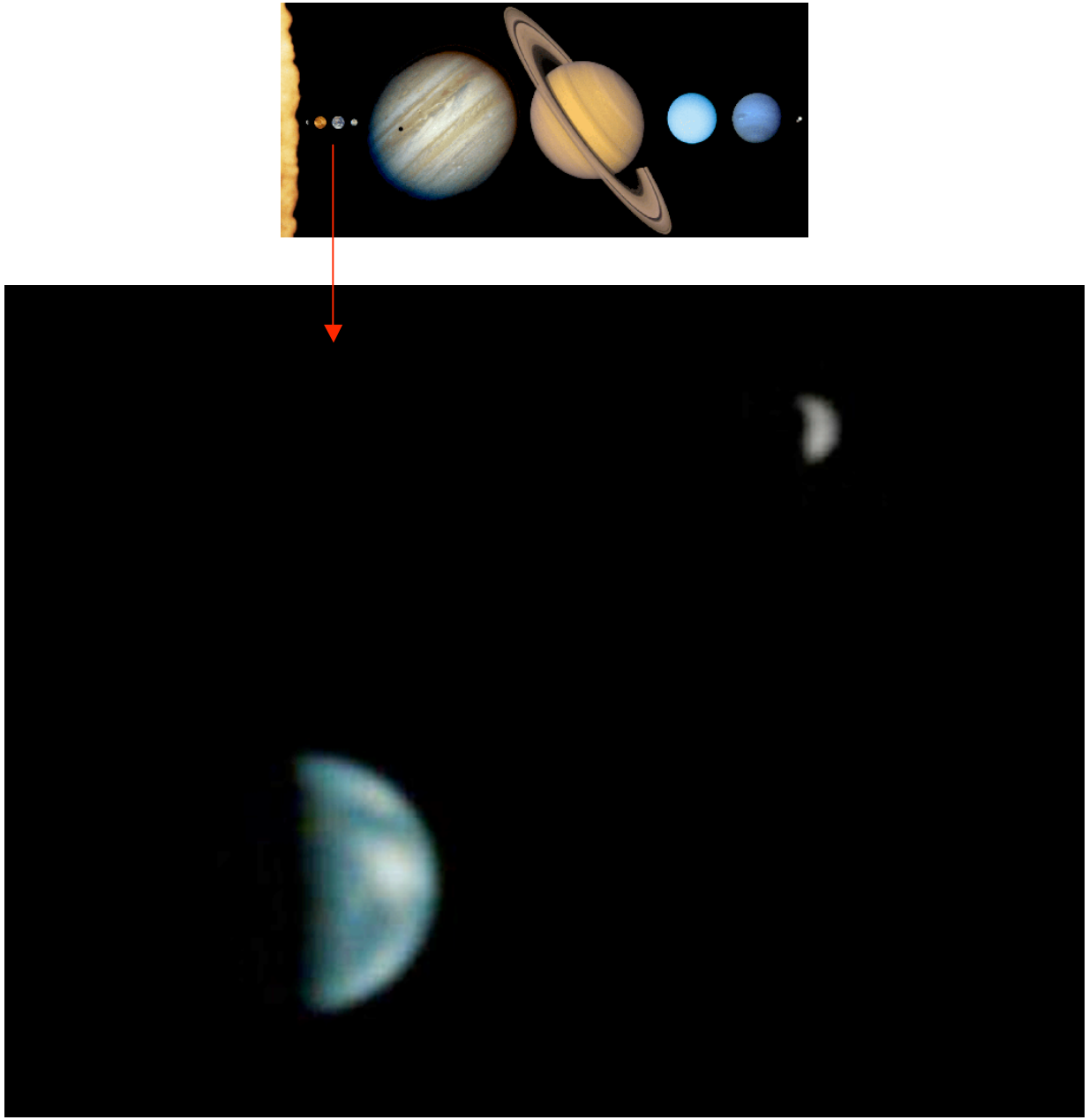
Mercury is small, very hot, dry and cratered







Venus is cloudy and hot



The **Earth** and **Moon**

The **Earth**, has an atmosphere too

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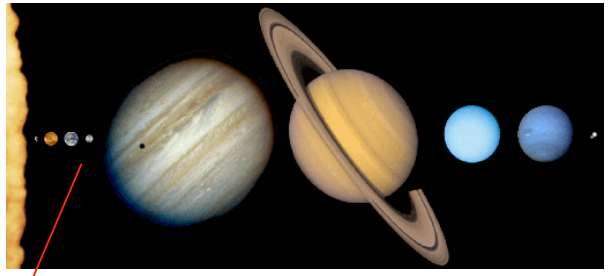
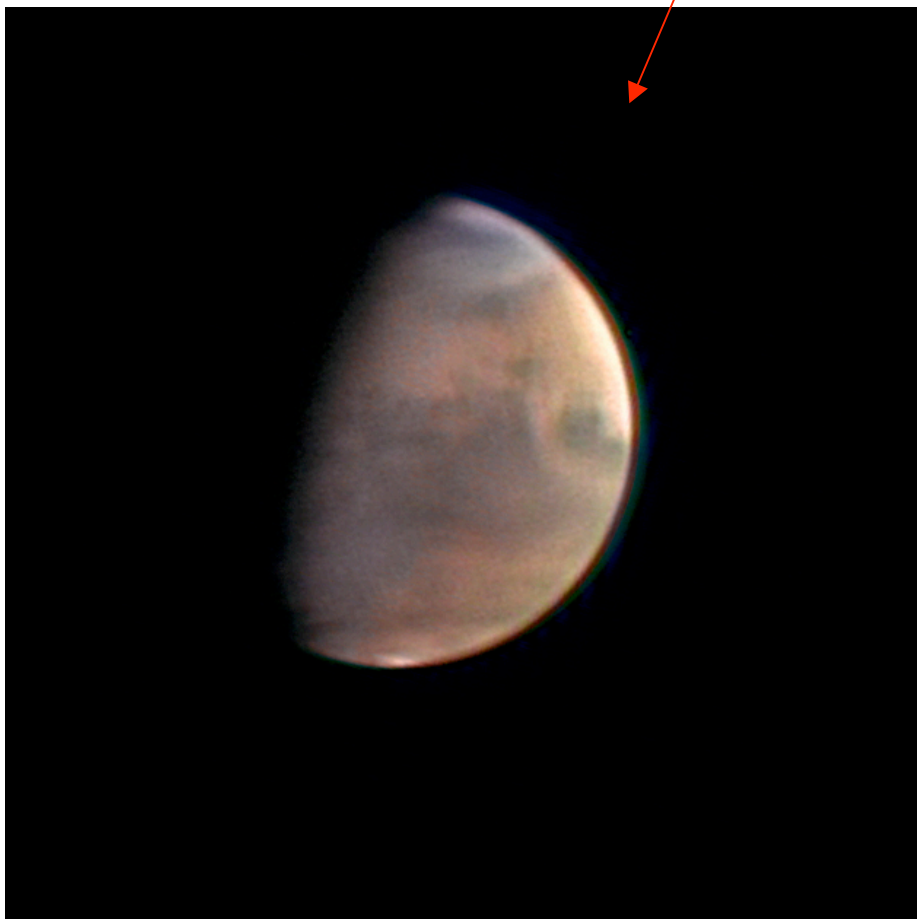
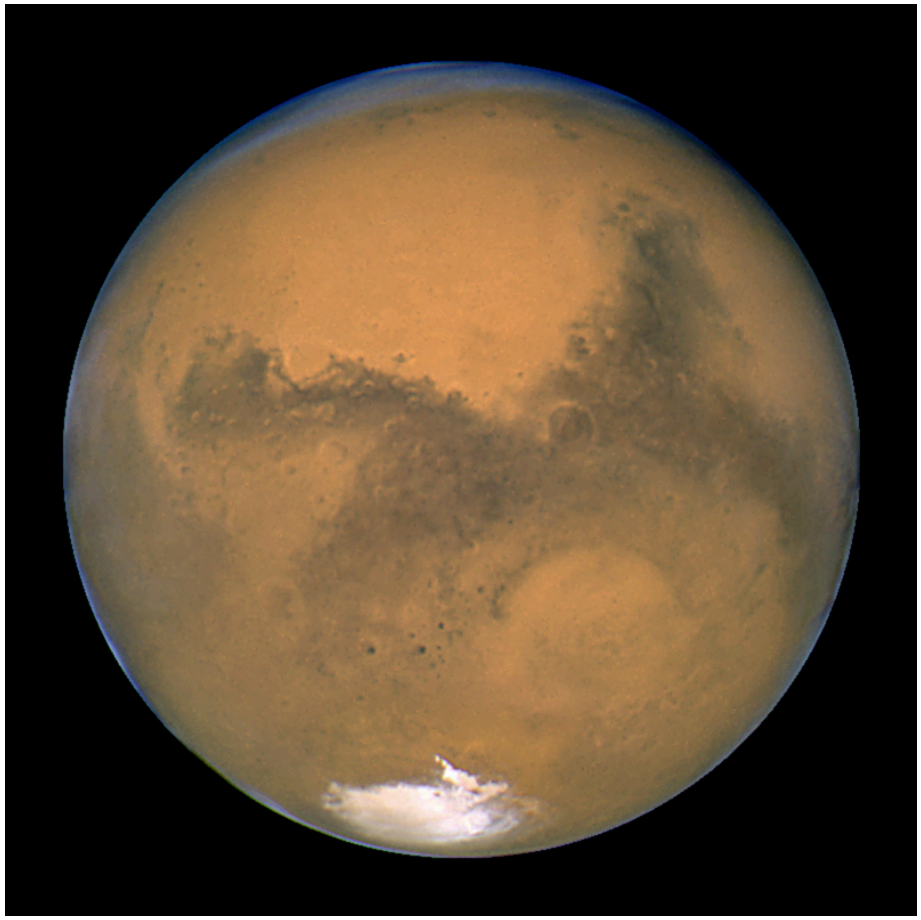
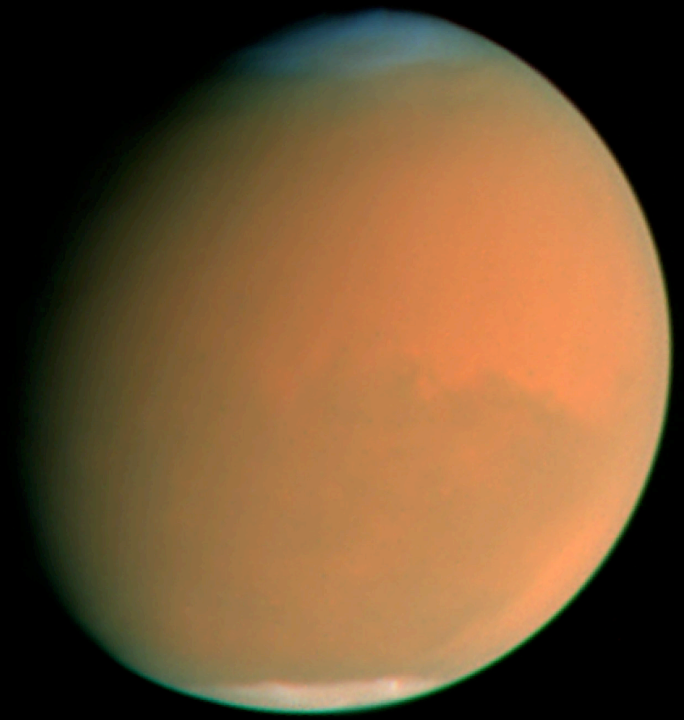






Mars has red sand, icy polar caps,
and a thin atmosphere

June 26, 2001



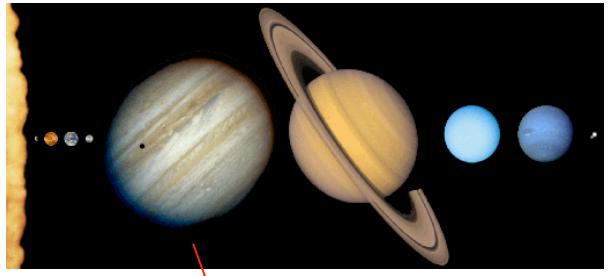
September 4, 2001

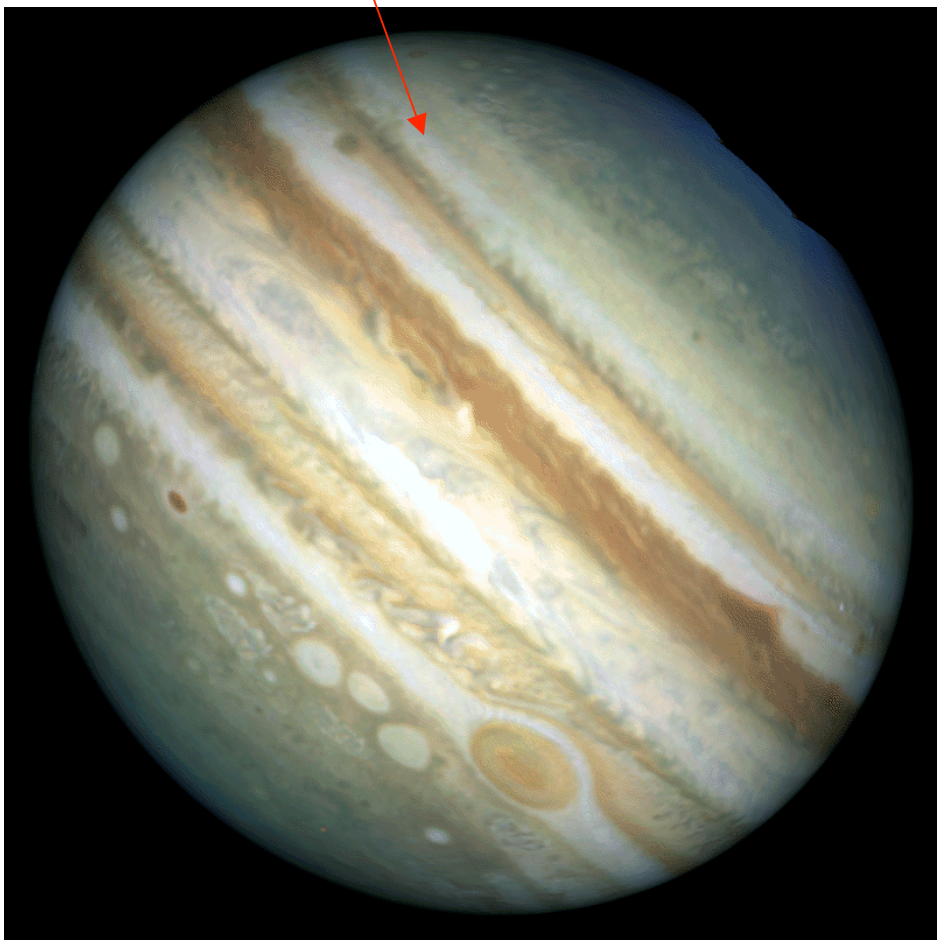
Mars • Global Dust Storm
Hubble Space Telescope • WFPC2

NASA, J. Bell (Cornell University), M. Wolff (SSI), and the Hubble Heritage Team (STScI/AURA) • STScI-PRC01-31

You've probably heard about the two spaceships that landed on Mars last month and are exploring it.

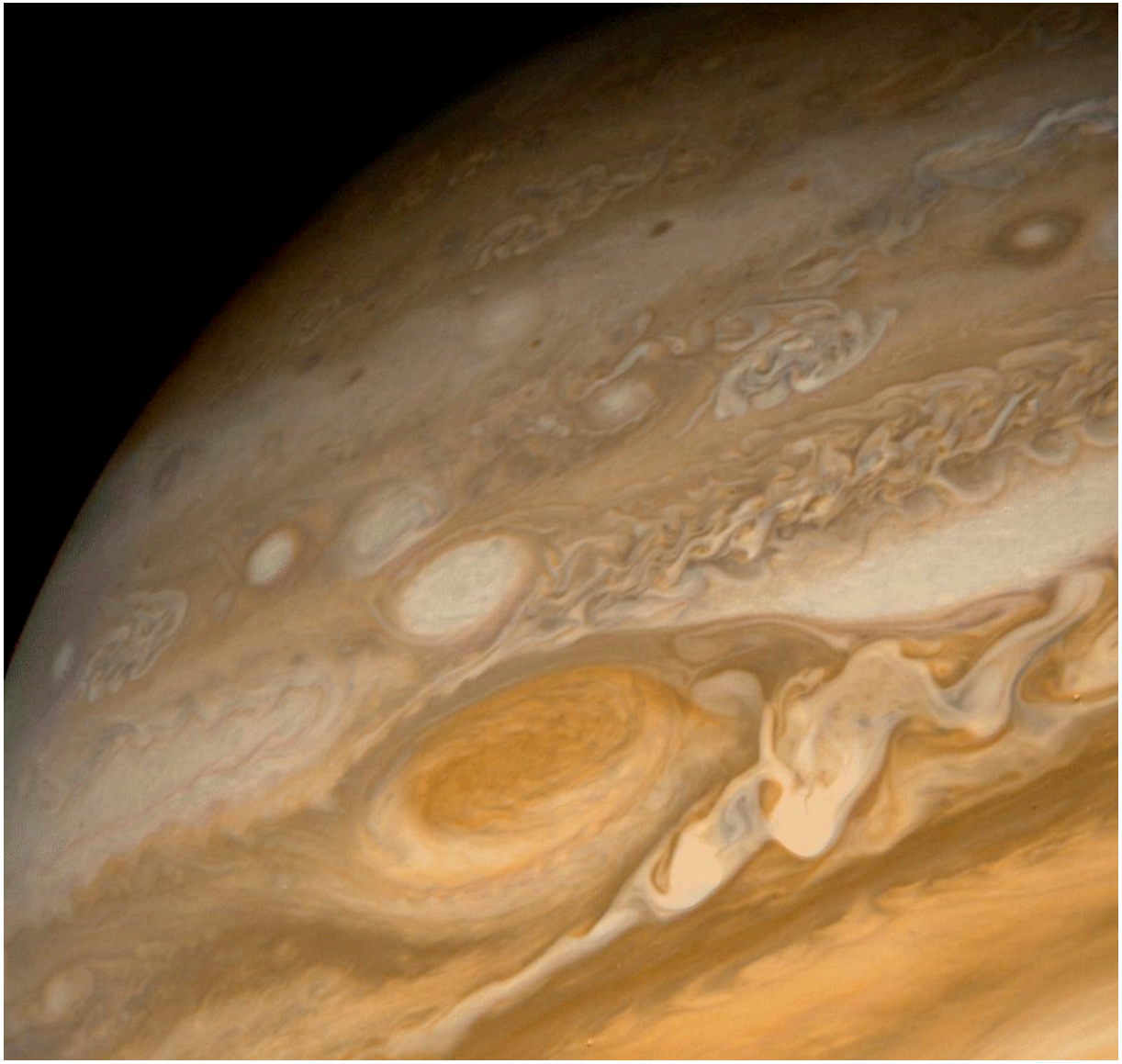
We'll look at some pictures and movies from them at the end of the talk.



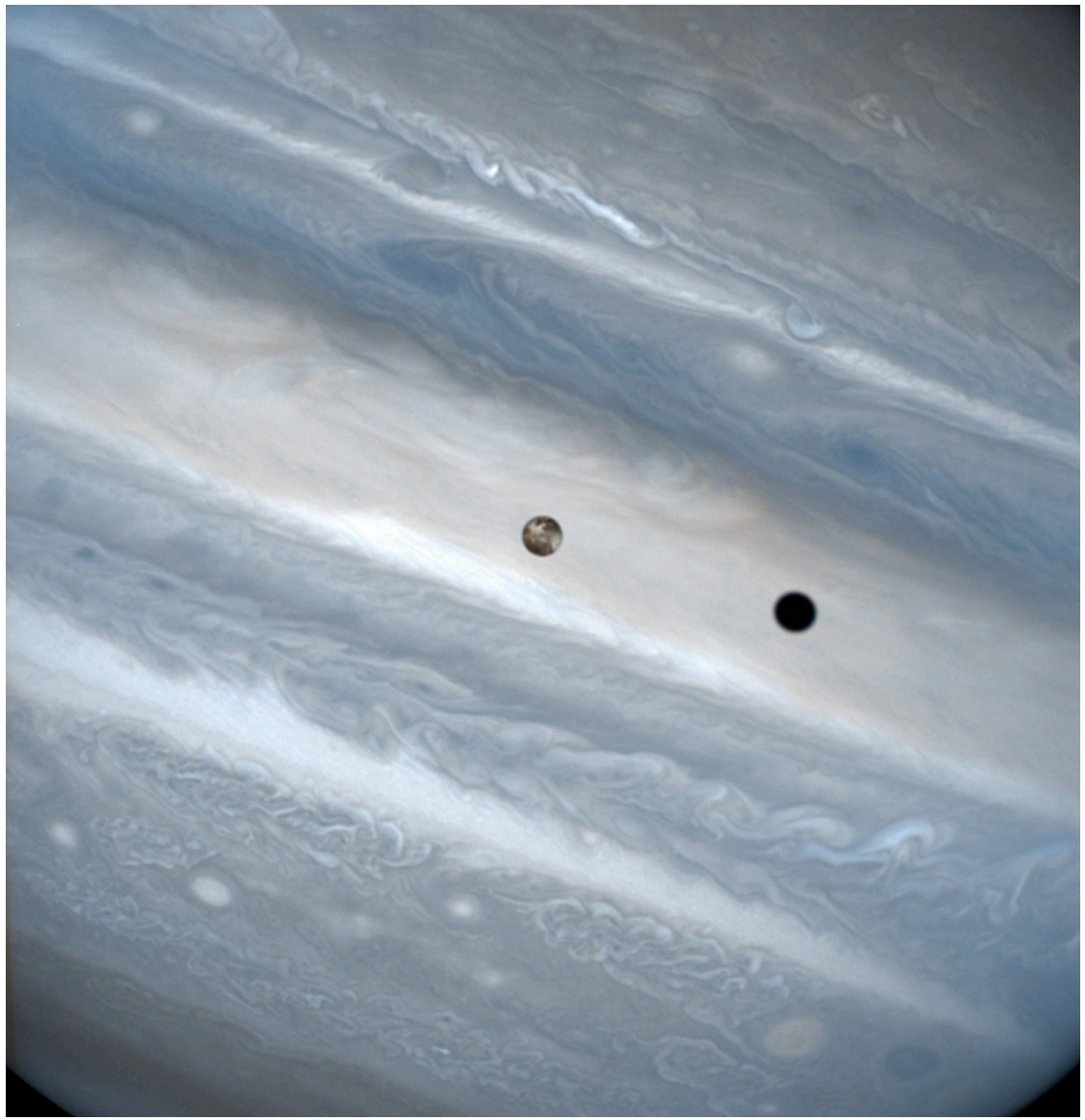


Jupiter…big and gassy with lots of clouds

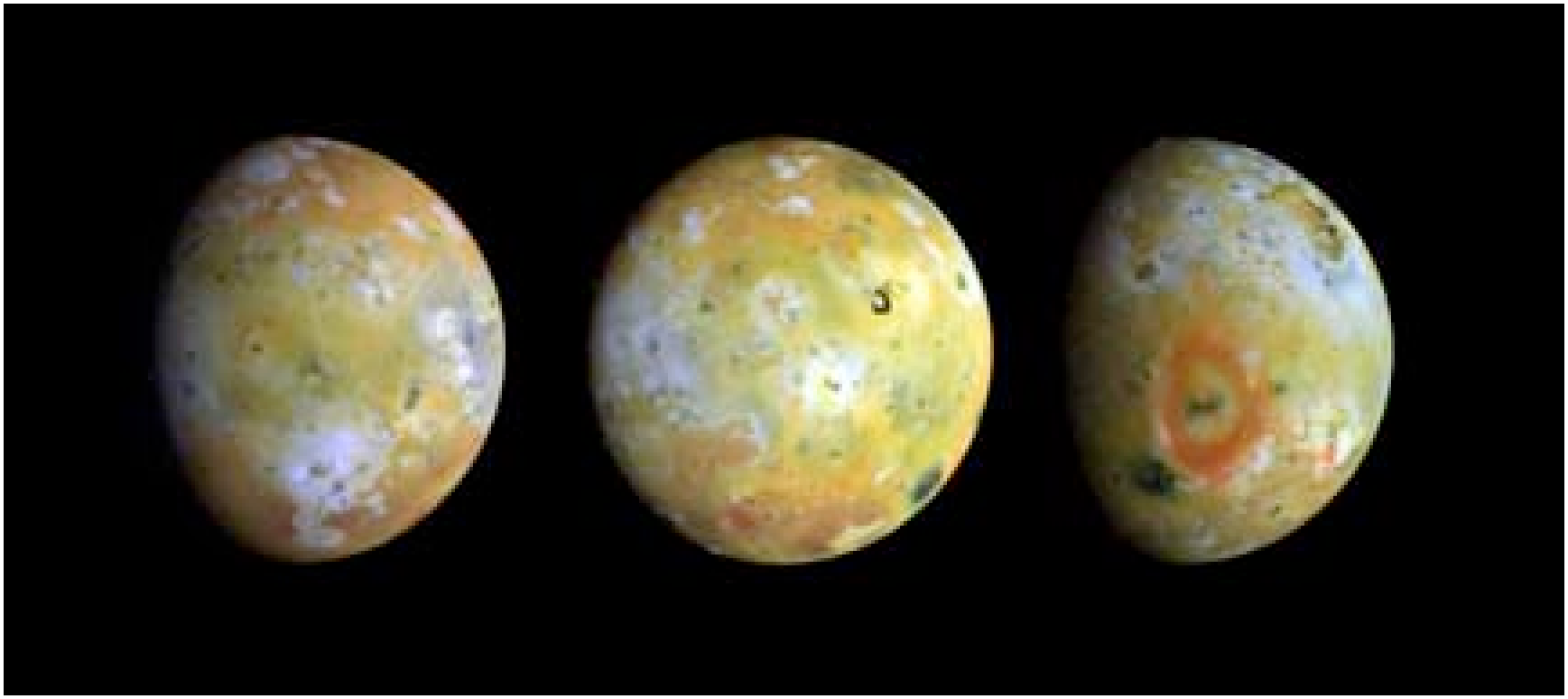
Jupiter’s giant red spot is a storm system

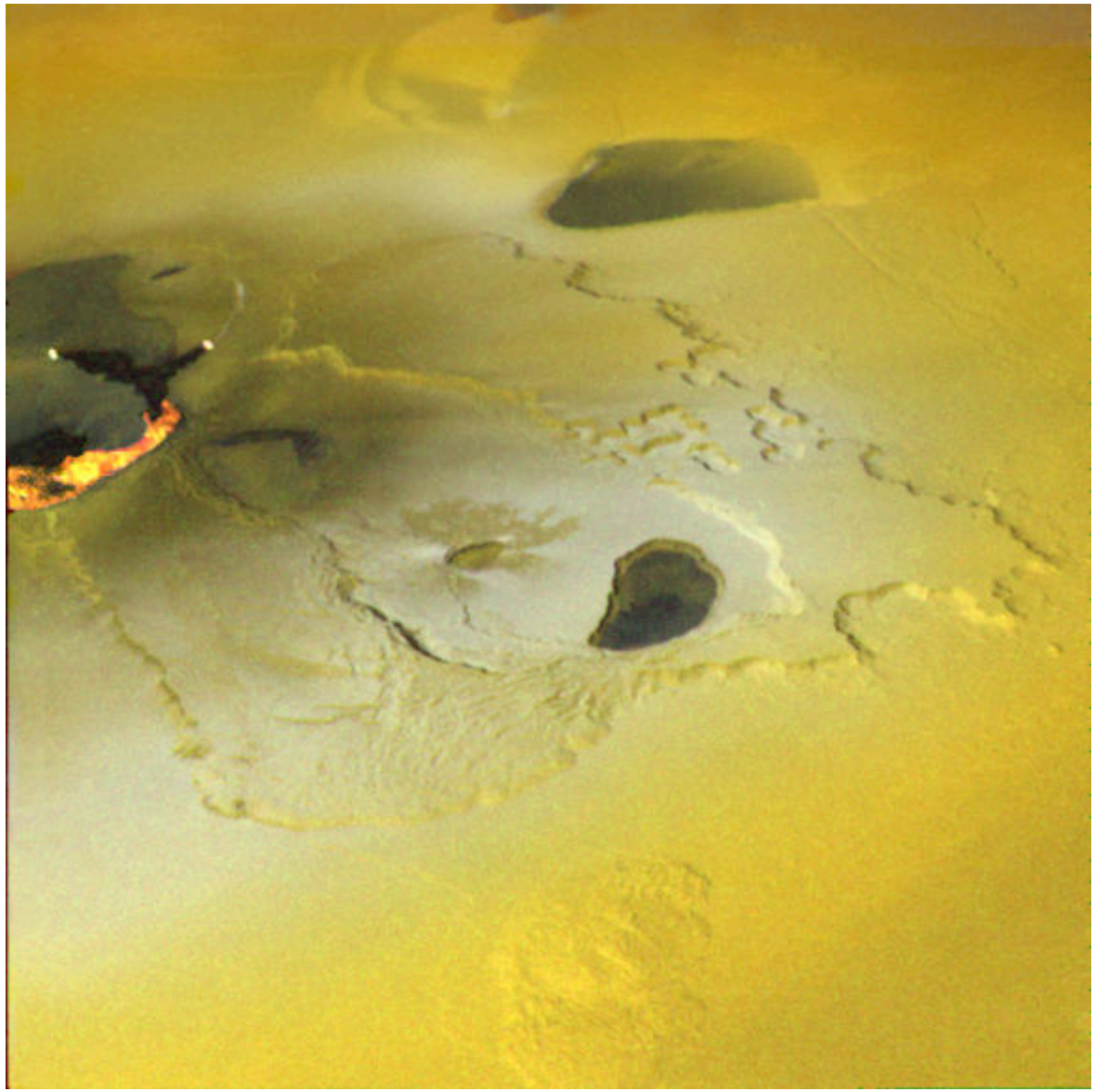


Jupiter with its moon Io - what's that other circle?

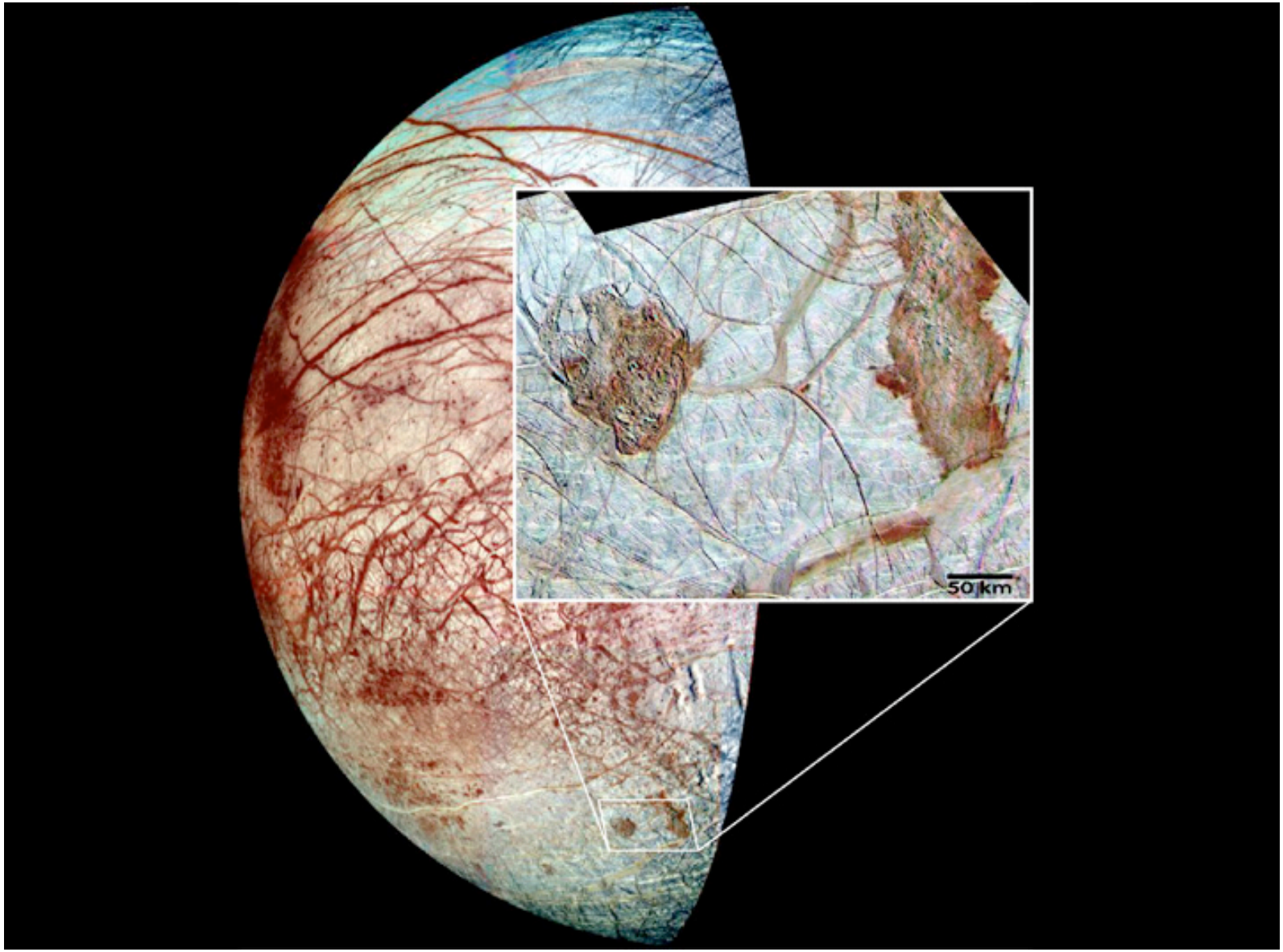


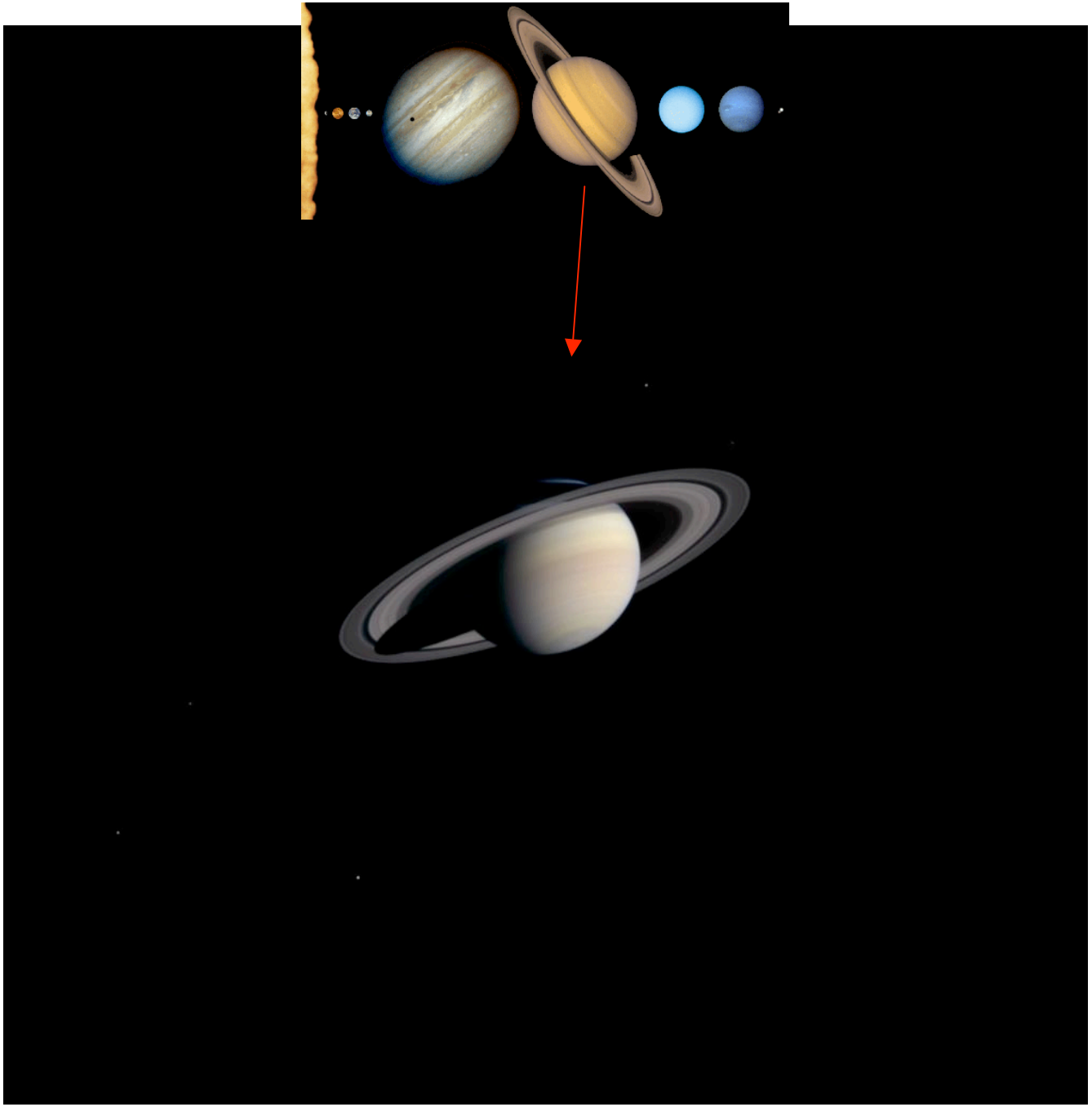
Jupiter's moon Io has the most volcanoes of anything in the solar system



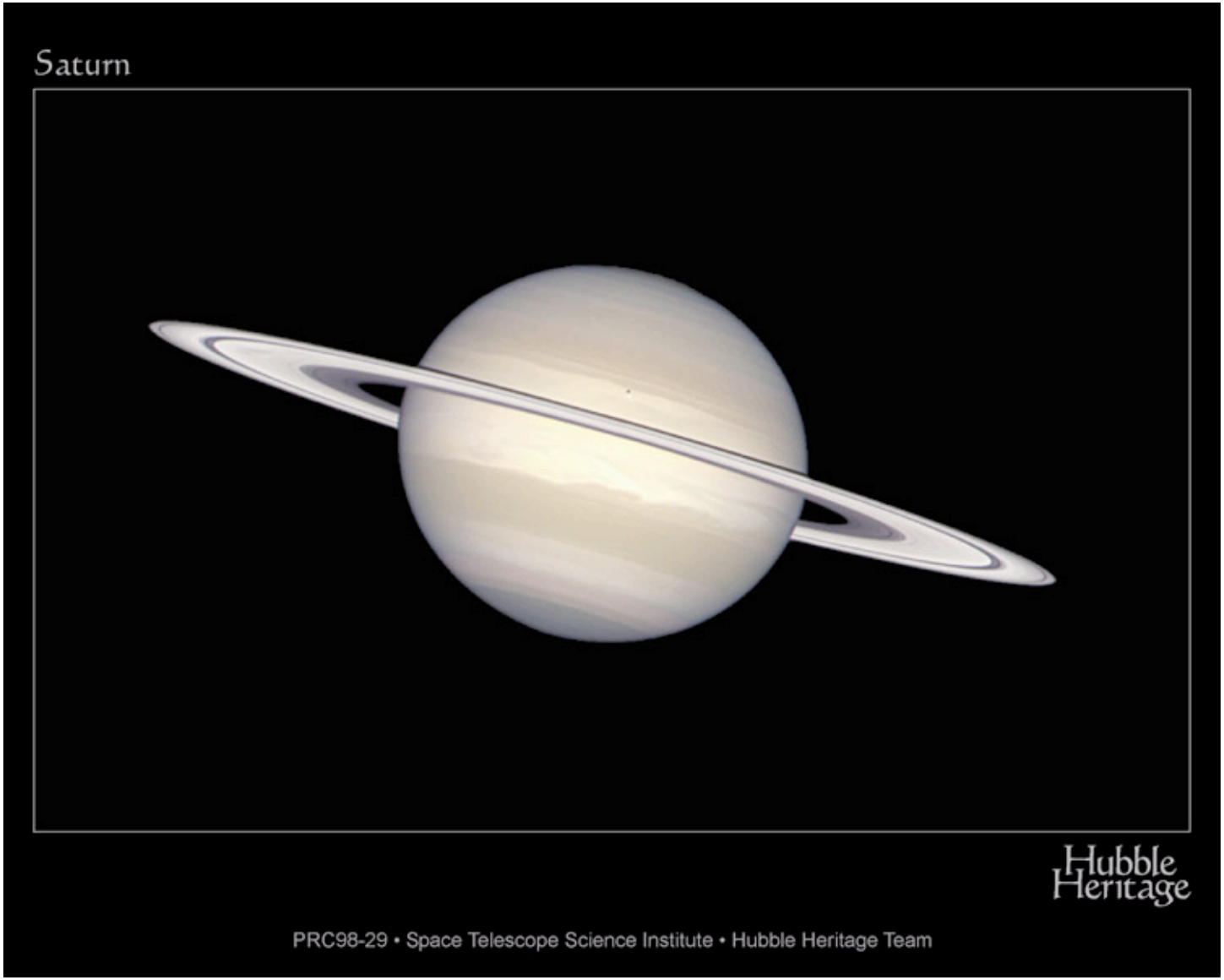


Jupiter’s moon Europa has saltwater oceans covered with ice

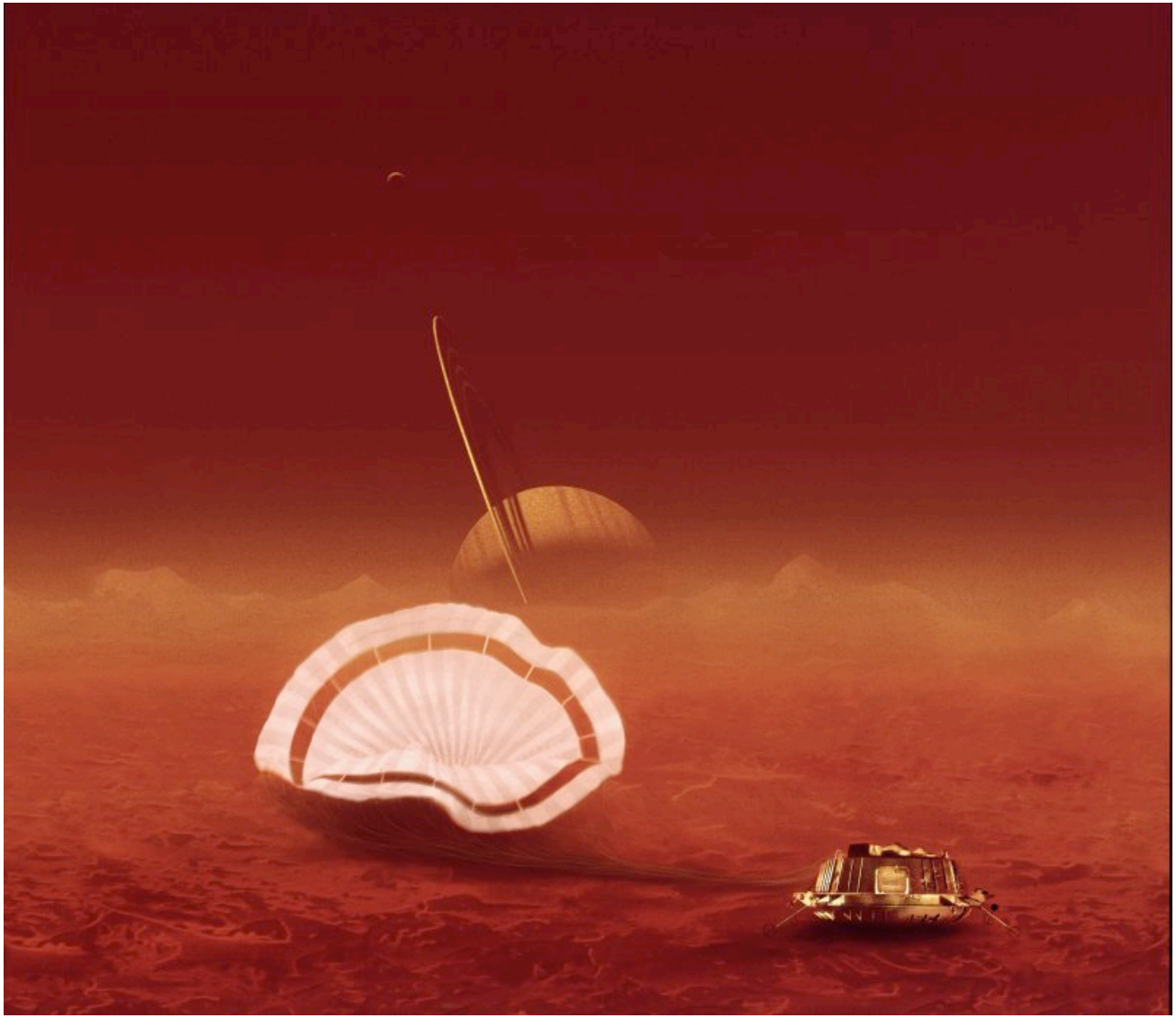


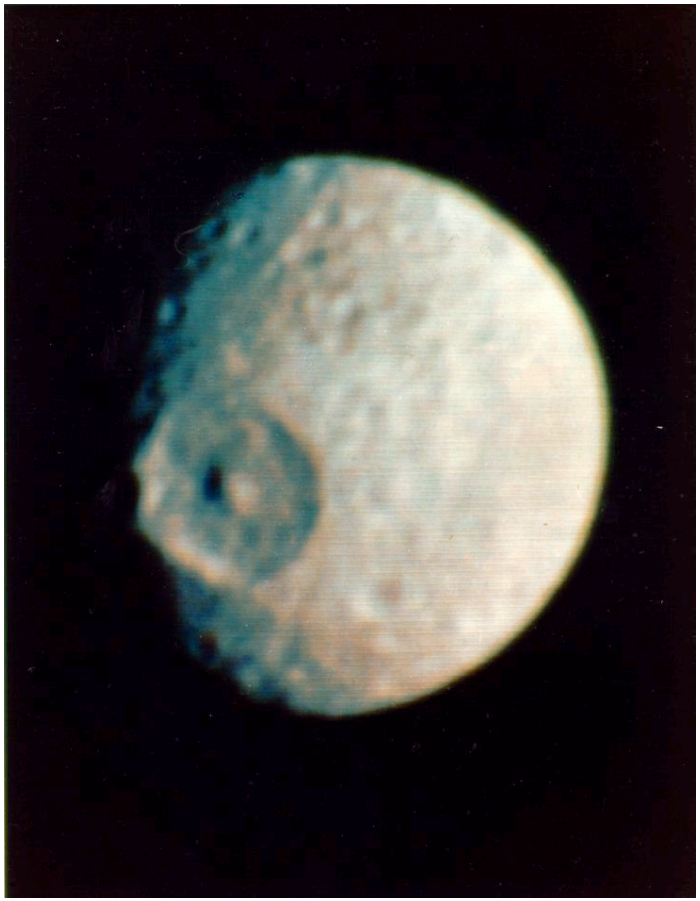


Saturn's rings are orbiting pebbles from crushed moons

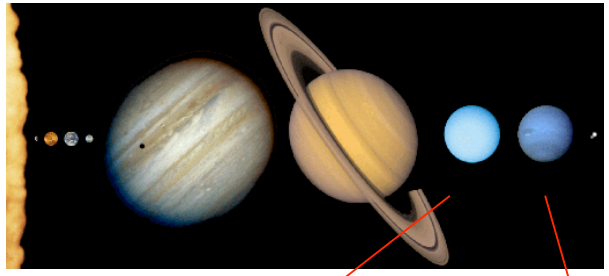


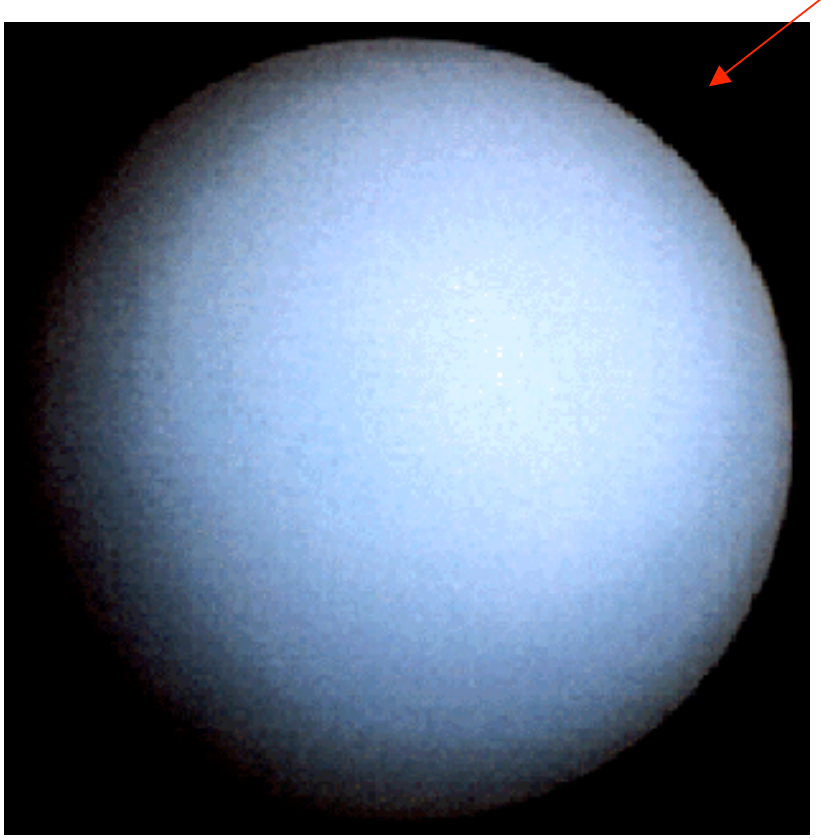
Artist’s vision of a spaceship landing on Saturn’s moon Titan

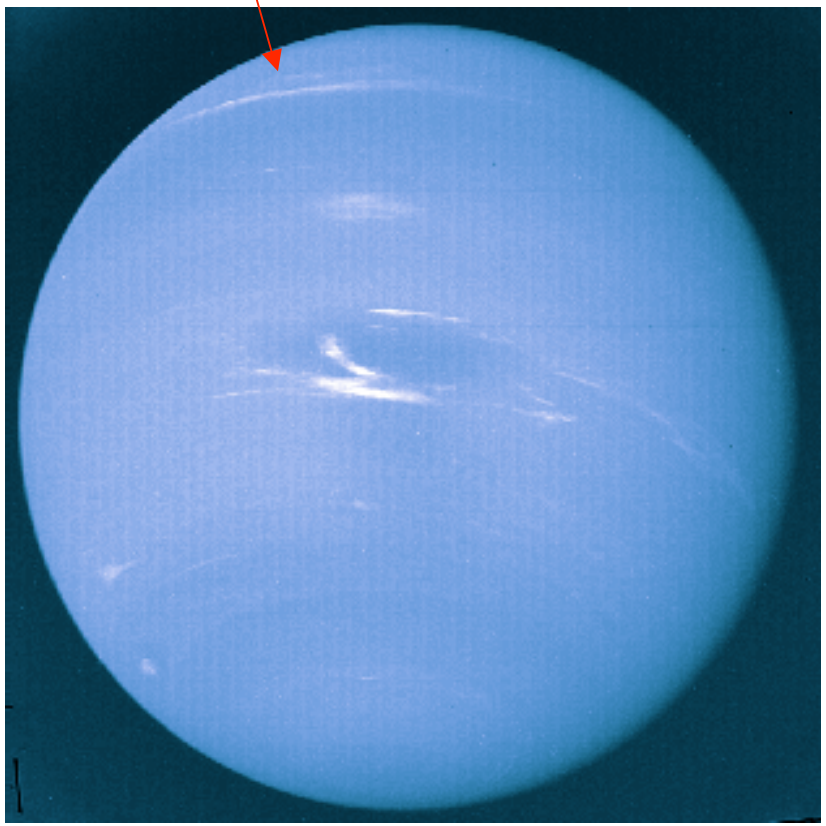




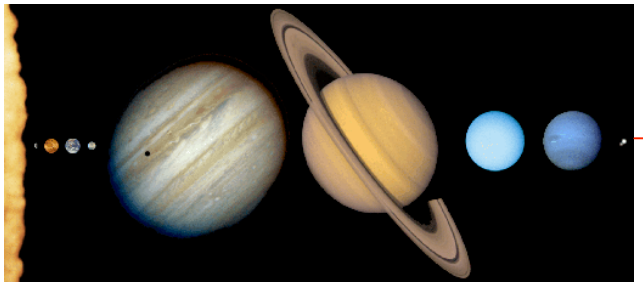
Saturn's moon Mimas seems to have been hit by a big meteor

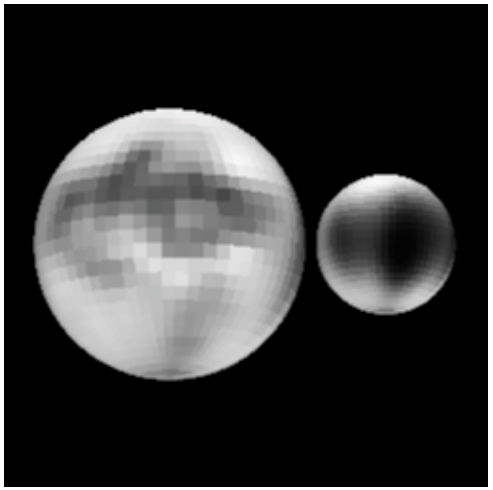






Uranus and Neptune are cold and gassy and far away; they were discovered with telescopes a few hundred years ago



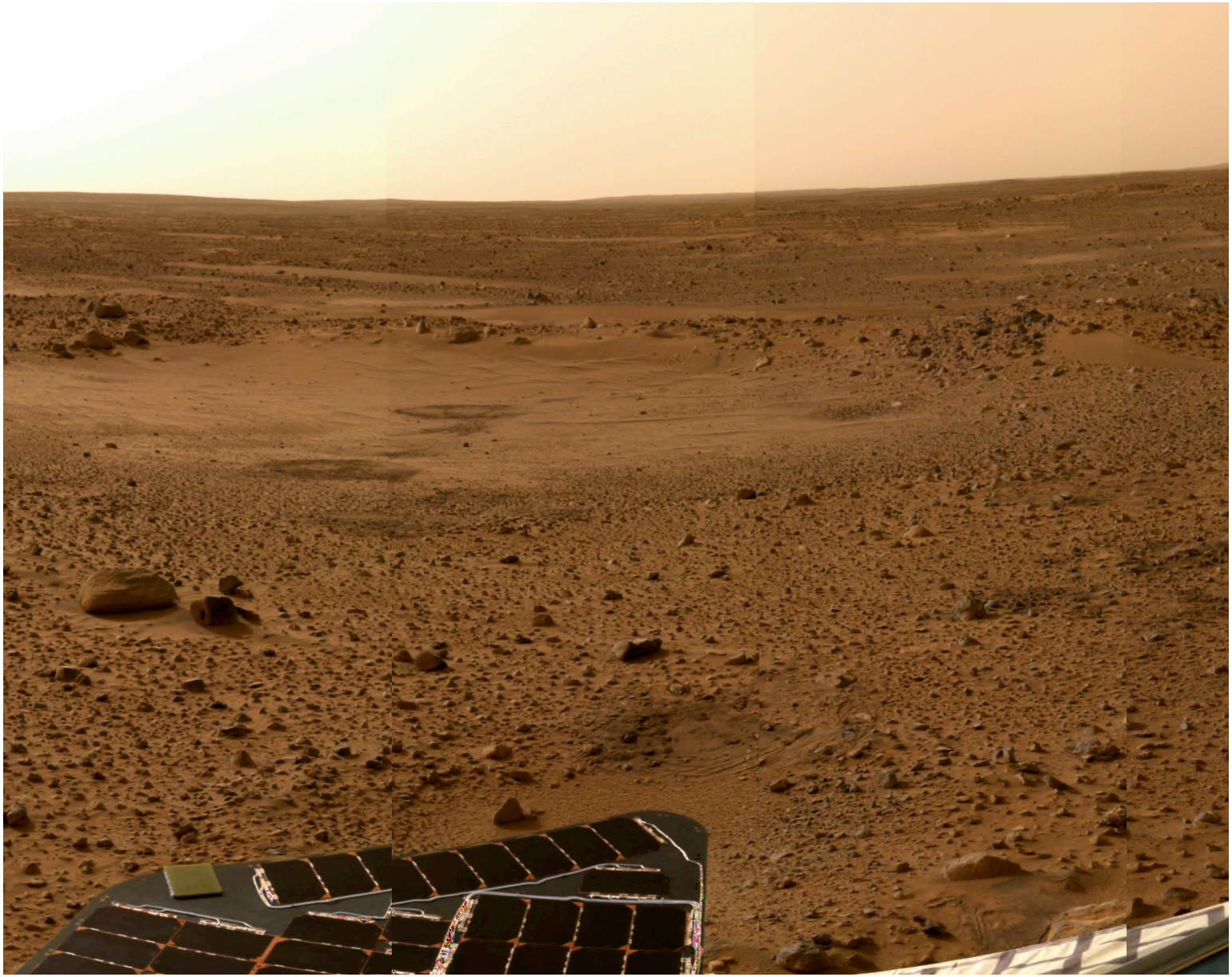


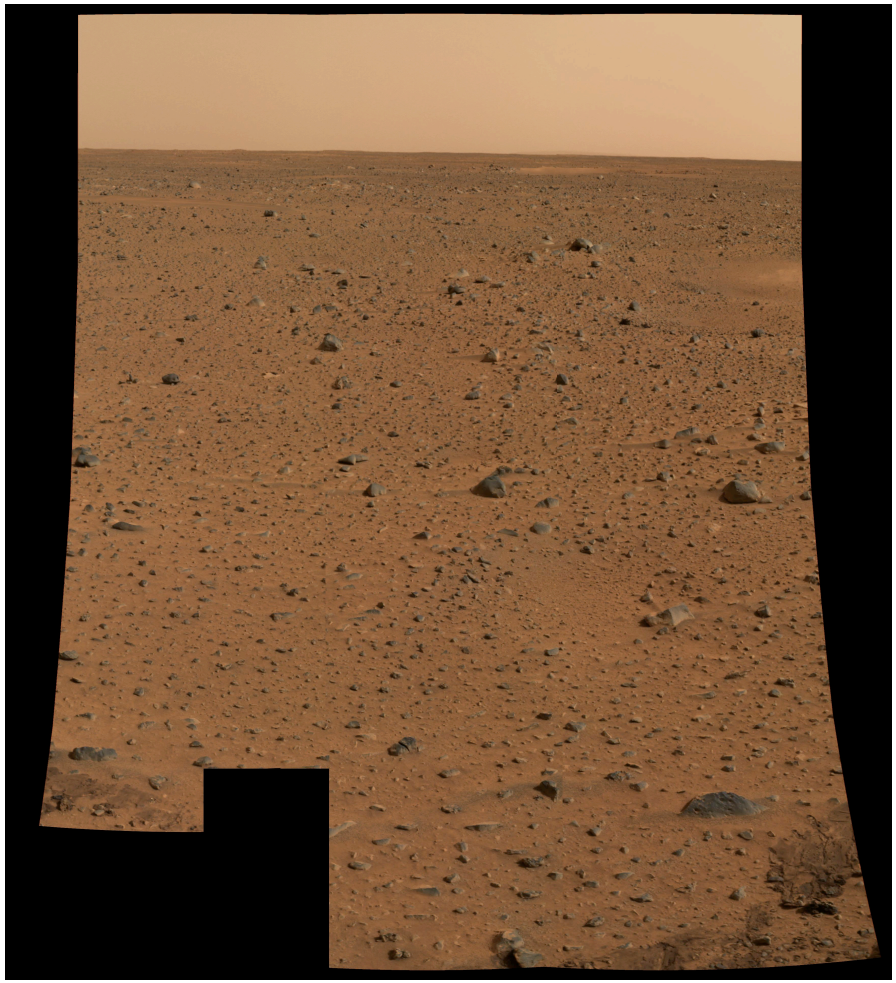
Pluto and its moon Charon are very far away…we don't have too many good pictures of it

Artist's idea of the view from Pluto…it's so far away that the Sun is very dim

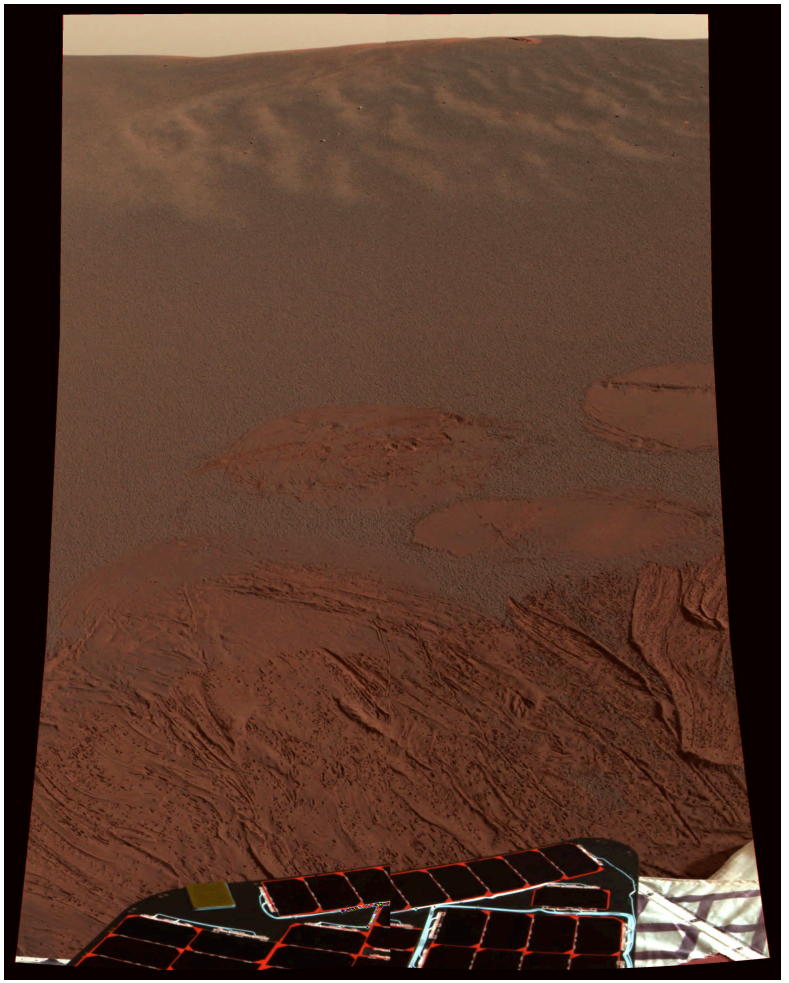
Go outside this weekend and look to the East after dinner, you'll see the full Moon rising

Now some new pictures from the Mars rovers, *Spirit* and *Opportunity*



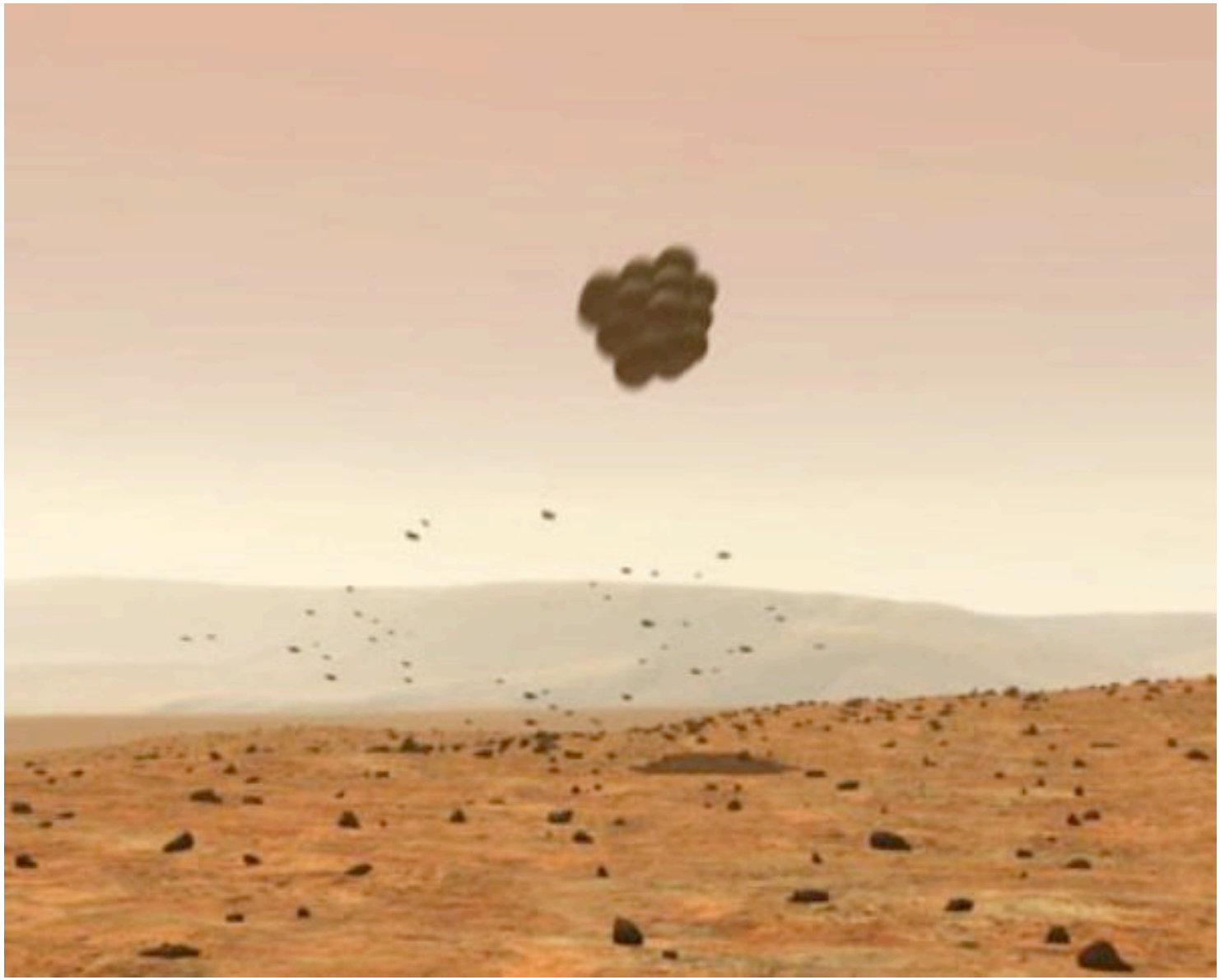


Spirit

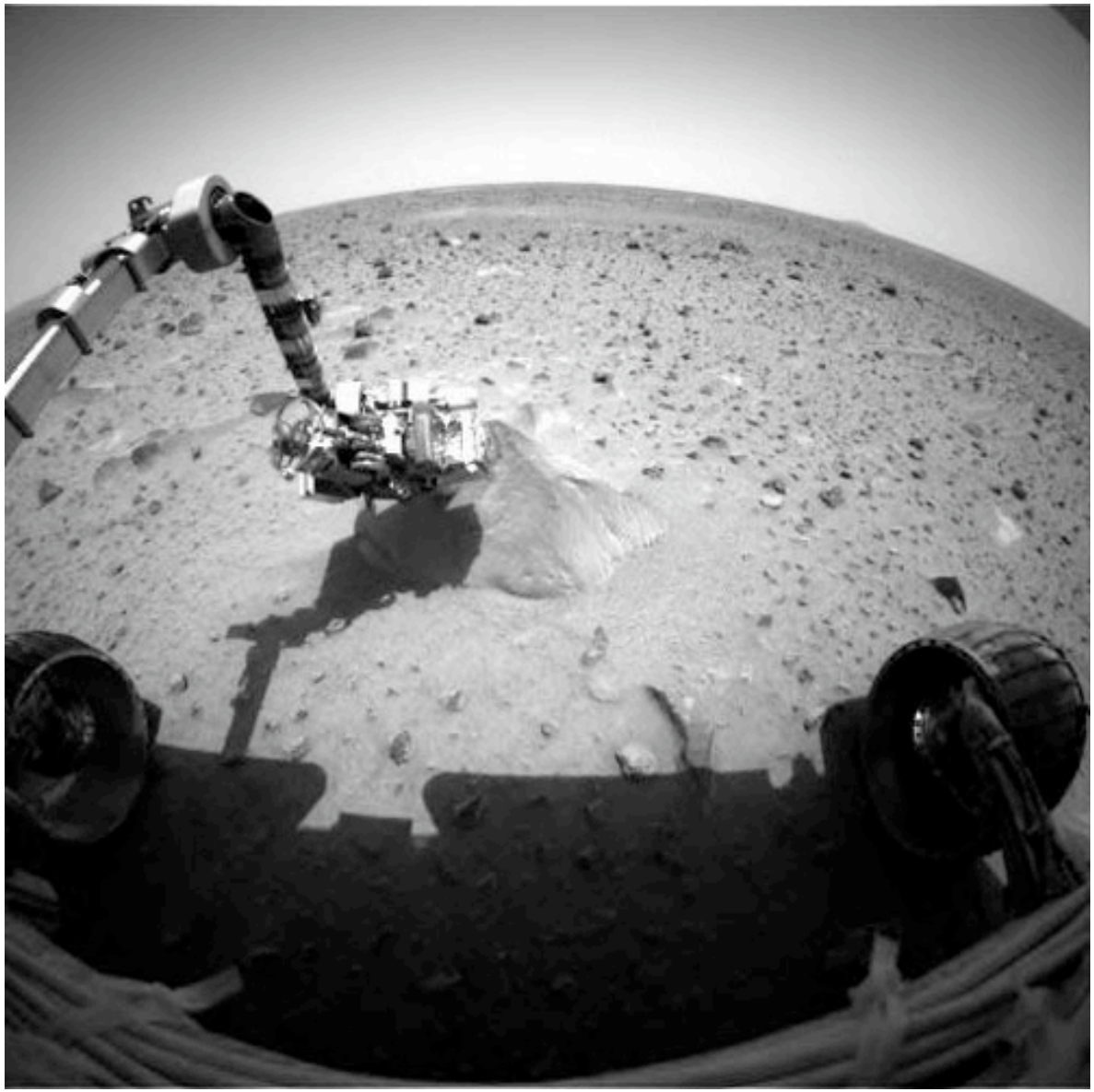


Opportunity

Artist’s rendition of one of the spaceships landing



Spirit checking out a rock



NASA's animation of the rovers' entry into the atmosphere of Mars and their landing

And another animation of the rover moving onto the surface of Mars

Come to the College's **telescope open house** the second Tuesday of each month at Sproul Observatory!