

# Venus and Earth

11/9/2009

# Opening Discussion

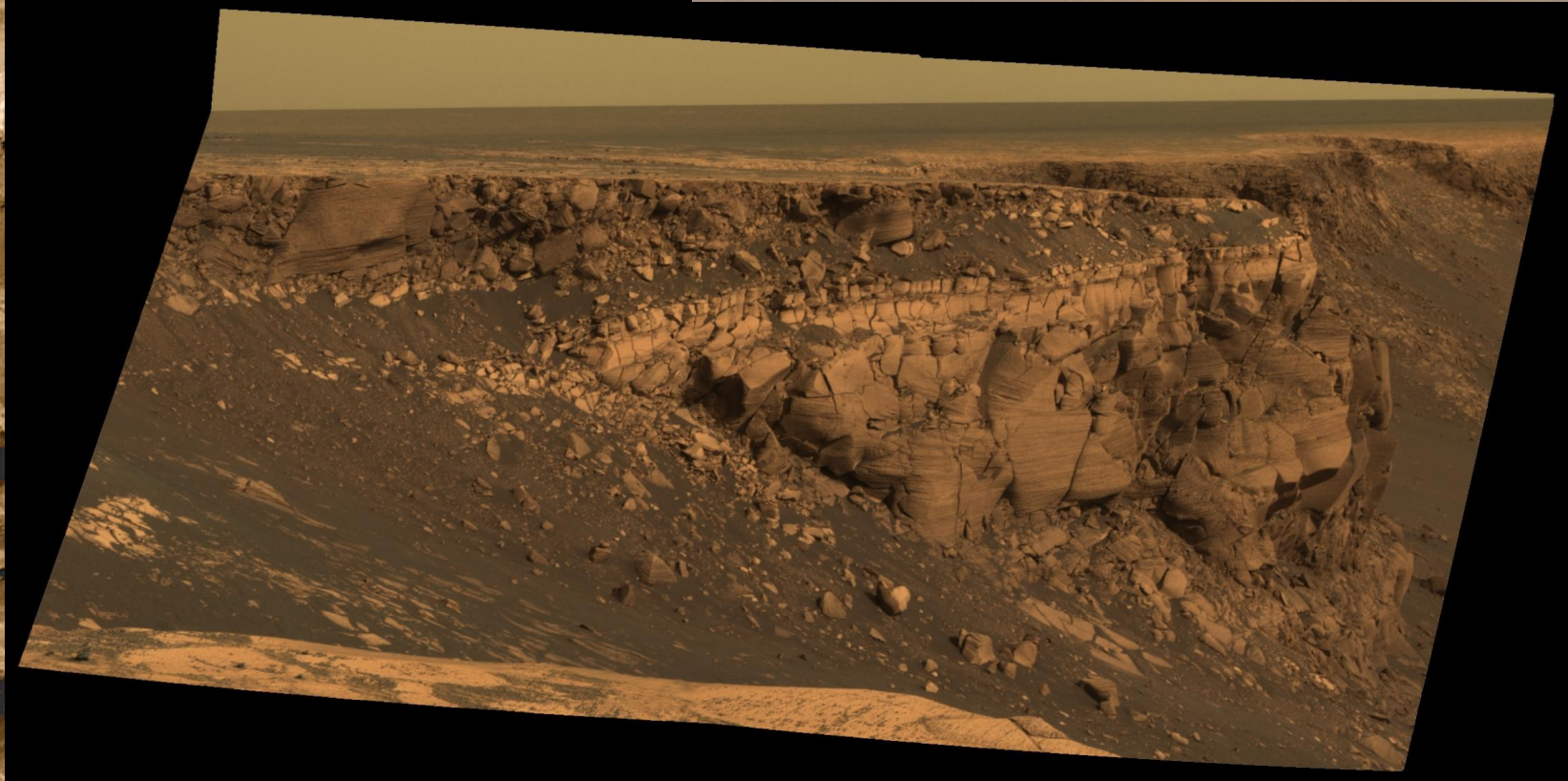
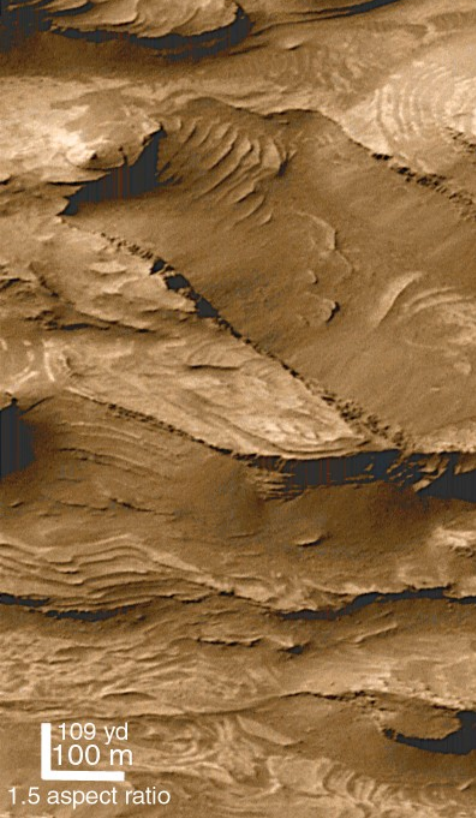
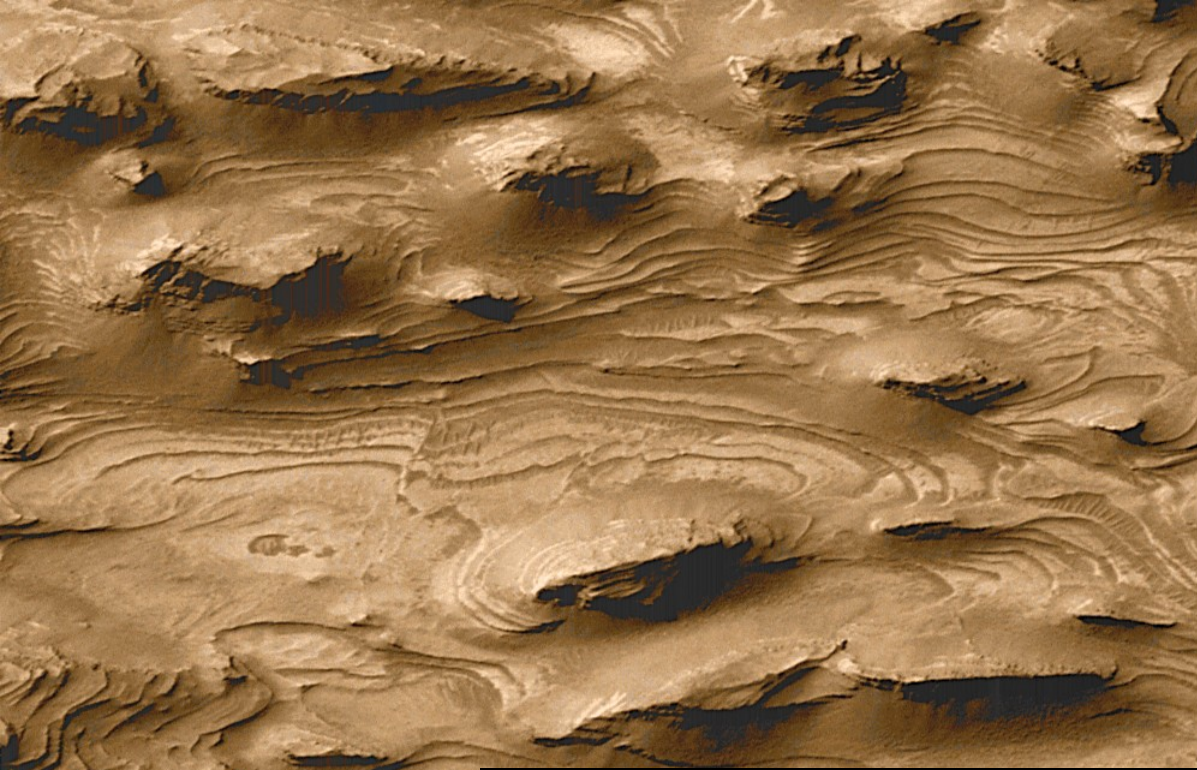
- <http://www.youtube.com/watch?v=7VBex8zbDRs>
- Have you seen anything interesting in the news?
- What did we talk about last class?

# Erosion on Mars

- Mars has a thin carbon dioxide atmosphere and we have seen images of dust devils in it. The wind is constantly changing the look of the surface and contributing to minor erosion.
- There are also many features on Mars that indicate that there had at one time been significant water on the planet. It is possible Mars was warm and wet during the first 1.5 billion years of its life. About 3 billion years ago it dried up.
- <http://marsprogram.jpl.nasa.gov/mgs/msss/camera>

# Water?

- A major question is that of whether there is currently water on Mars. The atmosphere is too thin to support liquid water today. That doesn't mean there is no water, it just isn't liquid.
- There are many features that indicate the sudden release of large underground repositories of water more recent than 3 billion years ago.
- MGS has also returned images that indicate that there is underground water on Mars today. Mars Odyssey has shown other evidence of underground water.



109 yd  
100 m

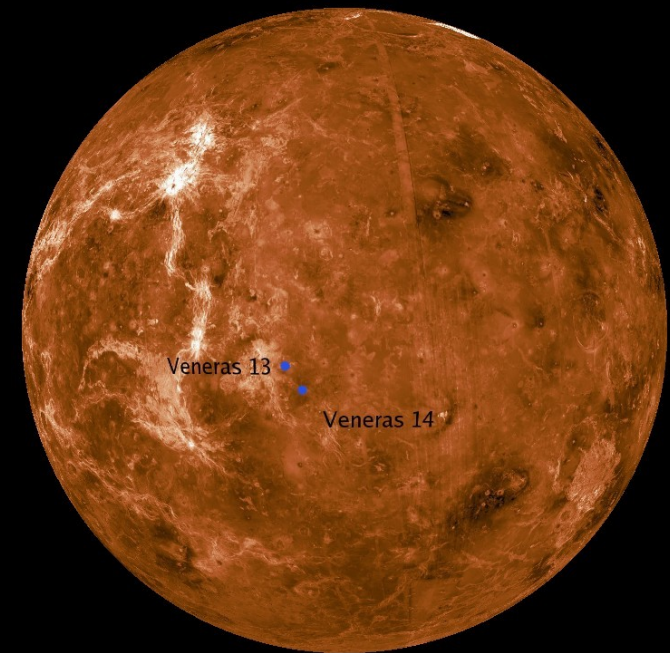
1.5 aspect ratio

# Mars Reconnaissance Orbiter (MRO)

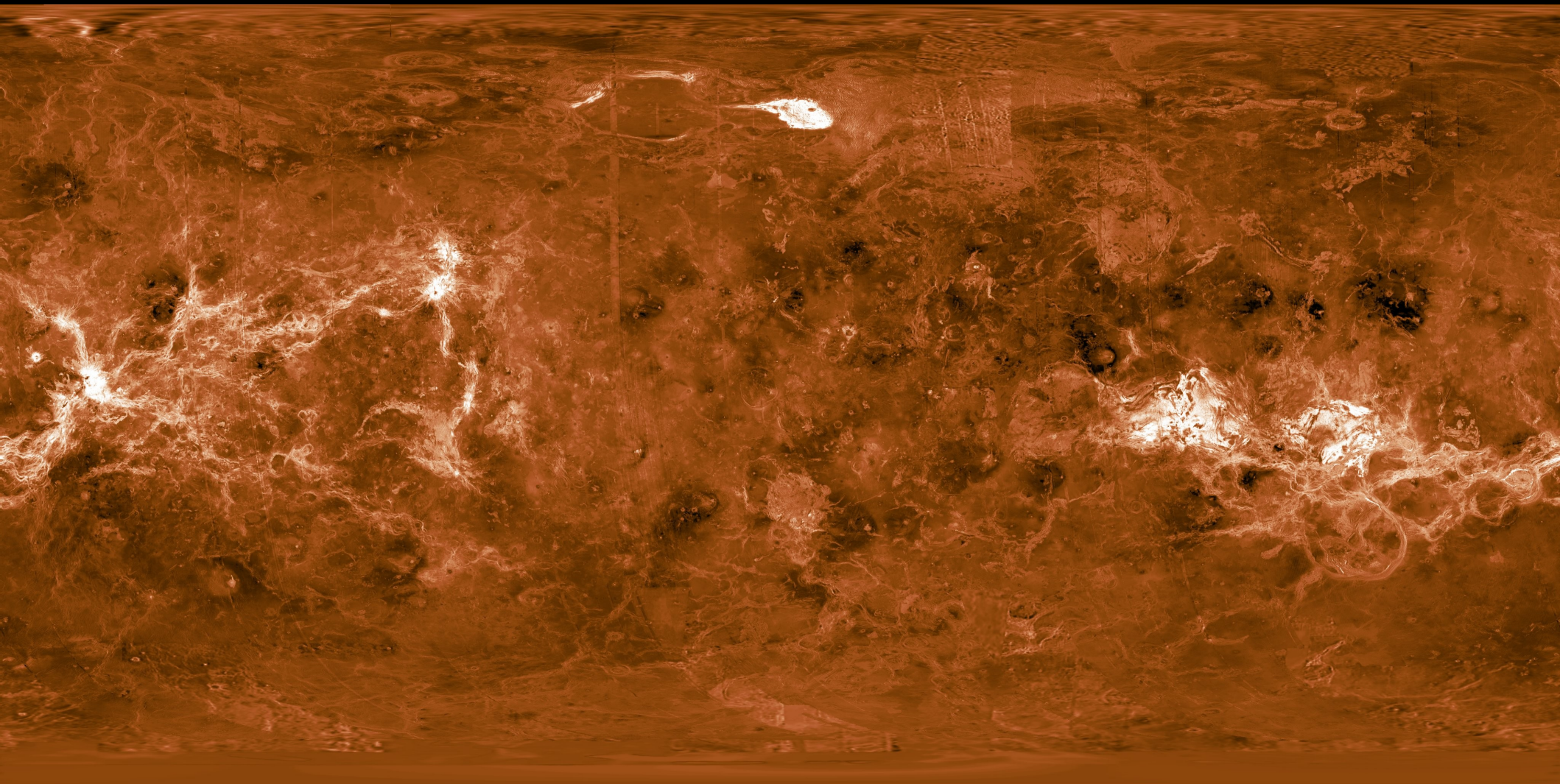
- This is the web site for the mission.
- <http://marsprogram.jpl.nasa.gov/mro/>
- The HiRISE camera takes remarkably high resolution images.

# Venus

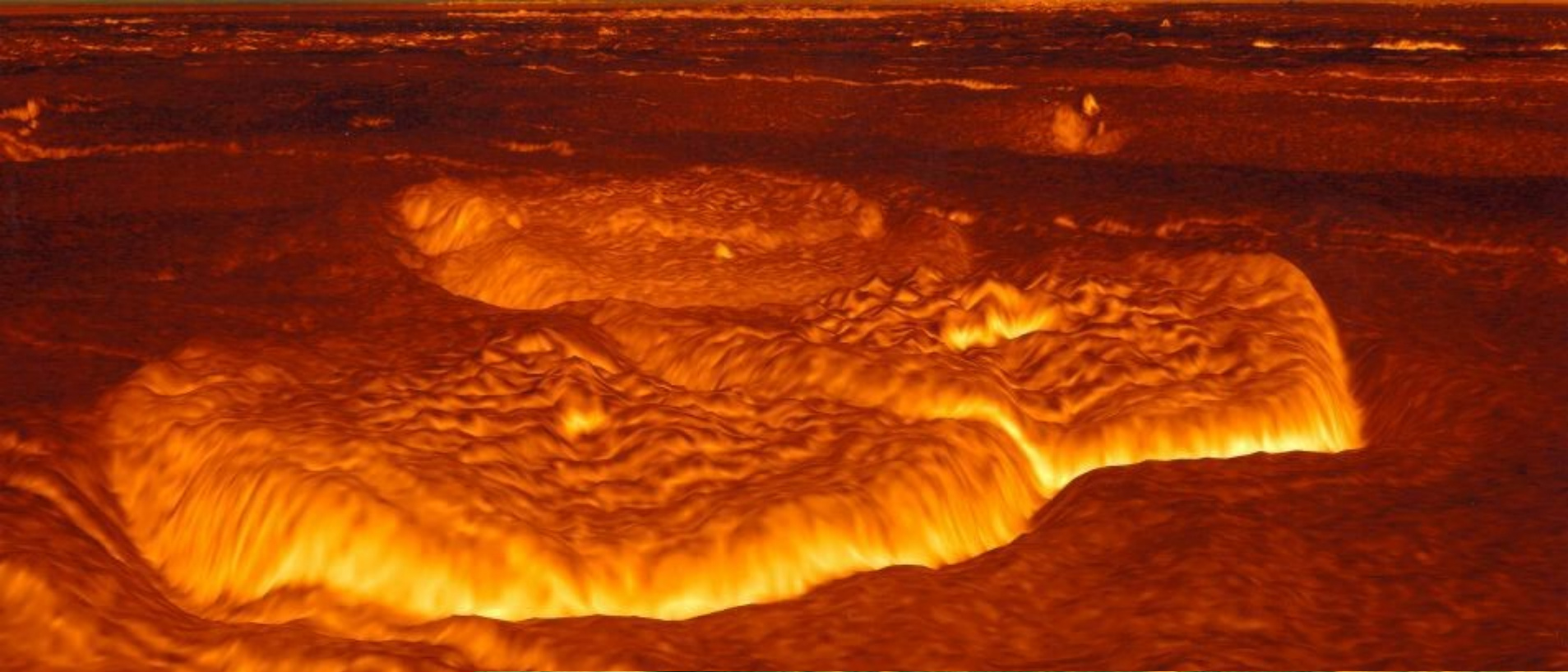
- Geologically, we expect that Venus should be very similar to Earth given the similarities in size and distance from the Sun.
- Venus has very few craters and is covered mostly by plains. It has mountains, but not as many ranges as on the Earth. The largest features are the three “Terra”.



# Venus







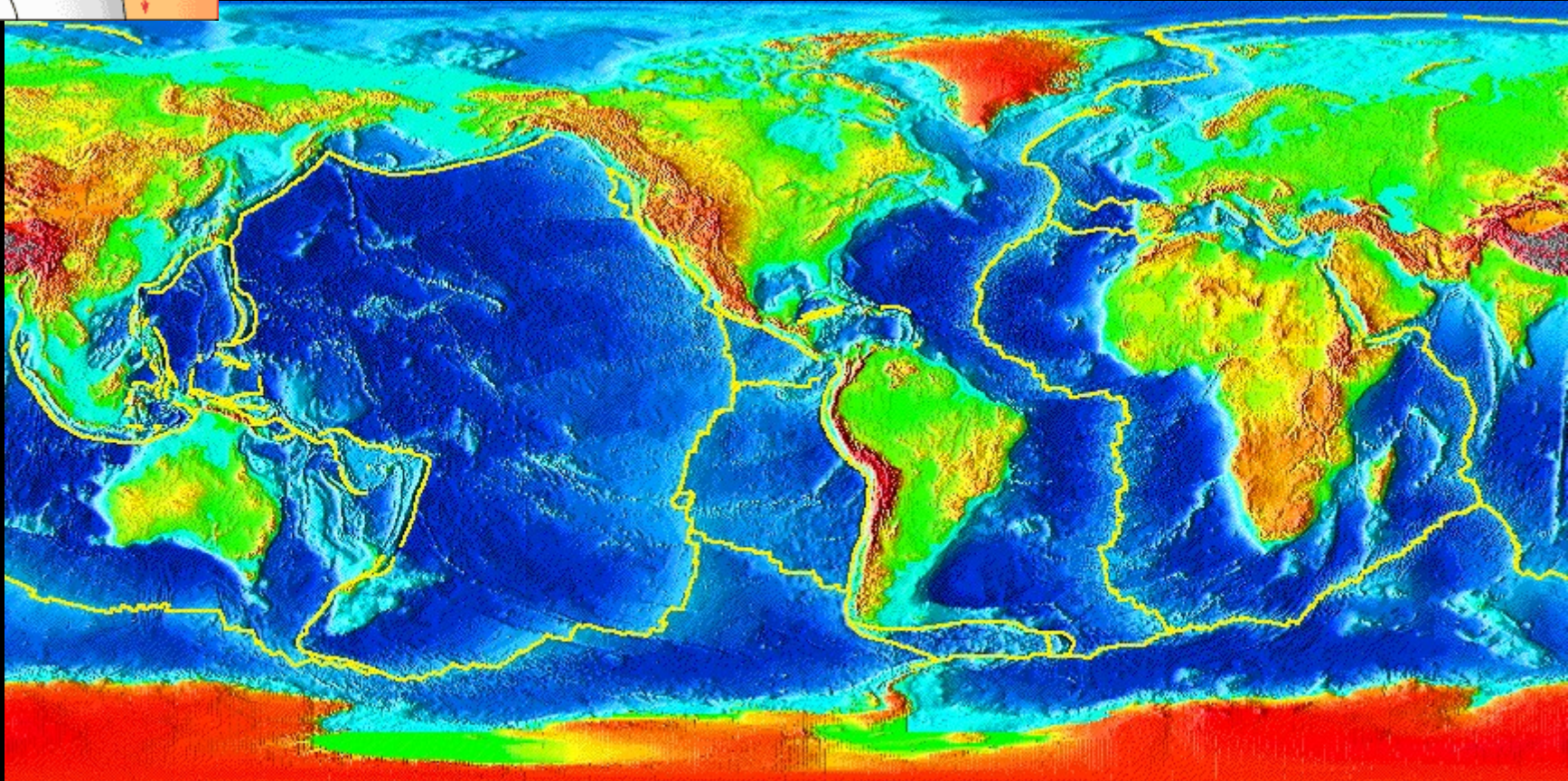
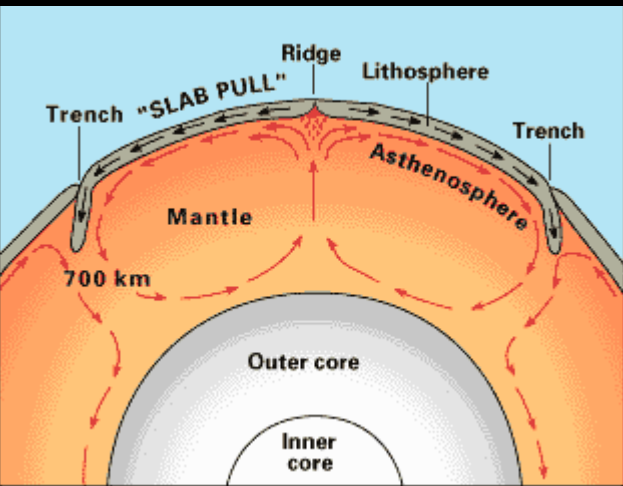
# Specifics of Venus

- Crater counting indicates that the entire surface of Venus is about 750 million years old.
- Venus has many lava flows and volcanic mountains.
- Venus has large fractured regions indicating significant tectonic activity. It does not appear that Venus has plate tectonics like the Earth does. A lack of water could explain this.
- Venus shows virtually no signs of erosion. There is certainly no water at the surface and the slow rotation means there is little wind either.

# Earth

- The Earth is different from the other terrestrial planets in that what we see is shaped mostly by erosion. Tectonics form mountains and there are occasional impacts, but features of both of these are eroded over time.
- Earth is also the only planet with plate tectonics.

# Plate Tectonics



Crustal Plate Boundaries

# Minute Essay

- Do you have any questions about terrestrial geology?
- The reading quiz will be posted soon.