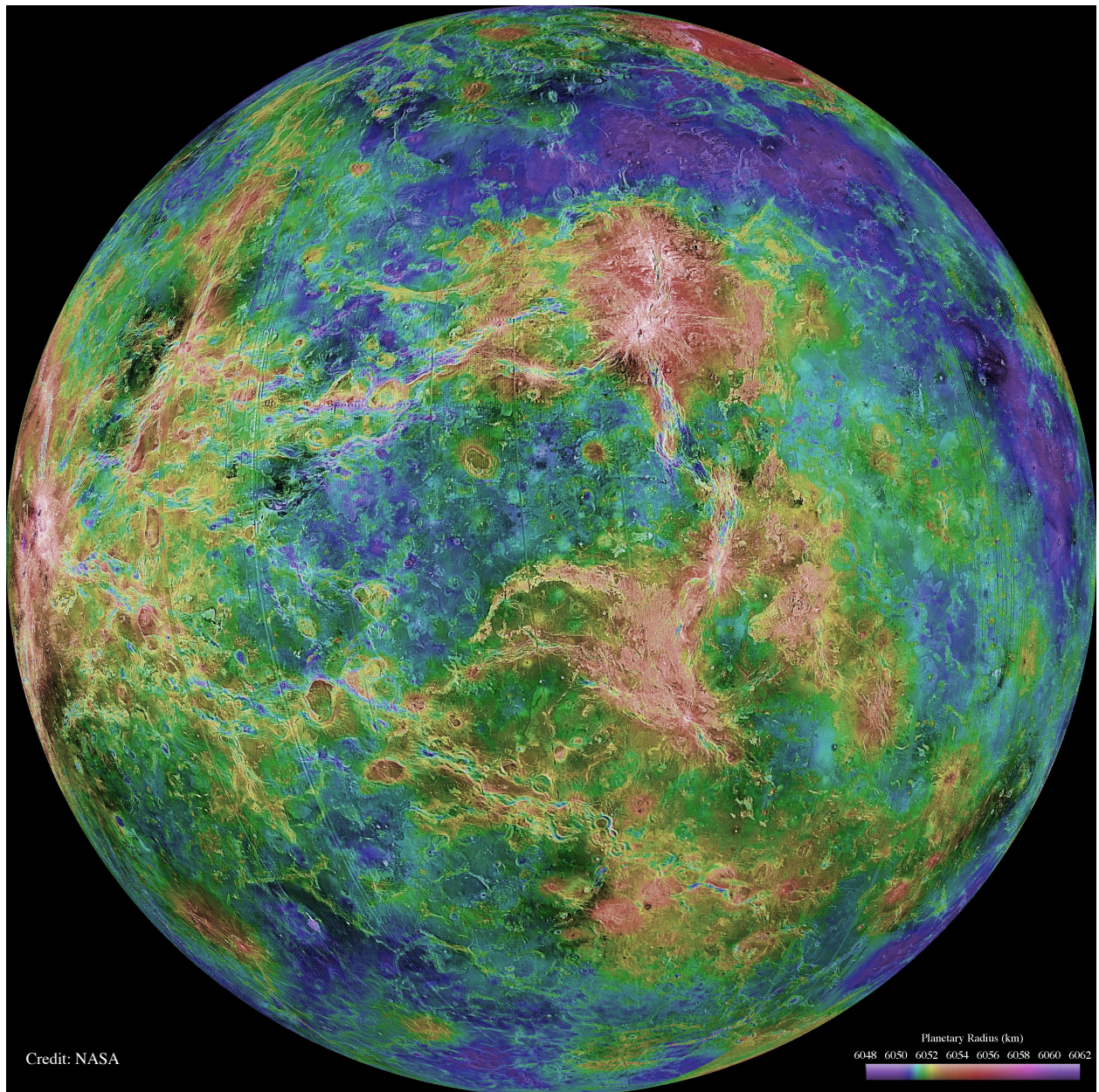


Venus favors the bold.
Ovid

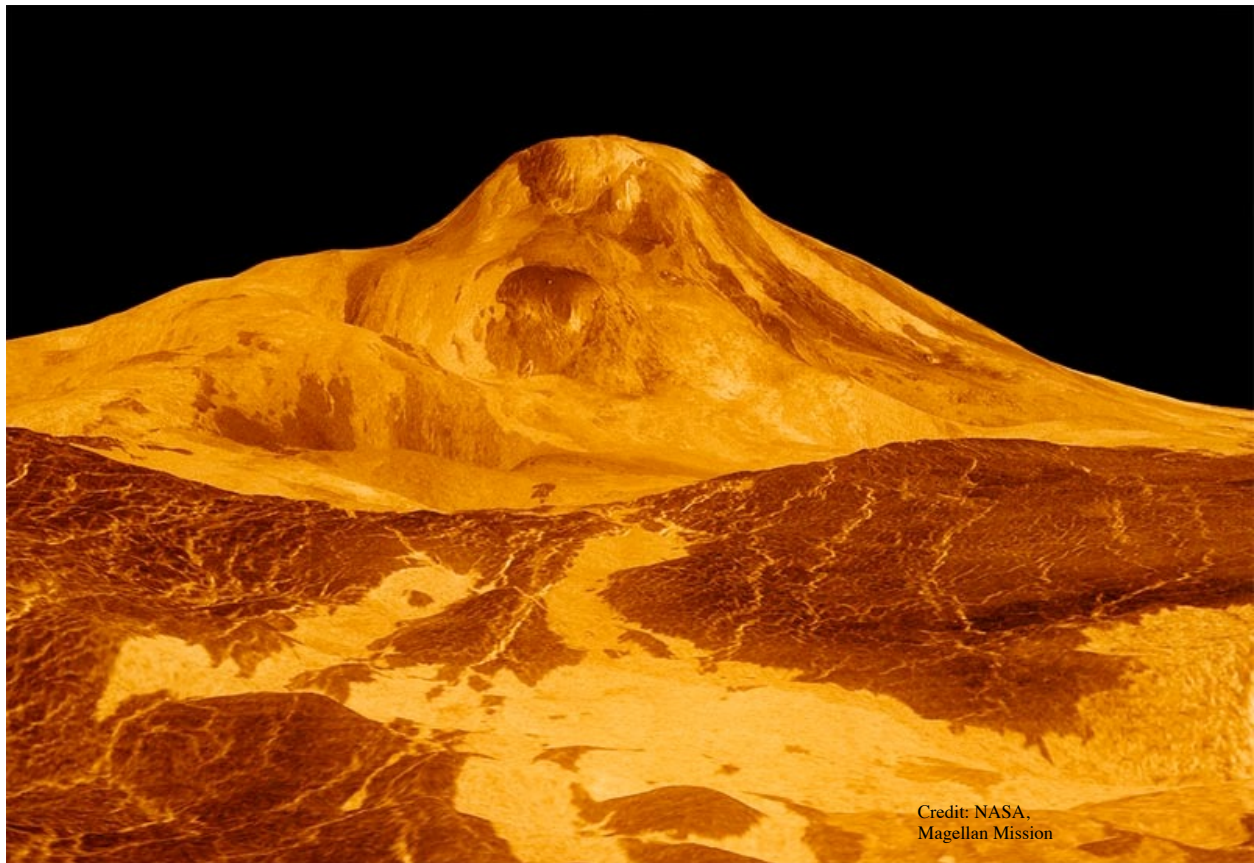
Freya's Planet

Hi everyone. In this module we'll explore the geology of Venus by taking a look at some of the major features - once you strip away the heavy sulfuric acid clouds!



The image above maps the height of features on Venus. Purple is low, green is “average”, and reddish hues are high. The total spread is about 15 kilometers of so. Venus's surface shows evidence for big time volcanic over the past billion years. Since Venus is almost as large as Earth and thus retained its internal thermal energy, this may not be too surprising. Venus’ surface is rather empty of craters. Certainly not big obvious ones. Volcanism, of course, it erases a planet’s surface, and for Venus that seems to be about every half billion years or so. This explains the relative lack of craters on Freya’s world.

Venutian lava tends to be is relatively thick, relatively viscous. So you get some odd, strange dome-shaped structures that we don't really see on Earth. An example is from the Magellan mission is shown below. These are radar scans, reconstructing a 3D topography of what a Venutian volcano looks like. Except the color is false. I like the 3D aspect of this though, as opposed to looking at a flat, two-dimensional map.

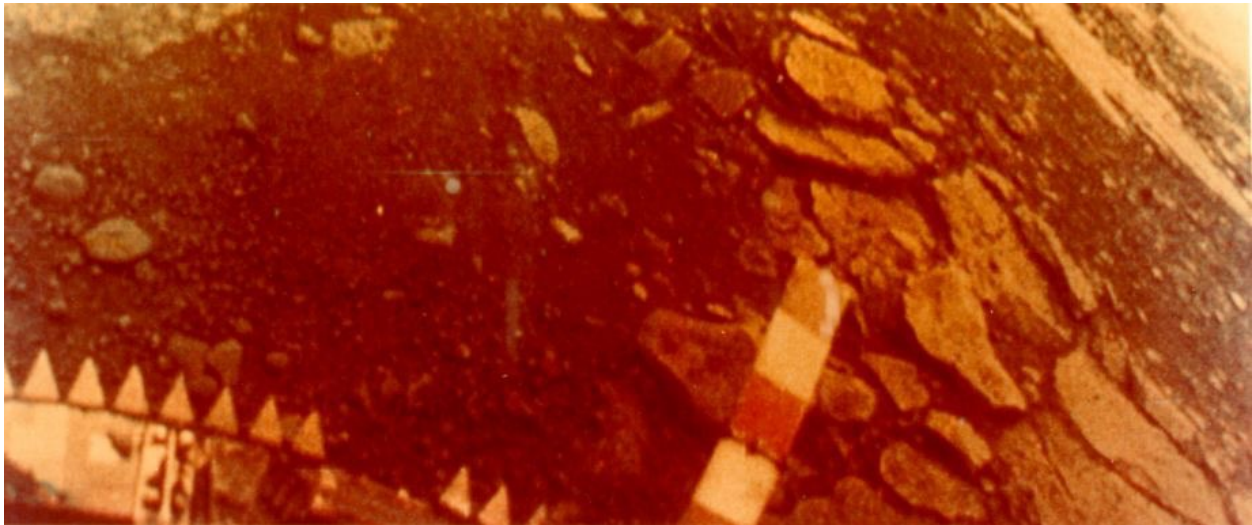


Credit: NASA,
Magellan Mission

Despite having an amazingly thick atmosphere - Venus’s oceans evaporated because of the greenhouse effect and became the atmosphere -- erosion on Venus is pretty small. There are certainly clouds on Venus. When it does rain from those clouds, the rain never touches the surface because it evaporates before it does hit the surface. Not

even close. So the surface of Venus is actually quite dry. No wind either because it rotates too slowly. No wind or rain means no erosion.

Despite the hellish conditions - relentless scorching temperatures and ginormous surface pressures - we have in fact landed on Venus. For a few minutes anyway. The image below is from the Soviet Venera 13 lander.



Credit: USSR, Venera 13 Mission

Not only do you get a view of the actual surface of Venus, but from the angle of the camera, you see the atmosphere of Venus! That's the yellow-ish stuff at the top right. The lander itself (selfie!) is in the lower left and the rectangle sticking out is a ruler to get a sense of scale. This probe lasted about 10 minutes before it melted and was crushed by the pressure. But within that time window, they were able to beam back what are our only images of being on surface looks like.

We're not totally positive, but Venus is may still be geologically active. However, the lack of any obvious plate tectonics or active volcanism may means that Venus has a thicker lithosphere than Earth. It could be the high temperature baked out any water that could softened the lithosphere. So it could be that Venus is starting the death process of cooling off. Maybe. Maybe Not. We don't know for sure. Until we get on the surface of Venus again to put, for example, seismometers on there to measure how much seismic activity there is, or see evidence of relatively smaller recent lava flows, we can't really tell yet. But, we shall.

Is it Friday? Thanks. Bye bye!