



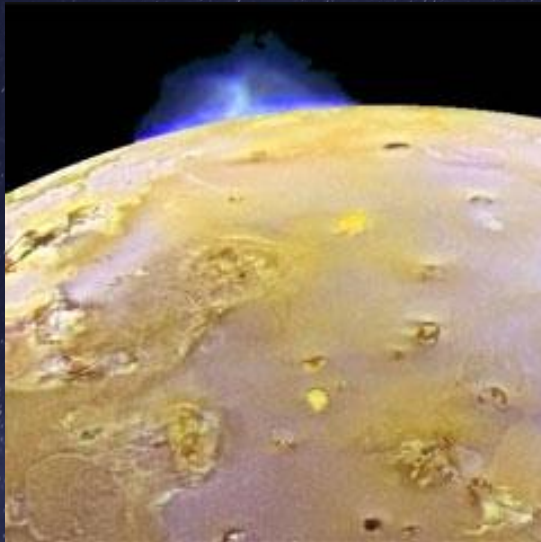
BIGGEST VOLCANOES: A COMPARISON OF IO AND VENUS

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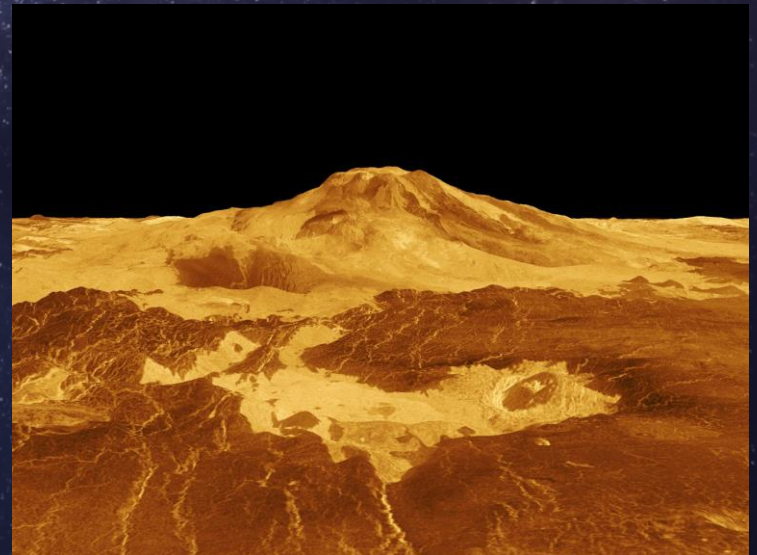
PROJECT OVERVIEW

How do the largest volcanoes on Io and Venus differ?



Io volcanic plume

Source: http://www.seasky.org/solar-system/assets/images/io03_sk12.jpg

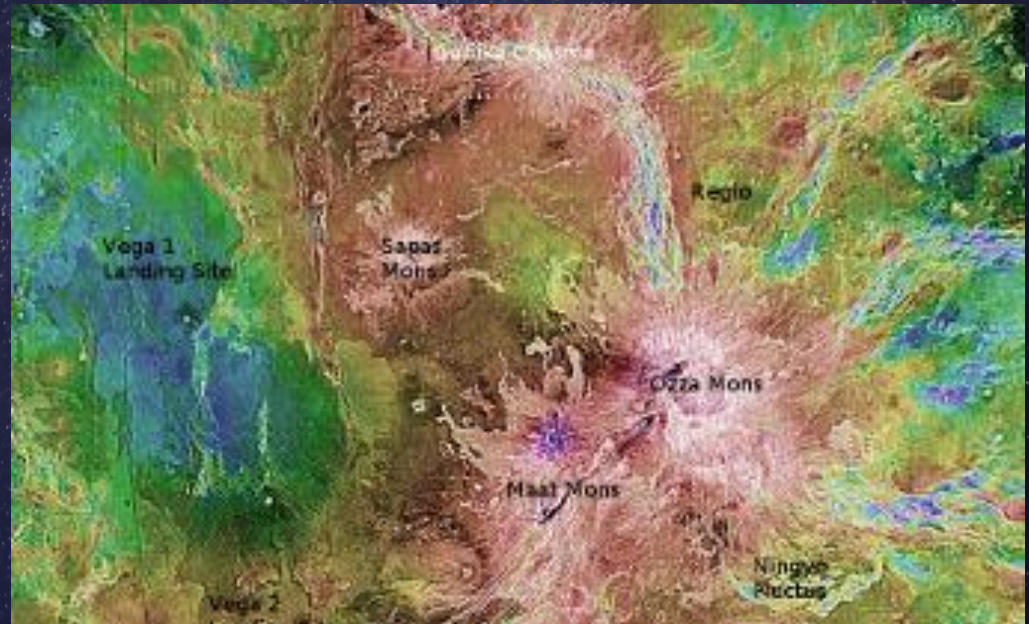


Maat Mons, Venus

Source: <https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA00106>

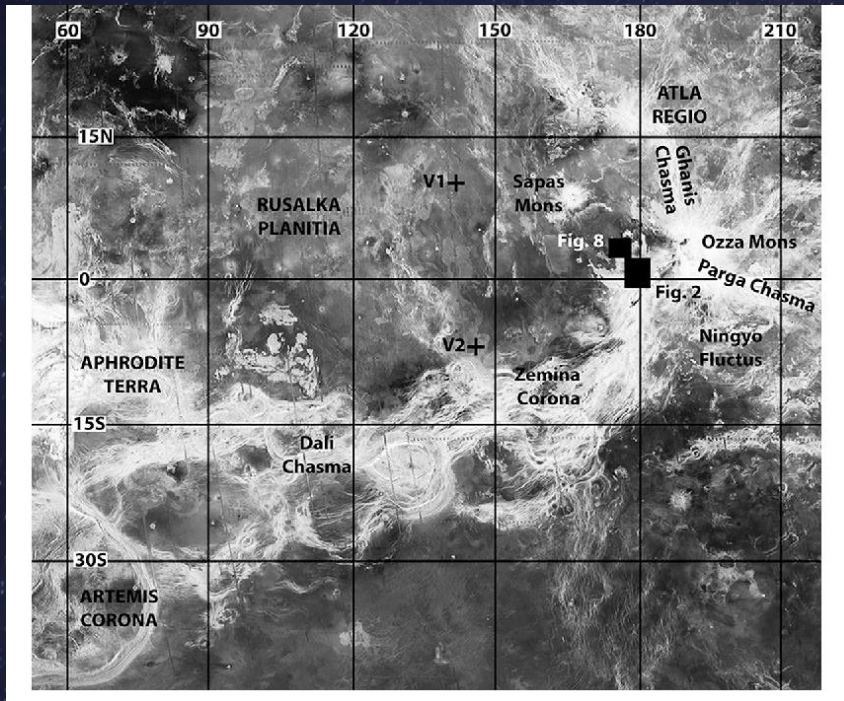
MAAT MONS

- Named for Egyptian goddess for truth and justice Ma'at
- 395 km diameter
- 8 km above mean planetary radius (5 km above surrounding plains)
- May still be active



- Source: <https://encrypted-tbn0.gstatic.com/images?q=tbn%3AANd9GcSjVIh7OOboxOJRCZ8l2ka3gDEghJaz0FrAae0K88-HVJ6p36Vo>

GEOMORPHOLOGY & VOLCANOLOGY



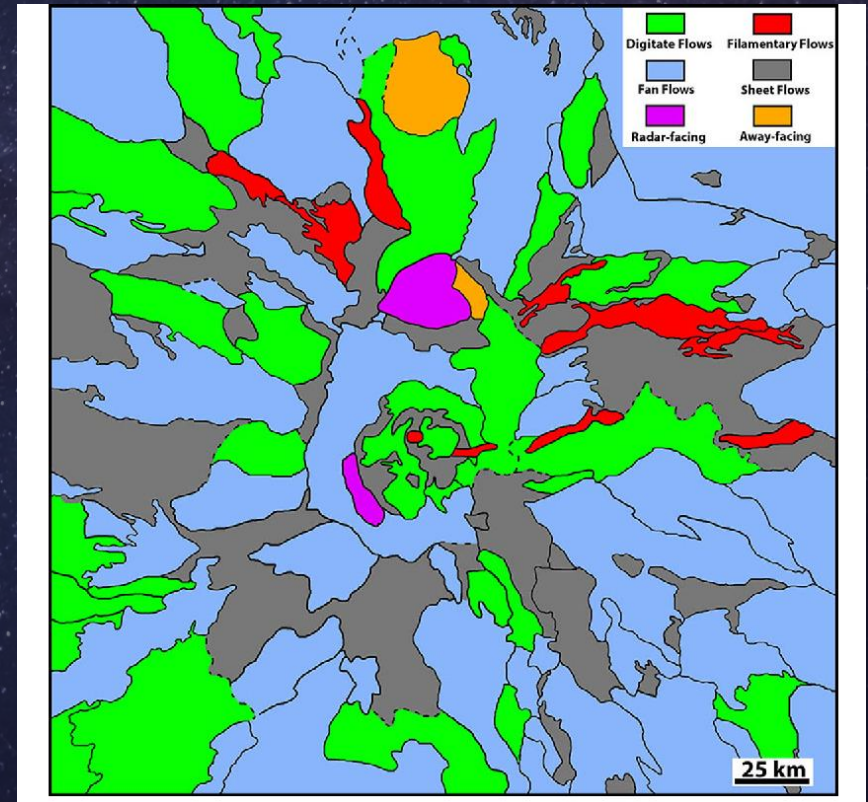
- Found in a region of strong volcanic and tectonic activity
- At one end of Dali Chasma, thought to be a rifting process
- Possible ash flow on northern flank
- 1980s Pioneer Venus data could be explained by Plinian eruption on Maat Mons

Source:

<https://d3i71xaburhd42.cloudfront.net/f15a9955baaa7b3773e4be353172f1f23f013310/2-Figure1-1.png>

GEOMORPHOLOGY & VOLCANOLOGY

- Different flow types on Maat Mons
- Summit caldera of 31 km maximum diameter
- Chain of small craters on southeast flank suggest collapse (lack of magma flows from craters)
- No confirmation of recent activity



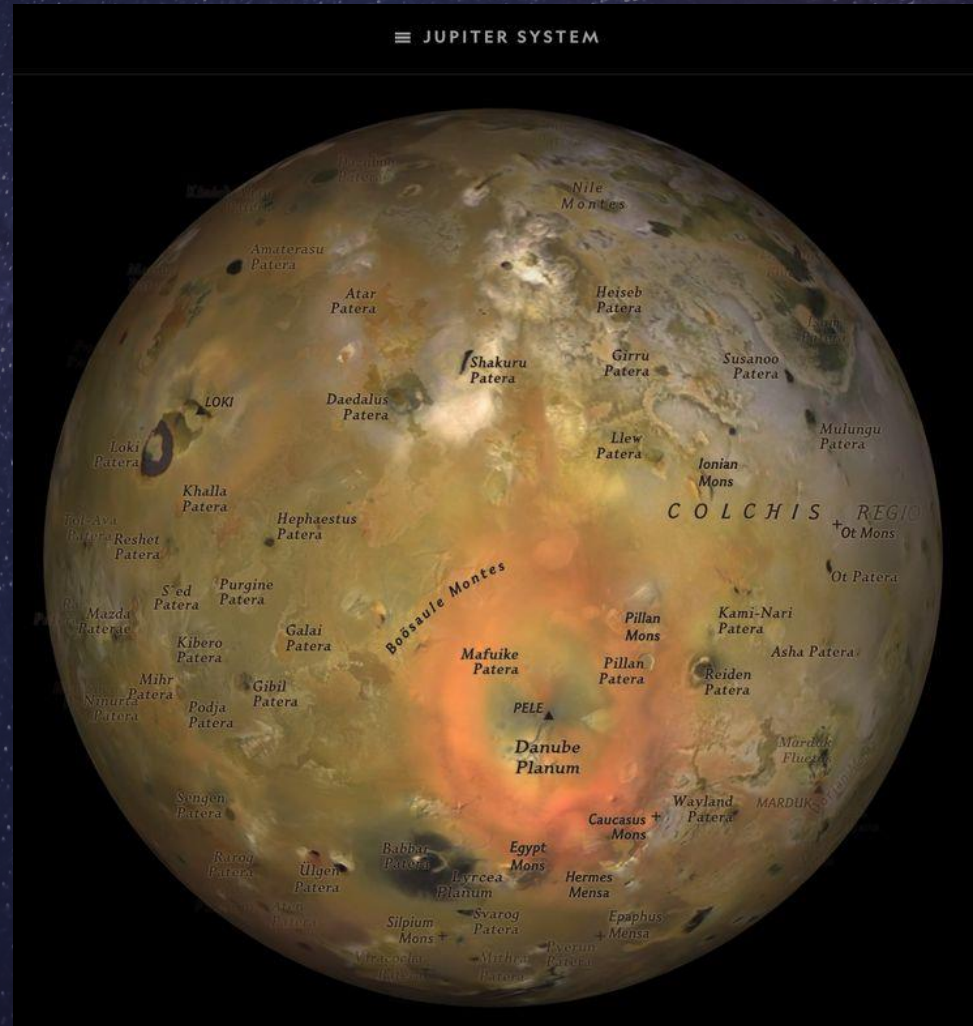
Source:

<https://www.semanticscholar.org/paper/Geomorphology-and-volcanology-of-Maat-Mons%2C-Venus-Mouginis-Mark/f15a9955baaa7b3773e4be353172f1f23f013310/figure/6>

WHAT IS THE LARGEST VOLCANO ON IO?

- The answer to that question turns out to be murky
- We'll consider two possible candidates

- Source:
<https://i.pinimg.com/736x/3a/81/51/3a8151d8920c9c4f72fbf233314badd9.jpg>



TVASHTAR PATERAE



- Io's largest volcanic patera (307 km across)
- Named for Hindu artisan god
- Known to be active

Source: <https://i.ytimg.com/vi/WteH7F0y2RI/hqdefault.jpg>

BOÖSAULE MONTES

- Boo-OH-saw-lay
- Three mountains, tallest is “South” Boösaule
- Named for cave in Egypt where Io gave birth to Epaphus
- 159 km diameter (range is 540 km)
- 18.2 km above mean planetary radius (17.5 km from base)
- 15 km cliff on south side due to a landfall, 40-degree slope
- Associated with nearby volcanism, but not itself volcanic (?)



Source:

<https://i.pinimg.com/736x/3a/81/51/3a8151d8920c9c4f72fbf233314badd9.jpg>

GENERAL PROPERTIES

- Io's heat comes from tidal friction
- Lavas are thought to be mafic and ultramafic
- Volcanism and thrust faults may be related to shrinking of Io as it cools
- Lava plumes can reach hundreds of kilometers high
 - Hottest lava
- Colors on surface the result of sulfur cooling rapidly from different temperatures

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