

A PLANETARY SCIENCE GROUP FOR CHILE



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Topics

- Dust Devils: A weaker approach to Tornadoes
- Approach to Mineralogy of Valleys marineris using spectroscopy
- Looking beneath the martian surface



Dust Devils: A weaker approach to Tornadoes

Priscilla Nowajewski

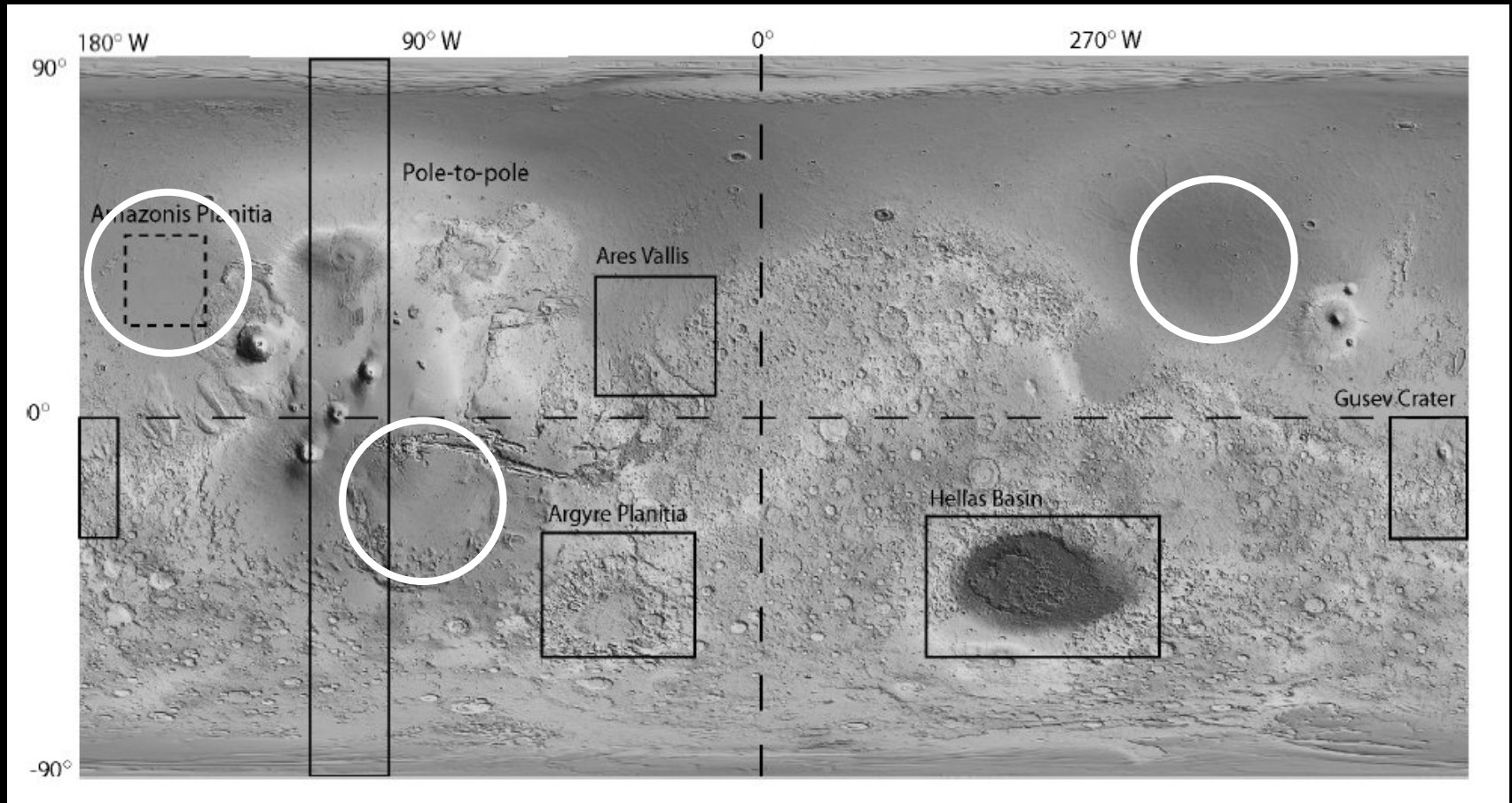
Dept. of Physics & Dept of Astronomy
University of Chile



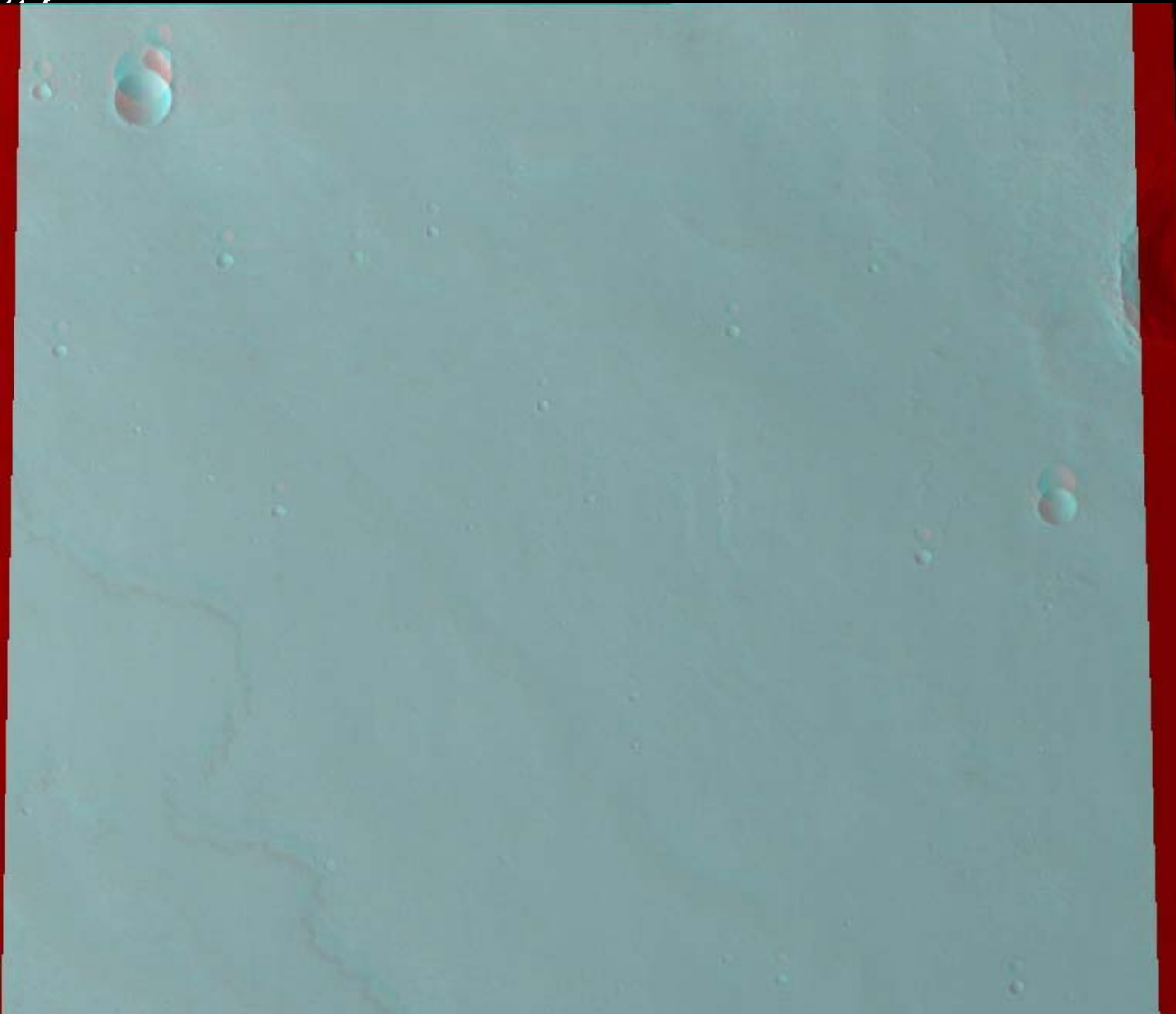
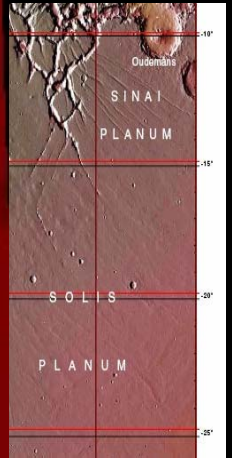
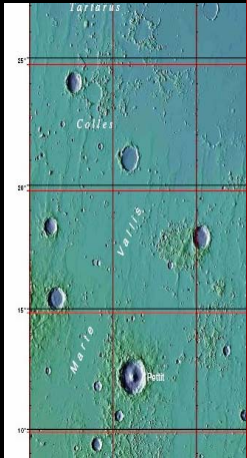
Dust Devils



Where are we looking for?



Places



What do we want to do?

- A theoretical thermodynamical approach about Dust Devils formation
- To quantify the seasonal dependence on Dust Devil's formation
- A comparison between 3 places with different features (height, latitude, temperature gradient).



Where do we get data?

As the Dust Devils measure up to 10 km at Mars
so we need a resolution between 5 and 10 km
For this reason we can use data from

HRSC: High Resolution Stereo Camera
(Mars Express)
Resolution: 30 ~ 15 meters/pixel

MOC: Mars Orbiter Camera
(Mars Global Surveyor)
Resolution: 1.5 to 12 meters/pixel



But...why do this?

Because Dust Devils are very similar to Tornadoes on Earth!!!

So... we can study them without risk



Approach to Mineralogy of Valleys Marineris using spectroscopy

Alejandra Molina Monje
Universidad de Chile
Departamento de Astronomía

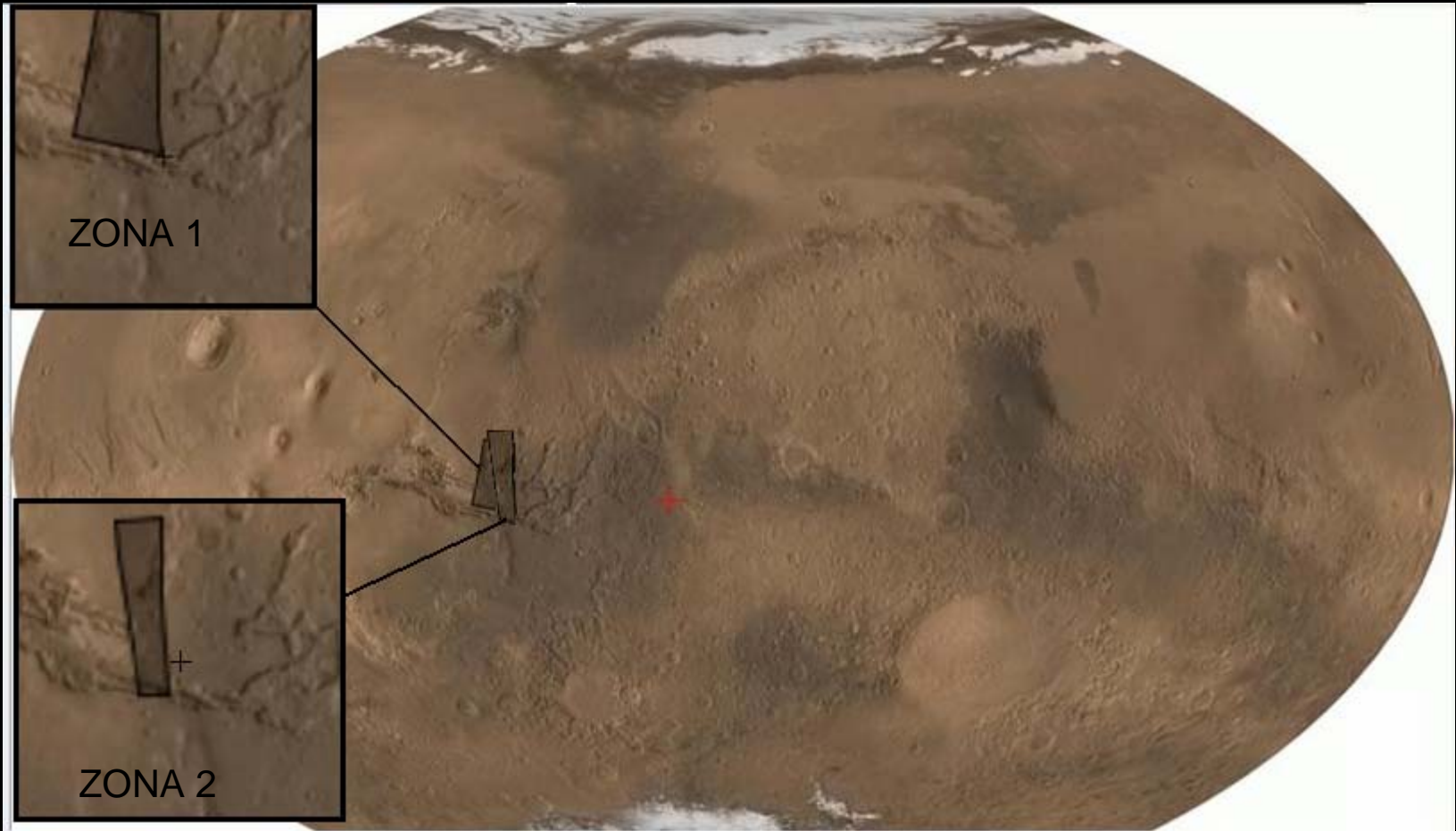


Introduction to the Project

To determine the composition of a zone inside the Marineris Valleys, through the comparison of two spectra taken at the same longitude but different latitude.



Introduction to the Project



What is done

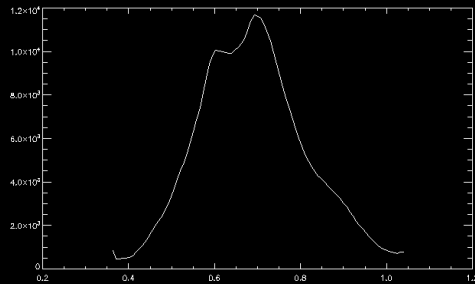
- Find spectra, taken by OMEGA during Mars Express mission, at ESA database:
<http://www.rssd.esa.int>



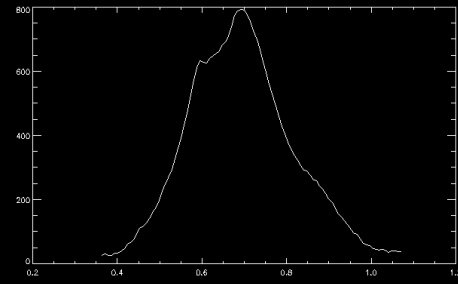
What is done

Visible
0.36- 1.06 μm

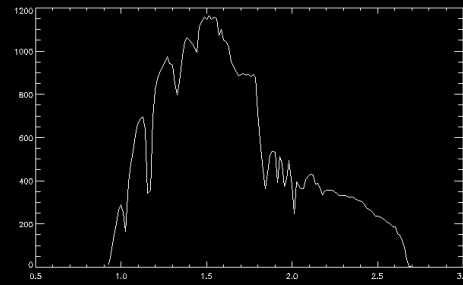
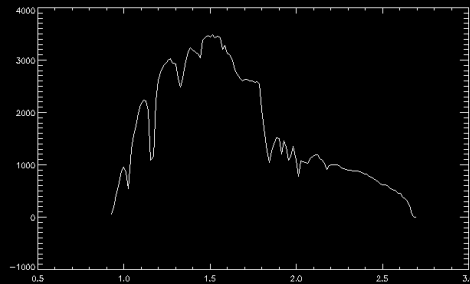
ZONE 1



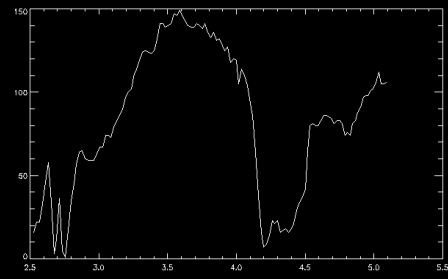
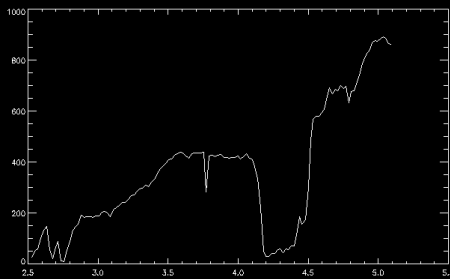
ZONE 2



Near IR
0.9 – 2.69 μm



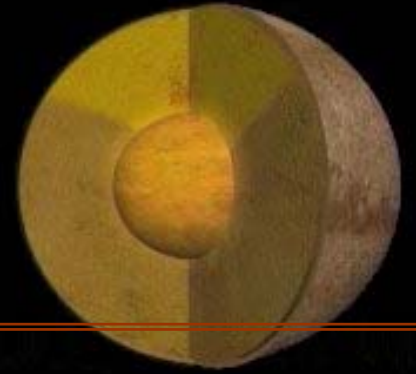
IR
2.52 – 5.08 μm



Following Steps

- To determine for each area its composition through a spectral analysis
- To compare the composition of both zones for each filter





Looking beneath the martian surface

Ismael Botti

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University of Chile

... about Mars' interior and surface

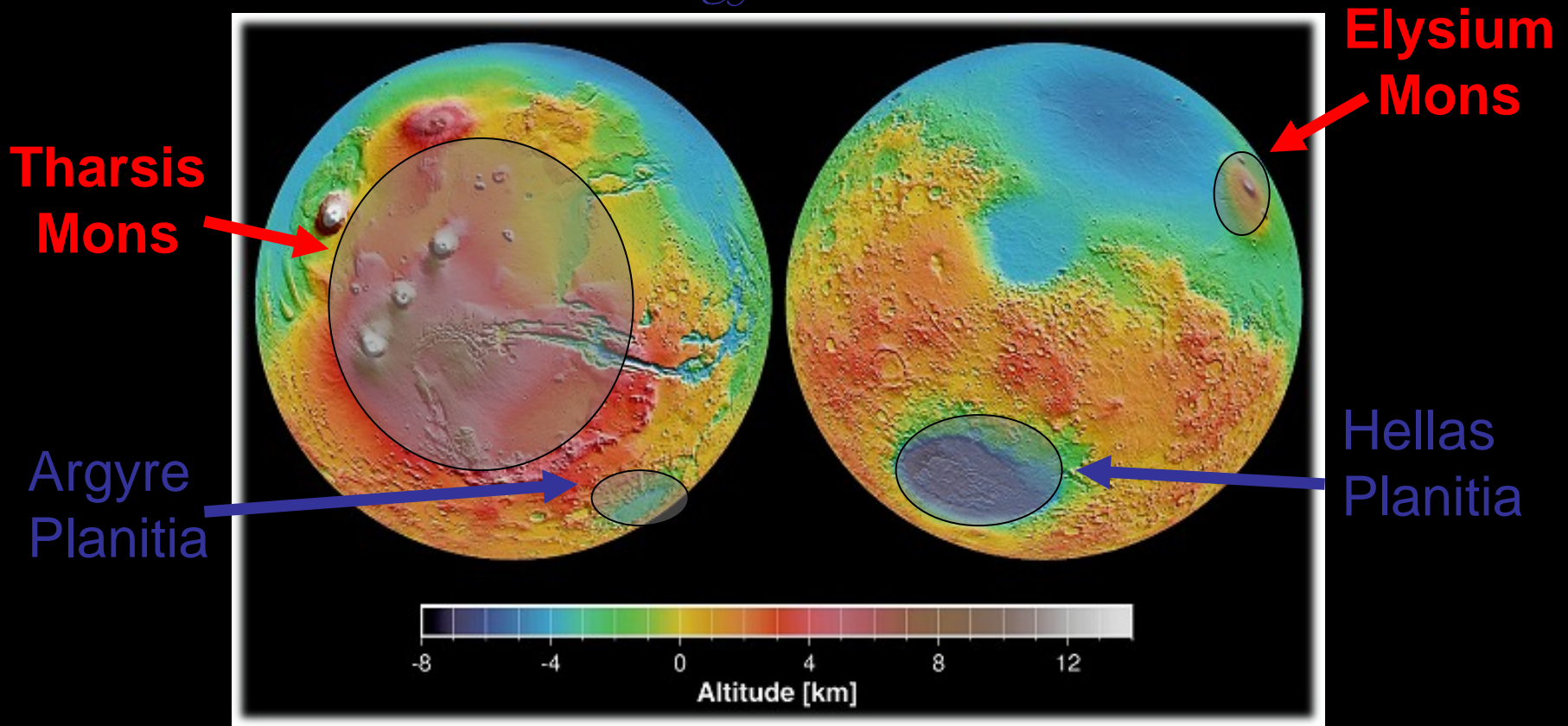
- Understand the internal structure is important for the understanding of the atmosphere and fate of life on Mars, but there's no seismological data in order to infer the internal structure
- There is no evidence for plate tectonics
- Volcanos are not homogenially distributed, but are concentrated in higher zones.



The Idea...

There are four, topographically, interesting zones

- High zones: *Tharsis Mons*, *Elysium Mons*
- Low zones: *Hellas Planitia*, *Argyre Planitia*

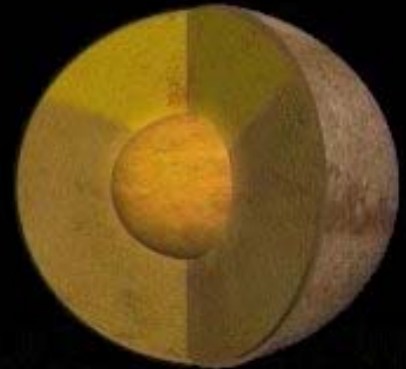


So... What's the plan?

A high zone can be related to a low one because their positions are diametrically opposed.

So, probably the low zones were produced because an impact in the past, which produced a movement of the material in a given direction.

The idea is to make a simple model of the internal structure of Mars. Then impact the surface (give an initial deformation—the low zones—) and try to reproduce the high zones on the other side of the planet.



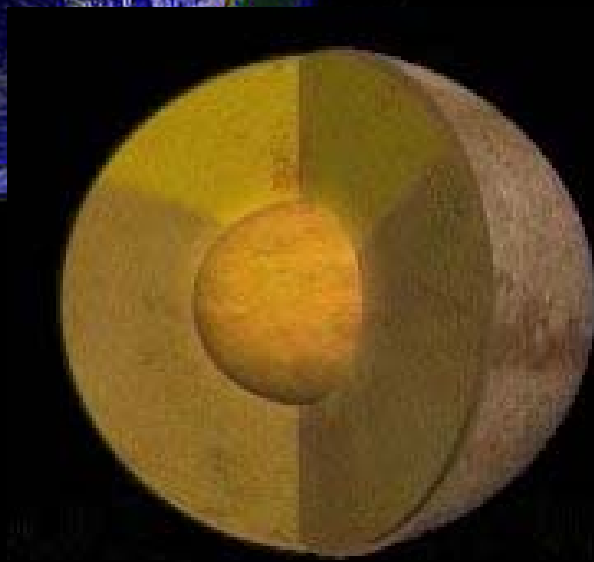
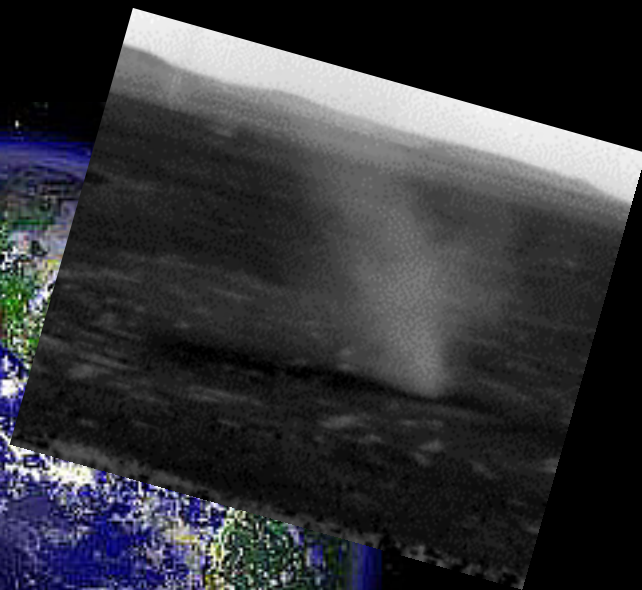
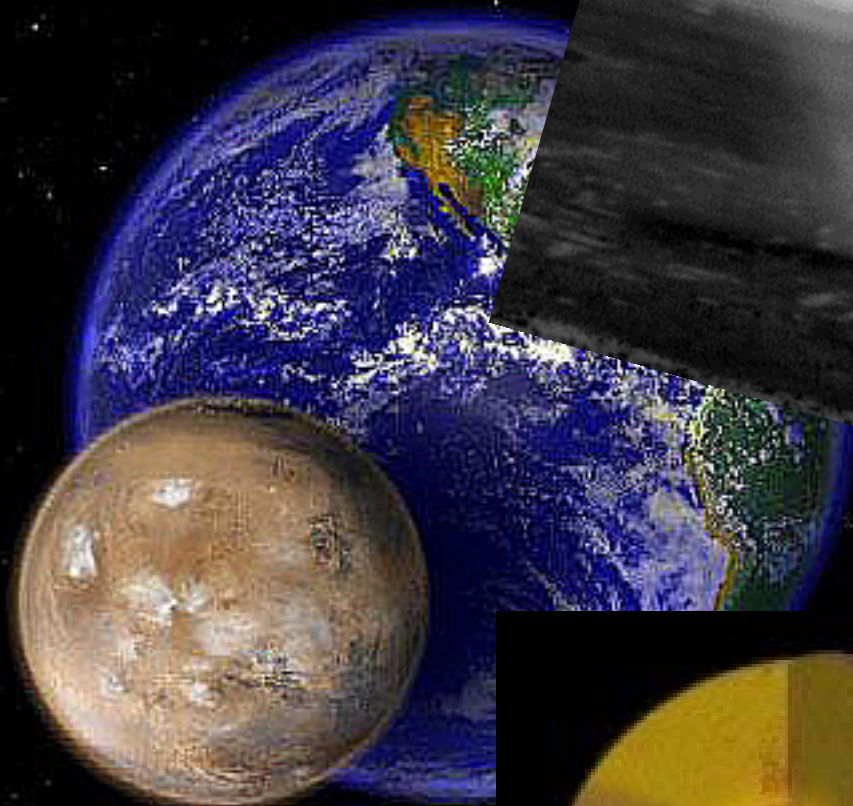
Tools

For the implementation of the model, the program will be developed in IDL

Images from the HRSC will be used in order to compare the final topography

Will it work???

Nobody knows... I hope so =)



The End