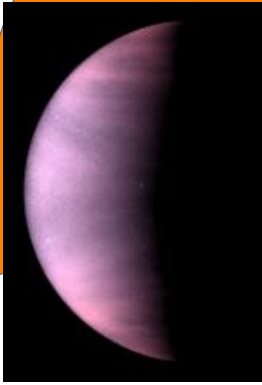


## Planet 1 - VENUS



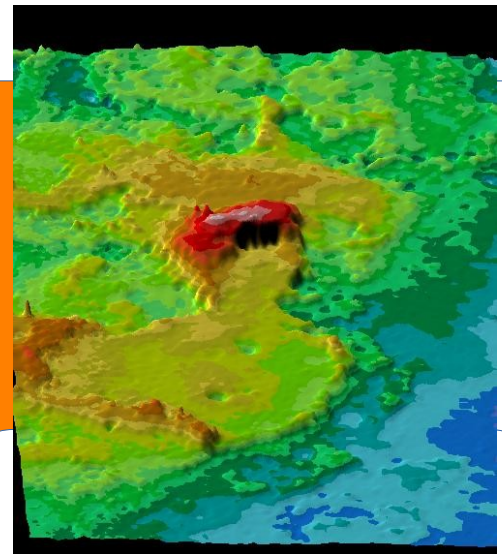
Ultraviolet Hubble Telescope image of the clouds of Venus

### Where is it/How big is it?

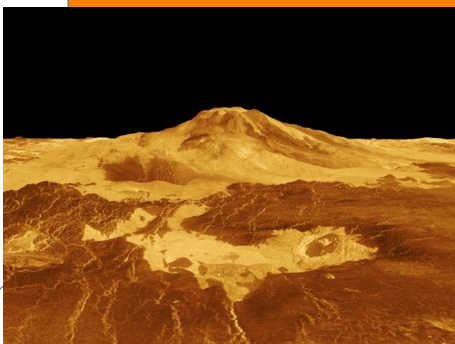
- Distance from the Sun: 108 million km (Earth: 150 million)
- Equator Diameter: ~12,102km (Earth: 12,742km 1.1x bigger)
- Venus slowly rotates in the opposite way to Earth, so the Sun travels across the sky in the opposite direction.
- It takes Venus 243 Earth days to rotate completely but because it rotates the other way, a day-night cycle is only 117 Earth Days
- It only takes 225 Earth days for it to orbit the Sun

### What's it like there?

- Larger planets retain internal heat for longer allowing for more geological activity: Venus is almost as active as Earth & has active volcanoes up to 8km tall (Maat Mons is the tallest Volcano on Venus)
- The thick atmosphere filters any light, giving everything an orange tinge
- All of the craters on Venus are greater than ~2km as any smaller objects would burn up in the atmosphere before hitting the ground
- Surface Pressure of 95 bar (Earth is 1 bar in the ground), equivalent to 900m underwater



Elevation Map of Australia-sized continent Ishtar Terra, with mountains Akna Montes (Bottom), Freya Montes (left) and the tallest on the planet Maxwell Montes (Top/Middle)



3d-Generated image of Volcano Maat Mons the peak of which is 8km above the average elevation

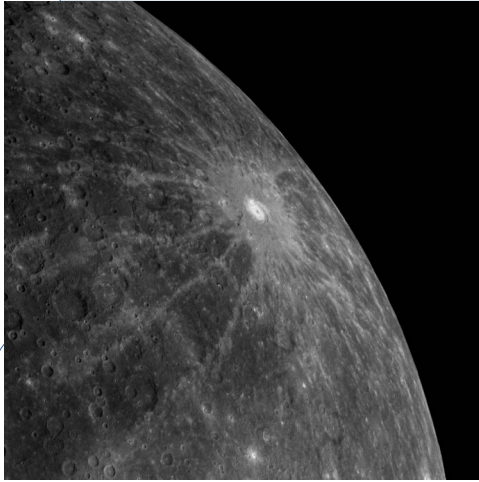
### Lovely Weather?

- 40-60km above the surface a thick cloud of CO<sub>2</sub> Covers the planet, this causes an extreme greenhouse effect which results in an average surface temperature of 740K = 467°C, Hot enough to melt Lead
- As a day on Venus is so long, the temperature doesn't vary hugely on the surface, only by 30° up or down
- Venus has very little tilt and as such has no seasons
- Venus has lightning strikes in the late afternoon, early evening, primarily between clouds but occasionally to the ground
- Around the equator it rains sulphuric acid

Images courtesy of JPL Photojournal; url: [photojournal.jpl.nasa.gov](http://photojournal.jpl.nasa.gov)



## Planet 2 - MERCURY



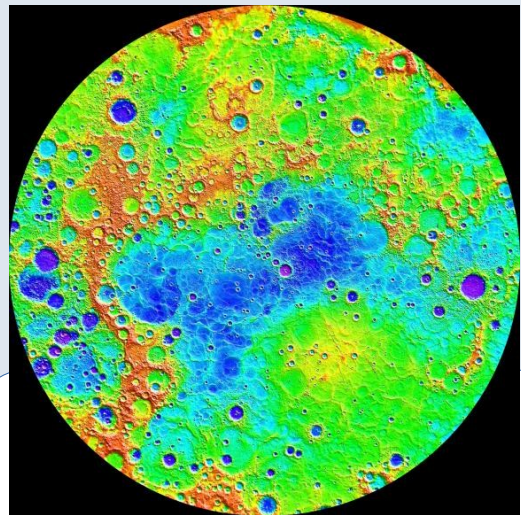
The Horizon over the crater Debussy, which appears lighter because the surface there has not been exposed for as long as the surroundings

### Where is it? How Big is it?

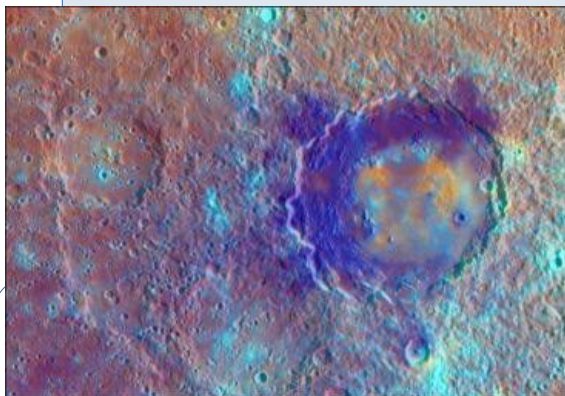
- Distance from the Sun: ~58 million km (Earth ~ 150 million)
- Equator Diameter: ~4,879 km (Earth: 12,742km 2.6x bigger)
- It has the fastest orbit in the Solar System only taking 88 Earth days for it to orbit the Sun
- It takes Mercury 59 Earth days to rotate completely
- Orbit is egg shaped coming as close as 47 million km and as far as 70 million km from the Sun
- This oval orbit means that the morning sun rises for a short time, sets, then rises again and the same happens in reverse at sunset, this results in Mercury's day-night cycle taking 176 Earth days, which is about 2 Mercury years

### Lovely Weather?

- Mercury has no atmosphere, only a thin exosphere sparsely made up of atoms and molecules either captured from the solar wind (Hydrogen, Helium and Oxygen) or thrown up from the planet's surface (Calcium, Sodium and Potassium)
- Having no atmosphere it has essentially no surface pressure (1/100,000,000,000,000 of The surface pressure on Earth): Liquids boil at far lower temperatures when pressure is low
- The temperature on Mercury varies drastically from 430 C to -180 C



With low points in purple and high points in red, this map shows the elevation across Mercury, the difference between the highest point and the lowest point is 10km



An enhanced-colour image of the Derain Basin, with different colours indicating different rock types

### What's it like there?

- Mercury is 'Geologically dead/dying' and so doesn't have continents that move or volcanoes like Earth or Venus
- The surface is a greyish brown, mostly solidified magma
- There are craters so deep that they never see the Sun and hold frozen water deep within them

Images courtesy of JPL Photojournal; url: [photojournal.jpl.nasa.gov](http://photojournal.jpl.nasa.gov)





## Planet 3 - MARS



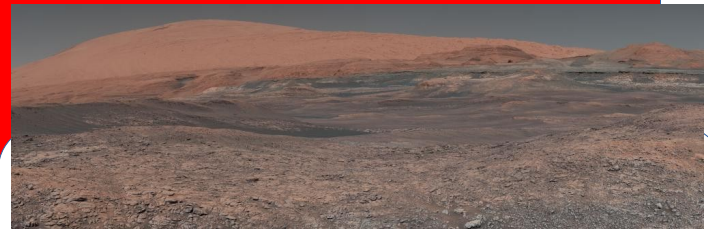
Mars and its two moons Phobos (left) and Deimos (right)

### Where is it? How big is it?

- Distance from the Sun: ~ 228 million km (Earth ~ 150 million)
- Equator Diameter: ~ 6,779 km (Earth: 12,742km 1.8x bigger)
- It takes 24.6 hours for Mars to complete one rotation
- It takes 669 Mars days(687 Earth Days) for it to completely orbit the Sun

### Lovely Weather?

- Avalanches occur on Mars causing large dust clouds
- The tilt of Mars is similar to Earth's so the temperature range across the planet is similar although with much simpler climate zones
- Similarly it has seasons but they vary in length because of the shape of Mars's orbit:
  - Spring: 194 Mars days,
  - Summer: 178
  - Autumn: 142
  - Winter: 154
- The temperature dramatically decreases at night and Mars experiences 'Martian water-ice microbursts' as water-ice particles are rapidly moved downwards, these only reach the surface if the cloud is 1-2km above the surface
- Dust storms reach max speeds of 60mph(half of some Earth hurricanes) and once every 3 years or so one grows large enough to cover the entire planet

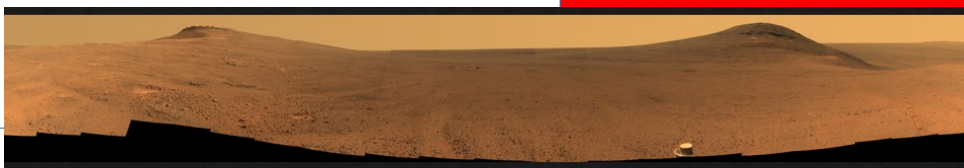


A look uphill on Mount Sharp located in the 10 mile wide Gale crater. The image is colour corrected to what it would look like on a Earth Day

### What's it like there?

- Red and dusty with an average surface temperature of 240K(-30C)
- The Hemispheric Dichotomy refers to the fact that about 1/3 of Mars, primarily in the northern hemisphere is 3-6km lower than the other 2/3 in the south, this is a similar distance to that between Earth's continents and ocean floors
- A large bulge on the equator called Tharsis, made up of volcanoes
- The atmosphere is a thin layer of CO<sub>2</sub> producing a surface pressure around 1/1000 of Earth's

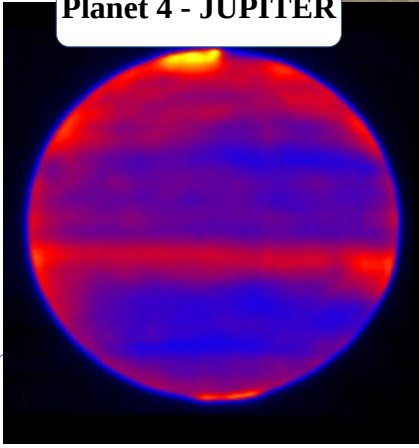
A panorama of Perseverance Valley taken by the Mars Curiosity Rover



Images courtesy of JPL Photojournal; url: [photojournal.jpl.nasa.gov](http://photojournal.jpl.nasa.gov)



## Planet 4 - JUPITER



A heatmap of the temperature across Jupiter's Stratosphere, the hottest parts in yellow

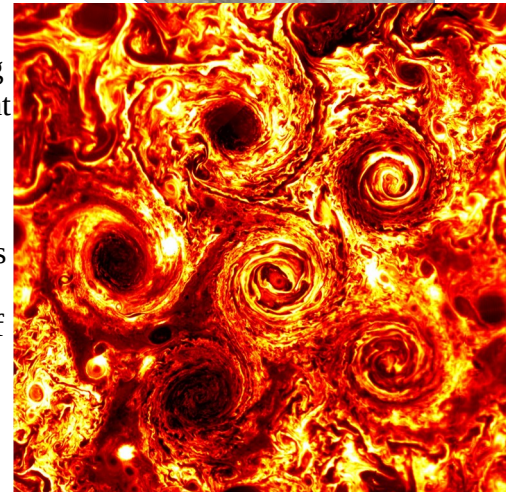
### Where is it? How Big is it?

- Distance from the Sun: ~ 778 million km (Earth ~ 150 million)
- Equator Diameter: ~ 139,822km (Earth: 12,742km 11x smaller)
- Has the shortest day in the Solar System taking only ~10 hours to rotate completely
- Takes around 12 Earth years(4,333 Earth Days) to complete an orbit around the Sun

### What's it like there?

- Jupiter is essentially a star that didn't get big enough to begin burning it's made up of mostly hydrogen and Helium and the temperature and pressure increases as you move towards the planet's core, turning gas to liquid so the 'surface' of Jupiter is a sea of Hydrogen
- The pressure increases from 1 bar (the atmospheric pressure on Earth) At the outer atmosphere to 2 Million bar when Hydrogen becomes Metallic and conductive to 40 Million bar at the beginning of the planet's core (maybe? No one knows for sure the exact interior structure of Jupiter)
- The Temperature on Jupiter doesn't depend on the distance from the equator like on Earth, but more height/depth, as the primary source of heat is the internal heat of the gasses inside the planet, not the sun

Infrared imaging of six cyclones at the south pole, the centre one is about the size of the United States and the area covered by all of them could hold the entire Earth



### Lovely Weather?

- Jupiter is full of large storms of swirling gas, such as the famous 'Great Red Spot' which is Twice as wide as Earth
- The winds in these storms can reach up to 335 mph and last more than 300 years
- The temperature at the 1 bar pressure level is about -135 °C and is estimated to reach up higher than 20,000 °C approaching the planet's core

Storm clouds over the north pole, taken by the Juno Spacecraft



Images courtesy of JPL Photojournal; url: [photojournal.jpl.nasa.gov](http://photojournal.jpl.nasa.gov)

