

7.14: Characteristics of the Solar System's Rocky Planets

Comparison of the Rocky Planets

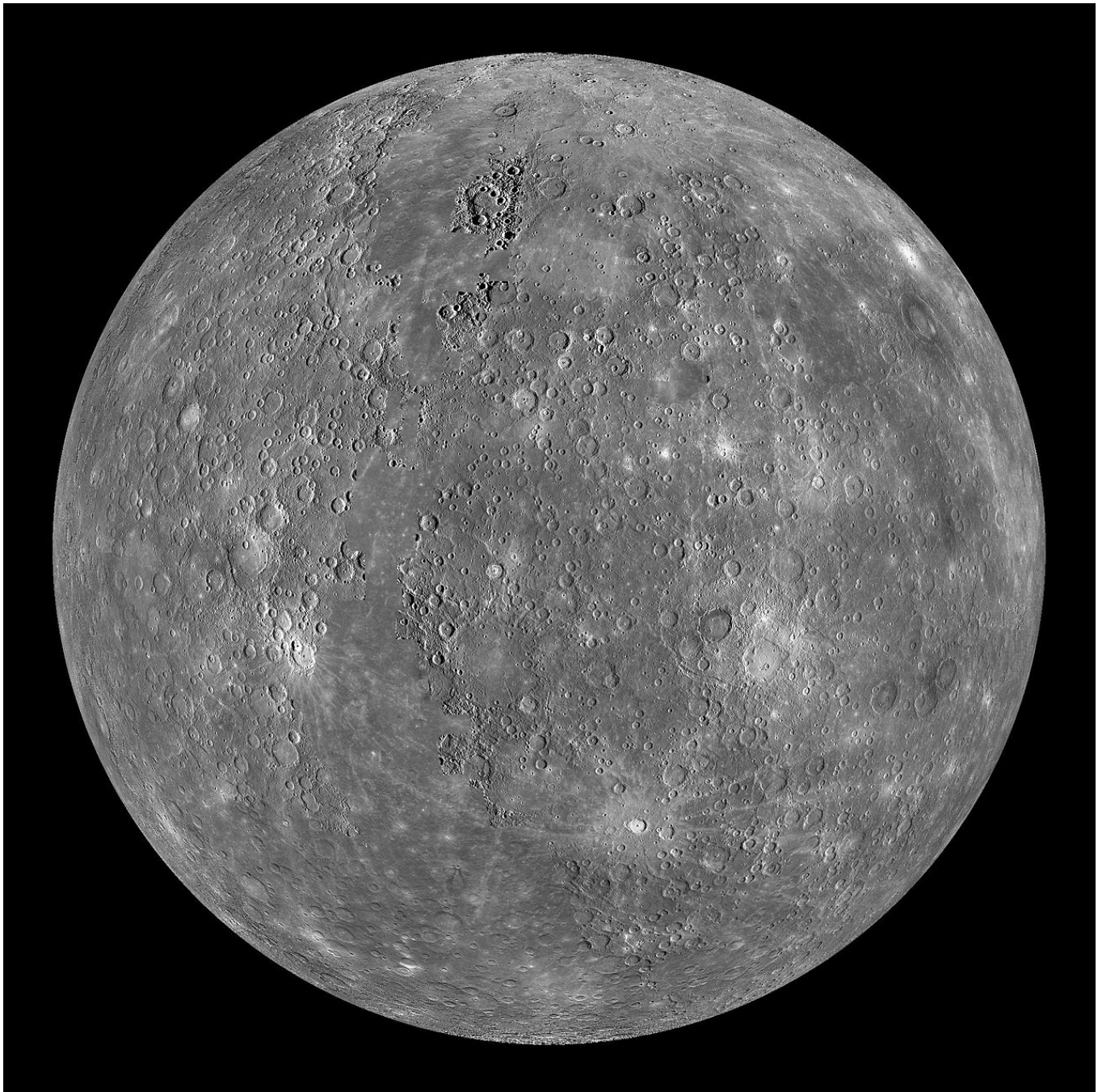
Mercury

Characteristic — Current State

- Impact Craters — Yes
- Tectonic Craters — Yes; not active
- Volcanoes — Yes; not active
- Atmosphere — No real atmosphere
- Water — Yes; water and ice in craters at the poles
- Erosion — No
- Dunes — No
- Polar Caps — No
- Satellites — No
- Life — Unknown

The Bottom Line...

- Looks like the Moon; heavily cratered
- No real atmosphere
- No seasons



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Venus

Characteristic — Current State

- Impact Craters — Yes
- Tectonic Craters — Yes
- Volcanoes — Yes; over 1,600 volcanoes – most on one body in the Solar System
- Atmosphere — Carbon Dioxide (CO₂), Sulfuric Acid (H₂SO₄), High Pressure, Clouds, Odd Polar Vortex
- Water — No
- Erosion — Yes
- Dunes — Yes
- Polar Caps — No

- Satellites — No
- Life — Unknown

The Bottom Line...

- Called Earth's twin
- Extreme Greenhouse effect
- Rains sulfuric acid
- Polar Vortex



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Earth**Characteristic — Current State**

- Impact Craters — Yes
- Tectonic Craters — Yes
- Volcanoes — Yes
- Atmosphere — Nitrogen (N), Oxygen (O₂), Clouds, Rain, Snow
- Water — Vapor, Liquid, and Ice → Primarily a water planet
- Erosion — Yes
- Dunes — Yes
- Polar Caps — Yes
- Satellites — One, Moon
- Life — Yes

The Bottom Line...

- Water Planet
- Big moon – double planet
- Life everywhere



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Moon

Characteristic — Current state

- Craters
- Evidence of past volcanic, tectonic activity
- No atmosphere
- Water ice found in a lunar south pole crater
- Probably formed from a collision with Earth

- Looks like Mercury...



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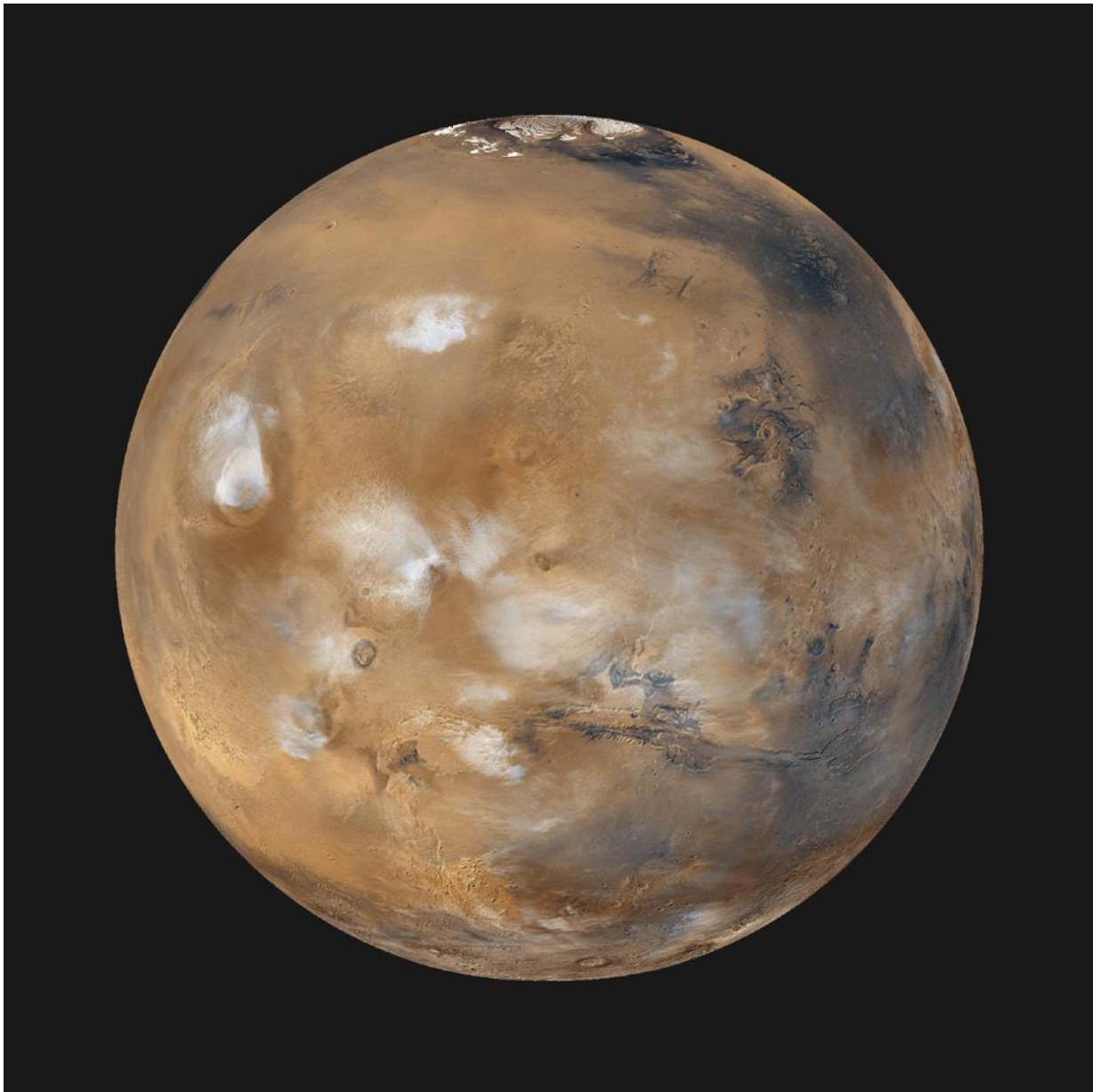
Mars

Characteristic — Current State

- Impact Craters — Yes; a very large impact crater **Borealis Basin** (largest known in the Solar System), 6,600 miles across
- Tectonic Craters — Yes, still active?
- Volcanoes — Yes, not active; One of the largest volcanoes in the Solar System; **Olympus Mons**
- Atmosphere — Carbon Dioxide (CO_2), Low Pressure, Clouds, Snow, Dust devils, Dust storms, Slight traces of Methane (CH_4)
- Water — Both liquid & water ice
 - Subsurface liquid water aquifers?
 - 2% water in soil
- Erosion — Yes
- Dunes — Yes
- Polar Caps — Yes
- Satellites — Two; Deimos and Phobos
- Life — Unknown; we are actively searching for life

The Bottom Line...

- Is liquid water still flowing?
- Very light compared to Venus and Earth (less dense)
- Life?



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Deimos and Phobos

Characteristic — Current state

- Craters
- No Atmosphere
- Very small
- Captured asteroids or result of collisions with Mars





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Consider this...

How did elementary school kids used to remember the order of the planets from the Sun? A simple mnemonic: My Very Educated Mother Just Served Us Nine Pizzas! (Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto) But with the demotion of Pluto as a full planet, the pizzas went away, so now it is My Very Educated Mother Just Served Us Nachos!

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