

Introduction to the Solar System (part 1)

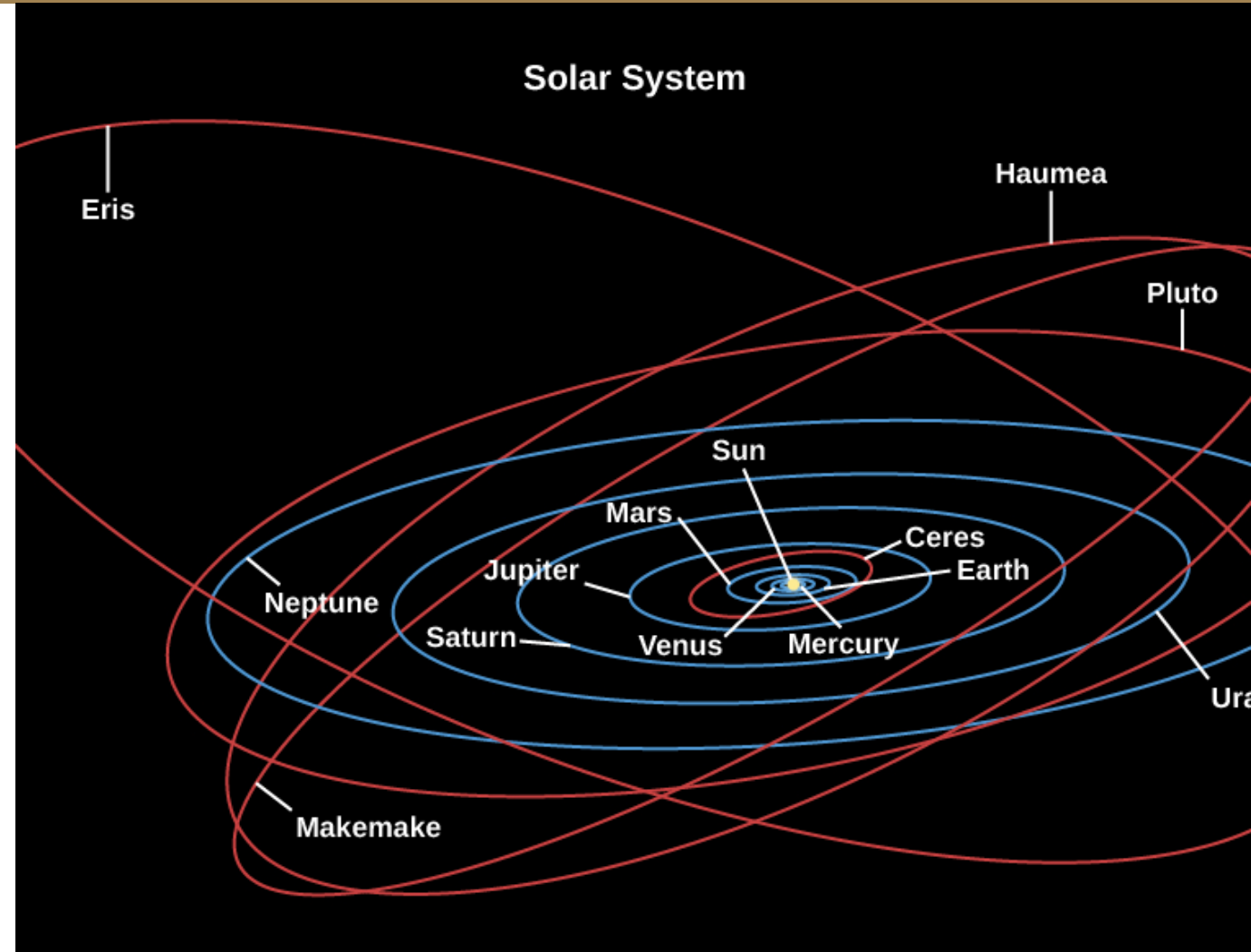
DR. DAVID YENERALL



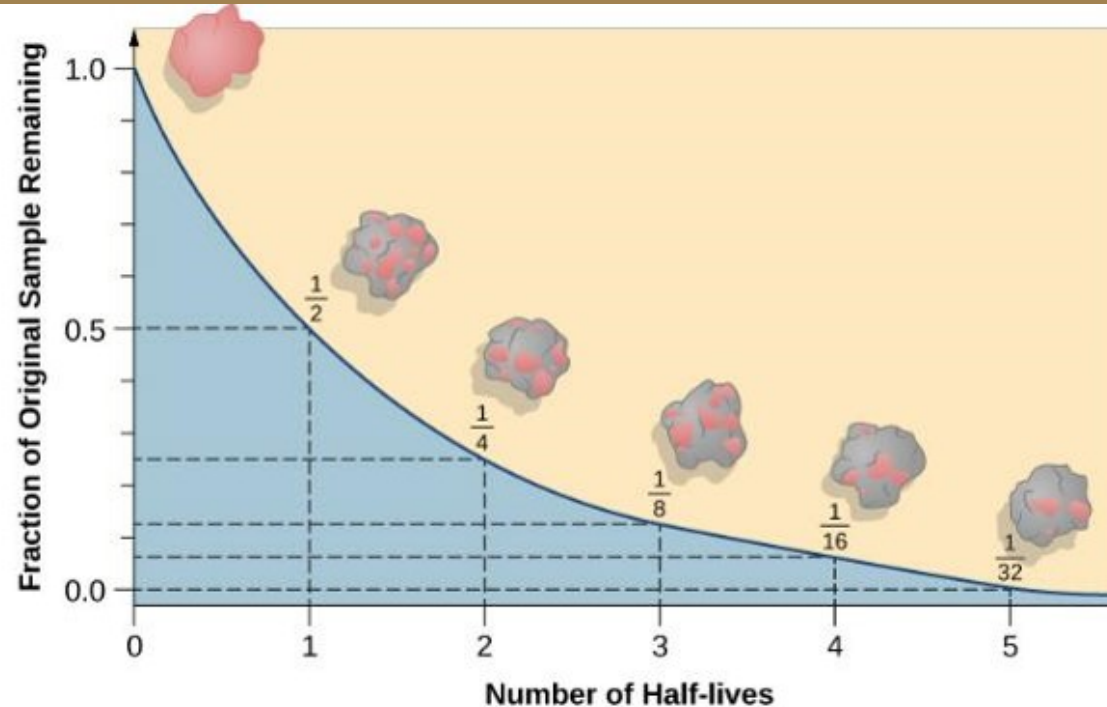


Orbits of Planets and Other Bodies

All eight major planets orbit the Sun in roughly the same plane. The five currently known dwarf planets are also shown: Eris, Haumea, Pluto, Ceres, and Makemake. Note that Pluto's orbit is not in the plane of the planets.

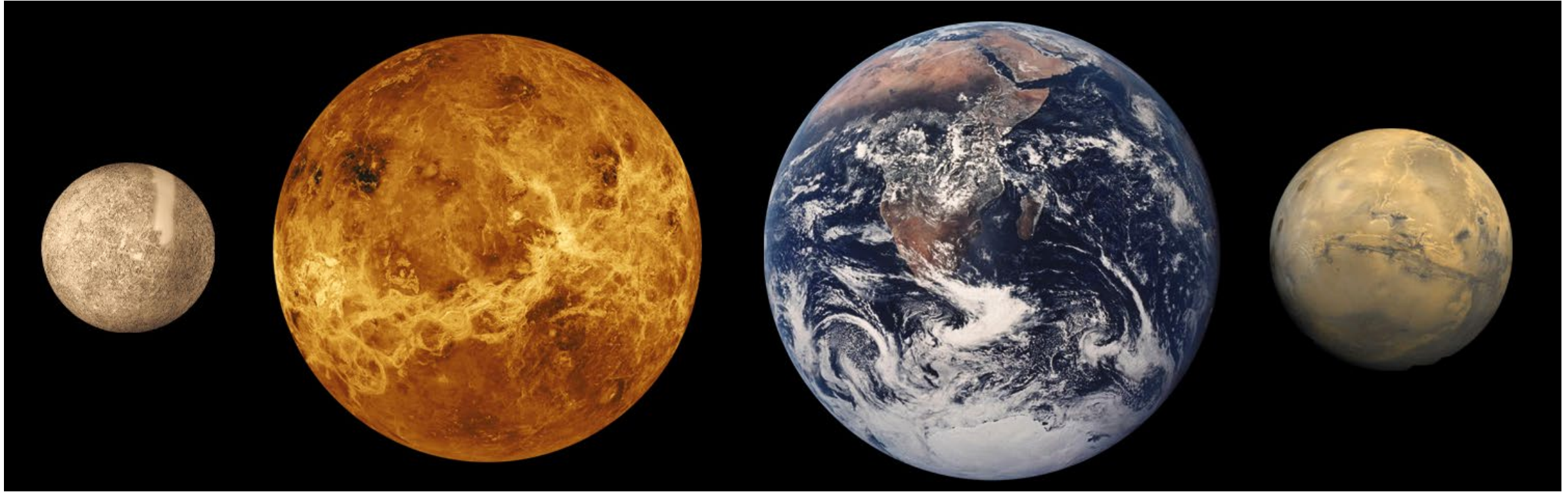


Radioactive Decay



This graph shows (in pink) the amount of a radioactive sample that remains after several half-lives have passed. After one half-life, half the sample is left; after two half-lives, one half of the remainder (or one quarter) is left; and after three half-lives, one half of that (or one eighth) is left. Note that, in reality, the decay of radioactive elements in a rock sample would not cause any visible change in the appearance of the rock; the splashes of color are shown here for conceptual purposes only.

Terrestrial Planets



Mercury

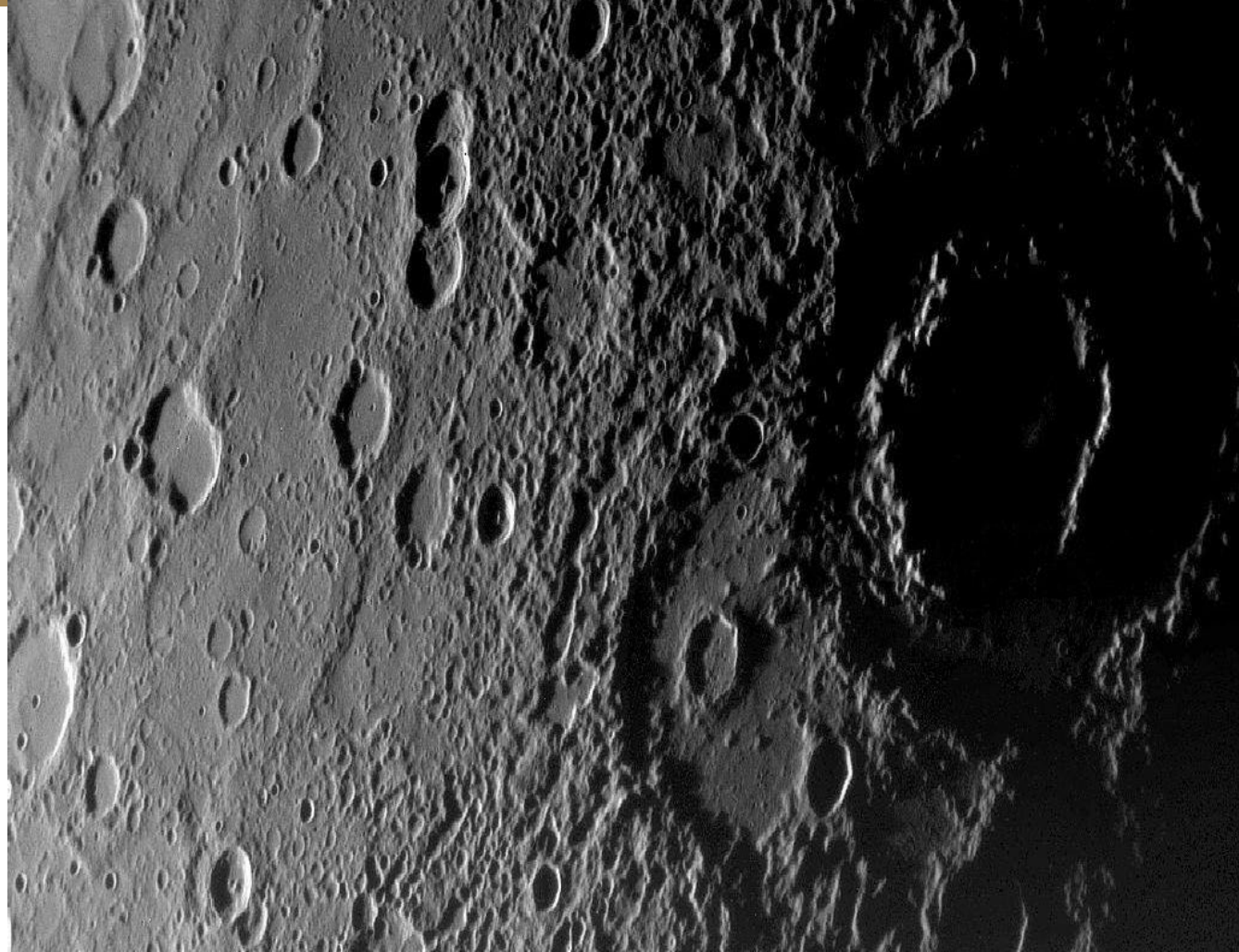
Venus

Earth

Mars

The Surface of Mercury

The pockmarked face of the terrestrial world of Mercury is more typical of the inner planets than the watery surface of Earth. This black-and-white image, taken with the Mariner 10 spacecraft, shows a region more than 400 kilometers wide (credit: modification of work by NASA/John Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington)



Venus

- Venus is often referred to as Earth's sister planet because they are similar in size, mass, and composition.
- Venus is the hottest planet in the Solar System because it has a thick atmosphere that causes the planet to retain heat.



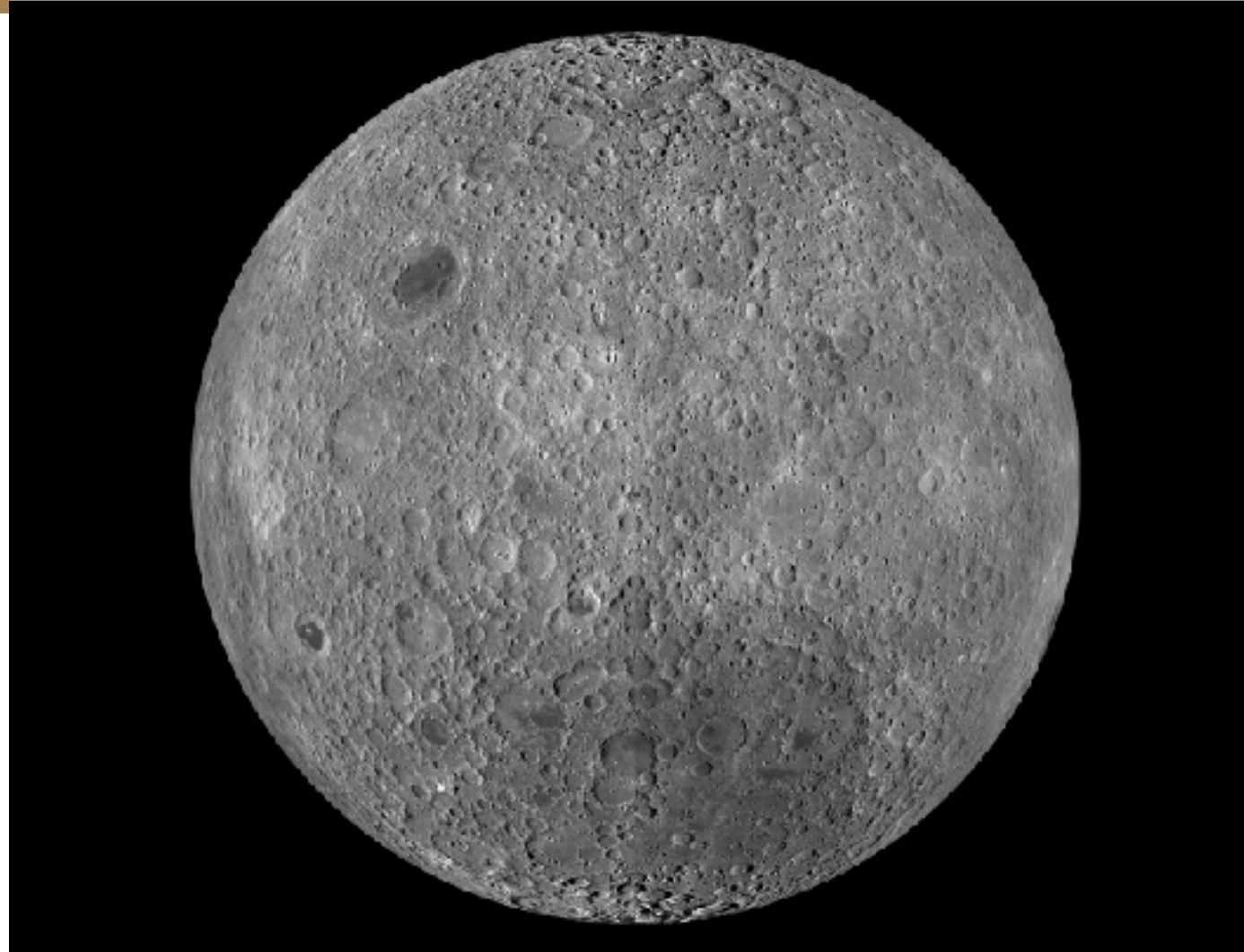
Earth

- Has liquid water on its surface
- Atmosphere contains oxygen
- Geologically active
- Currently the only place in the universe where we have found life



Earth's Moon

This composite image of the Moon's surface was made from many smaller images taken between November 2009 and February 2011 by the Lunar Reconnaissance Orbiter (LRO) and shows craters of many different sizes. (credit: modification of work by NASA/GSFC/Arizona State University)



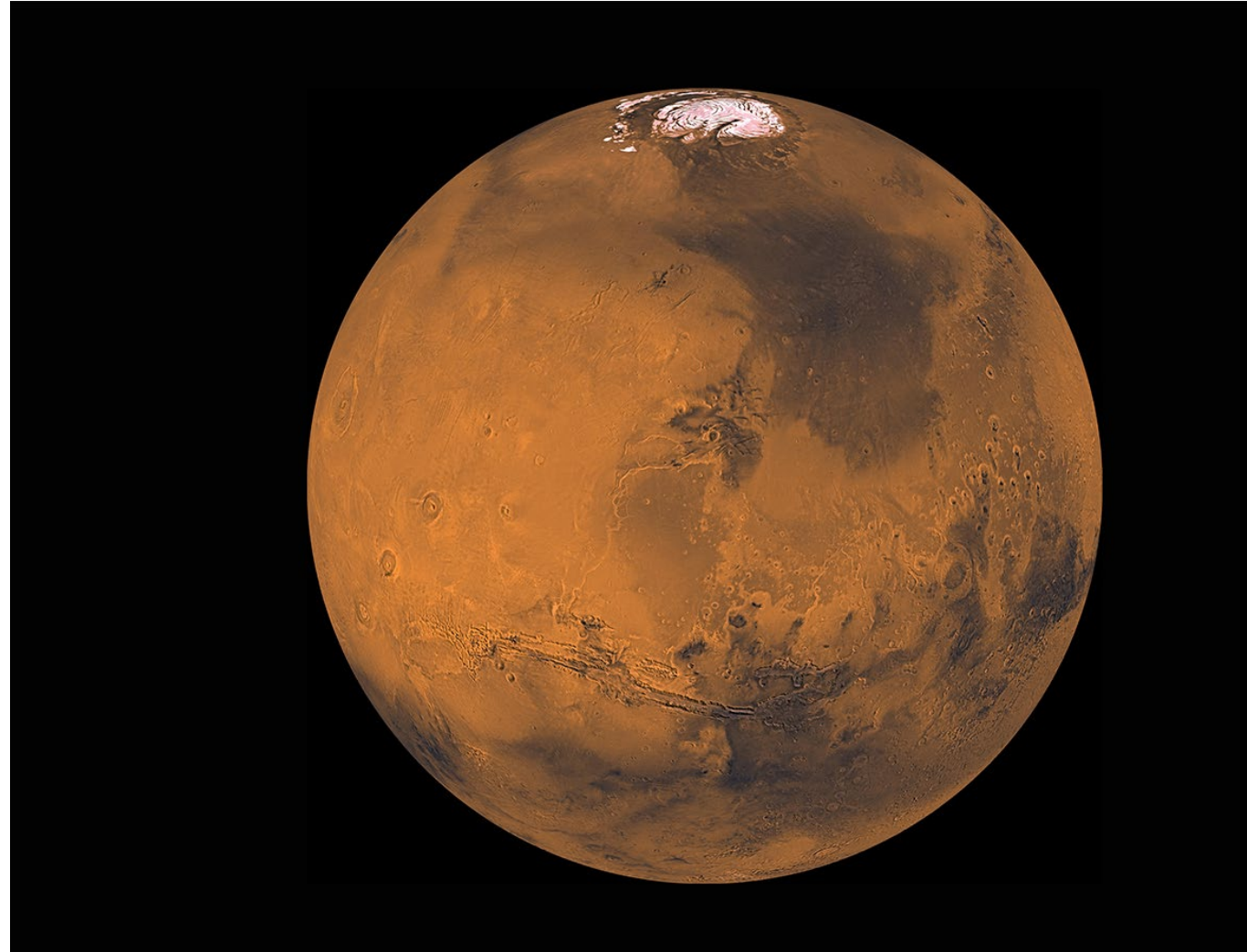
Astronauts on the Moon

The lunar lander and surface rover from the Apollo 15 mission are seen in this view of the one place beyond Earth that has been explored directly by humans. (credit: modification of work by David R. Scott, NASA)



Mars

- Was once geologically active
- Had liquid water on its surface
- Polar ice caps
- Olympus Mons Tallest Volcano in the Solar System (about 26 km)
- Valles Marineris (system of canyons)



Curiosity



This picture was taken by the *Curiosity* Rover on Mars in 2012. The image is reconstructed digitally from 55 different images taken by a camera on the rover's extended mast, so that the many positions of the mast (which acted like a selfie stick) are edited out. (credit: modification of work by NASA/JPL-Caltech/MSSS)

Asteroid Eros



This small Earth-crossing asteroid image was taken by the NEAR-Shoemaker spacecraft from an altitude of about 100 kilometers. This view of the heavily cratered surface is about 10 kilometers wide. The spacecraft orbited Eros for a year before landing gently on its surface. (credit: modification of work by NASA/JHUAPL)