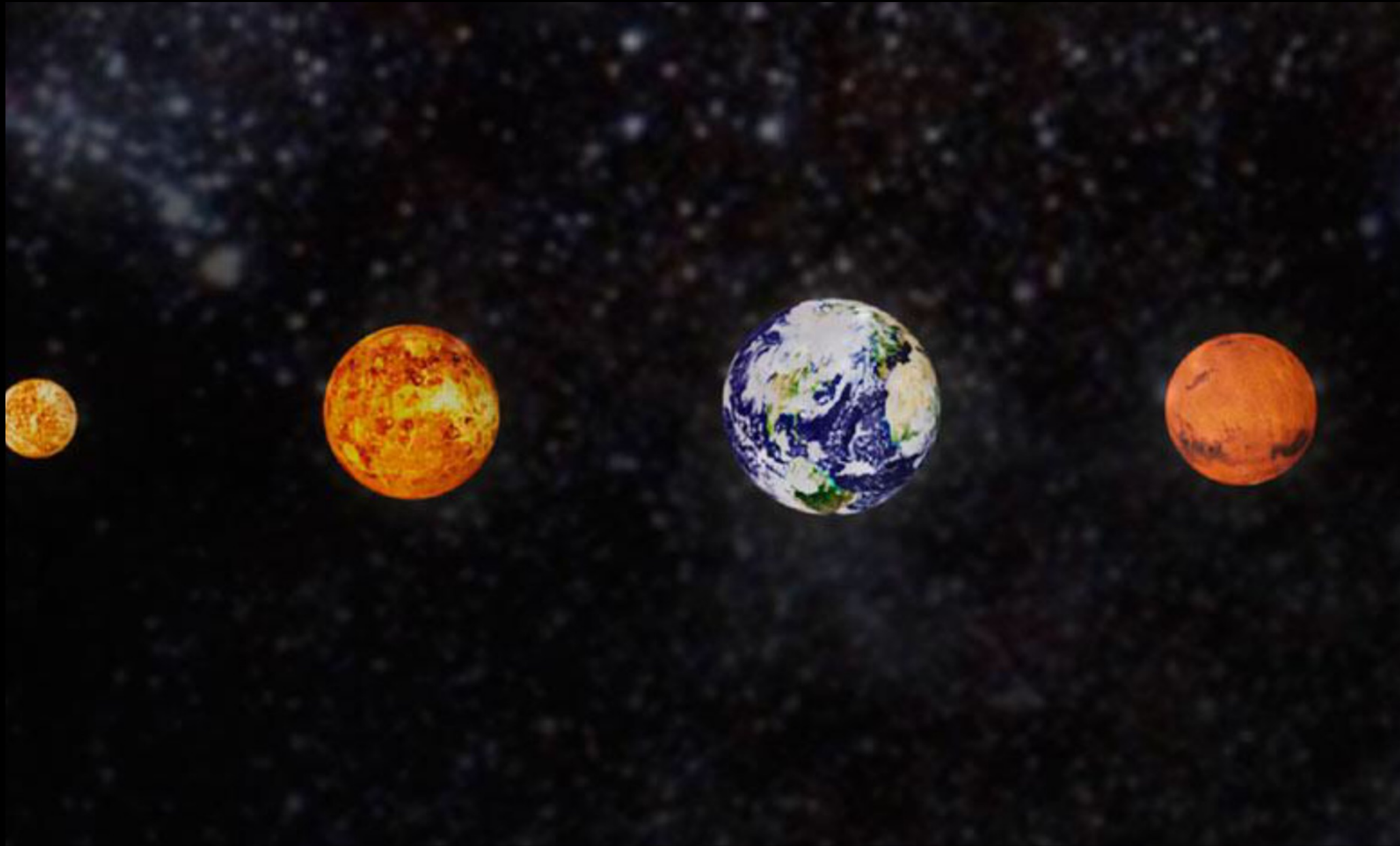


Mercury

Dennis Silverman
UCI OLLI

Mercury Specs

- Mercury at 1,515 mile radius is a third larger than the moon at 1,079.
- Since it orbits the sun in 88 days, it moves rapidly in our sky, although around the sun, so it was called Mercury, the messenger of the gods, by the Romans.
- It is about 0.38 of the earth's distance from the sun, but in an elliptical orbit from 29 million miles to 43 million miles.
- The earth is 93 million miles from the sun.
- Mercury is about a third of the earth's size, radius 1,515 miles compared to 4,000 miles.
- It doesn't have an atmosphere, and is heavily meteor cratered.
- Gravity on the surface is 0.38 that of earth.

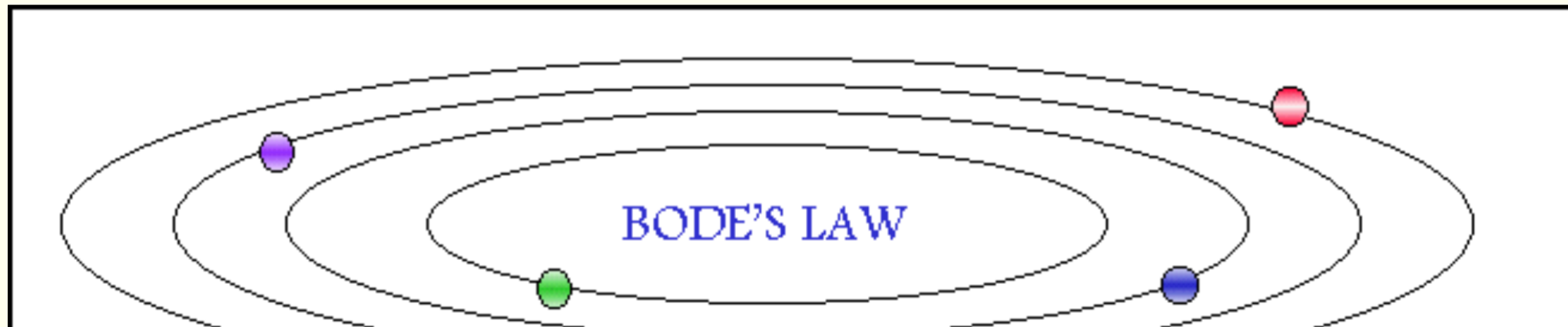


Sizes of the terrestrial planets

Mercury, Venus, Earth, and Mars

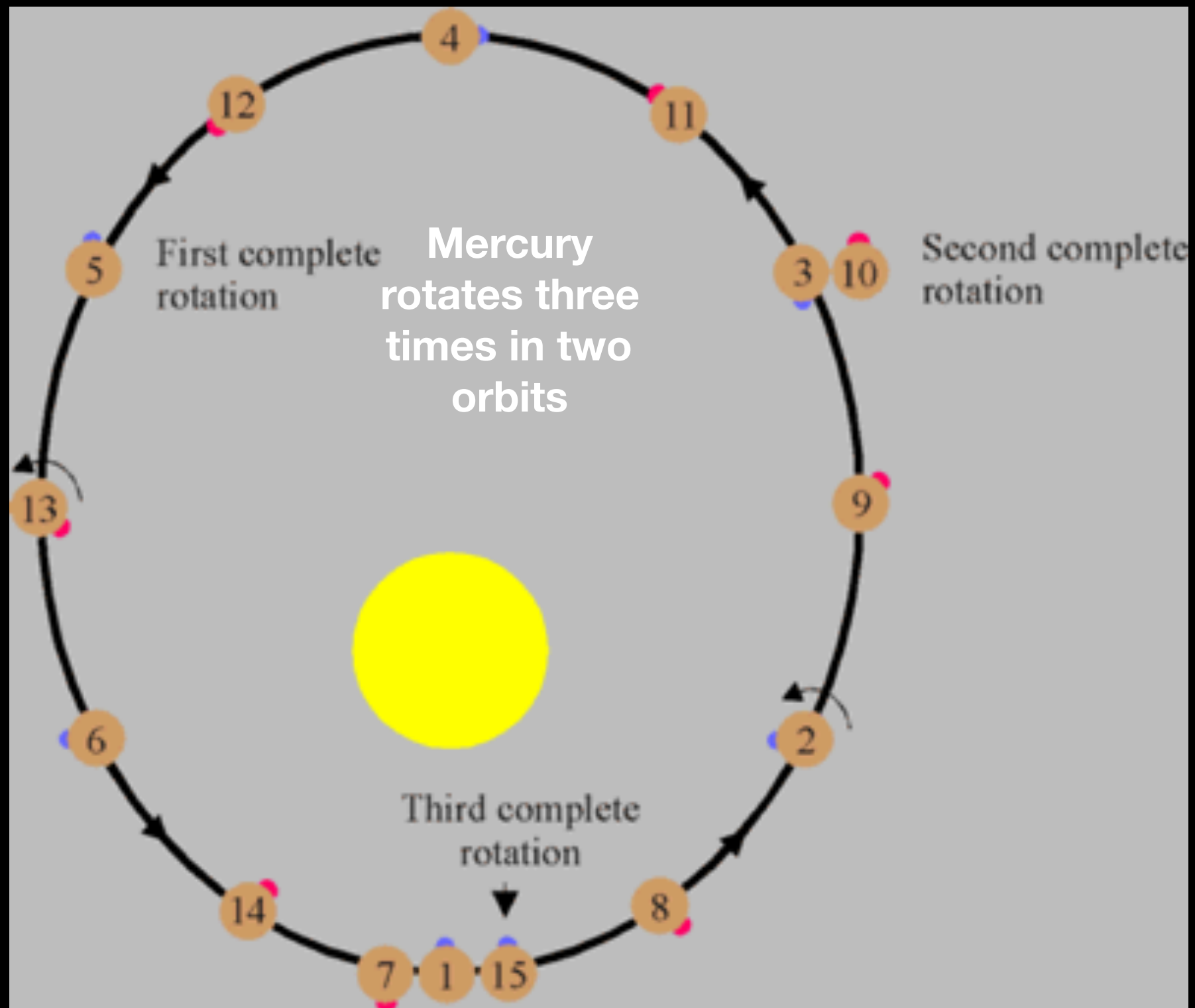
The resulting sequence is very close to the distribution of mean distances of the planets from the Sun.

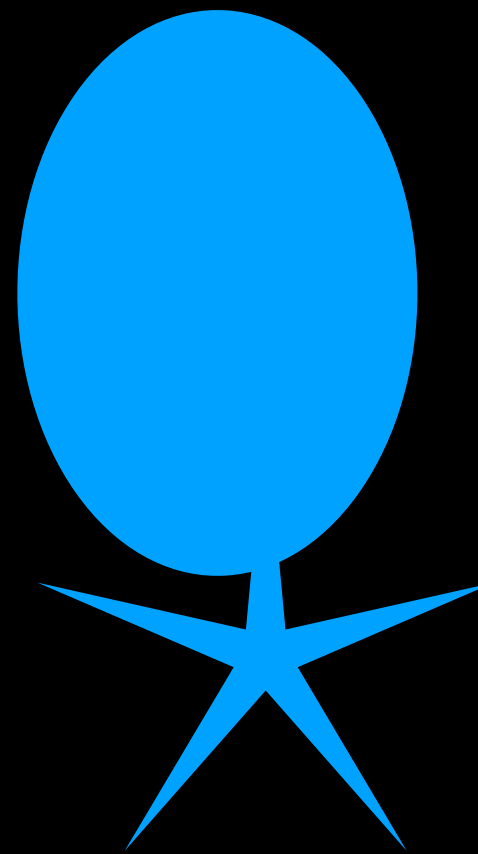
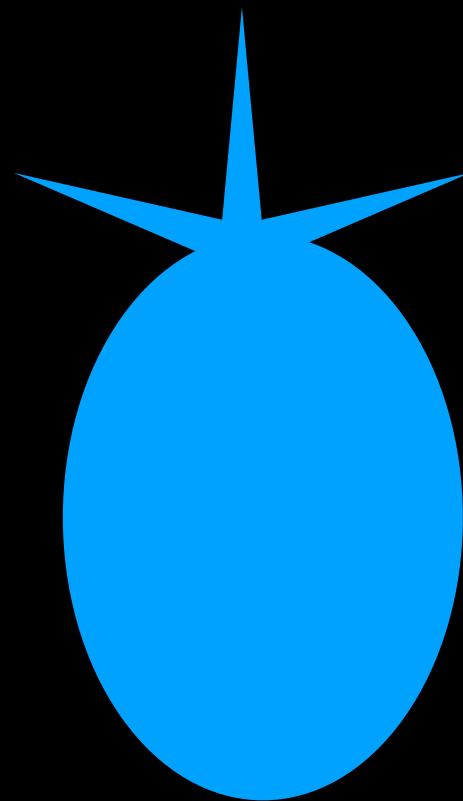
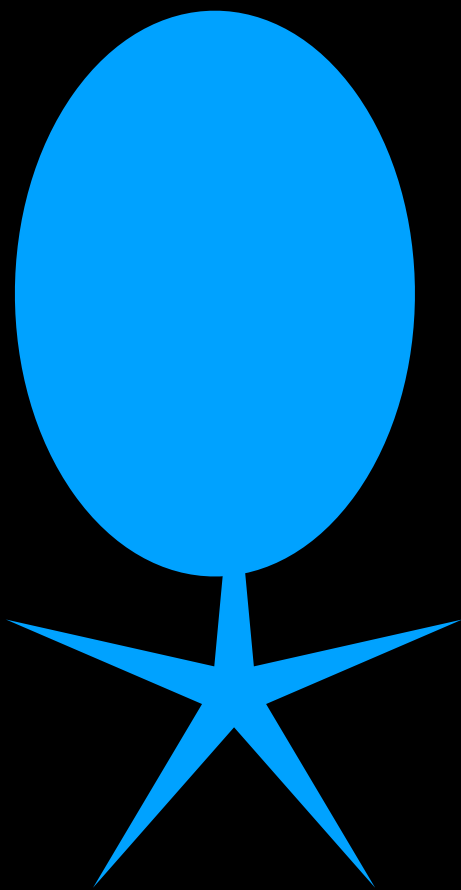
Body	Actual distance (A.U.)	Bode's Law
Mercury	0.39	0.4
Venus	0.72	0.7
Earth	1.00	1.0
Mars	1.52	1.6
		2.8
Jupiter	5.20	5.2
Saturn	9.54	10.0
Uranus	19.19	19.6



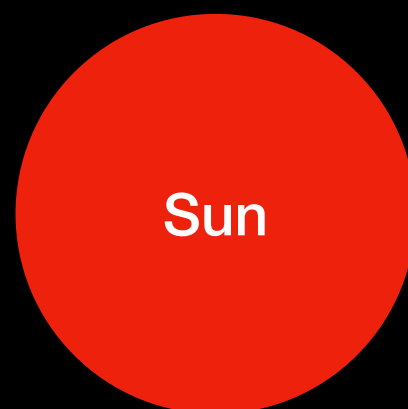
$$D = 0.4 + 0.3 \times 2^N$$

$N = -\text{INFINITY}, 0, 1, 2, 3, \dots$





Rotated 1 1/2 Times

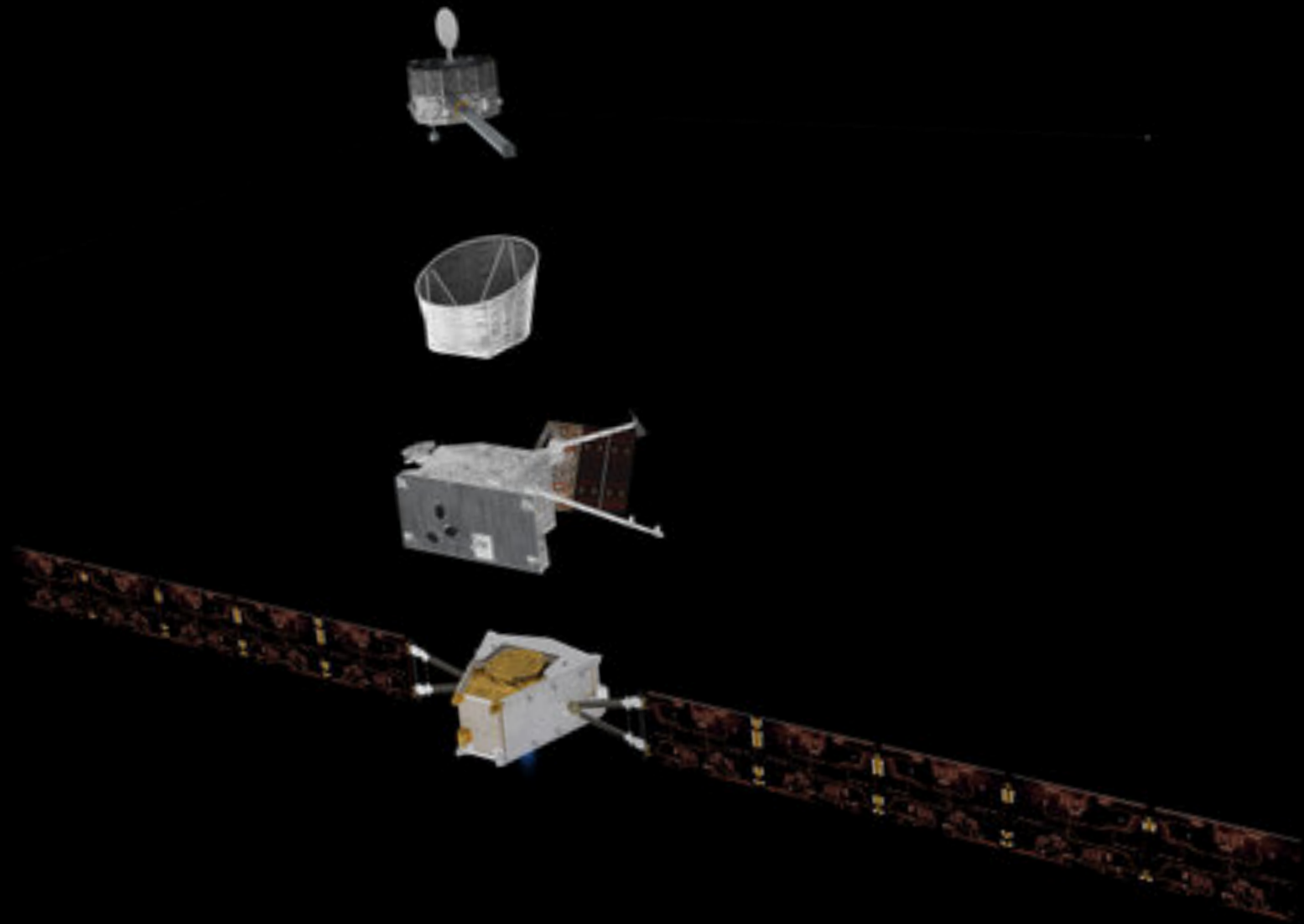


Mercury Probes

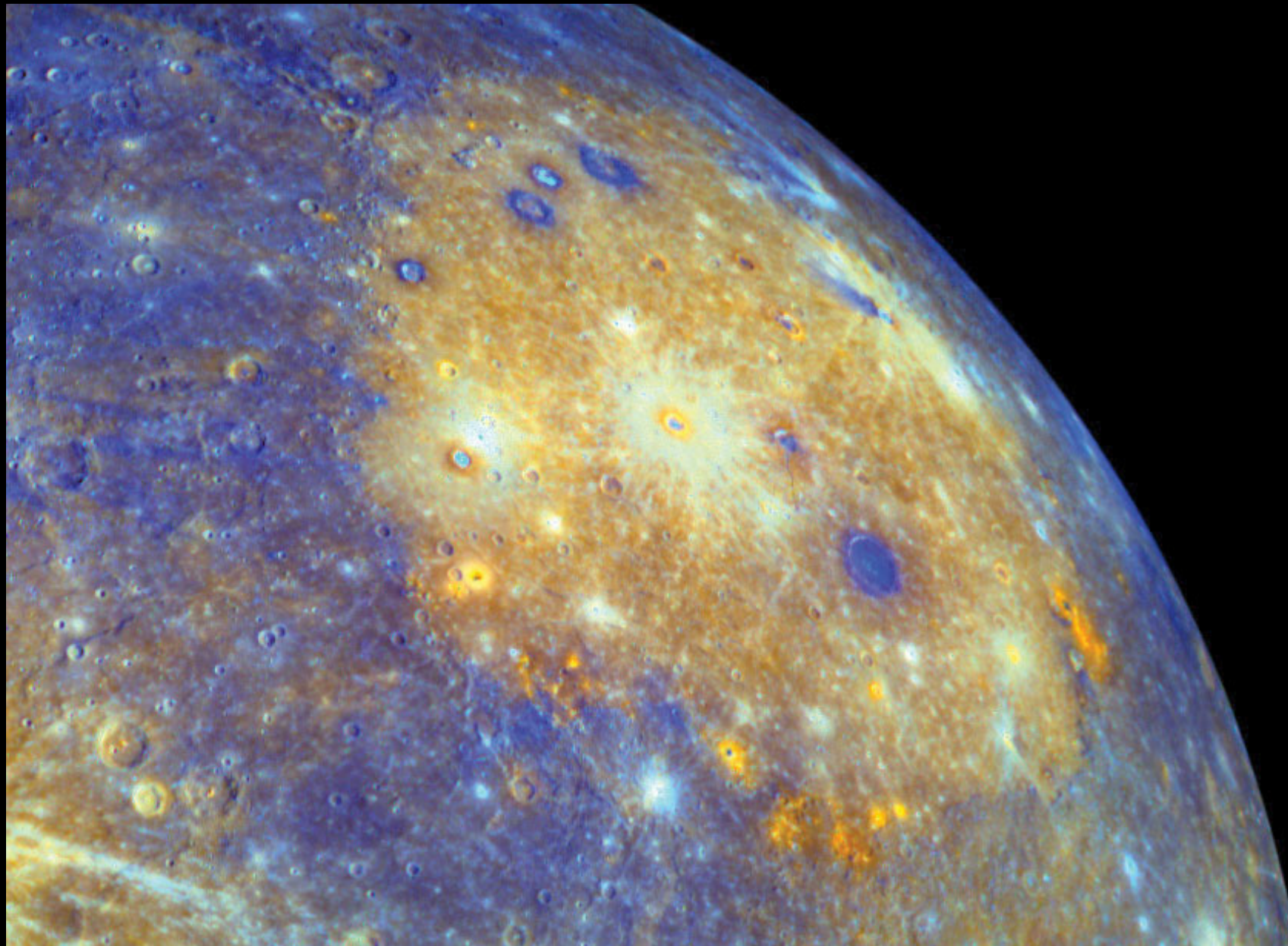
- Mariner 10 in 1974 orbited the sun and took three flybys of Mercury. It photograph 45% of the planet. Detected a magnetic field about 1% of earth's. Water hidden in craters at the poles.
- MESSENGER: Mercury Surface, Space ENvironment, GEochemistry, and Ranging. 2004 launch to 2011 in orbit. Flybys in 2008, 2009 and 2011. Mapped the planet in many wavelengths
- It studied its magnetic field, its core, and volatile materials at its poles.

BepiColombo Probes

- Just launched in October 2018, arrives in 2024 by ESA.
- MMO. Mercury Magnetosphere Orbiter, from JAXA Japan
- MPO. Mercury Planetary Orbiter by ESA.
- Why does Mercury have a high density?
- Does it have a liquid or solid core?
- Is Mercury tectonically active?
- Why a small magnetic field, 1% of earth's, and 3x stronger in the north
- Do poles contain water ice or sulphur?

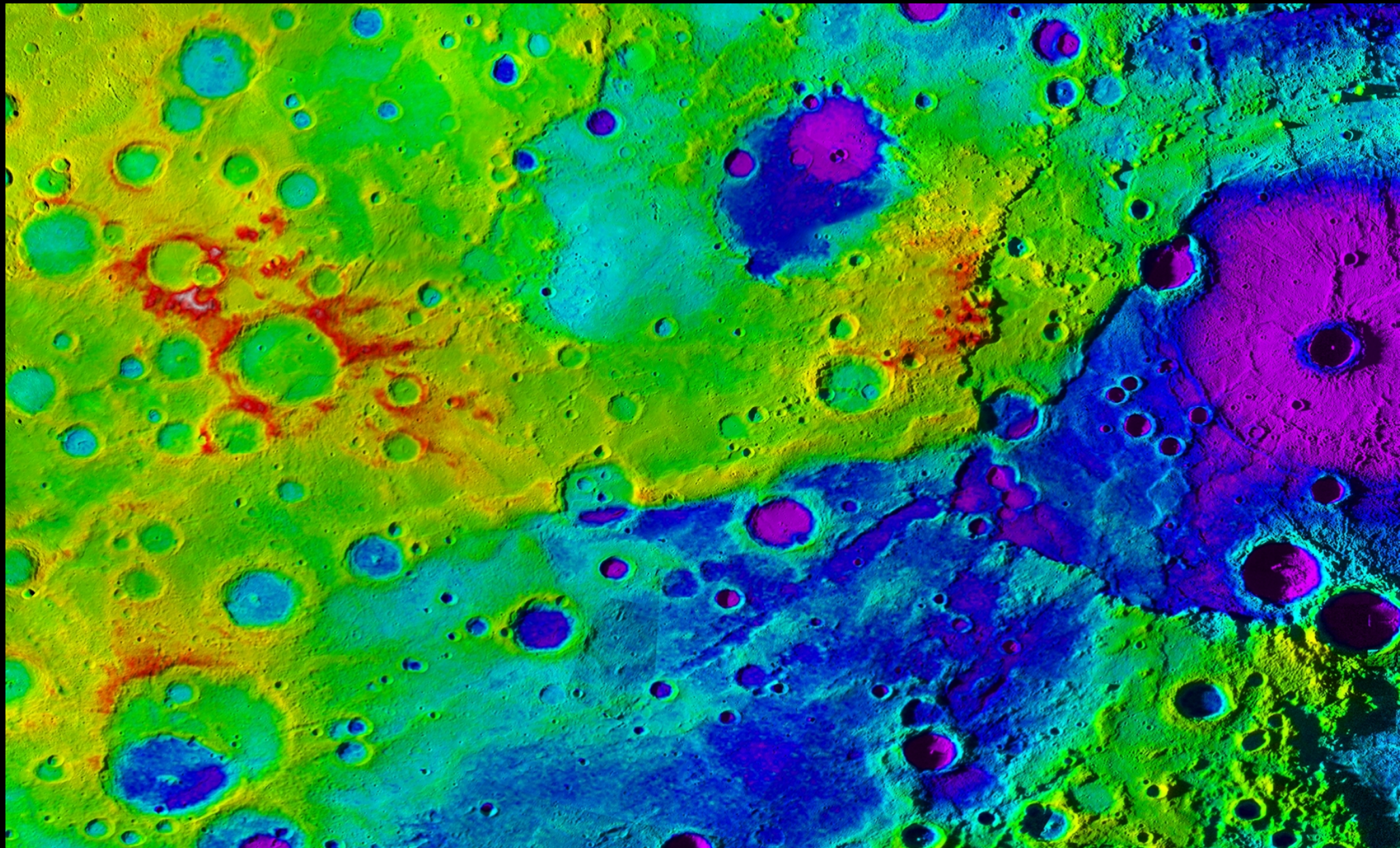


Top MMO, Sunshield, MPO,
Transfer module



Caloris Basin

960 miles across



Great Valley and ridges. 620 miles long. 2 miles deep.
Rembrandt Crater at right
From cooling and contraction of planet