

Shedding Ultraviolet Light on Asteroid (16) Psyche with the Hubble Space Telescope

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What is so interesting about (16) Psyche?

Thought to be primarily composed of metallic iron and nickel

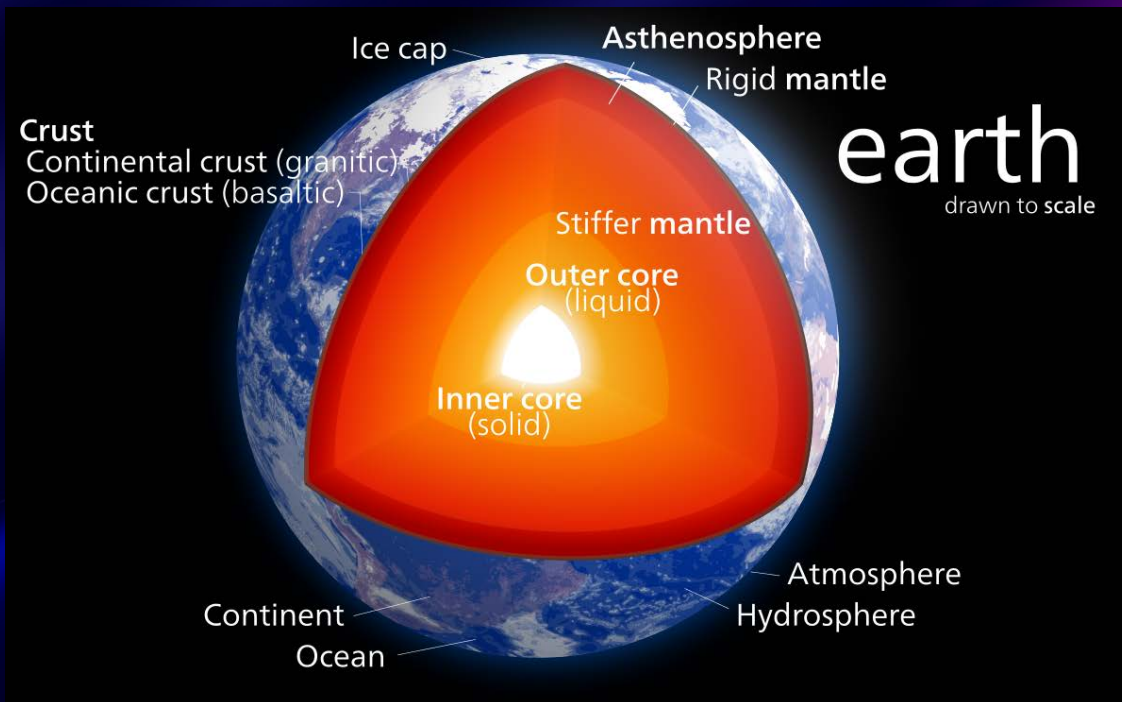


Credit: ASU/Peter Rubin

Very bright radar reflections from the Arecibo Observatory imply highly metallic

Shepard et al. 2016

What is so interesting about (16) Psyche?



Credit: Don Davis (SwRI)

A window into the core of planets



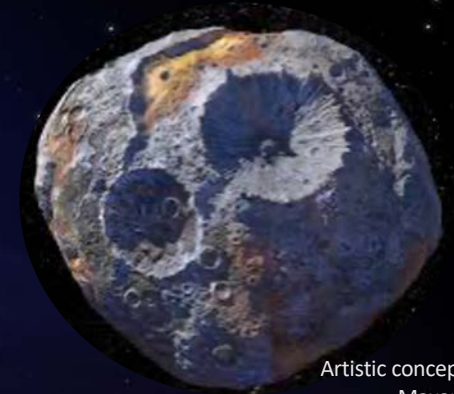
Photo credit: Mashable India

Psyche: Mission to a Metal World

NASA mission launch date: 2022

- Explore a new type of world: Not rock, not ice, but metal!
- Newer evidence for a higher percentage of rock
- But: no UV instrument on board!

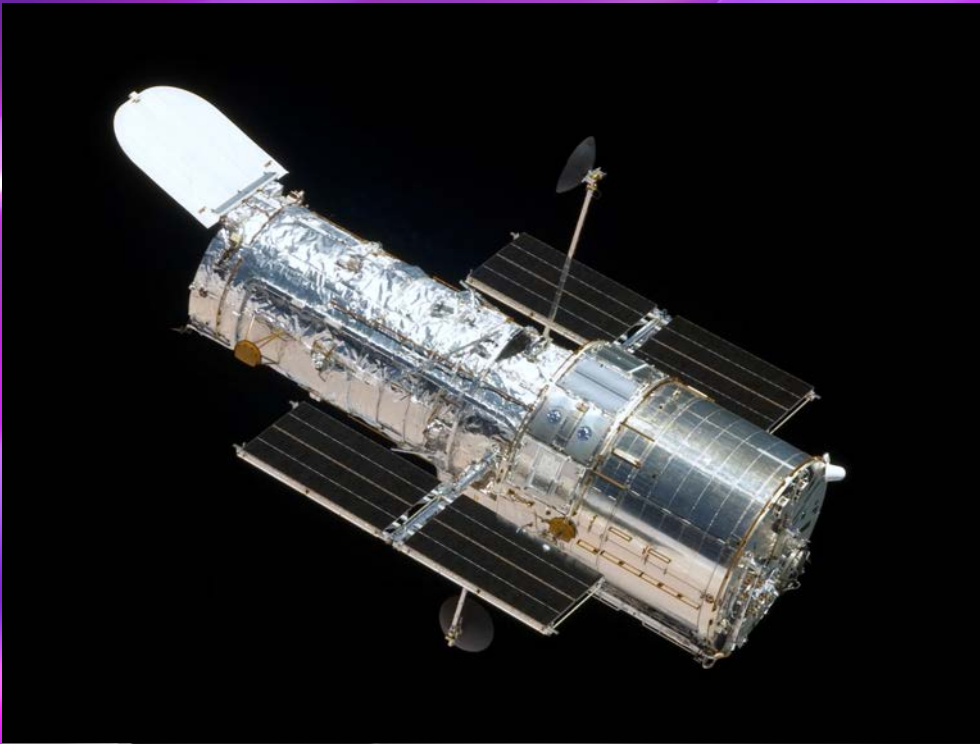
So many discoveries to be expected!



Artistic concept credit:
Maxar/ASU/P.
Rubin/NASA/JPL-Caltech

Please Note: I am *not* a part
of this NASA mission!

Our Research



- Ultraviolet observations from the Hubble Space Telescope
 - These can only be done from space!
 - Deeper into the UV than before!
- Goals:
 - Learn more about its composition
 - Look for “processing” of the surface

Is it metallic?

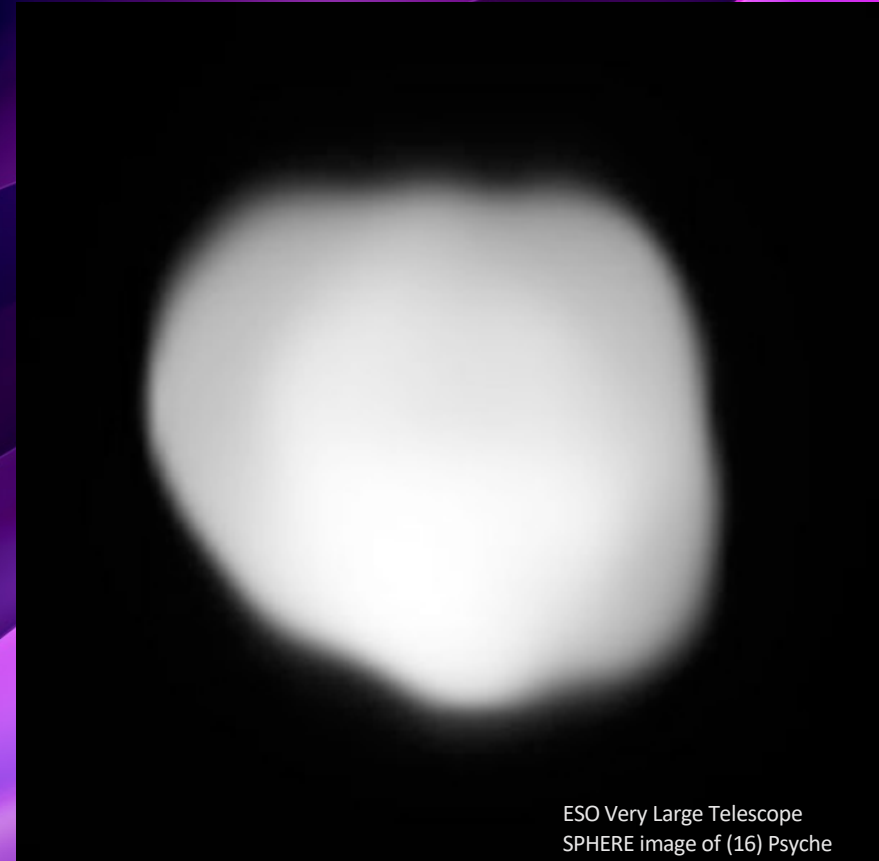
- Our results show that the way Psyche reflects UV light is very similar to the way iron reflects light



Caveat: Our computer modelling efforts show you only need to sprinkle a little bit of iron on the surface to make it appear that way!

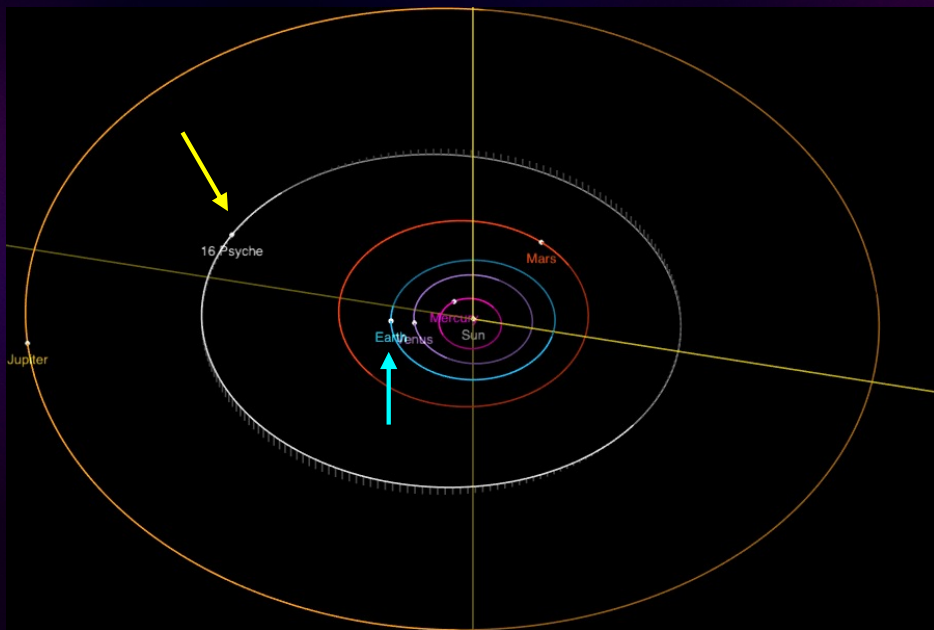
- We detected reflectance features in the UV that could be signs of oxidation of iron

This is the first time these signatures have been detected in the UV!



ESO Very Large Telescope
SPHERE image of (16) Psyche

Has it been processed?

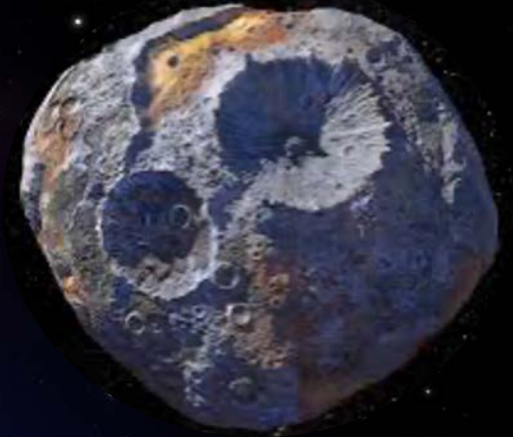


- Deep into the UV, the asteroid appears to brighten!
- We detected reflectance features in the UV that could be signs of oxidation of iron – *This is the first time these signs have been detected in the UV if true!*

Orientation of Psyche & Earth when observed by the Hubble Space Telescope
Image Credit: JPL Horizons

Key Takeaways

- Shedding “new light” on the asteroid (16) Psyche: these observations go deeper into the UV than any previous observations of this asteroid
- Psyche reflects UV light in a way that is similar to how iron reflects light
- First UV signs of possible oxidation on an asteroid
- (16) Psyche brightens in the deep UV – likely indicates processing of the surface through by the solar wind



Artistic concept credit:
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Rubin/NASA/JPL-Caltech

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