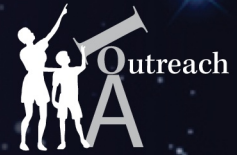


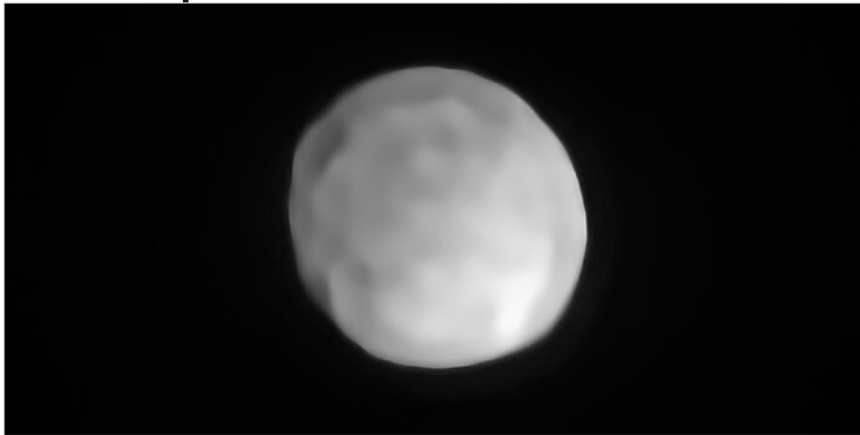


# INSTITUTE OF ASTRONOMY PUBLIC OPEN EVENING

— 30 OCTOBER 2019 —



## Asteroid 'Hygiea' might be a dwarf planet



*Hygiea, previously thought to be an asteroid, might actually be a dwarf planet. Image: ESO/P. Vernazza et al./MISTRAL algorithm (ONERA/CNRS)*

Hygiea, at 434 kilometres across, was thought to be the fourth-largest asteroid in the Solar System. However, new observations suggest that the body is actually spherical (see image above), which would mean Hygiea should be classified as a dwarf planet -- and not an asteroid.

There are three 'rules' to being a planet, brought in by the International Astronomical Union (IAU) in 2006. To be a planet, a body must be (1) in orbit around the Sun, (2) spherical, and (3) have cleared its orbit of debris. It was this third rule that got Pluto downgraded to 'dwarf planet' status.

Hygiea, being part of the asteroid belt, also fails to be classed as a full planet under rule 3. But, being spherical, it can be upgraded from 'asteroid' to 'dwarf planet', making it the smallest dwarf planet in our solar system.

The observations were carried

out by the 'SPHERE' instrument on the European Southern Observatory's Very Large Telescope.

"Thanks to the unique capability of the SPHERE instrument on the VLT, which is one of the most powerful imaging systems in the world, we could resolve Hygiea's shape, which turns out to be nearly spherical," said lead researcher Pierre Vernazza (who is based at the Laboratoire d'Astrophysique de Marseille in France).

Hygiea was expected to be heavily cratered, as it is the primary member of a 7000-strong family of bodies which originated when a larger parent object (around 100km across) was shattered around 2 billion years ago. Hygiea shows no sign of damage though, suggesting the formation process might have been more complex than previously thought.

### TONIGHT'S SPEAKER



Cora Uhlemann

The Skeleton of our Universe

### Our weekly welcome

**W**ELCOME to our weekly public open evenings for the 2018/19 season. Each night there will be a half-hour talk which begins promptly at 7.15pm. Please note that the talk will be recorded and archived for online streaming.

The talk is followed by an opportunity to observe if (and only if!) the weather is clear. The IoA's historical Northumberland and Thorrowgood telescopes, along with our modern 16-inch telescope, will be open for observations. In addition, the **Cambridge Astronomical Association** will provide a floorshow outdoors on the Observatory lawns, relaying live images from their telescopes and providing a commentary. If we're unlucky and it's cloudy, we'll offer you a conciliatory cup of tea after the talk (with perhaps some more astro-information in the lecture theatre for those who want to stay on).

If you have any questions, suggestions or comments about the IoA Open Evenings please contact Matt Bothwell at [bothwell@ast.cam.ac.uk](mailto:bothwell@ast.cam.ac.uk).

The talk schedule for this term can be viewed at: [www.ast.cam.ac.uk/public](http://www.ast.cam.ac.uk/public)

# Astronomers spot Exoplanet collision



*An artist's depiction of a collision between two exoplanets. (Credit: NASA/SOFIA/Lynette Cook)*

The early Solar System was a pretty violent place, and the results of ancient collisions are all around us. These primordial crashes caused Venus to spin backwards, Uranus to lie on its side, and even split the Moon off from the ancient Earth.

Now, astronomers have found evidence for colliding bodies in a different star system.

The star in question is known as BD+20307, and is around 300 light years away. The system is around a billion years old -- far younger

than our 4.5 billion year old Solar System, but plenty old enough to have settled down into peaceful stability (very much like our own Solar System, in which big collisions are a thing of the past).

Around 10 years ago, the system was found to be full of warm debris, suggesting a much more recent collision between planets. And new observations from the infra-red telescope SOFIA (Stratospheric Observatory for Infrared Astronomy) have found that over the past decade the

amount of debris in the system has actually increased!

"This is a rare opportunity to study catastrophic collisions occurring late in a planetary system's history," said Alycia Weinberger, who led the project. "The SOFIA observations show changes in the dusty disk on a timescale of only a few years."

More observations are needed before scientists are sure -- but right now, a cosmic crash seems to be the most likely option.

## Mission to Venus planned for 2026



*The surface of Venus, as seen by the Soviet Venera probe*

Venus is one of the most poorly-understood planets in our Solar System -- and for good reason. The extreme heat, crushing pressure and acid rain on the surface mean that the survival record for a landing probe is just 127 minutes.

Now, scientists want to send a harder probe to our Solar System's hottest planet, with the aim of surviving for 60 days. The

mission is called LLISSE, the Long-Lived In-situ Solar System Explorer, and will consist of a small cube-like probe less than 25cm across equipped with tools to study Venus's atmosphere and rocks.

Venus remains something of a mystery. It is thought that it originally had liquid water on its surface, which eventually boiled off due to the proximity of the Sun.

The resultant gasses caused a runaway greenhouse effect, which transformed Venus into the hellscape it is today. Venus's thick atmosphere prevents astronomers from studying the planet from orbit, which means that lander probes are the only way to unlock the secrets of Earth's "evil twin" planet.

The mission is being planned around Venera-D, a collaborative project between the Russian space agency and NASA, which would consist of a long-lived orbiter and a shorter-lived lander probe.

If the mission goes ahead, it should launch around 2026. So watch this space!

## Joke of the Week

'Telescope mirror inspector' sounds like a job I could really see myself doing...