



INSTITUTE OF ASTRONOMY PUBLIC OPEN EVENING

— 29 JANUARY 2020 —



Is asteroid 16 Psyche the remains of a planet?



An artist's impression of the asteroid 16 Psyche. Image credit: Maxar/ASU/P. Rubin/NASA/JPL-Caltech

The asteroid 16 Psyche has always been something of an enigma. Orbiting in the Asteroid Belt (around three times further away from the Sun than the Earth is), it might seem like a fairly ordinary astral body. Until, that is, you look inside.

16 Psyche is made up almost entirely of metal -- instead of being made of rock or ice, like most large asteroids. It is made up a mixture of Nickel and Iron (the same materials that comprise Earth's core), and (at around 200 km in every dimension) is the most massive metallic asteroid in our Solar System.

It is so massive, in fact, that astronomers have speculated that 16 Psyche is actually all that remains of a planet that was destroyed in the early days of the Solar System. A planet roughly the size of Mars would have a metallic core about the size of 16

Psyche. Such a planet that lost its outer rocky layers in a series of violent collisions would end up looking very much like 16 Psyche.

The asteroid is now the target of a new NASA mission! The Psyche mission, due to launch in 2022 (and due to arrive in 2026) will map and study the asteroid, hopefully unravelling the clue to Psyche's origins. The mission will carry a range of instruments, including imagers and instruments to measure the magnetic and radio properties of the object.

The Psyche mission is also a first step to possible future mining operations. Metallic asteroids can contain vast quantities of precious metals -- 16 Psyche is thought to contain around £500 quintillion (that's 18 zeros) worth of gold and platinum.

TONIGHT'S SPEAKER



Gareth Jones

The Galactic Mosh Pit: Merging in the Early Universe

Our weekly welcome

WELCOME to our weekly public open evenings for the 2019/20 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.

The talk schedule for this term can be viewed at: www.ast.cam.ac.uk/public

Pluto is fuzzier than expected



Haze around Pluto, as seen by New Horizons. image credit: NASA/JHUAPL/SwRI

For most of the 20th Century, our best view of Pluto was a tiny faint blob. But thanks to the New Horizons spacecraft, Pluto was fully revealed as a geographically complex world. But upon examination of the flyby data from New Horizons, astronomers noticed an unexpected feature: a hazy atmosphere. "It's surprising that Pluto has this fabulous haze layer," says Bonnie Buratti, a planetary scientist at NASA's Jet Propulsion Laboratory in California. "We talk about Pluto

being a new Mars, but it looks like it might be the new Titan as well".

Titan (Saturn's largest moon) is known for having oceans and lakes of liquid hydrocarbons on its surface, which contribute to a haze around the moon. So understandably, astronomers were immediately wondered whether Pluto's haze might have a similar source.

To find the answer, a team of scientists compared the haze around Titan, Pluto, and Triton (one of Neptune's icy moons,

which has a water haze around it).

Surprisingly, the haze around Pluto seemed to resemble that around Titan far more than Triton's haze.

"It's a factory for creating organic molecules," Buratti said. "Triton is icy, but Pluto is more like Titan."

These kinds of study open the doors to questions about the conditions around exoplanets, and even exomoons, which could well host similarly interesting atmospheres.

Massive star spotted in formation



A team of astronomers has spotted an 'accretion burst', a vast wave of energy emitted during the formation of a particularly massive star.

The most massive stars of all (which can weigh in at tens of times as massive as the Sun) have long puzzled astronomers. It is not clear how they initially form. Star formation is a complex process at the best of times, and as massive stars are all incredibly

distant, astronomers have only limited information about how these stellar giants behave in the earliest stages of their life. Current thinking suggests that massive stars are formed by short bursts of so-called 'accretion', where the protostar swallows great gulps of gas and dust from the surrounding cloud. These events are rare, however, with the first one only being spotted in 2016, and

astronomers are on the lookout for more.

The massive protostar G358-MM1 was identified back in January 2019 as a possible candidate for these extreme bursts. Followup observations with an Australian radio telescope revealed a totally new phenomenon: a vast heatwave of accretion energy, blasting through the young star's surroundings at nearly 5% of the speed of light. As this is a newly-spotted phenomenon, the team suspect that there are all different kinds of accretion events, which may end up affecting the final properties of the massive star.

Joke of the Week

If a meteorite hits a planet, what do we call the ones that miss? Metiowrongs