



<p>ESOCast Episode 38: Faraway Eris is Pluto's twin</p>	
<p>00:00 [Visuals start]</p> <p>[Narrator] 1. Astronomers have accurately measured the size of the remote dwarf planet Eris for the first time. They caught it as it passed in front of a faint star, using the Belgian TRAPPIST telescope at ESO's La Silla Observatory, along with two other telescopes in Chile. The new observations show that Eris is an almost perfect twin of Pluto in size. Eris also seems to be extremely reflective, probably because it is covered in a thin layer of frozen atmosphere.</p>	<p>Images:</p> <p>Computer animation on Eris</p>
<p>00:38 ESOCast intro</p> <p>This is the ESOCast! Cutting-edge science and life behind the scenes at ESO, the European Southern Observatory. Exploring the ultimate frontier with our host Dr J, a.k.a. Dr Joe Liske.</p>	<p>ESOCast introduction</p>
<p>00:58 [Narrator] 2. In this episode, we are going to look at new observations of the distant dwarf planet Eris as it passed in front of a background star — an event called an occultation — and what these results have revealed.</p>	<p>TRAPPIST/La Silla footage</p>

<p>01:11 [Narrator] 3. Occultations are rather like eclipses —the background star disappears behind the object and reappears on its other side. As viewed from Earth, the brightness of the background star suddenly drops and then returns equally suddenly to its previous level. By looking at these two events, astronomers can measure the size and shape of the occulting foreground object. If they also know the mass of this object they can then determine its density.</p> <p>Occultations of stars by distant objects in the Solar System are very hard to observe because of the small size of the objects. But occultations are often the only way to learn about these remote specks, as they are too distant and too small to be seen as anything more than faint points of light, even through powerful telescopes.</p>	<p>Computer animation of passage</p> <p>Animation of background star path from various sites</p> <p>Animation of the shadow on Earth</p>
<p>02:04 [Narrator] 4. The occultation technique has now enabled astronomers to learn a lot more about the dwarf planet Eris.</p> <p>Eris was identified as a large object in the outer Solar System in 2005. Its discovery was one of the factors that led to the creation of a new class of objects called dwarf planets and the reclassification of Pluto from planet to dwarf planet in 2006.</p> <p>Eris is three times farther from the Sun than Pluto at the moment, and until now was believed to be about 25% bigger. But the new observations show that Eris is in fact almost exactly the same size as Pluto, with a diameter of around 2330 kilometres.</p>	<p>Footage of La Silla</p> <p>Animations of Eris and Pluto</p> <p>Animations of Eris</p>
<p>02:50 [Narrator] 5. Because Eris also has a moon, called Dysnomia, astronomers have also been able to calculate the mass of Eris by a careful study of this moon’s orbit. Using the new diameter and known mass, they then calculated the density of the Eris, which now appears to be greater than astronomers had previously thought. Eris seems to be a rocky body surrounded by a thick mantle of ice.</p>	<p>Animation of Eris with its moon</p>

<p>The dwarf planet turns out to reflect almost all of the light that falls on it — its surface is even brighter than fresh snow on Earth. Eris is probably covered in a very thin layer of frozen atmosphere that is likely to consist of frozen nitrogen mixed with methane. It is probably the result of the freezing of Eris's atmosphere as the dwarf planet's elongated orbit takes it far away from the Sun.</p>	
<p>03:44 [Narrator]</p> <p>6. These important new observations, made with relatively small telescopes, have allowed astronomers to measure Eris's properties better than ever before. This is another step towards understanding the mysterious objects that lie in the remote parts of our own Solar System.</p>	<p>Footage of TRAPPIST</p> <p>Animation of Eris</p>
<p>04:00 [Outro]</p> <p>This is Dr. J signing off for the ESOcast. Join me again next time for another cosmic adventure.</p>	
<p>04:08 [Outro]</p>	<p>ESOcast is produced by ESO, the European Southern Observatory.</p> <p><i>ESO, the European Southern Observatory, is the pre-eminent intergovernmental science and technology organisation in astronomy designing, constructing and operating the world's most advanced ground-based telescopes.</i></p>

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