



<p><b>ESOCast Episode 64: First Ring System Around Asteroid</b></p>	
<p><b>00:00</b> [Visuals start]</p> <p>[Narrator] 1. Astronomers using seven telescopes across South America, including two at ESO's La Silla Observatory in Chile, have made a totally unexpected discovery. They have found that the minor planet Chariklo — a small rocky body orbiting the Sun beyond Saturn — is surrounded by two narrow rings. It's the first minor planet found to have rings.</p>	<p>Visual of La Silla telescopes</p> <p>View of Chariklo and rings</p>
<p><b>00:30</b> <b>ESOCast intro</b> 2. This is the ESOCast! Cutting-edge science and life behind the scenes of 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><b>00:51</b> [Dr J] 3. The rings around Saturn are one of the most spectacular sights in the sky. And Saturn isn't the only planet that has rings. Less prominent ones have also been found around the other giant planets in the Solar System — Jupiter, Uranus and Neptune.</p> <p>However, despite many careful searches, no rings had ever been found around any small objects in the Solar System — well, until now!</p>	<p>Dr J in virtual studio.</p> <p>Background image: Saturn/gas giant planets with rings</p> <p>Views of (ring-free) minor object</p>
<p><b>01:19</b> [Narrator] 4. Observations of the distant minor planet 10199 Chariklo as it passed in front of a star have now revealed that it is surrounded by two fine rings. This came as a complete surprise to astronomers as they never thought small bodies like Chariklo had them at all.</p>	<p>Generic animation on Chariklo 25-30 sec</p>

<p><b>01:44</b>  <b>[Narrator]</b>  5. Chariklo is the largest member of a class of minor planets known as Centaurs. It is about 250 kilometres across and orbits between Saturn and Uranus in the outer Solar System.</p> <p>Predictions had shown that Chariklo would pass in front of a faint star, as seen from South America in June 2013. This would allow astronomers to observe the star's brightness suddenly drop as the minor planet blocked the light — an event called an occultation.</p>	<p>Visual of location of Centaurs in Solar System</p> <p>Animation of minor planet blocking light of star.</p>
<p><b>02:22</b>  <b>[Dr J]</b>  6. But the astronomers found much more than they had bargained for — a few seconds before, and then again a few seconds after the main occultation, there were two further very short dips in the star's apparent brightness. Something around Chariklo was also blocking the star's light!</p>	<p>Visual of occultation/light curve to show drop and observation of rings</p>
<p><b>02:42</b>  <b>[Narrator]</b>  7. By comparing what was seen from different sites, the scientists could work out not only the shape and size of the minor planet itself but also other properties of the two newly-discovered rings. Observations found they are both very narrow, just seven and three kilometres wide, separated by a clear gap of nine kilometres.</p>	<p>Generic animation on Chariklo</p>
<p><b>03:13</b>  <b>[Narrator]</b>  8. The rings of Uranus, and the ring-arcs around Neptune, were found in a similar way during occultations back in 1977 and 1984. ESO telescopes at La Silla Observatory were also involved with the Neptune ring discovery.</p> <p>But now, decades later, observational techniques have improved a lot and many more occultation events have been observed — but no rings have turned up around smaller bodies.</p>	
<p><b>03:47</b>  <b>[Dr J]</b>  9. So it came as a bit of a surprise that small bodies like Chariklo can maintain their own ring system. Now astronomers think that this sort of ring is likely to have formed from debris left over after a collision.</p>	<p>Generic animation on Chariklo</p>

<p>Furthermore, this debris must have been shaped into the narrow rings by the presence of one or more small shepherding moons. So, apart from the rings there may be at least one tiny moon waiting to be discovered around Chariklo.</p>	
<p><b>04:19</b>  <b>[Outro]</b>  10. This is Dr. J signing off for the ESOcast. Join me again next time for another cosmic adventure.</p>	
<p><b>04:26</b>  <b>[Outro]</b></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>

**END**