



**Key words: Ultracool dwarf, Trappist, exoplanet**

<p><b>ESOCast Episode 83: Ultracool Dwarf with Planets</b></p>	
<p><b>00:00</b>  <b>[Visual starts]</b>          1. Where is the best place to search for life beyond the Solar System?</p> <p>Astronomers using telescopes at ESO's observatories in Chile have discovered three planets around a dim dwarf star just 40 light-years from Earth.</p> <p>These worlds have sizes and temperatures similar to those of Venus and the Earth.</p> <p>They may be the best targets so far found in the hunt for life elsewhere in the Universe.</p>	<p><b>00:00</b></p> <p>Computer animation Earth from space</p> <p>La Silla timelapse</p> <p>Computer animation exoplanets</p>
<p><b>00:34</b>  <b>ESOCast intro</b>          2. This is the ESOcast! Cutting-edge science and life behind the scenes at ESO, the European Southern Observatory.</p>	<p>ESOCast introduction</p>
<p><b>01:01</b>  <b>[Narrator]</b>          3. New telescopes and more sophisticated instruments have allowed astronomers to discover and study large numbers of planets around other stars — known as exoplanets.</p> <p>Now scientists are searching for planets where we could detect life in the near future — if it exists.</p> <p>Astronomers hope to find the characteristic signatures in the atmospheres of these planets of molecules that could indicate the presence of life.</p>	<p>Very Large Telescope timelapse</p> <p>Computer animations on exoplanets</p> <p>Computer animation on molecules in space</p>

<p><b>01:35</b>  <b>[Narrator]</b>          4. But there are billions of stars in our galaxy, so how can they find the kind of planets they are looking for?</p> <p>A type of tiny dim red star called an ultracool dwarf is a good place to look.</p> <p>They are the only places where life could be detected on an Earth-sized exoplanet using our current technology.</p> <p>The light from much brighter stars — like the Sun for example — would swamp vital measurements of the atmospheres of any candidate planets.</p>	<p>Computer animation on stars in the Milky Way</p> <p>Computer animation ultracool dwarf</p> <p>Computer animation on exoplanets</p>
<p><b>02:10</b>  <b>[Narrator]</b>          5. An international team of astronomers has used the Belgian TRAPPIST telescope to monitor the brightness of an ultracool dwarf star in the constellation of Aquarius, which has been named TRAPPIST-1.</p> <p>They found that it faded slightly at regular intervals, indicating that three planets were passing between the star and the Earth — events known as transits.</p> <p>The host star TRAPPIST-1 is much cooler and redder than the Sun and barely larger than Jupiter. Stars like this are very common in the Milky Way and they are very long-lived.</p> <p>This is the first time that planets have been found around one of them.</p>	<p>TRAPPIST telescope at La Silla</p> <p>Animation of transit</p> <p>Computer animations TRAPPIST-1 and planets</p>

<p><b>02:59</b> <b>[Narrator]</b> 6. Transits like these provide a surprising amount of information about the planet.</p> <p>The team were able to tell that the three planets are very similar in size to the Earth and that they orbit very close to their dim parent star.</p> <p>But the really exciting result is that all three planets might have habitable regions on their surfaces.</p>	<p><b>00:00</b></p> <p>TRAPPIST telescope interior view</p> <p>Computer animations on TRAPPIST-1 and planets</p>
<p><b>03:24</b> <b>[Narrator]</b> 7. This study has found the first Earth-like planets that are well suited for the detection of biological activity.</p> <p>The next step is to make more detailed observations, using the next generation of telescopes; such as ESO's European Extremely Large Telescope and the James Webb Space Telescope, scheduled for launch in 2018.</p> <p>That will allow astronomers to study the atmospheres of planets like this, and to search for molecules related to biological activity, like ozone, methane or water.</p>	<p>TRAPPIST telescope at La Silla</p> <p>Computer animations on E-ELT and JWST</p> <p>Computer animation on exoplanets</p>
<p><b>04:05</b> <b>[Narrator]</b> 8. Ultracool dwarf stars are common — they account for around 15% of the stars near to the Sun.</p> <p>So this discovery opens up a new direction for planet-hunting, a direction that is taking us one step closer to the goal of finding evidence for some kind of life on distant worlds.</p>	<p>Night timelapse</p> <p>Computer animation exoplanet</p>
<p><b>04:32</b> <b>[Outro]</b></p>	<p>ESOCast is produced by ESO, the European Southern Observatory.</p> <p><i>ESO builds and operates a suite of the world's most advanced ground-based</i></p>

	<i>astronomical telescopes.</i>
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