

Key words: Pale Red Dot, Exoplanets, Proxima Centauri, Habitable Zone



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| <p>ESOCast Episode 87: Planet found around closest Star</p> | |
| <p>00:00 [Visual starts]</p> <p>1. The results of the <i>Pale Red Dot campaign</i> — <i>the quest to find a planet orbiting the closest star to the Solar System</i> — have now been announced.</p> <p>Astronomers have found clear evidence of a planet orbiting the star Proxima Centauri. This alien world is the closest possible abode for life outside the Solar System!</p> | <p>00:00 [Visuals start]</p> <p>Computer animation trip from Earth to Proxima b</p> |
| <p>00:28 ESOCast intro</p> <p>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>00:48</p> <p>3. The search for other worlds has captivated imaginations throughout history, but only recently have we had the instruments able to detect worlds outside the Solar System,</p> <p>These extrasolar planets, or exoplanets, went undetected until 25 years ago. Today, thanks to advances in telescope technology, astronomers have detected over three thousand.</p> <p>And now the scientists behind the Pale Red Dot campaign have made a milestone</p> | <p>Computer animation of an exoplanet</p> <p>La Silla Observatory</p> <p>Computer animation of exoplanets</p> |

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| <p>discovery. They have discovered clear evidence for a potentially habitable planet orbiting Proxima Centauri, the closest star to the Solar System.</p> | |
| <p>01:41 [Narrator] 4. Using the HARPS spectrograph on ESO's 3.6-metre telescope at La Silla in Chile, astronomers spent the first half of 2016 looking for the tiny back and forth wobble of the star caused by the gravitational pull of an orbiting planet.</p> <p>They were trying to build on 16 years of earlier observations that hinted of the presence of a planet, but were inconclusive.</p> <p>Combining the data with observations from a network of telescopes around the world, the researchers confirmed the detection of an alien world. It's at least 1.3 times as massive as the Earth and orbits Proxima Centauri every 11.2 days.</p> | <p>La Silla Observatory</p> <p>Animation on Doppler shift</p> <p>La Silla Observatory</p> <p>Computer animation of Proxima b</p> |
| <p>02:36 [Narrator] 5. It was no easy task to identify the planet, however. Red dwarfs like Proxima Centauri are active stars prone to flares, and can vary in ways that would mimic the presence of a planet.</p> <p>To exclude this possibility, the team carefully monitored the brightness of the star with a network of telescopes to ensure they didn't misidentify such an important discovery.</p> | <p>La Silla Observatory</p> <p>Graphics of Proxima Centauri</p> <p>La Silla Observatory</p> |

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| <p>03:06 [Narrator] 6. Perhaps the most exciting aspect of this research is that the exoplanet, called Proxima b, orbits within the habitable zone of its star.</p> <p>This means that liquid water could exist on the planet's surface. If it were much closer the heat from the star would boil the water away. And if it were further out the planet's water would freeze solid.</p> <p>Since liquid water is essential for life as we know it, this makes Proxima b the closest exoplanet to Earth that may harbour life.</p> | <p>Proxima Centauri/Proxima b: Habitable zone animation</p> |
| <p>03:48 [Narrator] 7. However, the same stellar activity that made Proxima b so difficult to spot could also make it an inhospitable abode for life — the planet's surface is bathed by intense ultraviolet and X-ray radiation.</p> <p>The planet also orbits Proxima Centauri extremely closely, only 5% of the Earth-Sun distance. It is still a matter of debate whether a planet so close to its star could support life.</p> | <p>La Silla Observatory</p> <p>Computer animation of the surface of the planet Proxima b</p> |
| <p>04:19 [Narrator] 8. Proxima b's closeness to the Earth makes it an intriguing target in the search for extraterrestrial life.</p> <p>Astronomers will use the next generation of telescopes such as ESO's European Extremely Large Telescope to make an intensive study of this fascinating alien world in the hope of finding evidence of life elsewhere in the Universe.</p> <p>And if interstellar probes become a reality Proxima b may be their first destination.</p> | <p>Computer animation of Proxima b</p> <p>Computer animation of the e_ELT</p> <p>Concept of Interstellar probe</p> |

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| <p>05:03 [Narrator] 9. Scientific knowledge of exoplanets has grown hugely in the last 25 years. With this discovery, and armed with ESO's next-generation telescope, we may soon be within reach of answering the age old question — are we alone?</p> | <p>Animation of an exoplanet Animation of Proxima b</p> |
| <p>05:30 [Outro]</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 astronomical telescopes.</i></p> |