



<p>ESOCast Episode 71: New Exoplanet-hunting Telescopes on Paranal</p>	
<p>00:00 [Visuals start] 1. A new planet-hunting machine has started work at ESO's Paranal Observatory.</p> <p>The Next-Generation Transit Survey system will search for planets that pass in front of their parent stars. When this happens the star's light dims slightly — an telltale effect that can be spotted by sensitive instruments.</p>	<p>00:00 [Visuals start] NGTS timelapse</p> <p>Exoplanet animations</p>
<p>00:33 ESOCast intro 2. This is the ESOCast! Cutting-edge science and life behind the scenes of ESO, the European Southern Observatory.</p>	<p>00:00 ESOCast introduction</p>
<p>00:52 [Narrator] 3. ESO's Paranal Observatory in northern Chile offers superb observing conditions and excellent support facilities.</p> <p>It's the perfect place for the Next-Generation Transit Survey. This observing facility was built by a UK, Swiss and German consortium and is made up of an array of 12 telescopes, each with a diameter of just 20 centimetres.</p> <p>Its sole purpose is to spot transiting exoplanets.</p>	<p>PAO footage</p> <p>NGTS timelapse</p>

<p>01:38 [Narrator] 4. If we happen to see a planet’s orbit edge-on, the planet will transit in front of its star once per orbit and slightly reduce the apparent brightness of the star seen from Earth.</p> <p>These tiny, regular brightness dips can be used to detect the presence of an orbiting planet.</p> <p>This transit method is how the Next-Generation Transit Survey will discover exoplanets.</p>	<p>Light curve animation</p> <p>Exoplanet animation</p>
<p>02:14 [Narrator] 5. The system operates as a remote-controlled robot. It will focus on searching for Neptune-sized and smaller transiting exoplanets, with diameters between two and eight times that of Earth.</p> <p>It will continuously monitor the brightness of hundreds of thousands of comparatively bright stars in the southern skies.</p>	<p>NGTS</p> <p>Night timelapse Southern Sky</p>
<p>02:45 [Narrator] 6. The Next-Generation Transit Survey reaches a level of accuracy in measuring the brightness of stars — one part in a thousand — that has never before been achieved with a ground--based wide-field survey instrument.</p>	<p>NGTS night timelapse</p>
<p>03:03 [Narrator] 7. The exoplanets discovered by the Next-Generation Transit Survey will be studied further using other larger telescopes, including ESO’s Very Large Telescope.</p> <p>One goal is to find small planets that are bright enough for the planetary mass to be measured. This will allow planetary densities to be deduced, which in turn provides clues about the composition of the planets.</p> <p>It may also be possible to probe the</p>	<p>VLT footage</p> <p>Exoplanet animation</p> <p>Exoplanet atmosphere animation</p>

<p>atmospheres of the new detected exoplanets whilst they are in transit.</p> <p>At this time some of the star's light passes through the planet's atmosphere, if it has one, and leaves a tiny, but detectable, signature.</p> <p>This signature in the light can reveal much about the chemical makeup and other properties of the atmosphere.</p>	
<p>04:06 [Narrator]</p> <p>8. So far only a few such very delicate observations have been made, but the system will identify many more potential targets.</p> <p>The Next-Generation Transit Survey will provide a wealth of high accuracy data which will push forward the search for exoplanets.</p>	<p>Paranal distant view NGTS timelapse</p>
<p>04:34 [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>