

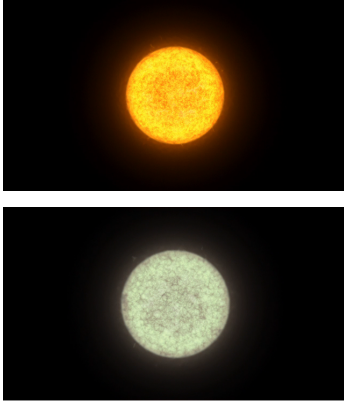


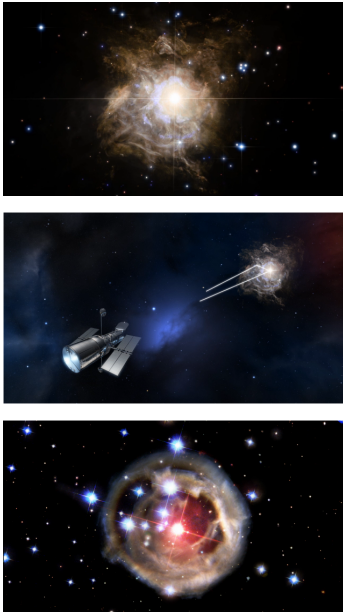





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<b>Hubblecast Episode 71: Visible echoes around RS Puppis</b>		<b>Visuals</b>
<p>00:00 [Narrator] 1. Everyone has heard echoes — but have you ever seen one? Hubble has. By watching the variable star RS Puppis, Hubble has captured a beautiful, and useful, phenomenon known as a light echo.</p>		 A composite image showing a bright star surrounded by a complex, multi-colored nebula of light echoes in shades of blue, purple, and red.
<p>00:20 2. Intro</p>		 The Hubble Space Telescope logo, featuring the telescope's structure and the word 'HUBBLE' in large white letters on a red and orange background.
<p>00:39 [Narrator] 3. For most of its life a star is quite stable, slowly consuming the hydrogen at its core to keep it shining brightly.</p> <p>But when most of the hydrogen has been consumed, some stars evolve into very different beasts known as variable stars. They become unstable and start pulsating; expanding and shrinking over a number of days or weeks and growing brighter and dimmer as they do so.</p>		 Two images of a variable star. The top image shows a bright, glowing orange-yellow sphere. The bottom image shows a dimmer, greenish-white sphere, illustrating the star's pulsation.

<p>01:21 [Narrator] 4. RS Puppis is one such variable star, a type known as a Cepheid variable. It varies in brightness by almost a factor of five every 40 days or so, and is engulfed in a thick shroud of cosmic gas and dust.</p>		
<p>01:41 [Narrator] 5. Hubble gazed at RS Puppis over a period of around 5 weeks back in 2010, observing it growing brighter and dimmer within its murky surroundings. This enabled scientists to create a time-lapse video that appears to show the gas around the star expanding outwards.</p> <p>However, this gas is not <b>actually</b> moving — it is an optical illusion known as a light echo.</p>		
<p>02:14 [Narrator] 6. The dusty environment around RS Puppis allows us to see this light echo with stunning clarity. As the star expands and brightens, some of the light does not reach Hubble directly but is first reflected off progressively more distant shells of dust and gas surrounding the star.</p> <p>This reflected light has further to travel, and so arrives at the Earth later than the light that has travelled straight from star to telescope.</p> <p>Hubble also observed a light echo around variable star V838 Monocerotis in 2002. This is very much like the experience of an audible echo, where the listener hears a sound once and then again as the second wave takes a longer path bouncing off surrounding objects.</p>		
<p>03:19 [Narrator] 7. Beyond the striking beauty of this effect, there is an important scientific reason to observe Cepheids like RS Puppis.</p> <p>The period of their pulsations is known to be directly connected to their intrinsic brightness, which allows</p>		

astronomers to use them as cosmic distance markers.

Astronomers have measured the distance to RS Puppis, calculating it to be around 6500 light years — the most accurate distance to such a star ever measured.



**Ends 04:08**