



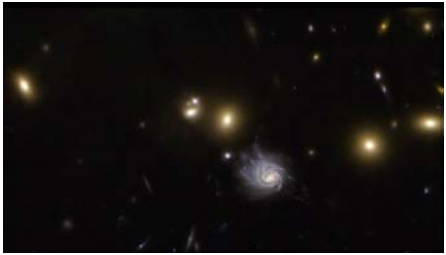







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Hubblecast Episode 72: Clues to a cosmic crime	Visual notes
<p>00:00 [Narrator] 1. Space is a pretty violent place, full of characters like monster black holes, colliding galaxies and exploding stars.</p> <p>However, sometimes these bullies are more elusive. Take this new Hubble image of ESO 137-001. Bright blue streaks are being ripped away from the galaxy — but where is the cosmic culprit?</p>	
<p>00:35 2. Intro</p>	
<p>01:05 [Dr. J] 3. Hello and welcome to another episode of the Hubblecast!</p> <p>Now galaxies exist in a range of different environments. Some live their lives in isolation, while others clump together to form groups and even clusters of galaxies — large gatherings bound together by gravity.</p> <p>The subject of this new Hubble image is a spiral galaxy called ESO 137-001. It is travelling through one of these clusters, the Norma cluster, and it's a journey that will change it forever.</p>	

	
<p>01:38 [Narrator]</p> <p>4. As the intrepid spiral ploughs onwards through this cluster, it encounters a severe drag, a force felt by any object moving through a fluid. In this case, the fluid is superheated gas, which lurks within galaxy clusters.</p> <p>The stars in the galaxy aren't much bothered by this drag, but gas is stripped away, creating tattered threads and electric blue jellyfish tendrils, as seen in this new image.</p>	
<p>02:17 [Dr. J]</p> <p>5. This process is known as ram pressure stripping. Here's a rough and ready analogy: it's a little bit as if the galaxy had leaned out of the window of a car that is travelling down a motorway at very high speed, and wisps of gas are being torn away by the headwind.</p> <p>Hubble has spotted a number of other galaxies that undergo this violent stripping — for example, the “comet galaxy”, which looks like a spiral galaxy with a knotty tail, and the mangled cosmic duo NGC 4402 and 4522.</p>	 
<p>03:00 [Narrator]</p> <p>6. Streams of murky dust are also being pulled away from ESO 137-001, visible as the dark brown tangled region around the galaxy's centre.</p> <p>This image also shows other telltale signs of this process, such as the curved appearance of the galaxy's disc — a result of the forces exerted by the heated gas.</p>	

03:34

[Narrator]

7. When these Hubble observations are combined with X-ray images from the Chandra X-ray Observatory, a bright, extended fog can be seen enveloping the galaxy and streaming off into space.

These X-ray tails are formed from the cool gas stripped from ESO 137-001, which has since been heated to many millions of degrees Celsius by the hot gas in the cluster.



04:08

[Dr. J]

8. Studying ram pressure stripping helps astronomers to better understand how galaxies evolve. ESO 137-001's trip through the Norma cluster will leave it with very little gas, rendering it pretty much incapable of forming any new stars. And that is precisely one of the things that you have to do in order to transform spiral galaxies into elliptical galaxies, which are typically found in galaxy clusters.

This is Dr. J, signing off for the Hubblecast. Once again, nature has surprised us beyond our wildest imagination.



Ends 05:02