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Hubblecast Episode 49: Supersonic jets from newborn stars		
<p>00:00 [Narrator] Star forming regions are some of the most visually striking parts of the night sky.</p> <p>Within these regions, perhaps the most spectacular stellar fireworks are the jets of matter that shoot out from new born stars.</p> <p>Now scientists have used Hubble to watch these jets move, giving new insights into how stars form.</p>		
<p>00:21 [Credits]</p>		
<p>00:41 [Narrator]</p> <p>The NASA/ESA Hubble Space Telescope has made detailed observations of the energetic jets that are ejected from young stars.</p> <p>Astronomer Patrick Hartigan and his team have been collecting high-resolution Hubble images of some of these jets for the past 14 years. The team have now combined their observations into movies that actually show how the jets evolve over time.</p> <p>Unlike most astronomical phenomena, which look completely static even over hundreds of years, these jets visibly change over human timescales.</p>		
<p>00:16 [Patrick Hartigan] Well my first reaction was 'wow, this is really neat!' And it was just really fun just to see all the dynamics of what's going on.</p> <p>Because if you just see a single picture you can kinda make up all sorts of stories but all of a sudden when you see a movie stitched together it completely changes everything. You really see what's happening.</p> <p>If you see just a single picture from Hubble you can interpret it in many different ways. But the fact that Hubble has been around for as long as it</p>		

<p>has means that by taking multiple images you can actually stitch them together and watch how the material moves. So that really gives you the only way to get true insight into the physics of the dynamics of what's going on.</p>		
<p>01:59 [Narrator] Some of the details in these jets had never been spotted before. For instance, the knots of gas brightening and dimming over time, and the collisions of fast and slow-moving material show that these jets are not ejected in a steady stream.</p> <p>Rather, they are launched sporadically in clumps.</p> <p>Astronomers think that the irregular structure of the jet is caused by material periodically falling onto the star.</p>		
<p>02:26 [Patrick Hartigan]</p> <p>We're trying to study how stars form. And that's a complex process because it has a lot of feedback in the sense that the stars affect the clouds, and the clouds form the stars.</p> <p>And just by looking at any particular one process, you don't get the full picture. And so the idea is, what we want to try to do is see the main ways in which the stars can affect the surrounding molecular clouds.</p>		
<p>02:53 [Narrator]</p> <p>These jets are known to scientists as Herbig-Haro objects, in honour of George Herbig and Guillermo Haro, two astronomers who studied these outflows in the 1950s.</p> <p>However it is only now that their complex nature is coming to light.</p> <p>As well as detailed Hubble observations, members of the team have carried out lab experiments and computer simulations in scientific facilities around the world including New York's Omega Laser Facility and the UK Atomic Weapons Establishment.</p>		
<p>03:24 [Narrator]</p> <p>By combining observations, experiments and simulations, scientists can attack the problem how stellar jets behave from three different perspectives.</p>		
<p>03:32 [Patrick Hartigan]</p> <p>The entire process is really very complex and it's very important to understand, because that's how our Sun formed and that's how planetary systems form, and that's basically how we got here.</p>		

Ends 05:15