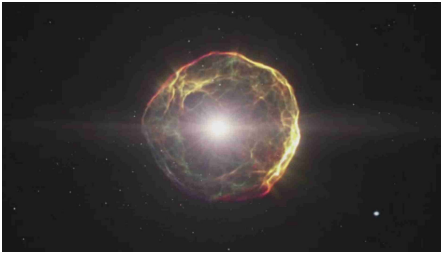
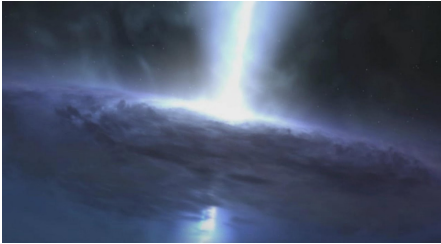






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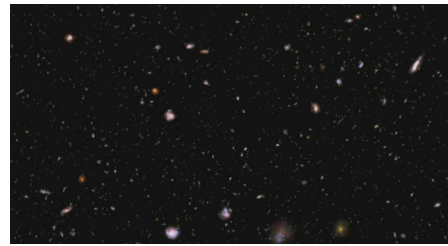
<b>Hubblecast Episode 76: Merging galaxies and droplets of starbirth</b>	<b>Visual notes</b>
<p><b>00:00</b> <b>[Narrator]</b> 1. You don't have to look for long to see violent events in the Universe.</p> <p>Exploding stars spewing out superheated gas.</p> <p>Supermassive black holes ripping material from nearby objects, expelling immense jets as they do so.</p> <p>And galaxies torn apart or blended together as they stray just a little too close to one another.</p> <p>Merging like the ones in this stunning new image from Hubble.</p>	  
<p><b>00:36</b> <b>2. Intro</b></p>	

**00:56**

**[Narrator]**

3. The Universe is a pretty empty place, dotted with galaxies at immense distances from one another.

But occasionally, two or more galaxies will come close to each other. This can lead to them coalescing into one larger body — an event known as a galactic merger.



**01:27**

**[Narrator]**

4. The violent merging process strips some of the gas, dust, and stars away from the galaxies and can alter their appearances dramatically, forming huge tails, glowing rings and warped galactic discs.

In 2008, Hubble team released a set of 59 new images of interacting and merging galaxies, showing the vast array of striking shapes these collisions can create.



**02:28**

**[Narrator]**

5. This time, Hubble has captured something a little more unusual:

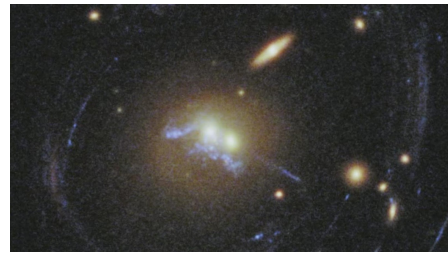
At the centre of this image lie two elliptical galaxies, part of a galaxy cluster known rather prosaically as SDSS J1531+3414. This cluster contains so much mass that it has bent light from more distant galaxies to form the spectacular blue arcs that surround it.

The rarity here is that the elliptical galaxies are not only merging, which is very unusual, but that the merger is rich enough in gas to spark the formation of many new



stars.

These infant stellar superclusters have formed through a process called “beads on a string” star formation, which has left them in even clumps strung out on a long, gaseous filament.



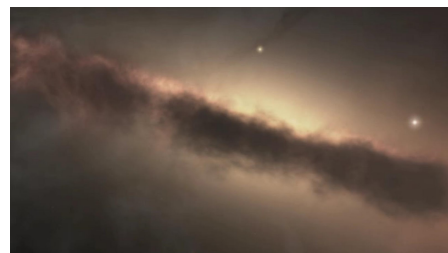
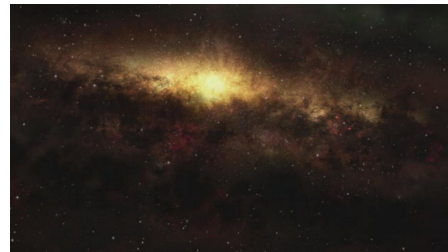
**03:37**

**[Narrator]**

6. The clumps of stellar infants are visible here as a speckling of bright blue dots. Nineteen compact clumps are woven together with narrow filaments of hydrogen gas.

The star formation spans 100 000 light-years, which is huge, at about the size of our galaxy, the Milky Way.

The strand is dwarfed, however, by the ancient, giant merging galaxies that it inhabits. They are about 330 000 light-years across, nearly three times larger than our own galaxy. This is typical for galaxies at the centre of massive clusters, which tend to be the largest galaxies in the Universe



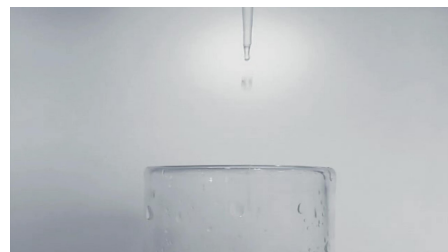
**04:33**

**[Narrator]**

7. These clumps formed as a result of the same fundamental physics that causes rain to fall in droplets, rather than a continuous column.

The merging system is forming stellar superclusters in equally spaced beads just as a tap drips evenly spaced water droplets. The only real difference is in the underlying force driving the droplet formation — surface tension in the falling water is replaced by gravity in the context of the star-forming chain.

This beautifully illustrates how the laws of physics apply



at every scale in our Universe. From millimetre rain drops to a chain of infant star clusters 100 000 light-years across.



**Ends xx:xx**