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<p>Video Podcast Episode 16: Hubblecast Special: Galaxies gone wild!</p> <p>FOR IMMEDIATE RELEASE 15:00 (CEST)/9:00 AM EDT 24 April, 2008</p>		
<p>00:00 [Visual starts]</p> <p>00:02 [Narrator] One of the big mysteries in astronomy is how galaxies grow and evolve over time. Collisions between galaxies are thought to be key events that shape their development. A stunning collection of 59 new images of colliding galaxies has been released to mark the 18th anniversary of the NASA/ESA Hubble Space Telescope. They give us a unique insight into how galaxies merge to form larger galaxies.</p> <p>00:24</p> <p>00:42 [Woman] This is the Hubblecast!</p> <p>News and Images from the NASA/ESA Hubble Space Telescope.</p> <p>Travelling through time and space with our host Doctor J a.k.a. Dr. Joe Liske.</p> <p>00:53 [Dr. J] Welcome to this Special Edition of the Hubblecast! Today we have a real treat in store for you, but before we start, the whole team here at the Hubblecast would like to say thank you to all of you for watching and making the Hubblecast such a success over the past year or so. We've received many emails with questions and comments and it's great to see that there are so many people out there we share our excitement about astronomy. On 24th April 2008, the NASA/ESA Hubble Space Telescope would have been in orbit around Earth for 18 years.</p>		<p>Images cross-fading of galaxy collisions.</p> <p>Image explosion</p> <p>Hubblecast Logo + web site</p> <p>Presented by ESA and NASA</p> <p>TITLE Slide: Episode 16: Hubblecast Special: Galaxies gone wild!</p> <p>Nametag</p> <p>Virtual studio: Dr J on camera</p>

<p>Hubble is one of the most successful scientific projects ever. Orbiting the Earth at an altitude of nearly 600km, it has peered to the very edges of the known Universe and it has delivered some of the most breathtaking images of the cosmos ever taken. Among its achievements are that it has helped scientists to discover what the atmospheres of extrasolar planets are made of, that there are black holes at the centres of nearly all galaxies, and that the expansion of the Universe is now accelerating.</p> <p>To celebrate the 18th anniversary of Hubble’s launch, we are releasing a collection of 59 brand new images of colliding galaxies. This is the largest collection of Hubble images ever released to the public simultaneously and we are proud to share them with you today.</p> <p>Astronomers think that the first galaxies formed out of clumps of gas in the early Universe. These proto-galactic clumps then went on to coalesce and to merge together to form bigger and bigger galaxies as time goes on and their gravity attracts each other.</p> <p>So what exactly happens when two big galaxies collide? That is precisely what Hubble is showing us in these new images where it has captured some of these “merger” events in the act.</p> <p>02:52 [Narrator] These cosmic collisions beautifully portrayed in the new Hubble images are not as swift and ferocious as we might think. They are not like collisions between everyday objects. They are slow stately affairs and may take hundreds of millions of years to take place. In this series of images, snapshots of different pairs of interacting galaxies are seen representing the different stages in this process — a gradual waltz of stars and gas choreographed by gravity.</p> <p>03:22 [Dr. J] Despite taking hundreds of millions of years to eventually merge, the two galaxies of a pair actually approaches each other at very high velocities, up to millions of kilometres per hour. Also, because the distances between individual stars are so large, it is actually very rare for two stars to hit each other. The hundreds of million of stars in each of the galaxies all move individually, following the pull of gravity from all the other stars and the dark matter in the galaxies. This interwoven tidal forces can produce the most intricate and varied effects as galaxies pass close to each other and eventually merge.</p> <p>04:05 [Narrator] The new collection of Hubble images illustrates how galaxy collisions produce a remarkable variety of intricate and delicately interwoven galactic shapes.</p>	<p>Show Hubble and stunning pictures, nebulae, galaxies, etc.</p> <p>Some of the new images</p> <p>Time sequence of morphing images of different objects interacting</p> <p>Images showing a few galaxies merging and interweaving</p>
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<p>Typically the first signs of an interaction appears in the first encounter of the galaxies. The tug of gravity teases out stars and gas from the passing galaxies, often building bridges between them.</p> <p>During subsequent encounters, long streams of gas and dust, known as tidal tails, stretch out and sweep back to wrap around the cores.</p> <p>These long and spectacular tidal tails are the clear signature of an interaction, and can persist long after the main action is over.</p> <p>As the galaxy cores finally approach each other, the gas and dust clouds are buffeted and accelerated dramatically by the push and pull of matter from various directions. These forces can result in shockwaves rippling through the interstellar clouds.</p> <p>Gas and dust are siphoned into the active central regions, fuelling bursts of star formation that appear as characteristic blue knots of young stars. As the clouds of dust build they are heated so that they radiate strongly, becoming some of the brightest infrared objects in the sky.</p> <p>Some of the galaxies show striking highly distorted features, dust lanes crossing between galaxies and long filaments of stars and gas extending far beyond the central regions. We see beautifully interwoven galaxies twisted by these gargantuan encounters.</p> <p>Triggered by the colossal and violent interaction between the galaxies, stars form from large clouds of gas in dramatic and brilliant bursts of stellar fireworks, creating new blue star clusters.</p> <p>06:40 [Dr J]</p> <p>Here in this image of NGC 6670 a pair of overlapping galaxies – seen edge-on on the Hubble image – resembles a leaping dolphin. Scientists believe that it has already experienced at least one close encounter and is now in an early stage of a second.</p> <p>The next image shows an astonishing pair of galaxies, composed of spiral galaxies of similar mass and size, NGC 5257 and NGC 5258. The galaxies are clearly interacting with each other creating a bridge of dim stars connecting the two galaxies, almost like two dancers holding hands while performing a pirouette. Both galaxies harbour supermassive black holes in their centres and are actively forming new stars in their discs.</p> <p>This galaxy pair, dubbed IC 694 and NGC 3690, is thought to have experienced one close pass some 700 million years ago. As a result of this interaction, the system underwent a fierce burst of star formation. In the last fifteen years or so six supernovae have gone off in the outer reaches of the galaxy, making this system a notable supernova factory.</p>	<p>Zoom on some galaxies with tidal tails and dust lanes.</p> <p>UGC 8335, NGC 6050</p> <p>Arp 256, ESO 77-14, Markarian 273</p> <p>NGC 6240, ESO 99-4, NGC 3256</p> <p>ZW II 96, AM1316-241</p> <p>ESO 593-8, NGC 520, Arp 148</p> <p>NGC 454, IC 1623, NGC 6090</p> <p>NGC 6670</p> <p>NGC 5257 and NGC 5258</p> <p>NGC 3690</p>
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The image of this beautiful interacting pair shows long tails sweeping out from the centre of the galaxies. These are tidal tails of stars and gas that have been pulled from the distorted discs of the merging galaxies.

08:18
[Dr. J]

So we can see that whilst these images represent the demise of two beautiful galaxies, the distorted destruction they experience also results in a flood of newborn stars and some incredible striking galactic landscapes.

If you would like to see all the 59 new Hubble images, please visit our webpage at spacetelescope.org

This is Dr. J signing off for the Hubblecast.

Once again nature has surprised us beyond our wildest imagination ...

08:46
[Outro]

Hubblecast is produced by ESA/Hubble at the European Southern Observatory in Germany.

The Hubble mission is a project of international cooperation between NASA and the European Space Agency.

09:04 END

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Virtual studio: Dr J
on camera

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