

Hubblecast 69: What has Hubble learned from star clusters?		Visual notes
<p>00:00 [Narrator] 1. Star clusters hang like sparkling firework displays in the sky, making them favourite observational targets for astronomers. Hubble has observed its fair share of these cosmic baubles, imaging and studying them to explore their secrets.</p> <p>This new image from Hubble shows a globular cluster known as Messier 15. As well as containing over 100 000 old stars, this cluster hosts something dark and mysterious at its heart.</p>		
<p>00:39 2. Intro</p>		
<p>01:0 [Narrator] 3. Star clusters are some of the most beautiful objects in our skies. Hubble has viewed many of these over the years — but it is not all style over substance. These clusters are incredibly useful to the astronomers studying them. What can they tell us about our Universe?</p>		
<p>01:24 [Narrator] 4. There are two main types of star cluster: open, and globular. Most stars, including the Sun, are thought to have formed within open star clusters — groups of thousands of stars loosely bound together by gravity, destined to be spread throughout their host galaxy once the cluster matures and most of its gas disperses.</p> <p>Globular clusters are different; they are huge balls of old stars that orbit the centres of galaxies. Many of them were once little galaxies, cannibalised by their larger companions over the history of the Universe.</p>		

02:16

[Narrator]

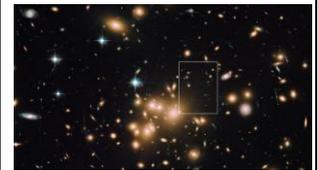
5. Hubble has explored many globular clusters. The Milky Way alone has over 150 of these starry satellites, and Hubble's sharp vision can resolve the individual stars. This has allowed Hubble to explore these star clusters in unprecedented detail.

Hubble has produced the deepest, most detailed images ever of a galaxy outside our own, the Andromeda Galaxy, spotting individual star clusters and even resolving their separate stars.

It has detected a population of white dwarfs within NGC 6397. These ancient, dying stars are the dimmest stars ever seen in any globular cluster. They led to the first accurate measurements of cluster ages.

Hubble has also spotted the largest collection of globular clusters ever found — a staggering 160 000, swarming around at the heart of galaxy cluster Abell 1689.

It has probed the Milky Way's clusters to understand how different stars age at different rates, and investigated why some clusters seem to host multiple generations of stars while others contain stars of mostly the same age.



04:00

[Narrator]

6. Now, Hubble has looked towards the globular cluster Messier 15, one of the oldest globular clusters known in our galaxy, at around 12 billion years old.

This image of Messier 15 is reminiscent of a dazzling firework display, with golden and bright blue stars swarming together across the frame.

Messier 15 houses a planetary nebula known as Pease 1 — making it the first globular ever known to contain one of these objects. Even now, only three other similar clusters have been found to host such a planetary nebula.



04:49

[Narrator]

7. However, all it not as it seems — this sparkling bauble has hidden secrets. Astronomers studying Messier 15 with Hubble in 2002 found there to be something dark and mysterious lurking at its heart.

There are two possible explanations for this intriguing finding. It could either be a collection of dark, incredibly dense neutron stars, or a rare and exotic intermediate-mass black hole. Studying these unusual black holes could tell us about how such objects grow and evolve within both star clusters and galaxies.



End

05:36