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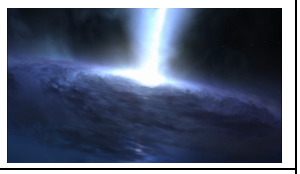
Hubblecast Episode 62: A spiral galaxy with a secret		
00:00 [Narrator] The NASA/ESA Hubble Space Telescope – with a little help from an amateur astronomer – has produced one of the best views yet of nearby galaxy Messier 106, a striking spiral galaxy with a number of secrets.		
		
00:38 [Narrator] Located a little over 20 million light-years away, practically a neighbour by galactic standards, Messier 106 is one of the brightest and nearest spiral galaxies to our Milky Way. Although it may not look particularly unique, some of its features have baffled astronomers for years.		
01:00 [Narrator] Messier 106 has a supermassive black hole at its centre. Although this is true for most galaxies, this black hole is particularly active and hungry, gobbling up nearby material at a startling rate.		
01:18 [Narrator] This huge black hole's bottomless appetite is behind much of the galaxy's unusual behaviour. Messier 106 appears to be emitting powerful radiation from its centre — something we do not see with our Milky Way or other similar spirals. This is caused by the very active black hole at the galaxy's centre, which violently drags gas and dust inwards. This material heats up, emitting bright microwave and X-ray radiation as it does so.		
01:52[Narrator] However, this emission is not the most intriguing feature of this spiral galaxy. This image shows the galaxy's other not-so-hidden secret — alongside its two regular star-packed spiral arms, it appears to have two more, made of hot, glowing gas. While these extra arms have been known about for decades, astronomers		

were unsure of how they formed — until recently.		
02:26 [Narrator] 6. Yet again, the culprit is Messier 106's supermassive black hole. The extra arms are actually regions of gas that have been heated up to scorching temperatures of millions of degrees. As material spins around and heats up at the galaxy's centre, the turbulent motion causes jets of material to shoot outwards.		
02:48 [Narrator] 7. The jets disrupt and heat up all the gas in their path, which in turn excites denser gas towards the centre of the galaxy. This gas is tightly bound together, so it remains roughly straight. However, the looser gas further out is blown away from the jets so that it curves out of the galactic plane — creating the arching red arms seen in this image.		
03:15 [Narrator] These "extra" arms are very unusual, and this poses a bit of a puzzle, because galactic jets are actually quite common. It is not just spirals that show jets — elliptical galaxies do too, such as the spectacular radio jets seen around the nearby galaxies Hercules A and Centaurus A. And yet none of these shows any of the features seen in Messier 106.		
03:42 [Narrator] 9. Some of the data for this image of Messier 106 was provided by amateur astronomer Robert Gendler. Together with Hubble, these data allow us to visualise the galaxy's chaotic centre and mysterious structure better than ever before.		

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