**Transcript** | Retrieved from https://www.youtube.com/watch?v=UE8yHySiJ4A
0:17

There are about 100 billion galaxies in the universe. For roughly 13 billion years they've

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swarmed around each other, colliding and merging, undergoing rapid star formation and suffering

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periods of drought, where no new stars are born.

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They range in size and shape from small, dwarf galaxies to the beautiful and graceful mid-range

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spiral galaxies to the gigantic and ancient ellipticals.

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The smallest, the dwarf galaxies, can be as small as 200 light years across and not much

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more massive than a star cluster. They contain as few as a hundred million stars and act

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as shepherds of most of the spiral galaxies we see today.

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The largest galaxies in the universe are the ellipticals. They are featureless collections

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of very old stars stars that range in shape from nearly spherical to highly flat and contains

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as many as a trillion stars.

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So an intriguing question to ask is, of all these giant galaxies in the universe, which

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one is the largest? What is the largest galaxy we've ever seen?

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The answer is this one: known as IC 1101, this galaxy is located one billion light years

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away in the constellation Serpens, this is the largest galaxy in the known universe.

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It is enormous, it has a diameter of six million light years and a mass of over 100 trillion

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stars, with most of that mass in the form of elusive dark matter.

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IC 1101 is more than 50 times the size of the Milky Way and 2000 times as massive. If

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it were in put in place of our galaxy, it would swallow up the Large Magellanic Cloud,

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Small Magellanic Cloud, Andromeda Galaxy, and Triangulum Galaxy.

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IC 1101 has spent most of its life colliding with other galaxies and owes its size to these

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collisions. Over billions of years, galaxies about the size of the Milky Way and Andromeda

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have been merging together to sculpt and shape this titan of the cosmos.

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This galaxy is bereft of star making gasses, here rapid star formation has long ago ceased.

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Because of the lack of gas and dust, very few new stars are being born. Instead, those

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that remain provide the only source of fuel for their progeny when they die.

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IC 1101 is slowly eating itself to death.

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Through a telescope, in contrast to the blue-tinged spiral galaxies, IC 1101 is yellow-red in

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color. The color of a galaxy says a lot about the stars it contains: blue galaxies are alive

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and vibrant with new stars, while the yellow-red tinge ellipticals signals almost none.

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IC 1101 and other ellipticals contain at its center, a supermassive black hole. It is commonly

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understood that the mass of a galaxy's central black hole is tightly linked to the size of

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the galaxy, making the one at the center of IC 1101 the largest known supermassive black

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hole.

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This galaxy is dying a slow death. While not entirely devoid of new stars, unless it continues

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to merge with newer, younger galaxies, IC 1101 will slowly fade to oblivion.

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Galaxy collisions and mergers are pulse of the universe, with each one, galaxies are

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pollinated with new seeds for more stars, keeping them vibrant and young. Over time

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however, these collisions take their toll, the central supermassive black holes devouring

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all they encounter and leaving behind the shells of ever aging stars.

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We live in a universe teeming with activity, galaxies swarm around each other in a symphony

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of possibilities, each interaction sparking new life and new energy.

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If some theories prevail, then our universe may be about 2 billion years away from the

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halfway point in its life. As our Milky Way galaxy participates in this great cosmic dance

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and collides and merges, morphing from spiral to elliptical and ultimately sharing the fate

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of IC 1101, it will preside as a venerable statesmen over the Great Rip - the untimely

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death of our universe.