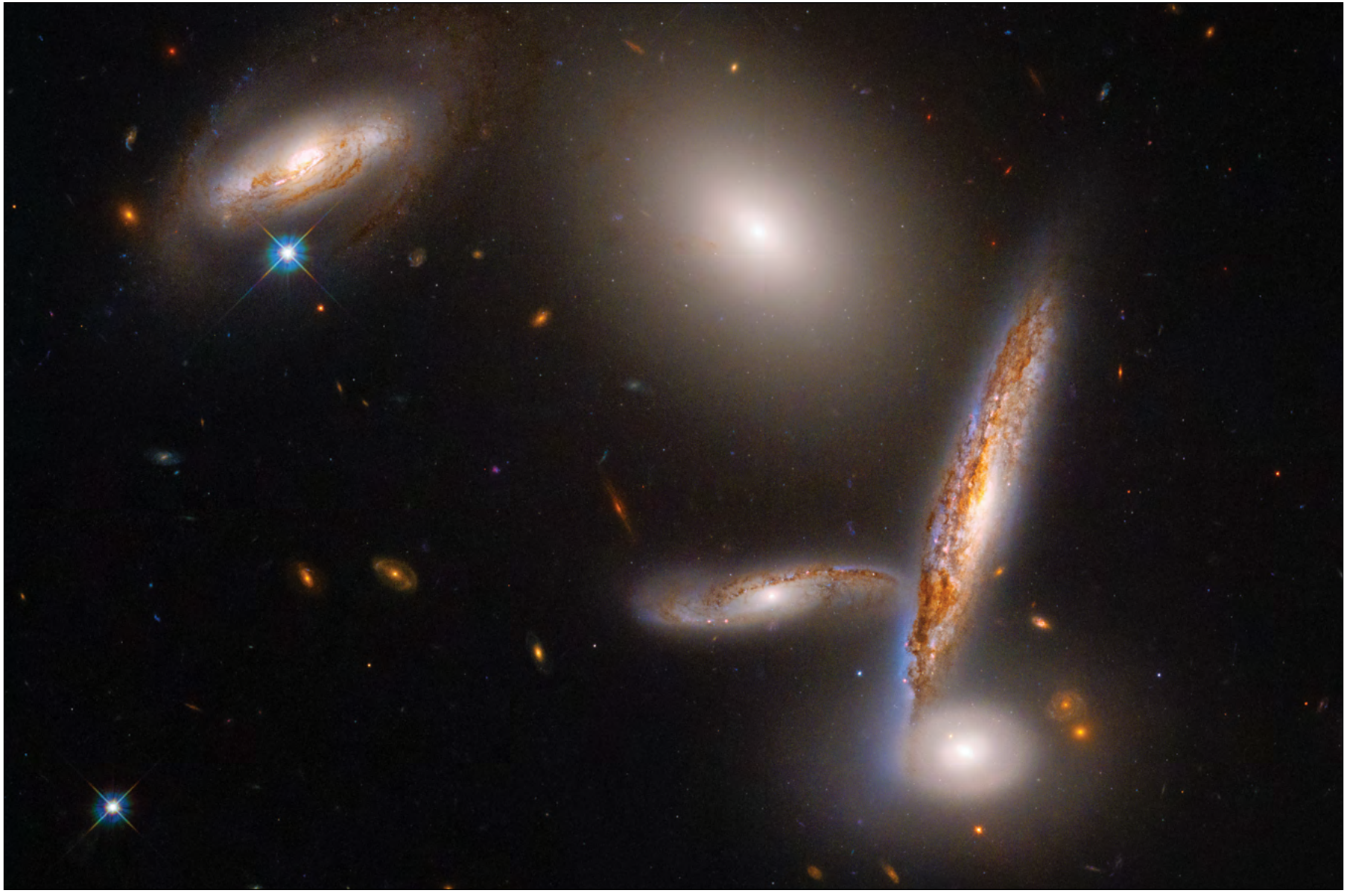
National Aeronautics and Space Administration



Hickson Compact Group 40 (HCG 40)

Hubble Catches Galaxies in a Gravitational Dance

Galaxies are immense islands of billions of stars adrift on a seemingly infinite cosmic ocean. They are normally separated from each other by many millions of light-years, but do occasionally huddle together. The five galaxies in this NASA Hubble Space Telescope image, called Hickson Compact Group 40, are one of the tightest-knit examples.

The galaxies appear so tightly packed on the night sky, they could all fit within a region of space less than 200,000 light years across – no more than twice the diameter of our Milky Way's disk.

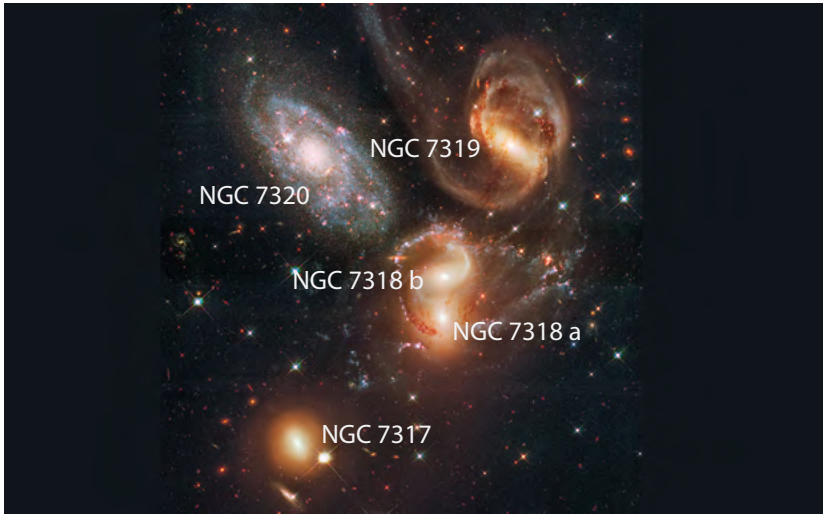
The members of this menagerie are an eclectic sample of the types of galaxies scattered across space and time. A classic spiral galaxy with extended arms is at upper left. A large, ball-shaped elliptical galaxy is next to it. Directly below the elliptical galaxy, and to the right, are two nearly edge-on spirals with dusty arms. The areas of blue glowing light within these galaxies are evidence of hot, young stars being born. At bottom right is a face-on galaxy that seemingly has properties of both ellipticals and spirals. Though it appears to have a disk, it does not show signs of spiral arms or star formation typical of spiral galaxies.

The galaxies in this Hickson Group likely formed separately before gathering together, with each galaxy developing within its own halo of dark matter. Over time, the halos attracted one another and combined to form a common, dark matter envelope that holds the group together.

The image is a snapshot in time that illustrates the dynamic nature of our universe. Under the persistent tug of gravity, the galaxies will eventually merge together, forming one monstrous elliptical galaxy in about one billion years. For now, they offer a wonderful and unique glimpse into our restless universe – where five galaxies are momentarily caught in a cosmic waltz.

This image was released to celebrate Hubble's 32 years of exploring the heavens.

Image Credits: NASA, ESA, STScI



The Hubble image above shows another example of a tight-knit galaxy grouping called Stephan's Quintet or HCG 92. Contrary to its name, this group has four members – not five. Spiral galaxy NGC 7320 is actually a foreground galaxy that is about seven times closer to Earth than the rest of the group. The other galaxies show the tell-tale features common to these types of groupings – distorted shapes, elongated arms, and myriad star clusters. NGC 7319 is a barred spiral with distinct arms that have become distorted due to gravitational interactions with its neighbors. Below NGC 7319, a galaxy appears to have two cores, but it is actually two galaxies in the act of merging. This has sparked a frenzy of star birth within the pair's stretched-out arms. At bottom left, an elliptical galaxy called NGC 7317 is less affected by the interactions within the group.

Credits: NASA, ESA, and the Hubble SM4 ERO Team

VOCABULARY

Galaxy: A collection of millions to billions of stars, gas, dust, and dark matter held together by their mutual gravity.

Dark Matter: Matter that is not detected by telescopes. Astronomers infer its existence by measuring its gravitational influence. Dark matter makes up most of the total mass of the universe.

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For images and information on the Hubble mission, go to **www.nasa.gov/hubble** and **hubblesite.org.** Follow the Hubble mission on social media: **@NASAHubble**.