



Hubble Captures Glittering View of the Milky Way's Core

Our Milky Way galaxy is a vast collection of hundreds of billions of stars. It is shaped like a fried egg, with a central bulge of stars surrounded by a broad, flat disk of stars, gas, and dust. The Sun lives about halfway out in this galactic disk, and our view toward the galaxy's center is heavily blocked by intervening clouds of gas and dust.

Astronomers, however, have found a unique keyhole that offers a tunnel view deep into our galaxy's core. Called "Baade's Window," this region of the sky is like a small clearing in the clouds on an overcast day.

The Hubble Space Telescope's view through this window, featured in the front image, is breathtaking. Over 100,000 stars, in a dazzling array of colors, fill the narrow, 26,000 light-year-long corridor into our galaxy's hub. Much of the image is taken using infrared light, so the colors are not what the human eye would see.

Most of the faint red and white stars are smaller and cooler than our Sun, and make up the bulk of our galaxy's population. Dozens of bright red stars are aging, bloated red giants. These dying stars were once similar to our Sun, but have expanded and cooled as they aged. The bluer stars are generally larger and hotter than our Sun, with shorter lifespans.

Using Hubble's keen vision, astronomers can measure both the chemical compositions and motions of these stars. Chemical composition indicates a star's age, while motion indicates when it joined the bulge.

A study of 10,000 stars offers insight into how our galaxy formed. If the bulge formed first, then it should contain mostly slower and less enriched stars. However, results show a rich mixture of chemical compositions and a wide variety of stellar speeds.

Researchers concluded that the Milky Way's bulge contains a mixed population of stars – some that formed in an early epoch and others that joined in over billions of years. This exercise in galactic archaeology shows that the bulge was an initial component of our galaxy, but also one that never stopped growing.

Image Credits: NASA, ESA, Thomas M. Brown (STScI)

This photomosaic shows our Milky Way galaxy as seen from Earth. It highlights the Milky Way's disk and central bulge. Our view into the bulge is blocked by intervening dust clouds, making detailed studies of our galaxy's central regions difficult. However, a notable bright spot in the Milky Way called Baade's Window offers a relatively unobscured keyhole view into the galactic center. Much of our knowledge of the stars in the Milky Way's bulge is derived from studies using Baade's Window.

Credits: ESO/S. Brunier, D. Player (STScI)

VOCABULARY

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

Star: A huge ball of gas held together by gravity. The central core of a star is extremely hot and produces energy. Some of this energy is released as visible light. Stars come in different sizes, colors, and temperatures.

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