

Caldwell 48

Imaging a galactic spiral masterpiece

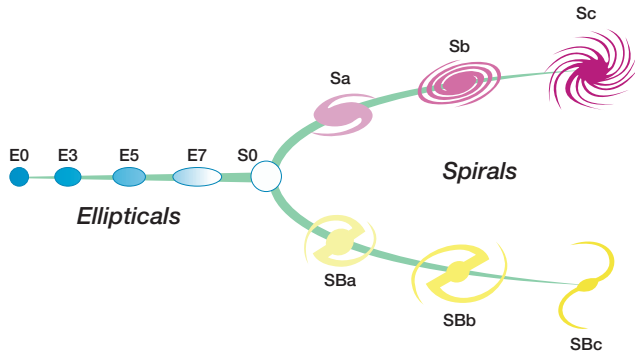
A whirled, cotton candy-like nimbus of stars, gas and dust surrounds a hazy yellow center to make up the striking galaxy NGC 2275. This galaxy, also known as Caldwell 48, is a unique spiral galaxy located 67 million light-years away in the constellation Cancer. It's notable for its distinctively fluffy, feathery arms and massive—but relatively empty—nucleus.

This spiral galaxy displays a significantly large and unusually bare galactic bulge containing old, yellow stars. The tuft-like, or “flocculent,” spiral arms outline the galaxy’s center, surrounded by millions of bright, young, blue stars that are intricately interlaced with dark dust lanes to create its delicate appearance.

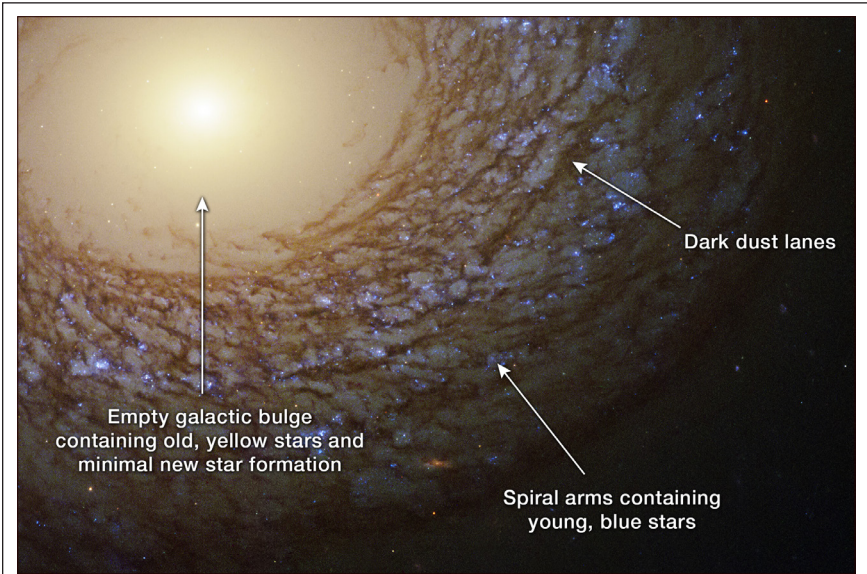
Caldwell 48’s distinctive features provide clues about the galaxy’s past and its star formation history. Unlike galaxies with pronounced spiral arms, the intricate, feathery spiral arms of Caldwell 48 indicate that recent star formation has been relatively quiet and less robust. Additionally, the bulge in the center of the galaxy, where gas was converted into stars long ago, demonstrates virtually no recent star formation.

Caldwell 48 highlights the diversity of galaxies, even within the main categories of spiral, elliptical and irregular galaxies. The spiral category alone contains flocculent galaxies with their fluffy, disorganized arms, “grand design” spiral galaxies with sharply delineated lanes of gas and dust, and barred spirals like our own Milky Way.

Galaxy shape has long been studied for clues about galaxy evolution and growth. Astronomer Edwin Hubble, whom the Hubble Space Telescope is named after, organized galaxies by their appearance into a “tuning fork” diagram. This diagram shows elliptical galaxies along the stem, with spiral and barred spiral galaxies along the forks, and was once used as a diagram of galaxy evolution. Though we now know that that process is much more complex, the diagram is still used for galaxy shape classification. Caldwell 48 is classified as either an Sa galaxy or between categories Sa and Sb.



Caldwell 48 is a member of the Caldwell Catalog of cosmic objects, which are visible to amateur astronomers in the night sky. This image of Caldwell 48 (front) was captured by Hubble’s Wide Field Camera 3 in 2019 and combines visible, infrared, and ultraviolet wavelengths.



This image provides an up-close view of Caldwell 48, showcasing the galaxy’s intricate spiral arms and massive galactic bulge in greater detail.

Credit: ESA/Hubble & NASA, J. Lee and the PHANGS-HST Team; Acknowledgment: Judy Schmidt (Geckzilla)

VOCABULARY

Galactic bulge: The dense collection of stars at the center of a spiral galaxy.

Spiral galaxy: A galaxy characterized by its spiral structure, with arms extending outward from the center of the galaxy.

Hubble Classification: A tuning-fork shaped diagram originally created by astronomer Edwin Hubble to characterize galaxies according to their shapes.

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

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