Hubble views a billowing cosmic cloud

November 21 2022

Credit: ESA/Hubble, NASA & STScI, C. Britt, T. Huard, A. Pagan

A small, dense cloud of gas and dust called CB 130-3 blots out the center of this image from the NASA/ESA Hubble Space Telescope. CB 130-3 is an object known as a dense core, a compact agglomeration of gas and dust. This particular dense core is in the constellation Serpens and seems to billow across a field of background stars.

Dense cores like CB 130-3 are the birthplaces of stars and are of particular interest to astronomers. During the collapse of these cores enough mass can accumulate in one place to reach the temperatures and densities required to ignite hydrogen fusion, marking the birth of a new star. While it may not be obvious from this image, a compact object teetering on the brink of becoming a star is embedded deep within CB 130-3.

Astronomers used Hubble's Wide Field Camera 3 to better understand the environment surrounding this fledgling star. As this image shows, the density of CB 130-3 isn't constant; the outer edges of the cloud consist of only tenuous wisps, whereas at its core CB 130-3 blots out background light entirely.

The gas and dust making up CB 130-3 affect not only the brightness but also the apparent color of background stars, with stars toward the cloud's center appearing redder than their counterparts at the outskirts of this image. Astronomers used Hubble to measure this reddening effect and chart out the density of CB 130-3, providing insights into the inner structure of this stellar nursery.

Provided by NASA's Goddard Space Flight Center