

Haunting portrait: Webb reveals dust and structure in pillars of creation

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This is not an ethereal landscape of time-forgotten tombs. Nor are these soot-tinged fingers reaching out. These pillars, flush with gas and dust, ‘enshroud’

stars that are slowly forming over many millennia. The NASA/ESA/CSA James Webb Space Telescope has snapped this eerie, extremely dusty view of the Pillars of Creation in mid-infrared light — showing us a new view of a familiar landscape. Credit: NASA

Why does mid-infrared light evoke such a somber, chilling mood in Webb's Mid-Infrared Instrument (MIRI) image? Interstellar dust cloaks the scene. And while mid-infrared light specializes in detailing where dust is, the stars aren't bright enough at these wavelengths to appear. Instead, these looming, leaden-hued pillars of gas and dust gleam at their edges, hinting at the activity within.

Thousands and thousands of stars have formed in this region. This is made plain when examining Webb's recent Near-Infrared Camera (NIRCam) image of this object. In MIRI's view, the majority of the stars are missing. Why? Many newly formed stars are no longer surrounded by enough [dust](#) to be detected in mid-infrared light.

So MIRI is only able to see those [young stars](#) that have not yet cast off their dusty 'cloaks'. These are the crimson orbs toward the fringes of the pillars. In contrast, the blue stars that dot the scene are aging, which means they have shed most of their layers of gas and dust.

Mid-infrared light excels at revealing gas and dust in extreme detail. This is also unmistakable throughout the background. The densest areas of dust are the darkest shades of gray. The red region toward the top, which forms an uncanny V, like an owl with outstretched wings, is where the dust is diffuse and cooler. Notice that no background galaxies make an appearance—the [interstellar medium](#) in the densest part of the Milky Way's disc is too swollen with gas and dust to allow their distant light to penetrate.

How vast is this landscape? Trace the topmost pillar, landing on the bright red star jutting out of its lower edge like a broomstick. This star and its dusty shroud are larger than the size of our entire Solar System.

This scene was first imaged by the NASA/ESA Hubble Space Telescope in 1995, and again in 2014, but many other world-class observatories have also stared deeply at this region, such as ESA's Herschel Telescope. Each advanced instrument offers researchers tantalizing new details about this region, which is practically overflowing with stars.

With every observation, astronomers gain new information, and through their ongoing research build a deeper understanding of this star-forming region. Each newly imaged wavelength of light and each new instrument delivers ever more precise information about the gas, dust and stars, which informs researchers' models of how [stars](#) form.

As a result of the new MIRI image, astronomers now have data in mid-infrared light at higher resolution than ever before, and will analyze its far more precise dust measurements to create a more complete three-dimensional landscape of this distant region.

The pillars of creation lie within the vast Eagle Nebula, which is 6500 [light](#)-years away.

Provided by European Space Agency

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