IN CELEBRATION OF ITS 25th anniversary, the Hubble Space Telescope has revisited the famous “Pillars of Creation” in the Eagle Nebula, providing astronomers with a sharper and wider view of the giant structures where young stars are being born.

The original Hubble photo, taken in 1995, revealed never-before-seen details of three giant pillars of cold gas bathed in the ultraviolet light from a cluster of young, massive stars.

Revisiting a space icon

NASA’s Hubble Space Telescope has revisited the famous Pillars of Creation, revealing a sharper and wider view of the structures in this visible-light image.

The pillars are about 5 light-years tall in this image. Streamers of gas can be seen floating from the giant structures as intense radiation heats and evaporates them into space. Buried inside the pillars, stars are being born.
The brilliant glow of massive stars

In fact, that bright star cluster was the first object discovered almost 370 years ago in what is now the Eagle Nebula. The discoverer, Philippe Loys de Chéseaux, could only see the glow of the stellar grouping when he recorded his finding in 1745-1746. While studying the cluster 20 years later, Charles Messier wrote that the stars were surrounded by a faint glow and looked like a nebula. He catalogued the cluster as Messier 16, or M16. Astronomer Edward Emerson Barnard was the first to photograph the nebula in the late 1800s at the Lick Observatory in California. The image revealed a large area of glowing gas. In 1908, the nebula, along with the M16 star cluster, was added to a catalogue of nebulae, galaxies, and star clusters, and was named IC 4703. Astronomers later named the region the “Eagle Nebula” because it looked like an eagle with outstretched wings.

Giant pillars of star birth

Almost 100 years later, the Hubble image of the tall pillars of gas, taken in visible light, made the Eagle Nebula famous. When the Hubble observations were taken in 1995, astronomers had seen the pillar-like structures in ground-based images, but not in detail. They knew that the physical processes are not unique to the Eagle Nebula because star birth takes place across the universe. Its location near Earth, however, makes the Eagle Nebula the most dramatic example of those star-making pillars.

Looking at the Hubble image, the first features that jumped out at the

A ground-based view inside the Eagle Nebula

This wide-field image of the Eagle Nebula, a vast star-forming region, reveals a cluster of bright stars surrounded by dust and gas. The three pillars at the center of the image (circled) are the famous Pillars of Creation. The image was taken at the National Science Foundation’s 0.9-meter telescope on Kitt Peak with the NOAO Mosaic CCD camera.
This NASA Hubble Space Telescope image, taken in near-infrared light, reveals the pillars as wispy silhouettes, which are seen against a background of many stars. Near-infrared light can penetrate much of the gas and dust, revealing stars behind the nebula as well as those hidden away inside the pillars. Some of the gas and dust clouds are so dense that even near-infrared light cannot penetrate them.

Placing the Hubble images side-by-side emphasizes how different the pillars appear in visible and in near-infrared light. The visible-light image (far left) provides a detailed view of the stars, gas, and dust within the nebula. In contrast, the near-infrared image reveals stars behind the nebula as well as stars inside the pillars, since infrared light can penetrate gas and dust. By using both types of light, astronomers can get a more complete picture of where and how stars are forming in the nebula.
astronomers were the streamers of gas seemingly floating away from the pillars. These features were evidence that ultraviolet radiation from the cluster of hefty stars was eating away at the gaseous structures. The Hubble picture provided the first view of this process.

A sharper look at the Pillars of Creation

In 2014, Hubble again observed the Eagle Nebula, this time with one of its new cameras, the Wide Field Camera 3. Astronauts installed the camera during the last Servicing Mission in 2009, allowing Hubble to take sharper pictures. The versatile camera took images of the pillars in visible light and in near-infrared light.

The near-infrared view reveals the pillars as wispy silhouettes seen against a background of stars. That is because near-infrared light can penetrate much of the gas and dust, revealing stars behind the nebula as well as those hidden away inside the pillars. Some of the gas and dust clouds are so dense that even near-infrared light cannot penetrate them. By using both types of light, astronomers can get a more complete picture of where and how stars are forming in the nebula.

Creation and destruction in one view

Although the original image was dubbed the Pillars of Creation, the new image hints that they are also pillars of destruction. The near-infrared image reveals that the pillars are slowly disappearing before our very eyes. The ghostly bluish haze around the dense edges of the pillars is material getting heated up and evaporating away into space. Astronomers say they have caught the pillars at a very unique and short-lived moment in their evolution.

The promise of a future telescope

More infrared images like this one await us in the future with NASA's James Webb Space Telescope, scheduled to launch in 2018. Astronomers hope that Webb will help yield more information on how stars form and on the chaotic environment in which stars are born. ★

SEE MORE Hubble images and read more Star Witness news stories at Amazing Space, NASA's award-winning educational website for K-12 students and teachers.