

Star-birth “Fireworks”



Gemini Observatory Legacy Image

Image Credit: Gemini Observatory/AURA/B. Reipurth, C. Aspin, T. Rector



The Gemini Observatory is operated by the Association of Universities for Research in Astronomy, Inc., under a cooperative agreement with the National Science Foundation on behalf of the Gemini Partnership.



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This Gemini North telescope image reveals no less than six gas jets emerging at supersonic speeds from the reddish Herbig-Haro 24 (HH 24) complex — a small cluster of young stars embedded in a molecular cloud some 1,300 light years distant in the direction of the constellation Orion. It is the most detailed image ever obtained from the ground of this remarkable region, which contains the highest concentration of gas jets known. Many of the jets show clear evidence of wiggling, suggesting that in each case the source may be a close binary whose orbit perturbs the jet.

This dynamic environment also may be responsible for expelling some of the lowest mass stars in the area. Most puzzling are five very-low-mass protostars discovered well outside of the star-forming cloud core. As the gas is far too tenuous for the stars to have formed in their present locations, these orphaned protostars were most likely ejected shortly after birth from the core, which hosts a small multiple protostellar system known as SSV 63. Such ejections may occur when the crowded stars start moving around each other in a chaotic dance, ultimately leading to the ejection of the smallest ones.

The bright nebulous star to the south (bottom) is the visible T Tauri star SSV 59.

Gemini Observatory Facts

PRIMARY MIRRORS:

Diameter: 8.1 meters; 26.57 feet; 318.84 inches
Mass: 22.22 metric tonnes; 24.5 U.S. tons
Composition: Corning Ultra-Low Expansion (ULE) Glass
Surface Accuracy: 15.6 nm RMS (between 1/1000 - 1/10,000 thickness of human hair)

TELESCOPE STRUCTURES:

Height: 21.7 meters; 71.2 feet; 7 stories (from “Observing Floor”)
Weight: 380 metric tonnes; 419 U.S. tons
Optomechanical Design: Cassegrain; Alt-azimuth

DOMES:

Height: 46 meters; 151 feet; 15 stories (from ground)
Weight: 780 metric tonnes; 860 U.S. tons (moving mass)
Rotation: 360 degrees in 2 minutes
Thermal Vents: 10 meters; 32.8 feet (width – fully open)

GEOGRAPHICAL DATA:

Elevation: Gemini North: 4,214 meters; 13,824 feet / Gemini South: 2,737 meters; 8,980 feet
Location: Gemini North: 19°49.4’N; 155°28.1’W / Gemini South: 30°14.5’S; 70°44.8’W

To see this, and many other images, please visit: <http://www.gemini.edu/legacyph>