

Bullets Rip Through Orion Nebula



*Gemini Observatory
Legacy Image*

*Gemini Observatory/AURA/J. Bally (University of Colorado)
(Background Images: Space Telescope Science Institute/NASA)*



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Blue cosmic “bullets” rifle through the outskirts of the Orion Nebula (inset, at top left) in this highly detailed, large-field composite image from the Gemini South telescope in Chile. Discovered in 1983, the Orion Bullets are clumps of gas ejected from deep within the Orion Nebula, located some 1,500 light years away from us. The violence causing this is likely related to the recent formation of a cluster of massive stars with strong winds that can expel gas at very high velocities.

As these bullets pass through neutral hydrogen gas, they heat up the cloud and produce the pillars that trace the passage of the clumps of gas. The blue bullets are actually quite large — about 10 times the size of Pluto’s orbit around the Sun. They are being propelled from a region of massive star formation outside, and below, the main image’s field of view. As the bullets speed outward, they leave behind distinctive tubular and cone-shaped wakes, which shine like tracers due to the bullets shock-heating the molecular hydrogen gas in the Orion Nebula. The wakes span much greater distances than the bullets, measuring as much as a fifth of a light year in length.

Multiple fields are combined into this image that measures 2.9 x 3.8 arcminutes in extent. The image was achieved using the high-resolution capability of the Gemini Multi-conjugate adaptive optics System (GeMS) with the Gemini South Adaptive Optics Imager (GSAOI).

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>