

Comet Lovejoy glows brightest during mid-January

January 9 2015, by Alan MacRobert, Sky And Telescope



The bright stars of Orion rising on January 5th as seen from City of Rocks State Park in New Mexico. Comet Lovejoy is the small green glow just to the right of top center. Credit: Alan Dyer / amazingsky.com

Comet Lovejoy, already being tracked by backyard astronomers worldwide, is entering its best and brightest two weeks for viewing. From about January 7th through 24th the comet is predicted to be glowing at 4th magnitude—bright enough that skywatchers with clear, dark skies might be able to just glimpse it by eye, without optical aid.

And the early-evening sky during this time will be dark and moonless, allowing the best views.

On January 7th, Comet Lovejoy passes closest by Earth at a distance of 44 million miles (70 million km), nearly half the distance from Earth to the Sun. But its [distance](#) will change only a little for many nights after that, so you'll have plenty of opportunities to track it down.

"If you can find Orion shining high in the southeast after dinnertime," says Sky & Telescope senior editor J. Kelly Beatty, "you'll be looking in the right direction to track down Comet Lovejoy." From there, use Sky & Telescope's sky maps (see below) to find the right spot for each date.

To the unaided eye, Comet Lovejoy might be dimly visible as a tiny circular smudge under dark-sky conditions. Through binoculars or a wide-field telescope, it will be more obvious as a softly glowing ball. Light pollution will make it less apparent.

During the next two weeks, the comet crosses the constellations Taurus, Aries, and Triangulum, climbing higher and higher in early evening. It passes 10° to the right (west) of the Pleiades star cluster on the evenings of January 15th through 17th. Although by then Comet Lovejoy will be receding from Earth, it doesn't come closest to the Sun until January 30th, at a rather distant 120 million miles (193 million km). By that date moonlight will begin to interfere, and the comet should be starting to fade as seen from Earth's point of view.

This is the fifth comet discovery by Australian amateur astronomer Terry Lovejoy, and he found it in images taken with his backyard 8-inch telescope. It's a very long-period comet, meaning that it has passed through the inner solar system before, roughly 11,500 years ago. Slight gravitational perturbations by the planets will alter the orbit a bit, so that the comet will next return in about 8,000 years. Astronomers have given

it the official designation C/2014 Q2.



On January 6th, Comet Lovejoy showed a circular green-hued coma around its small, icy nucleus, and a long bluish tail pointed away from the Sun. Credit: Alan Dyer / amazingsky.com

Hints of Green and Gold

Based on its steady, uninterrupted brightening, observers estimate that the comet's solid, ice-rich nucleus is at least 2 or 3 miles across, slightly larger than typical. But the glowing object we actually see is vastly larger and less substantial. The comet's visible head, or coma, is a cloud of gas and dust roughly 400,000 miles across, that has been driven off the nucleus by the warmth of sunlight.

Human eyes can't perceive color in dim nighttime objects well, but

photographs show that Comet Lovejoy has a lovely green hue. The green glow comes from molecules of diatomic carbon (C_2) in the coma that fluoresce in response to ultraviolet sunlight. By contrast, Comet Lovejoy's long, delicate gas tail is tinted blue, thanks to carbon monoxide ions (CO^+) that are likewise fluorescing.

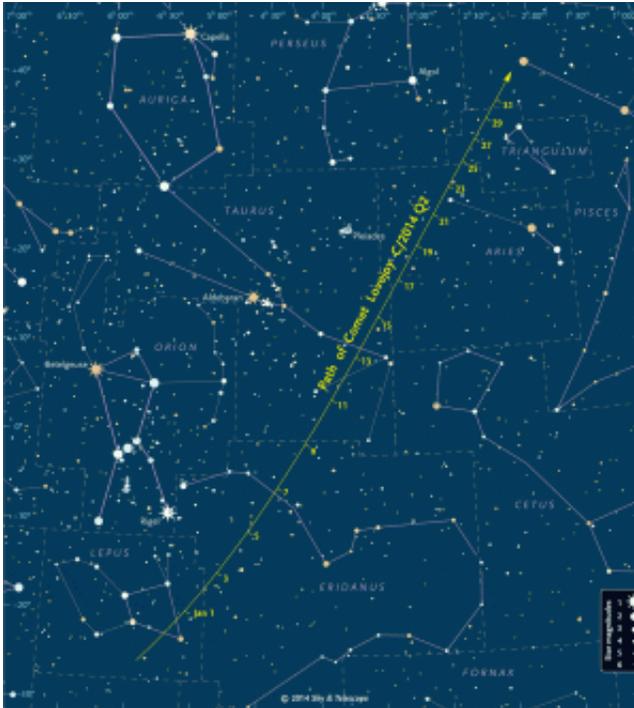


This chart shows the view looking southeast during mid-January at about 8 p.m. local time. Look to the upper right of the distinctive constellation Orion to locate Comet Lovejoy. Binoculars will help. Credit: Sky & Telescope diagram

In addition, dust in a comet's coma and tail simply reflects sunlight, so dust features appear pale yellowish white. The most memorable comets tend to have dramatic dust tails, such as spectacular Comet Hale-Bopp in 1997 and another discovery by Lovejoy, C/2011 W3, in 2011.

The current Comet Lovejoy is not producing enough dust to create a bright tail - and in fact this interloper wasn't expected to become so obvious at all. But by late 2014 amateur astronomers had noticed that the

[comet](#) was brightening steadily and faster than predicted.



A detailed finder chart for Comet Lovejoy during January 2015. Here the dates' tick marks are plotted for 0:00 Universal Time (7 p.m. on the previous date Eastern Standard Time). Credit: Sky & Telescope diagram

Source: Sky and Telescope

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