

New comet NEOWISE graces the skies

July 9 2020, by Mikayla MacE



Comet NEOWISE captured on July 6, 2020 above the northeast horizon just before sunrise in Tucson. Viewers in the region can find the comet in the northeastern sky near the horizon between 4 and 4:30 a.m. until July 11, after which it will be visible in the northwestern sky just after sunset, below the Big Dipper. Credit: Vishnu Reddy

A comet visiting from the most distant parts of our solar system is putting on a spectacular nighttime display. The comet C/2020 F3 NEOWISE made its once-in-a-lifetime close approach to the sun on July 3 and will cross outside the Earth's orbit on its way back to the outer

parts of the solar system by mid-August.

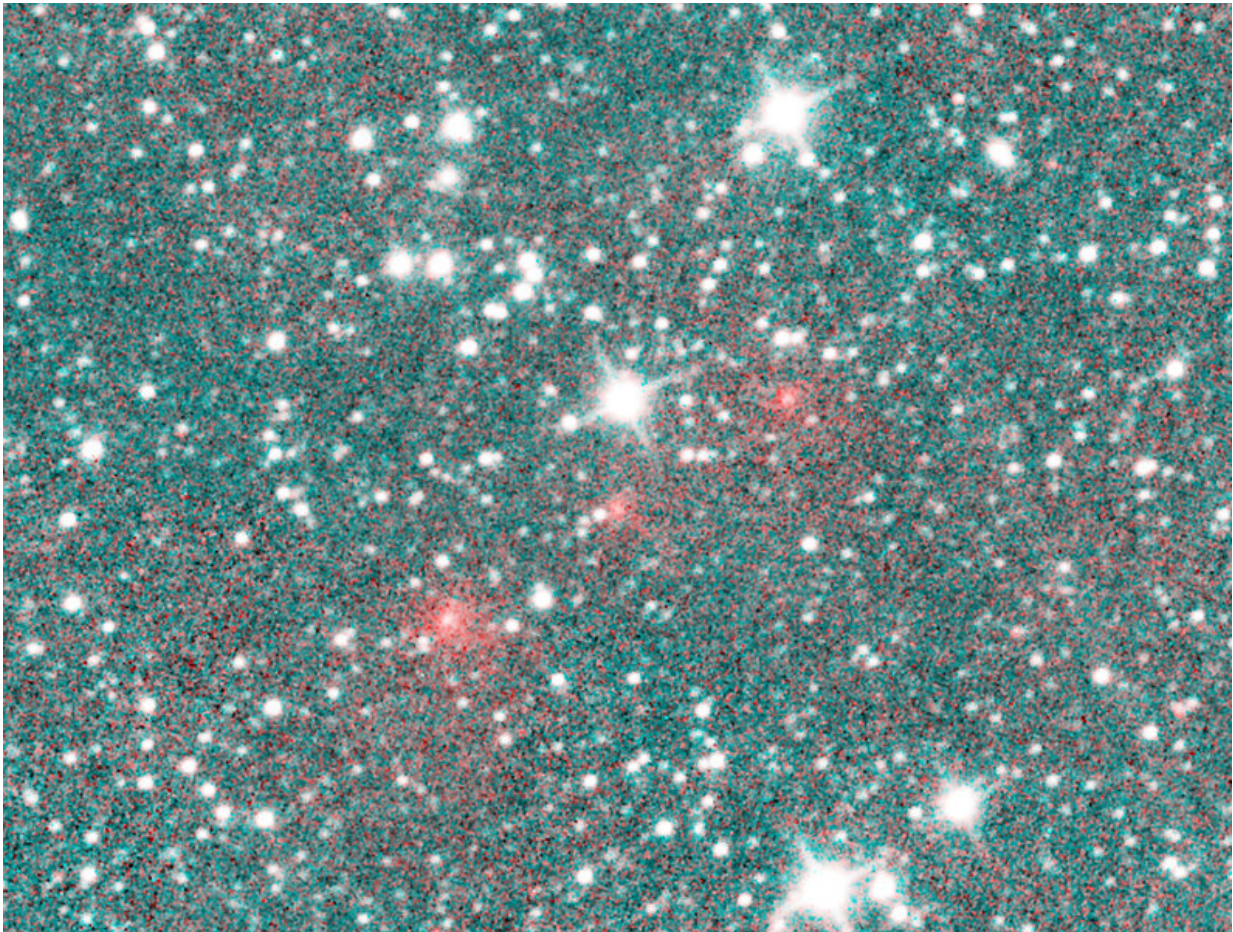
"For the next couple of days, Arizona viewers can catch a glimpse of the comet in the early morning northeastern sky near the horizon between 4 and 4:30 a.m.," said Amy Mainzer, a University of Arizona professor of planetary sciences. "Then, on July 11, it will begin to be visible in northwestern sky just after sunset, just below the constellation Ursa Major," which contains the Big Dipper.

Mainzer is the principal investigator of NASA's Near-Earth Object Wide-field Infrared Survey Explorer, or NEOWISE, mission, which discovered the comet on March 27.

Its very close passage by the sun is cooking the comet's outermost layers of gas and dust and lofting them into a large, wide tail of debris, yet the comet has managed to survive this intense roasting. Observers all over the world—and off it—are racing to capture this natural firework display before the comet speeds away into the blackness of space. Even the astronauts aboard the International Space Station spotted it from their vantage point high above Earth's surface.

Observers might be able to see the comet's central core, or nucleus, with the naked eye in dark skies; using binoculars will give viewers a good look at the fuzzy comet and its long, streaky tail, which looks a bit like the beam of a flashlight pointing up.

NEOWISE spotted the icy visitor using its two infrared channels that are sensitive to heat signatures given off by the object baking in the sunlight.



Comet NEOWISE appears as a string of fuzzy red dots crossing through the constellation Puppis in this composite image that combines multiple exposures taken by the NEOWISE mission on March 27. The comet appears red in this heat-sensitive infrared image because it is much cooler than the background stars, which are thousands of degrees. Credit: University of Arizona/NASA/Jet Propulsion Laboratory

The NEOWISE spacecraft—originally named the Wide-Field Infrared Survey Explorer, or WISE—launched in December 2009. WISE was not designed to study asteroids and comets and is now long past its expected lifetime of seven months. Although incapable of discovering large numbers of near-Earth asteroids and comets, the spacecraft has provided

information on asteroid and comet numbers and sizes based on a small sample of them. NEOWISE was repurposed for this use in 2013 by what is now known as NASA's Planetary Defense Coordination Office.

"In its discovery images, comet NEOWISE appeared as a glowing, fuzzy dot moving across the sky even when it was still pretty far away. As soon as we saw how close it would come to the sun, crossing inside the orbit of Mercury, we had hopes that it would put on a good show," Mainzer said.

The search for asteroids or comets that could potentially impact Earth also expands scientific understanding of primitive solar system bodies like comets. In this case, comet NEOWISE will pass harmlessly at 64 million miles from Earth while giving astronomers the opportunity to learn more about its composition and structure.

"From its infrared signature, we can tell that it's about 5 kilometers, or 3 miles, across, and by combining the infrared data with visible light images, we can tell that the [comet](#)'s nucleus is covered with sooty, dark particles leftover from its formation near the birth of our solar system 4.6 billion years ago," said NEOWISE Deputy Principal Investigator Joseph Masiero from NASA's Jet Propulsion Laboratory.

The NEOWISE mission is not expected to last much longer due to the nature of its orbit and will eventually harmlessly re-enter Earth's atmosphere. The University of Arizona and the Jet Propulsion Laboratory are working on the formulation of a highly capable next-generation space-based telescopic survey—the Near-Earth Object Surveillance Mission, or NEOSM.

When funded, NEOSM will greatly extend NASA's ability to identify, track and characterize asteroids and comets that could potentially impact Earth. The mission will help the U.S. reach a near-Earth asteroid

discovery goal set by Congress and complement existing and planned ground-based searches. NEOSM will optimize the NEOWISE mission's architecture for the study of near-Earth objects, improving it by using next-generation infrared sensors and strategic operations that will allow it to search a much larger swath of space around Earth's orbit.

Provided by University of Arizona

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