Acadiana Sky

Seeing Comet C/2023 A3 (Tsuchinshan-ATLAS) October, 2024

What's a Comet?

Comets are small bodies orbiting the sun, typically only miles to a few tens of miles wide. They are mixtures of rock, dust, and ices (made from frozen water, carbon dioxide, and more). Most comets orbit the sun on very "stretched out," elliptical orbits. *Short period comets* take under 200 years to orbit the sun while *long period comets* may take thousands, or even tens of thousands, of years to do that. When comets are relatively near the sun, their ices sublimate (changing from solid to gas without ever being a liquid) and their dust gets released. Energy and particles from the sun drive that material away from the comet to make its tail. The released material around the frozen comet nucleus is called the comet's head and may be as big or bigger than a planet, while its tail may be tens of millions of miles long (comets have been seen with tails longer than the distance from the sun to Earth). The tails are such thin material that Earth can go through a comet tail without any consequences. Most of the meteor showers seen every year are caused when Earth plows through streams of material left behind by comets. A couple of comets thought to have originated in other solar systems have been seen.

What about Comet Tsuchinshan-ATLAS?

Comets are named after their discoverers. Robotic telescopes at China's Tsuchinshan Observatory and South Africa's Asteroid Terrestrial-impact Last Alert System (ATLAS) discovered Comet Tsuchinshan-ATLAS in January, 2023. Its official designation, C/2023 A3, indicates that it was the third comet discovered in the first half of January of that year. Astronomers estimate the comet's greatest distance from the sun at over 90,000 times Earth's distance from the sun (by comparison, Pluto is a tiny bit less than 40 times farther from the sun than Earth), and the immense size of the comet's orbit suggests that its orbital period must be millions of years. Gravitational interactions with the planets of our solar system might result in Comet C/2023 A3 ultimately being completely ejected from the solar system. It's possible that this is Tsuchinshan-ATLAS's first and only pass near the sun.

Although Comet Tsuchinshan-ATLAS was incredibly far from the sun at its farthest point, on September 27 it passed the sun at a distance similar to that of Mercury, the innermost planet of our solar system. It will pass closest to Earth on October 12, 2024, but will come no closer to our planet than almost half the distance to the sun and will pose no danger.

How to See Comet Tsuchinshan-ATLAS (See the finder chart at the end of this)

Comets have been described as being like cats: they have tails and do whatever they want no matter what we expect! The path Comet Tsuchinshan-ATLAS will take through the sky is quite certain, but our expectations about brightness and tail length could be quite wrong. As of mid-September, Comet Tsuchinshan-ATLAS's actual brightness is very much as expected, however, which is promising!

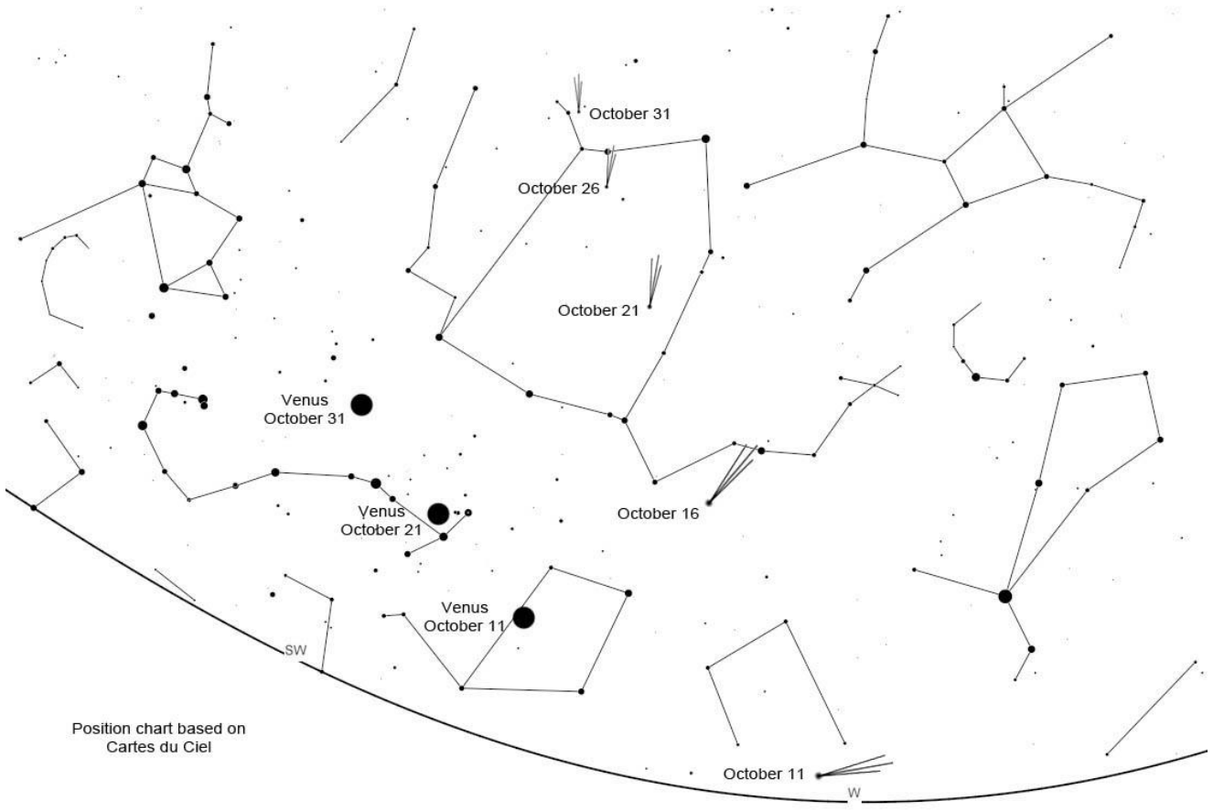
October will be your best chance to see the comet. It will be in the evening sky just after sunset during the middle to late part of the month. Although it was visible in the morning sky in September, the evening viewing opportunity should be better in the Northern Hemisphere.

Beginning October 10, 2024, look for it very low in the west during early evening. You'll need binoculars or a low-power telescope, and the comet will look like a softly glowing ball of light. Be sure the sun has fully set before looking! A short tail may be visible. The farther you are from lights, the easier this will be to find, and the longer the tail will look. Each evening through October, the comet will be farther above the horizon as the sky darkens, setting later and later, but each night it will fade a little and appear smaller.

Comet Tsuchinshan-ATLAS may become bright enough to be seen with the unaided eye quite easily, or it may only be visible—barely—in very dark conditions (the actual apparent brightness of a comet is one of those characteristics that's *very* hard to predict). Binoculars may be helpful, and even if the comet is easily seen with just the eye, binoculars will enhance the view. From about October 14 – 16, brilliant Venus will be a good landmark. The comet will be roughly off to its right and a little above it (see the finder chart below for help). Importantly, don't expect the comet to look like its pictures. Photographic techniques will capture detail far beyond the ability of the human eye.

By the end of October, Comet 2023 A3 will have faded a great deal, and may well no longer be visible to the unaided eye. It will remain visible in binoculars as a faint patch of light for a while longer, and in telescopes for longer than that.

Below is a finder chart for Comet Tsuchinshan-ATLAS, set for about 7:30 p.m. CDT, looking west, although the comet will remain visible farther into the evening as October goes by. Comet positions are marked every five nights beginning October 11, with the comet found between those positions on other dates. The position of Venus as a landmark is shown every 10 nights during the month.



Position of Comet 2023 A3 (Tsuchinshan-ATLAS) looking west at 7:30 p.m. CDT, October, 2024