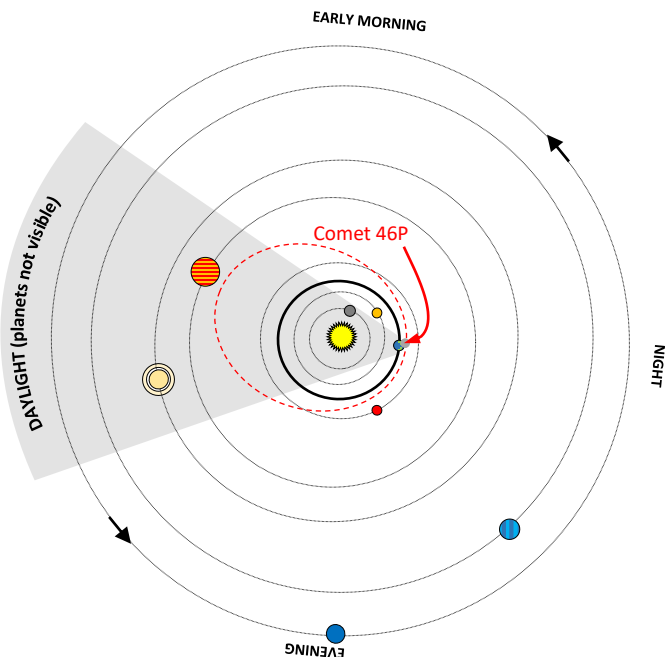


There is much for amateur astronomers to celebrate this month! Whether you celebrate Hanukkah (Dec 2-10), the Winter Solstice (December 21), Christmas (Dec 25), Kwanza (Dec 26-Jan 1), or other traditions; the night-sky this December offers many gifts. The sky will be beautifully clear and dark early in the month. **Comet 46P** will be easily visible throughout the night all month long. Join me this month as we hitch a ride on a comet to experience the wonders of the December skies!

**Solar System:** Deep-sky viewing will be at its best during the first 2 weeks of December, with a **NEW MOON** on Dec 8. The moon will again be **FULL** on Dec 23, shining brightly from the Winter Solstice through the New Year.

Venus is visible at sunrise. And although Mercury, Jupiter, and Saturn are not visible this month, our closest companion planet **Mars** continues to shine in the southwest, passing through Aquarius during December. Neptune and Mars will be in close conjunction on Dec 7. Planet Uranus appears as a pale blue hazy “star” in Pisces.

*The Solar System on December 15, 2018 (not to scale)*



**Deep Sky:** This month we will follow comet 46P as it passes near the Earth. **Comet 46P/Wirtanin** is a small (1/2-mile diameter) but “hyperactive” short-period comet which orbits the sun every 5.4 years. (46P’s orbit is shown as a dashed ellipse on the solar system map.) It gets its name because it was the **46<sup>th</sup>** confirmed “**P**eriodic” comet and was discovered in 1948 by US Astronomer Karl **Wirtanin**.

Comets are fragments of rock and ice, left over from the formation of the solar system over 4.5 billion years ago. Periodic comets (designated “P”) orbit the sun and return “periodically” to the inner solar system, usually less than every 200 years. Other comets (designated “C”) appear rarely and return to their “home” in the Keiper Belt or the Oort Cloud.” As comets approach the sun, they are heated by the sun’s radiation which releases gas and debris, forming the characteristic coma and tail. If their orbits cross the Earth’s orbit, they produce meteor showers as the earth passes through the debris left by their tails. Since 46P does not cross the orbit of earth, it doesn’t produce a meteor shower.

Comet 46P is expected to be bright enough to be easily visible in binoculars, telescopes, and possibly the unaided eye all month long. However, comets are notoriously unpredictable, so brightness and location are likely to vary: “Comets are like cats: they have tails and do what they want!” Let’s hitch a ride...!

**Dec 1:** 46P begins the month in constellation *Cetus*, 2° northwest of 4<sup>th</sup> magnitude star **Tau-1-Eridani**, an F-type star of 1.3 solar-masses. 46P follows “the river” *Eridanis* then enters this constellation near 4<sup>th</sup> magnitude blue-giant star **Pi-Ceti** on Dec 4<sup>th</sup>.

**Dec 6:** 46P passes within ½° of 3<sup>rd</sup> magnitude K-type orange-giant star **Eta-Eridani (“Azha”)**.

**Dec 9:** 46P passes near the tail of *Cetus*, just south of the bright star Alpha-Ceti and distant galaxy M77. **Alpha-Ceti (“Menkar”)**, is a 2.5 magnitude, three-solar-mass red-giant star, located 249 LY from earth. *For you*

*sci-fi fans: “Ceti-Alpha V” (presumably describing a 5<sup>th</sup> planet around Alpha-Ceti) was featured in the movie “Star Trek: The Wrath of Khan.”* **M77 (NGC 1068)** is a barred-spiral galaxy 33,000,000 LY from Earth. It is an active radio source and therefore also designated “Cetus A.”

**Dec 11:** 46P enters the constellation *Taurus*.

**Dec 12:** 46P is 2° from the 3<sup>rd</sup> magnitude visual pair of stars **Xi-Tauri** (a blue giant) and **Omicron-Tauri** (a yellow-orange giant).

**Dec 13:** 46P reaches “perihelion” (closest to the sun): passing 1.048AU from sun and 1.0 AU from earth.

**Dec 16:** 46P is at its brightest as it makes its closest approach to earth: a safe 7.16 million miles away. It is passing between two well-known open star-clusters: **M45 (“The Pleiades”)** and **C41 (“The Hyades”)**.

**Dec 18:** 46P enters *Perseus*, just south of a dim planetary nebula, **NGC 1514**, and an equally faint emission nebula, **NGC 1499 (“The California Nebula”)**.

**Dec 21:** 46P enters *Auriga* where it will spend Christmas.

**Dec 23:** 46P passes less than 1° from the bright 1<sup>st</sup>-magnitude star **Capella (Alpha-Aurigae)**. Capella is a class-G giant (20 sun-diameters) dying star (no longer fusing hydrogen in its core) only 42 LY from earth.

**Dec 28:** 46P enters the constellation *Lynx*.

**Dec 31:** 46P passes 1° from **15-Lyncis**, a 4<sup>th</sup> magnitude G-type yellow-orange giant star.

*46P will spend the first few days of 2019 in Lynx before passing on into Ursa Major, where it will dim quickly as it leaves our neighborhood and returns back towards Jupiter on its 5.4-year orbit.*

