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Evenings in February 2023 feature a striking array of three bright planets, Venus, Jupiter, and Mars. (Saturn disappears into bright twilight within first few days or month.) The length of the 3-planet lineup shrinks from 93° on Feb. 1 to 68° on the 28th. **In the year's brightest planet pairing, Venus will pass 0.5° north (right) of Jupiter on March 1.** Follow the pair for several evenings before and after, to watch for daily changes. On Feb. 19 and March 11, ten days before and after their March 1 conjunction, Venus-Jupiter are 10° apart. Five days out, on Feb. 24 and Mar. 6, they are separated by 5° . [See evening twilight all-sky chart N202302P.pdf for northern U.S. or S202302P.pdf for southern U.S.]

Binoculars provide fine views of the Moon, pairings of planets such as Venus-Jupiter around March 1, star clusters such as the Pleiades and Hyades in Taurus, the Great Nebula in Orion's Sword, Andromeda Galaxy, and

even an occasional comet. Comet ZTF (C/2022 E3) -- discovered in March 2022 by the Zwicky Transient Facility at Palomar Observatory -- has reached mag. 5 in late January. It will pass closest to Earth, at a distance of 26 million miles, on Feb. 1.

In a rare 2-week run of clear skies, I enjoyed following Comet ZTF in my 8x42 binoculars before the start of morning twilight daily, January 17-30. As the 5th-magnitude comet zips past the North Celestial Pole in late January, the time of its best observing position shifts into evening hours.

The Comet appears about 10° from Polaris on night of Jan. 29 (on a line from the North Star toward the Pointer Stars of the Big Dipper), **and on evening of Jan. 30** (on a line from the North Star toward Omicron in Ursa Major, marking the nose of the Great Bear on the detailed star map, *February Evening Skies*). For six nights, the nights of Jan. 29-Feb. 3, the Comet shifts more than 6° daily, moving toward Capella. On night of Feb. 1, Comet ZTF, plying the wilderness of the faint constellation Camelopardalis, the Giraffe, is just east of the midpoint between Polaris and Capella. **On the evening of Feb. 5, the Comet passes within 1.6° W of Capella.** Moving through the nearby compact isosceles triangle called the Kids, by the next evening, Feb. 6, ZTF passes only 0.2° W of Zeta Aurigae, one of the baby goats. By the evening of Feb. 8, in a moonless sky as twilight ends, the Comet, now moving less than 4° per day, has passed within 0.7° W of Iota Aurigae, the 2.7-mag. star nearly halfway from Capella toward Aldebaran. **On the night of Feb. 10-11, the fading Comet, moving**

3° per day, will pass about 1° east of Mars. On the next night, Feb. 11, ZTF passes the descending node of its orbit and plunges through the ecliptic, the plane of Earth's orbit, from north to south. **On evening of Feb. 14, the Comet passes 1.5° E of Aldebaran.** By then, the Comet will have slowed to 1.9° per day, and is expected to have faded to magnitude 6.5 or 7.0.

Follow Moon in evening sky Feb. 1-6 and 20-28 and observe its gatherings with planets and bright zodiacal stars: **Pollux and Castor** in Gemini, near a waxing gibbous Moon on the evenings of Feb. 2 and 3; **Regulus**, heart of Leo, near the Moon, just past Full, from nightfall until dawn on nights of Feb. 5 and 6.

Try for zodiacal light -- dust in the plane of the solar system -- in dark moonless sky at end of evening twilight Feb. 8-20.

Moon returns to early evening sky on Feb. 20. Best view of young Moon in contiguous 48 states is in Southwest U.S., where Moon sets longest after sunset. A very thin crescent may be seen with unaided eye in excellent sky conditions.

Venus pairs up with an easier crescent Moon low in western sky at dusk on Feb. 21; and **Jupiter** within 2° of an even fatter crescent Moon on the next evening, Feb. 22. The gatherings with the two brightest planets 8° or 7° apart those evenings will present an excellent photo-op!

On the evening of Feb. 26, the nearly First Quarter (half full) Moon will lie in Taurus, **between two clusters of stars, the Hyades and Pleiades, and not far from Aldebaran.** On Feb. 27 during the 9 p.m. hour, the southern edge of the Moon will miss **Mars** by little more than one moon-diameter. Seen from the Arctic, the Moon will occult Mars.

Follow the Moon in the morning sky Feb. 4-18 and catch it near **Regulus** on Feb. 6, **Spica** in Virgo on Feb. 11, and **Antares** in Scorpius on Feb. 14. [See morning twilight all-sky chart N202302A.pdf for northern U.S. or S202302A.pdf for southern U.S.]

Regulus is at opposition on night of Feb. 18-19. As Earth passes between Sun and Regulus, the star appears 180° from the Sun. Spaceship Earth is then moving away from a point 4° S of the Pleiades in evening sky, and toward a point 3° W of the head of Scorpius in morning sky.

Do not miss the monthly conjunctions of Moon and Venus; during the current evening apparition of Venus, the best of these will occur on June 21. **In coming months, watch Venus chase Mars** through the evening zodiacal constellations until Venus eventually gives up the pursuit. Watch for these planets' conjunctions with Pleiades, Aldebaran, and Beta in Taurus; Pollux and Castor in Gemini; Beehive in Cancer; and Regulus in Leo. When will Venus finally catch up to and pass Mars? With Pollux and Castor, watch for three events for each planet: (1) when the planet forms an isosceles triangle with the "Twin" stars. (2) Watch for when the

planet passes closest to Pollux. And (3), watch for when Castor, Pollux, and the planet lie in a straight line. For Mars, the three Gemini events will occur April 22-May 16; for Venus, May 21-June 1. Watch for a trio of two planets and a first-magnitude star in July, when all three will fit into a 5° field. All these events will be illustrated in *Sky Calendar*.

See also Jeffrey's Hunt's graphical summaries of evening and morning planetary visibility for 2023.
[2023_Chicago_evening_planets.pdf and
2023_Chicago_morning_planets.pdf]

Illustrations of many of the events described here, including nightly views leading up to the conjunction of Venus-Jupiter, appear on the February 2023 ***Sky Calendar***. Subscriptions and a sample issue are also available at www.abramsplanetarium.org/skycalendar/

Southern sky challenge: Two objects visible from southern parts of the U.S. can be observed reaching their highest positions in the south 7 hours apart on February nights. First is **Canopus**, at mag. -0.7 the second brightest star in the night sky, reaching its high point 21-22 minutes before Sirius, at mag. -1.5 the brightest nighttime star.

As an example for a particular location, Palm Springs, California, at longitude 116.5° W, latitude 33.8° N, Canopus is only about 3° up, due south, at about 9:30 p.m. PST on Jan. 30, shifting 4 minutes earlier each day, to about 7:30 p.m. by March 1.

Seven hours later, **the brightest globular cluster Omega Centauri** passes 9° above the south point of the horizon and 36° directly below Spica -- at 4:30 a.m. on Jan. 31, shifting earlier to about 2:30 a.m. by March 2. Through binoculars on a clear moonless night, 3.7-mag. Omega Centauri, larger than the Moon in apparent diameter, is impressive even in binoculars! Can your telescope resolve it into stars? Binocular star hop to Omega Centauri: Starting at 2.1-mag. Theta Centauri, go southwest (lower right) to an attractive, compact isosceles triangle of Mu, Nu, and Phi, of mag. 3.4 to 3.7. South of (below) the triangle, find 2.6-mag. Zeta Centauri. From Zeta, go 4° to the west (right), and there is a fuzzy spot, Omega Centauri!

Thanks to Robert Miller for his twilight charts and to Jeffrey Hunt for his graphic summaries of evening and morning planet visibility in 2023.