OBSERVING HIGHLIGHTS for January 6 to 21, 2025, a "bright Moon period"
Black Canyon Astronomical Society (BCAS), western Colorado, USA

SUMMARY.

Wow – there's a parade of planets in the evening sky during this "bright Moon" period! Venus shines in the southwest through bright twilight and then becomes a striking beacon as it descends toward the horizon as twilight fades. After twilight ends and the Moon leaves the early evening sky beyond January 16, you may be able to see shadows cast by Venus! On January 17, Venus and Saturn appear less than 3 degrees apart. Venus appears 190 times brighter than Saturn, but the Ringed Planet still shines at first magnitude (a great view in binoculars!). As darkness falls, bright Jupiter is prominent high in the east-southeastern sky. And reddish (or butterscotch-colored?) Mars, at its closest and brightest for 2025, is visible all night long. There's a special event on January 13 between 6:55 PM and 7:53 PM MST (+/- a few minutes), when the full Moon occults (moves in front of) Mars as seen from western Colorado! Early risers with an unobstructed southeastern horizon may be able to spot Mercury in morning twilight on January 6, but on mornings thereafter the Innermost Planet becomes lost in the Sun's glare.

The Moon reaches first quarter on January 6. From January 7 to 12, watch the gibbous Moon wax. The Moon is full on the night of January 13-14. From January 15 to 20, the gibbous Moon wanes, and the Moon reaches last quarter on January 21. On the night of January 10-11, the waxing gibbous Moon passes about 7 degrees north of Jupiter. On the night of January 13-14, the full Moon is very near Mars, and the Moon occults Mars for about an hour as seen from Colorado (as noted above).

Comet C/2024 G3 (ATLAS) is currently nearing the Sun, and it's now an interesting sight from the southern hemisphere. Unfortunately, this Comet is poorly placed for viewing from the northern hemisphere. But all is not lost! Between January 11 and 14, as C/2024 G3 nears the Sun, we can likely see it virtually (in near-real-time) on the LASCO C3 coronograph of the SOHO satellite.

As of January 5, there are many active regions on the Earth-facing side of the Sun, and X-class (extreme) solar flares occurred on December 30, and on January 3 and 4. Moderate and even extreme, solar flares are likely, as are coronal mass ejections of charged particles. You can monitor solar activity safely in real time on the internet. This high solar activity is triggering geomagnetic storms, auroras (aka "northern lights"), and airglow. So, keep watch for these phenomena!

From western Colorado, view passes of interesting satellites, including evening passes of the bright International Space Station (ISS) from January 10 to 18. Also, you can see evening passes of the almost-as-bright Tiangong (Chinese) Space Station from January 5 to 13. And there are evening passes of NASA's Advanced Composite Solar Sail System (ACS3) on January 5 through 21. ACS3 has been tumbling. This results in large changes in brightness over a period of about 6 seconds (from as bright as magnitude +1 to fainter than magnitude +5), as this satellite crosses the sky.

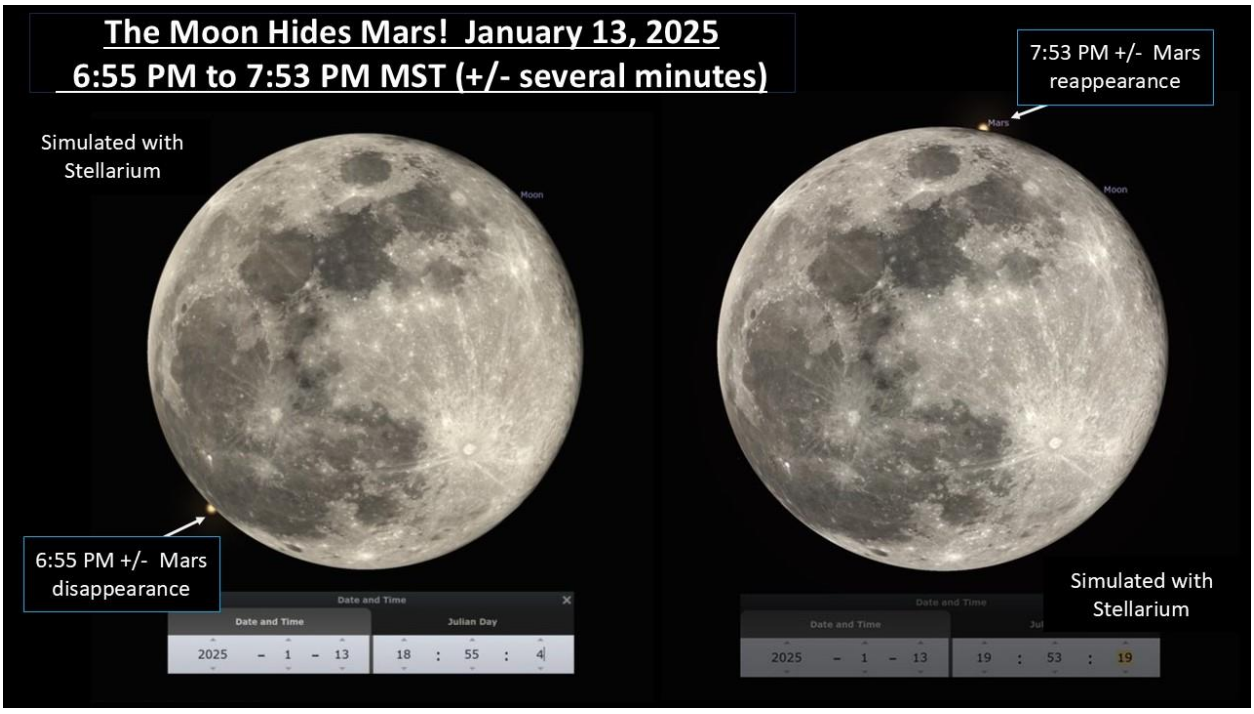
WESTERN SLOPE SKIES. Since 2011, BCAS and KVNF Community Radio have produced Western Slope Skies (WSS), a biweekly astronomy feature, which has aired every two weeks on Friday mornings and on following Wednesday evenings. On January 3 and 8, Peyton Goumas, an astronomy student of Dr. Catherine Whiting at Colorado Mesa University (CMU) tells us about "The Drake Equation", a formula that attempts to predict the number of technical civilizations in our Milky Way Galaxy. For 2025, WSS features on KVNF are being coordinated by Dr. Catherine Whiting, Assistant Professor of Physics and Astronomy at CMU, with contributions from CMU, the Western Colorado Dark Sky Coalition, and the Black Canyon Astronomical Society.

Note: The apparent brightness of sky objects is measured in "magnitude" units. Many bright stars are magnitude +1, while the faintest stars easily visible to unaided eyes under dark skies are magnitude

+6. Some of the brightest stars are 0 magnitude (e.g., Vega, Arcturus), while the brightest sky objects have negative magnitudes (e.g., Sirius at -1.5, Jupiter at -2 to -3, Venus at -4 to -5, the full Moon at -12 to -13, and the Sun at -26.7 magnitude). Angular distances on the sky are usually cited in degrees of arc. Helpful ways to estimate 1, 5, 10, 15, and 25 degrees of arc can be found here: https://www.timeanddate.com/astronomy/measuring-the-sky-by-hand.html

THE MOON. The Moon reaches **first quarter on January 6** (exactly at 4:56 PM MST). From January 7 to 12, watch the gibbous Moon wax. **The Moon is full on the night of January 13-14** (exactly full at 3:27 PM MST on January 13). From January 15 to 20, we can watch a gibbous Moon wane. The Moon reaches **last quarter on January 21** (exactly at 1:21 PM MST). On the night of January 10-11, the waxing gibbous Moon passes about 7 degrees north of Jupiter. On the night of January 13-14, the full Moon is very near Mars, and from the Western Slope the Moon occults (moves in front of) the Red Planet between about 6:55 and 7:53 PM MST on January 13 (see next item for details). NASA has published a stunning visualization of lunar phases for year 2024. Another fun site is NASA's daily Moon guide.

THE MOON OCCULTS MARS – JANUARY 13! As seen from the Western Slope, the full Moon occults (moves in front of) Mars on January 13 from 6:55 PM to 7:53 PM MST, +/- a few minutes based on your location. At the time of this occultation, the Moon is a few hours past "exactly" full phase. The leading, eastern side of the Moon is fully illuminated by the Sun when it covers Mars at about 6:55 PM MST. Mars disappears behind the lunar mare or "sea" called Oceanus Procellarum (the "Ocean of Storms"). At about 7:53 PM MST, Mars reappears from behind a thin sliver of shaded lunar surface near Mare Crisium (the "Sea of Crises"). The images below show where Mars disappears and reappears for the Western Slope, based on simulations from Stellarium. Despite their names, lunar maria (plural of "mare", Latin for "seas") are low areas of the lunar surface that were flooded by dark, basaltic lava, not by water. The brighter areas of the Moon are highlands, which are mostly underlain by the lighter colored rock, anorthosite. Lighter colored anorthosite contains more aluminum and much less iron than basalt, a darker rock.



VENUS: BRIGHTER YET IN THE EARLY EVENING! Wow! As the sky darkens, Venus is brilliant, high above the southwestern horizon. Can "Earth's Sister Planet" possibly get any brighter? It turns out that it will! Venus is predicted to be brightest between February 15 and 23. **When the Moon is absent from the early evening sky (January 17 to 30), it may be possible to see shadows cast by Venus after the end of twilight! To see a Venus-cast shadow, try placing a small object directly in front of a white surface, aligned toward Venus**. During this period Venus brightens from magnitude -4.49 to -4.65. "Earth's Sister Planet" now sets well after twilight's end, at about 8:56 PM MST on January 6 and 9:14 PM MST on January 21. Venus is at its greatest angular separation east from the Sun on January 10. Venus continues to get closer to Earth: Our "Sister Planet" is 66 million miles distant on January 6 and 55 million miles distant on January 21. Through telescopes, Venus' phase wanes from a 53%-illuminated gibbous disk on January 6 to a 44%-illuminated crescent on January 21, as Venus' apparent diameter increases from 23.7 to 28.1 arc seconds during this period. **Please do your Venus spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

SATURN IN THE EVENING SKY. Saturn, moving against the stars of Aquarius, is about 30 degrees high in the southwest as the sky darkens. The Ringed Planet sets in the west at about 9:48 PM MST on January 6 and 8:57 PM MST on January 21. **Between January 13 and 21, Saturn appears very close to Venus. The two planets appear closest on January 17 (less than 3 degrees apart)**, although the date of their "astronomical conjunction" is January 19 (that's when these two planets have the same right ascension, aka "astronomical longitude"). Although Saturn and Venus appear close in the sky from our earthly perspective, Saturn is more than 10 times as distant as Venus. Saturn is 940 million miles away on January 6 and 958 million miles distant on January 21. Saturn fades slightly from magnitude +1.07 to +1.10 during this period. Through telescopes, the Ringed Planet appears 16 arc seconds wide, and its rings span 38 arc seconds. With a telescope or high-magnification binoculars, it's possible to spot Titan, Saturn's largest moon.

Telescopes with apertures 5 inches or larger may reveal several other moons of the Ringed Planet. Saturn's rings now appear nearly "edge-on", so they may seem less impressive in telescopes than they did during the past several years. These thin rings will nearly disappear from our perspective during 2025. Because Saturn's rings now appear less inclined, and dimmer, than in past years, it may be easier to spot some of Saturn's mid-sized moons through telescopes. You can follow the changing positions of Saturn's moons by using various planetarium apps and/or logging onto this site:
https://skyandtelescope.org/observing/interactive-sky-watching-tools/saturns-moons-javascript-utility/
For more info on the appearance of Saturn's rings in 2024 and 2025 and phenomena associated with Saturn's moons, see this article…
https://skyandtelescope.org/astronomy-news/observing-news/see-mutual-events-close-approaches-of-saturns-moons/

JUPITER: NEARLY ALL NIGHT LONG. As twilight fades, bright Jupiter stands about 35 degrees above the eastern horizon and is more than 65 degrees above the southern horizon between 9 and 10 PM MST. Jupiter is currently moving against the stars of Constellation Taurus, about 5 degrees from the red giant star, Aldebaran. The Giant Planet sets in the west northwest at about 5:10 AM MST on January 6 and 4:05 AM MST on January 21. During this period Jupiter fades slightly from magnitude -2.70 to -2.60. Jupiter is 394 million miles distant on January 6 and 409 million miles distant on January 21. Through telescopes or binoculars, the Giant Planet's apparent equatorial diameter is 45 arc seconds.

Use a telescope or binoculars to spot Jupiter's four bright "Galilean" moons. You can identify them by their changing positions and referring to various planetarium apps or this website:
https://skyandtelescope.org/wp-content/plugins/observing-tools/jupiter_moons/jupiter.html

Use a telescope to view shadow transits (total solar eclipses on Jupiter!) by Jupiter's large moons (see details below). Ganymede, the largest moon in the Solar System, casts the largest shadow of Jupiter's moons, and its shadow is usually the easiest to spot crossing the Giant Planet. Io's shadow is larger than Europa's, but smaller than Ganymede's shadow. Callisto's shadow does not cross Jupiter during this period.

January 6, 2025, 4:38 AM to 6:52 AM MST, Io's shadow crosses Jupiter (Locally, this event begins with Jupiter only 5 degrees high in the west northwest and ends after Jupiter sets at about 5:10 AM MST).

January 6, 2025, 7:52 PM to 10:26 PM MST, Europa's shadow crosses Jupiter.

January 7 to 8, 2025, 11:08 PM to 1:20 AM MST, Io's shadow crosses Jupiter.

January 9, 2025, 5:36 PM to 7:50 PM MST, Io's shadow crosses Jupiter (Locally this event begins in bright twilight with Jupiter 36 degrees above the eastern horizon and ends with Jupiter 62 degrees high in the sky, well after twilight has ended).

January 13 to 14, 2025, 10:28 PM to 1:02 AM MST, Europa's shadow crosses Jupiter.

January 15, 2025, 1:02 AM to 3:16 AM MST, Io's shadow crosses Jupiter.

January 16, 2025, 7:32 PM to 9:46 PM MST, Io's shadow crosses Jupiter.

January 20, 2025, 3:30 PM to 6:02 PM MST, Ganymede's shadow cross Jupiter at high southern latitude on Jupiter (Locally this event begins in daylight with Jupiter 20 degrees above the eastern horizon and ends during nautical twilight with the Sun 8 degrees below the horizon).

January 21, 2025, 1:04 AM to 3:40 AM MST, Europa's shadow crosses Jupiter (Locally this event begins with Jupiter 33 degrees high in the western sky and ends with Jupiter only 4 degrees above the western horizon.

January 22, 2025, 2:58 AM to 5:12 AM MST, Io's shadow crosses Jupiter (Locally this event begins with Jupiter only 11 degrees above the west-northwest horizon and ends long after Jupiter sets at 4:02 AM MST).

MARS - ALL NIGHT LONG – AT ITS CLOSEST AND BRIGHTEST IN 2025! Reddish (or butterscotch-tinted?) Mars rises in the east northeast in evening twilight at about 5:48 PM MST on January 6 and in daylight at 4:18 PM MST on January 21. On the evening of January 13, the full Moon occults (moves in front of) Mars, as detailed in an item above. During this period, Mars retrogrades (moves westward) against the stars of Constellation Cancer from January 6 to 11, re-entering Constellation Gemini on January 12. Mars is opposite the Sun in our sky on January 16, and therefore visible all night long. Mars is as bright as it gets in 2025 during this period. On January 6, the Red Planet shines at magnitude -1.40, brightening slightly to magnitude -1.45 on January 12, then fading a bit to magnitude -1.31 by January 21. This is a great period for viewing Mars through telescopes. Not only is Earth as close to the Red Planet as it gets this year (60.0 million miles on January 6, 59.7 million miles on January 12, and 60.7 million miles on January 21), but Mars rises more than 70 degrees high in Colorado's skies between 11 PM and 1 AM. Through telescopes Mars' disk spans 14.35 to 14.58 arc seconds. When Mars rises high in our sky, we see it through a relatively thin cross section of Earth's turbulent atmosphere, which may

allow for good views of Martian surface features such as Syrtis Major, Mare Acidalium, and the north polar ice cap and/or clouds of the "north polar hood." You can identify Martian surface features for any date and time by using the interactive chart at the following link…
https://skyandtelescope.org/wp-content/plugins/observing-tools/mars_profiler/mars.html
Find more info on observing Mars here:
https://www.alpo-astronomy.org/jbeish/2025_MARS.htm

LAST CALL FOR MERCURY BEFORE DAWN. If you can find a place with an unobstructed east-southeastern horizon (not always easy in Colorado!), you may be able to spot -0.4 magnitude Mercury on January 6 at around 6:45 AM MST about 5 degrees above that horizon (with the Sun still 9 degrees below the horizon). On following mornings, Mercury descends into glaring twilight leading up to its solar conjunction on February 8. On January 6, Mercury is 115 million miles distant from Earth, and through telescopes, its 84%-illuminated, gibbous disk spans 5.5 arc seconds. **Please do your Mercury spotting before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.**

DON'T GIVE UP - KEEP WATCHING THE NORTHERN CROWN! Better late than never? Will there soon be a bright "new" star in Constellation Corona Borealis ("The Northern Crown"), at least briefly? During January, you can find Corona Borealis in high in the eastern sky before morning twilight. T Coronae Borealis (T CrB) is a recurrent nova that (based on its past behavior) may rapidly increase in brightness 1500-fold (to second magnitude) to become the brightest star (or 2nd brightest star) in Corona Borealis between now and sometime in 2025 or 2026. Then this "new star" may fade rapidly below naked-eye visibility in about a week. As of early on January 5, T CrB had not yet exploded. For more about T CrB, read the article, "Get Ready for a Nova's Bright Return", by astrophysicist Brad Schaefer in the March 2024 issue of Sky & Telescopes Magazine, p. 34-40. You can find additional info at these sites…
https://blogs.nasa.gov/Watch_the_Skies/2024/02/27/view-nova-explosion-new-star-in-northern-crown/
https://skyandtelescope.org/astronomy-news/is-the-blaze-star-about-to-blow-you-may-be-the-first-to-know/
https://en.wikipedia.org/wiki/T_Coronae_Borealis
https://ui.adsabs.harvard.edu/abs/2023ATel16107....1S/abstract
https://www.aanda.org/articles/aa/full_html/2023/12/aa48372-23/aa48372-23.html

SEE A BRIGHT COMET (C/2024 G3) – AT LEAST VIRTUALLY! 2024 was a banner year for bright comets, including C/2023 A3 (Tsuchinshan-ATLAS), 13P/Olbers, and 12P/Pons-Brooks. What bright comets may be visible in 2025? Unfortunately, most of the comets that are predicted to enter the inner Solar System during 2025 will be either too faint to see with unaided eyes, or they will be best viewed from the southern hemisphere. The latter group includes C/2024 G3 (ATLAS), which may be at its brightest during this period. During January C/2024 G3 may become a stunning site from the southern hemisphere, before passing within 9 million miles of the Sun on January 13. After January 13, C/2024 G3 may again appear bright as seen from the southern hemisphere, if it survives its close solar encounter. We northerners can satisfy ourselves by viewing C/2024 G3 virtually (in near real time), when it passes through the field of view of the LASCO C3 Coronagraph of the SOHO satellite between January 11 and 14:
https://soho.nascom.nasa.gov/data/realtime/c3/512/
You can find more information on C/2024 G3 (ATLAS) and other comets for 2025 here…
https://skyandtelescope.org/astronomy-news/comet-atlas-c-2024-g3-kicks-off-the-new-year-what-to-expect/

And it's possible that a bright, yet-to-be discovered "wild comet" will grace our skies during 2025, as did C/2023 P1 (Nishimura) during August and September 2023.

THE SUN. The Sun has been very active over the past year, and intensely so in the past several months, when solar active regions have unleashed numerous flares and coronal mass ejections (CMEs) of charged particles. There have been M-class (moderate) solar flares each week for the past year, and there have been many X-class (extreme) solar flares, including X-class flares on July 14, 16, and 29, August 5, 8, and 14, September 12 and 14, October 1, 3, 7, 9, 24, 26, 31, November 6 and 10, December 8 and 30, and January 3 and 4. There also have been CMEs that have triggered geomagnetic storms that caused auroras. Many folks in Colorado and elsewhere viewed and/or photographed striking auroras during the nights of May 10-11 and October 10-11. As of January 5, there are many active regions with sunspots on the Earth-facing side of the Sun, and an X-class flare occurred as recently as January 4. So, we may experience more M- and possibly X-class flares and powerful CMEs. Airglow and "SARs" also result from high solar activity, and these phenomena also have been photographed and/or observed from Colorado. You can monitor sunspots, solar flares, CMEs, and other solar activity safely and in "real time" at the following sites:
https://sdo.gsfc.nasa.gov/data/
https://stereo.gsfc.nasa.gov/beacon/
http://halpha.nso.edu/
https://www.swpc.noaa.gov/
https://sohowww.nascom.nasa.gov/data/realtime-images.html
http://www.sidc.be/silso/ssngraphics
Note: As of January 5, many real-time images from SDO and SOHO sites are unavailable, due to a technical problem at Stanford. Do not look at the Sun directly without safe, specialized solar filters. Looking at the Sun can be very dangerous unless you take adequate precautions. Severe eye damage and even blindness can result.

AURORAS (aka "polar lights" or "northern lights"). It can be challenging to spot auroras from Colorado's mid-northern latitudes. But on the nights of May 10-11 and October 10-11, many of us were able to see and/or photograph some amazing auroras from Colorado! Coronal mass ejections (CMEs) from the Sun were aimed at our planet. Charged particles from CMEs were captured by Earth's magnetic field, energizing the ionosphere, thereby triggering geomagnetic storms and widespread auroras. As of January 5, there are many active regions with sunspots on the Earth-facing side of the Sun. So, the chances for geomagnetic storms are good and spotting auroras may be possible. You can get predictions and updates for auroras, their intensity, and geographic extent from NOAA's Space Weather Prediction Center:
https://www.swpc.noaa.gov/products/aurora-viewline-tonight-and-tomorrow-night-experimental
Auroras are most frequently seen from high latitudes, e.g., from Canada, Alaska, Iceland, northernmost Europe, southern New Zealand and Antarctica. We can watch auroras in real-time from Yellowknife, Northwest Territories on an all-sky camera at the Canadian Space Agency's AuroraMax website. Like Colorado, Yellowknife is in the Mountain Time Zone. An aurora webcam at the University of Alaska-Fairbanks is two hours behind the Mountain Time Zone…
https://www.youtube.com/watch?v=O52zDyxg5QI

EARTH SATELLITE HIGHLIGHTS. The following predictions are for western Colorado, specifically Montrose. Numerous Earth satellites are visible every clear night. Brighter satellites have smaller magnitude numbers, and the brightest (e.g., the International and Tiangong Space Stations) may have negative magnitudes. These predictions are for selected passes of some bright and/or interesting

satellites (as summarized from heavens-above.com). Satellite orbits can change. These predictions may be inaccurate. This is especially true for the International Space Station (ISS) and the Chinese Space Station, Tiangong, and we no longer show ISS and Tiangong predictions more than 5 days beyond the distribution date of the current "BCAS Observing Highlights" edition. Orbits of both space stations change frequently, due to periodic re-boosting and avoidance maneuvers (to prevent collisions with other orbiting objects). For accurate predictions of the ISS, Tiangong, and other satellites beyond January 10, check heavens-above.com or other satellite prediction sites for updates on the nights you wish to observe. Be sure to set application(s) for your location and time zone. On April 23, 2024, Rocket Lab launched a NASA satellite called the Advanced Solar Sail System (ACS3) to test propulsion from the solar wind. There are several optimal passes of ACS3 over the Western Slope during the next two weeks. The Advanced Composite Solar Sail System (ACS3) has been tumbling, resulting in big variations in its brightness. I observed ACS3 pass high in the sky on the evenings of December 24, 31 and January 2, when it varied from as bright as magnitude +1 to fainter than +5 over a period of about 6 seconds.

January 5, 2025. Tiangong (Chinese Space Station). 5:51 to 5:54 to 5:56 PM MST. W to N to ENE. Max altitude 47 deg above N, disappears into Earth's shadow 15 deg above ENE, max magnitude -1.6 (Passing through Lyra/Cygnus, Cepheus/Draco, Camelopardalis, and Gemini). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 5, 2025. Advanced Composite Solar Sail System (ACS3), 7:21 to 7:27 to 7:33 PM MST. S to W to NNW. Max altitude 59 deg above W, max magnitude +2.4 (Passing through Eridanus, Fornax, Cetus, Pisces, Pegasus, Lacerta, Cepheus, and Draco). **Brightness may vary hugely over a period of several seconds due to tumbling. Predictions for ACS3 are subject to change due to orbital changes from the solar wind. Also, NASA plans to control attitude and halt tumbling. Check for updated predictions.**

January 6, 2025. Tiangong (Chinese Space Station). 6:28 to 6:30 to 6:31 PM MST. WNW to N to NE. Max altitude 51 deg above N, disappears into Earth's shadow 43 deg above NE, max magnitude -1.8 (Passing through Cygnus, Cepheus, and Camelopardalis). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 7, 2025. Advanced Composite Solar Sail System (ACS3), 6:31 to 6:37 to 6:43 PM MST. SSE to ENE to N. Max altitude 59 deg above ENE, max magnitude +1.9 (Passing through Eridanus, Taurus, Perseus/Auriga, Camelopardalis, and Draco). **Brightness may vary hugely over a period of several seconds due to tumbling. Predictions for ACS3 are subject to change due to orbital changes from the solar wind. Also, NASA plans to control attitude and halt tumbling. Check for updated predictions.**

January 7, 2025. Tiangong (Chinese Space Station). 7:04 to 7:06 PM MST. In WNW. Disappears into Earth's shadow at max altitude 39 deg above WNW, max magnitude -0.8 (Passing through Vulpecula and Cygnus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 8, 2025. Tiangong (Chinese Space Station). 6:04 to 6:07 to 6:09 PM MST. WNW to NNE to E. Max altitude 65 deg above NNE, disappears into Earth's shadow 18 deg above E, max magnitude -2.1 (Passing through Cygnus, Cepheus, Cassiopeia, Perseus, Auriga, Taurus, and Orion). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 8, 2025. Advanced Composite Solar Sail System (ACS3), 6:57 to 7:03 to 7:10 PM MST. SSE to WSW to NNW. Max altitude 86 deg above WSW, max magnitude +1.9 (Passing through Eridanus,

Fornax, Eridanus again, Cetus, Aries, Triangulum, Andromeda, Cassiopeia, Cepheus, and Draco). **Brightness may vary hugely over a period of several seconds due to tumbling. Predictions for ACS3 are subject to change due to orbital changes from the solar wind. Also, NASA plans to control attitude and halt tumbling. Check for updated predictions.**

January 9, 2025. Tiangong (Chinese Space Station). 6:40 to 6:43 to 6:44 PM MST. WNW to SSW to SSE. Max altitude 54 deg above SSW, disappears into Earth's shadow 38 deg above SSE, max magnitude -1.6 (Passing through Delphinus, Pegasus, Pisces, Cetus, and Eridanus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 9, 2025. Advanced Composite Solar Sail System (ACS3), 7:24 to 7:30 to 7:36 PM MST. S to W to NNW. Max altitude 52 deg above W, max magnitude +2.6 (Passing through Eridanus, Cetus, Pisces, Pegasus, Lacerta, Cepheus/Cygnus, and Draco). **Brightness may vary hugely over a period of several seconds due to tumbling. Predictions for ACS3 are subject to change due to orbital changes from the solar wind. Also, NASA plans to control attitude and halt tumbling. Check for updated predictions.**

January 10, 2025. Tiangong (Chinese Space Station). 5:40 to 5:43 to 5:46 PM MST. 1st PM Tiangong pass of January 10. WNW to SSW to ESE. Max altitude 89 deg above SSW, max magnitude -2.2 (Cygnus, Lacerta, Andromeda, Triangulum, Aries, Taurus, and Orion). **This pass occurs in bright twilight and may be difficult to see. Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

January 10, 2025. Advanced Composite Solar Sail System (ACS3), 6:07 to 6:13 to 6;19 PM MST. SE to ENE to N. Max altitude 40 deg above ENE, max magnitude +2.3 (Passing through Eridanus, Orion, Taurus, Auriga, Camelopardalis, and Draco/Ursa Major). **Brightness may vary hugely over a period of several seconds due to tumbling. Predictions for ACS3 are subject to change due to orbital changes from the solar wind. Also, NASA plans to control attitude and halt tumbling. Check for updated predictions.**

January 10, 2025. International Space Station (ISS). 6:34 to 6:36 PM MST. S to SE. Disappears into Earth's shadow at max altitude 16 deg above SE, max magnitude -1.8 (Passing through Phoenix, Fornax, and Eridanus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

January 10, 2025. Tiangong (Chinese Space Station). 7:17 to 7:19 PM MST. 2nd PM Tiangong pass of January 10. W to SSW. Disappears into Earth's shadow at max altitude 18 deg above SSW, max magnitude +0.4 (Passing through Aquarius-near Venus to Cetus/Piscis Austrinus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

As of January 5, additional evening passes for the ISS are predicted from January 11 to 18. Additional evening passes for Tiangong are predicted from January 11 to 13. More evening passes for the Advanced Composite Solar Sail System (ACS3) are predicted for January 11 to 21. These predictions are subject to change. For updates on times, check heavens-above (or other prediction websites) shortly before you want to observe. Be sure to enter your location and time zone info when using prediction websites.

HAPPY OBSERVING!