OBSERVING HIGHLIGHTS for February 20 to March 6, 2025, a "dark Moon period"
Black Canyon Astronomical Society (BCAS), western Colorado, USA

SUMMARY. On evenings during this "dark Moon period", be sure to enjoy the bright stars and constellations of winter and a striking alignment of planets! As darkness falls, Constellation Orion (with bright stars, Betelgeuse and Rigel) is high in the south, Auriga (with bright Capella) is nearly overhead, and Canis Major (with brilliant Sirius) is high in the southeast. The winter Milky Way extends from the northwestern horizon, through Constellation Auriga near the zenith, to the south-southeastern horizon. As a bonus, Venus, now as bright as any planet can appear, is moving against the stars of Constellation Pisces high in the west, Jupiter shines brightly high in the south among the stars of Constellation Taurus, and reddish Mars is moving against the stars of Constellation Gemini, high in the east. From the Western Slope on February 24 between 6:35 to 6:45 PM MST, you may be able to spot Mercury and fainter Saturn in evening twilight very low above an unobstructed western horizon (you'll likely need binoculars to see Saturn). And, if you have a telescope, you may be able to find faint Neptune between Saturn and Venus and Uranus between Jupiter and Mars.

The Moon reaches last quarter on February 20, and from February 21 to 25, we can watch a crescent Moon wane in the morning sky. The Moon is new, and consequently invisible, on February 27. Watch the crescent Moon wax during evenings from February 28 to March 5. The Moon reaches first quarter on March 6. On the morning of February 21, look for the waning crescent Moon just southeast of the reddish star, Antares. On February 28 at about 6:40 PM MST, look for a thin, waxing crescent Moon about 2 degrees below Mercury and 3 degrees above Saturn (even with binoculars spotting Saturn may be difficult). On the evening of March 1, the 5%-illuminated, crescent Moon is about 8 degrees below and left from brilliant Venus. Enjoy seeing reflected light from Earth (earthshine) faintly illuminate the nightside of the crescent Moon, especially on mornings from February 22 to 25 and on evenings from February 28 to March 3 (binoculars enable striking views!). Please do your planet and crescent Moon spotting after sunset or before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.

As of February 19, there are several active regions with large sunspots on the Earth-facing side of the Sun. 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. Never look at the Sun without safe, specialized solar filters. This high solar activity is triggering geomagnetic storms, auroras (aka "northern lights"), and airglow. So, keep watch for these phenomena!

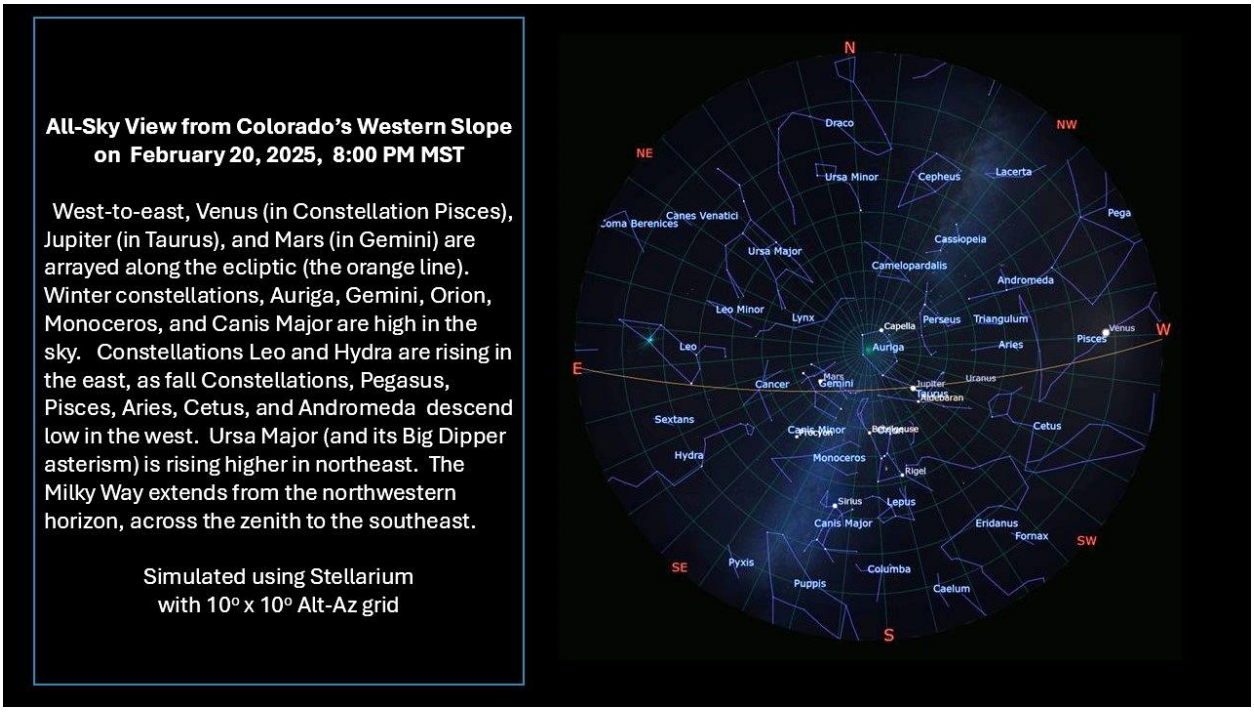
From western Colorado, view predicted passes of interesting satellites, including evening passes of the bright Tiangong (Chinese) Space Station from February 19 to March 4. There are predicted predawn passes of the even brighter International Space Station (ISS) from February 21 to March 6. And there are predicted evening passes of NASA's Advanced Composite Solar Sail System (ACS3) between February 19 and March 6. ACS3 has been tumbling. This results in large changes in brightness over a period of several seconds (from as bright as magnitude +1 to fainter than magnitude +5), as this satellite crosses the sky.

WESTERN SLOPE SKIES. Since 2011, KVNF Community Radio has aired Western Slope Skies (WSS), a biweekly astronomy feature every two weeks on Friday mornings and on the following Wednesday evenings. On February 19, Jaxon Potts, President of the CMU Astronomy Club, is scheduled to tell us about the striking alignment of planets in the evening sky of late February. Then, on February 28 and March 5, Art Trevena discusses the total lunar eclipse that will occur on the night of March 13-14.

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

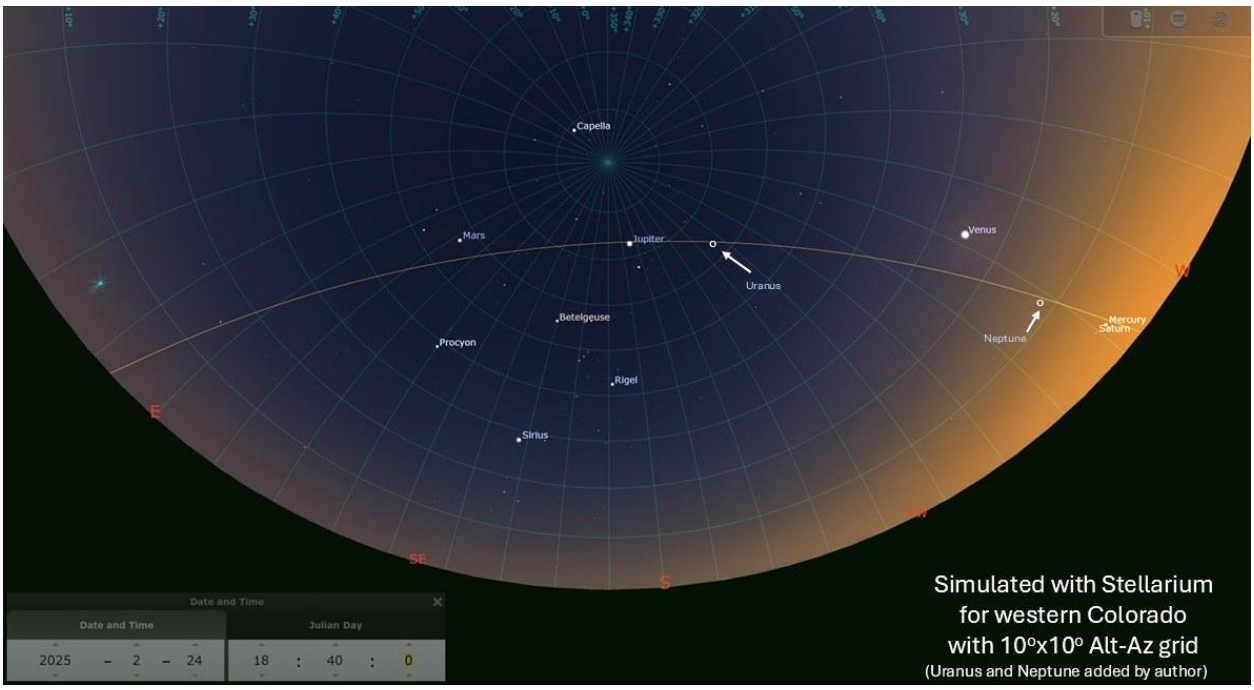
+6. Some of the brightest stars are 0 magnitude (e.g., Vega, Arcturus), while the brightest sky objects have negative magnitudes (e.g., Sirius at -1.5, Jupiter at -2 to -3, Venus at -4 to -5, the full Moon at -12 to -13, and the Sun at -26.7 magnitude). Angular distances on the sky are usually cited 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

BRIGHT STARS AND PLANETS IN A DARK WINTER SKY! Late February 2025 is a wonderful time to enjoy the bright stars and constellations of winter, which are high in our Western Slope's dark skies during early evening hours. Use a planetarium app or the chart below to find Constellation Orion (with bright stars, Betelgeuse and Rigel, high in the south), Constellation Auriga (with the bright star, Capella, nearly overhead), Constellation Gemini high in the east, Constellation Canis Major (with brilliant Sirius, high in the southeast), and Constellations Leo and Hydra, rising in the east. The Constellations of fall, including Pisces, Pegasus, and Cetus, are now descending in the west. Ursa Major (and its Big Dipper asterism) is rising high in the northeast. The winter Milky Way (with its numerous star clusters and nebulae) extends from the northwest, across the zenith to the south southeast. As a bonus, bright planets are also visible, including Venus (currently in Pisces), Jupiter (now in Taurus), and Mars, (passing through Gemini). And during evening twilight, you may be able to spot Mercury and Saturn (as noted in a separate item, below).



SEE ALL THE PLANETS IN THE EARLY EVENING - FEBRUARY 24 AND 25! From 38 to 48 minutes after sunset on February 24 (that translates to about 6:35 to 6:45 PM MST for the Western Slope), look just south of west and just above the horizon to spot Mercury 2 degrees to the right of fainter Saturn. On the following evening (February 25), Mercury will be a bit above and to the right of Saturn. You need to find a place with an unobstructed western horizon, and you may need binoculars to spot Saturn. Mercury, shining at magnitude -1.2, is 8 times brighter than Saturn, so use Mercury as a guide for finding +1.1 magnitude Saturn with binoculars. Then gaze upward in the west to spot brilliant Venus (magnitude -4.8), find bright Jupiter (magnitude -2.3) high in the south, and reddish Mars (magnitude

-0.4), high in the southeast. You can use a planetarium app or the chart below to navigate. If you have a telescope (especially one with a computerized "Go-To" mount), you may also find faint Neptune between Saturn and Venus and Uranus between Venus and Jupiter. Then look beneath your feet: there's Earth! The other planets appear near the ecliptic, shown as the orange line in the chart below. The ecliptic is the apparent path of the Sun against background stars. The planets always appear near the ecliptic, because their orbits of the Sun are inclined by only a few degrees to Earth's orbit of our central star. **Please do your planet spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**



THE MOON. The Moon reaches **last quarter on February 20** (exactly at 10:32 AM MST), and from February 21 to 25, we can watch a crescent Moon wane in the morning sky. The **Moon is new, and consequently invisible, on February 27** (exactly new at 5:45 PM MST). Watch the crescent Moon wax during evenings from February 28 to March 5. The **Moon reaches first quarter on March 6** (exactly at 9:31 AM MST). On the morning of February 21, look for a 42%-illuminated, waning crescent Moon just southeast of the reddish star, Antares. On February 28 at about 6:40 PM MST (with the Sun 8 degrees below the horizon), look for a thin (1%-illuminated), waxing crescent Moon about 2 degrees below Mercury and 3 degrees above Saturn. Even with binoculars, spotting Saturn may be difficult, as it's only 2 degrees above the horizon in bright twilight. On the evening of March 1, the 5%-illuminated, crescent Moon is about 8 degrees below and left from brilliant Venus. Enjoy seeing earthshine faintly illuminate the nightside of the crescent Moon, especially on mornings from February 22 to 25 and on evenings from February 28 to March 3 (binoculars can provide eye-catching views!). NASA has published a stunning visualization of lunar phases for year 2025. Another fun site is NASA's daily Moon guide. **Please do your crescent Moon spotting before sunrise and after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

VENUS AT ITS BRIGHTEST! Wow! As the sky darkens, Venus is a brilliant beacon high in the west. On February 20, our "Sister Planet" shines at magnitude -4.87; that's as bright as any planet can appear from Earth! After February 22, Venus, still awesomely bright, fades slightly to magnitude -4.65 by March

6. Venus is now retrograding (moving westward against the stars), as it nears solar conjunction on March 22. Venus still sets in a dark sky, at about 9:03 PM MST on February 20 and at about 8:17 PM MST on March 6. **With bright moonlight absent from February 20 to 28 and Venus still well above the western horizon between 7:25 and 8:00 PM MST, you may be able to see shadows cast by Venus from dark locations! To see a Venus-cast shadow, try placing a small object directly in front of a white surface, aligned toward Venus (moving the object may help you see the shadow)**. Our "Sister Planet" is 36 million miles distant on February 20 and only 29 million miles distant on March 6. Through telescopes, Venus' crescent phase wanes from 22% illuminated on February 20 to only 9% illuminated on March 6, as Venus' apparent diameter increases from 43.1 to 53.1 arc seconds. **By early March Venus' crescent may be large enough to resolve in binoculars (it may be easiest to resolve during bright twilight, when your eyes are not overwhelmed by Venus' brightness)! Please do your Venus spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

LAST CALL FOR SATURN IN THE EVENING. On February 20 between 6:35 and 6:50 PM MST, try to spot Saturn just a few degrees above an unobstructed western horizon. On February 24, Saturn (at magnitude +1.1) appears about 2 degrees to the left of Mercury (magnitude -1.2). Mercury is about 8 times brighter than Saturn. With binoculars, try using Mercury as a guide for finding Saturn. Evening-by-evening, Saturn descends into brighter evening twilight in advance of its solar conjunction on March 11. After February we won't see Saturn in the evening sky again until late summer, although early risers may spot the Ringed Planet in morning twilight by mid-April. **Please do your Saturn spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

MERCURY – BEST EVENING APPEARANCE OF 2025! At about 6:22 PM MST on February 20 from the Western Slope, you may be able to spot Mercury in bright twilight, just 3 degrees above an unobstructed western horizon. This will be challenging, and you may need binoculars. The "Speedster Planet" is rapidly emerging into our evening sky from the far side of the Sun, after its solar conjunction on February 9 (February 8 in the Mountain Time Zone). On February 20 at 6:22 PM MST, Mercury shines at magnitude -1.34, but its brightness is masked by glaring twilight, with the Sun just 6 degrees below the horizon. On the evening of February 24, Mercury (at magnitude -1.1) appears about 2 degrees from fainter Saturn, as noted above. Then on February 28 at about 6:45 PM MST, you may spot Mercury (at magnitude -1.0) just above a very thin, 1%-illuminated, crescent Moon. By March 6 at 7:05 PM MST, Mercury, shining at magnitude -0.45, gets easy to spot, as it's still 6 degrees above the western horizon at the end of nautical twilight (with the Sun 12 degrees below the horizon). Mercury is 119 million miles distant on February 20, but only 88 million miles distant on March 6. As seen through telescopes between February 20 and March 6, Mercury's gibbous phase wanes from 94% to 51% illuminated, as its apparent diameter increases from 5.3 to 7.1 arc seconds. **Please do your Mercury spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

BRIGHT JUPITER IN THE EVENING. As twilight fades, bright Jupiter is more than 70 degrees above the southwestern horizon. Jupiter is currently the third brightest object in the night sky (after the Moon and Venus). Jupiter is moving against the stars of the Constellation Taurus, about 5 degrees north from the red giant star, Aldebaran, and the Hyades Star Cluster. The Giant Planet sets in the west northwest at about 2:08 AM MST on February 20 and 1:18 AM MST on March 6. During this period Jupiter fades slightly from magnitude -2.36 to -2.26, but it's still very bright. Jupiter is 451 million miles distant on February 20 and 471 million miles distant on March 6. Through telescopes or binoculars, the Giant Planet's apparent equatorial diameter decreases from 41 to 39 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. Unfortunately for us on the Western Slope, the only visible transit of Ganymede's shadow during this period occurs during local daylight on March 4 from 3:30 PM to 5:14 PM MST. You may be able to observe this transit of Ganymede's shadow if you can locate Jupiter with a Go-To telescope during this time. Io's shadow is larger than Europa's, but smaller than Ganymede's shadow. Callisto's shadow does not cross Jupiter during this period.

February 22, 2025, 12:42 AM to 3:22 AM MST, Europa's shadow crosses Jupiter (Locally, this event begins with Jupiter 14 degrees above the west-northwestern horizon and ends after Jupiter sets at about 2:01 AM MST).

February 22-23, 2025, 11:38 PM to 1:54 AM MST, Io's shadow crosses Jupiter (Locally, this event begins with Jupiter 25 degrees high in the west and ends with Jupiter less than 1 degree above the west-northwestern horizon).

February 24, 2025, 6:08 PM to 8:24 PM MST, Io's shadow crosses Jupiter (Locally this event begins with Jupiter 72 degrees above the southern horizon during bright twilight and ends with Jupiter 61 degrees high in a dark sky).

March 3, 2025, 8:04 PM to 10:20 PM MST, Io's shadow crosses Jupiter.

March 4, 2025, 3:30 PM to 5:14 PM MST. Ganymede's shadow crosses Jupiter at high southern latitude on Jupiter (Locally this event occurs with Jupiter high in the sky during daylight. You may be able to observe it, if you can find Jupiter using a Go-To Telescope).

MARS THROUGH MOST OF THE NIGHT. Reddish (or butterscotch-tinted?) Mars is more than 50 degrees above the eastern horizon in Constellation Gemini as the sky darkens. During this period, Mars ceases retrograding (moving to the west against the starry background), and the Red Planet resumes its "normal" eastward motion. Mars is still prominent through much of the night, setting in the northwest at about 5:00 AM MST on February 20 and 4:01 AM MST on March 6.

After Earth's close approach to Mars on January 12, the Red Planet continues to fade, from magnitude -0.5 on February 20 to magnitude -0.1 on March 6, as its distance from Earth increases from 74.5 million miles to 85.0 million miles. Although fading, Mars is still the brightest, reddish natural object in our sky. Mars rises more than 70 degrees high in the Western Slope's skies between 8 and 10 PM MST during this period. Through telescopes Mars' apparent diameter decreases from 11.7 to 10.3 arc seconds, but that still may be large enough for spotting interesting features on the Red Planet. When Mars rises this high in our sky, we see it through a relatively thin cross section of Earth's turbulent atmosphere. This 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

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 this period, you can find Corona Borealis 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 February 19, 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

THE SUN. The Sun has been very active over the past year, and intensely so in the past year, 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 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. In 2024, 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 February 19, there are several active regions with large sunspots on the Earth-facing side of the Sun. So, we may experience more M- and possibly X-class flares and powerful CMEs. Airglow and SAR arcs 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
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 in 2024, 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 February 19, there are several active regions with large 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 satellite 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 February 24, 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, the Advanced Solar Sail System (ACS3), to test propulsion from the solar wind. There are some evening 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, from as bright as magnitude +1 to fainter than +5 over a period of several seconds.

February 19, 2025. Advanced Composite Solar Sail System (ACS3), 6:24 to 6:30 to 6:37 PM MST. SSE to WSW to NNW. Max altitude 86 deg above WSW max magnitude +2.0 (Passing through Lepus/Eridanus, Taurus, Perseus, Cassiopeia/Camelopardalis, Cepheus, and Draco. This pass may be hard to see in bright twilight.). **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 may try to halt tumbling, which would impact its brightness. This pass occurs with the Sun just 6 to 9 degrees below the horizon and may be challenging to see. Check for updated predictions.**

February 19, 2025. Tiangong (Chinese Space Station). 6:34 to 6:37 to 6:40 PM MST. SW to SSE to E. Maximum altitude 49 deg above SSE, disappears into Earth's shadow 14 deg above E, max magnitude -1.7 (Passing through Cetus/Sculptor, Eridanus, Orion, Canis Minor, Cancer/Hydra, and Leo). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

February 20, 2025. Advanced Composite Solar Sail System (ACS3), 6:50 to 6:56 to 7:02 PM MST. S to W to NNW. Max altitude 53 deg above W, max magnitude +2.8 (Passing through Eridanus, Cetus, Aries, Triangulum, Andromeda, Cassiopeia, and Cepheus). **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 may try to halt tumbling, which would impact its brightness. Check for updated predictions.**

February 20, 2025. Tiangong (Chinese Space Station). 7:12 to 7:16 to 7:16 PM MST. W to NNW to NE. Maximum altitude 68 deg above NNW, disappears into Earth's shadow 42 deg above NE, max magnitude -2.0 (Passing through Pisces-near Venus, Andromeda, Perseus, Camelopardalis, and Ursa Major).

Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.

February 21, 2025. International Space Station (ISS). 5:34 to 5:35 AM MST. NNW to N. Appears from Earth shadow 11 deg above NNW, maximum altitude 12 deg above NNW, max magnitude -1.3 (Passing through Camelopardalis and Cassiopeia). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

February 21, 2025. Tiangong (Chinese Space Station). 7:51 to 7:53 PM MST. WNW to NW. Disappears into Earth's shadow at maximum altitude 33 deg above NW, max magnitude -0.5 (Passing through Pisces, Pegasus, and Andromeda/Cassiopeia). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

February 22, 2025. International Space Station (ISS). 4:47 to 4:48 AM MST. NNE to NE. Appears from Earth shadow near max altitude 10 deg above NNE, maximum altitude 10 deg above NNE, max magnitude -0.7 (Passing through Cassiopeia). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

February 22, 2025. Tiangong (Chinese Space Station). 6:52 to 6:55 to 6:57 PM MST. W to N to ENE. Maximum altitude 52 deg above N, disappears into Earth's shadow 20 deg above ENE, max magnitude -1.6 (Passing through Pisces, Pegasus, Cassiopeia, Camelopardalis, Ursa Major, and Leo Minor). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

February 23, 2025. Advanced Composite Solar Sail System (ACS3), 6:24 to 6:30 to 6:37 PM MST. S to WSW to NNW. Max altitude 81 deg above WSW max magnitude +2.1 (Passing through Lepus/Eridanus, Taurus, Perseus, Cassiopeia, Cepheus, and Draco. This pass may be hard to see in bright twilight.). **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 may try to halt tumbling, which would impact its brightness. This pass occurs with the Sun just 6 to 8 degrees below the horizon and may be challenging to see. Check for updated predictions.**

February 23, 2025. Tiangong (Chinese Space Station). 7:30 to 7:33 PM MST. WNW to N. Disappears into Earth's shadow at max altitude 47 deg above N, max magnitude -1.6 (Passing through Pegasus, Cassiopeia, and Camelopardalis). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

February 24, 2025. International Space Station (ISS). 6:22 to 6:23 AM MST. N to NNE. Appears from Earth shadow near max altitude 10 deg above N, maximum altitude 10 deg above N, max magnitude -0.9 (Passing through Camelopardalis, Cassiopeia, and Andromeda). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

February 24, 2025. Tiangong (Chinese Space Station). 6:31 to 6:34 to 6:37 PM MST. WNW to N to ENE. Max altitude 46 deg above N, disappears into Earth's shadow at max altitude 10 deg above ENE, max magnitude -1.5 (Passing through Pegasus, Cassiopeia/Lacerta/Cepheus, Camelopardalis, Ursa Major, and Leo. This pass may be difficult to observe in bright twilight). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

February 24, 2025. Advanced Composite Solar Sail System (ACS3), 6:50 to 6:56 to 7:02 PM MST. S to W to NNW. Max altitude 49 deg above W max magnitude +2.9 (Passing through Eridanus, Cetus, Aries, Triangulum, Andromeda, Cassiopeia/Lacerta, and Cepheus). **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 may try to halt tumbling, which would impact its brightness. Check for updated predictions.**

There are additional, predicted passes for Tiangong on evenings from February 25 to March 4. There are predicted, predawn passes of the bright International Space Station (ISS) from February 26 to March 6. More evening passes for the Advanced Composite Solar Sail System (ACS3) are predicted from February 25 to March 6. 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!