BCAS OBSERVING HIGHLIGHTS for July 17 to August 1, 2025, a "dark Moon period"
Black Canyon Astronomical Society (BCAS), western Colorado, USA

SUMMARY. If we can avoid smoke and/or monsoonal cloudiness, this is a great time to enjoy the stars on mid-summer evenings and to preview our fall and early winter stars before dawn in mild temperatures! After twilight ends, the Milky Way spans our dark sky from Constellations Scorpius and Sagittarius in the south southeast, through Aquila and Cygnus high in the east, to Cepheus and Cassiopeia in the northeast. If clouds block the evening sky, try viewing after midnight when clouds sometimes dissipate. How early can you spot the heliacal rising (first visible rising before the Sun) of bright stars in Orion? Although it's warm in western Colorado, the heliacal rising of Betelgeuse and Rigel in Orion portends the cooler weather of fall and early winter.

Reddish Mars, having faded to magnitude +1.6, becomes visible about 15 degrees above the western horizon as twilight fades. Saturn rises in the east at around 11:04 PM MDT on July 17 and 10:26 PM MDT on August 1. The Ringed Planet brightens from magnitude +0.87 to +0.79 during this period. On July 18 between 1:00 AM MDT and sunrise, use a telescope to view a total solar eclipse on Saturn, when the shadow of Titan, Saturn's largest moon, crosses the Ringed Planet. Brilliant Venus, shining at magnitude -4.0, rises at about 3:12 AM MDT on July 17 and 3:18 AM MDT on August 1. Bright Jupiter (magnitude -1.9) is getting easier to spot above the east-northeastern horizon just before dawn.

The Moon reaches last quarter on July 17, and from July 18 to 23 the crescent Moon wanes in the morning sky. The Moon is new on July 24. Watch the crescent Moon wax during evenings from July 25 to 31. The Moon reaches first quarter on August 1. On the morning of July 20, watch the waning crescent Moon move in front of the Pleiades Star Cluster, a striking sight in binoculars and telescopes! In the predawn of July 21, the crescent Moon is about 7 degrees above brilliant Venus. On July 23 at 5:00 AM MDT, look for a skinny, crescent Moon about 6 degrees left of Jupiter, when both are about 5 degrees above an unobstructed, east-northeastern horizon. On July 26 at about 9:15 PM MDT, look for the 6%-illuminated, crescent Moon about 3 degrees above the first-magnitude star, Regulus. In the early evening of July 28, the lunar crescent is about 5 degrees to the left of reddish Mars. Enjoy seeing earthshine delicately illuminate the nightside of the crescent Moon, especially on mornings from July 19 to 23 and on evenings from July 26 to 29 (binoculars can provide eye-catching views!).

There are numerous active regions containing sunspots on the Earth-facing side of the Sun, which may produce solar flares and coronal mass ejections. Coronal mass ejections can trigger auroras (aka northern lights), which could become visible from Colorado.

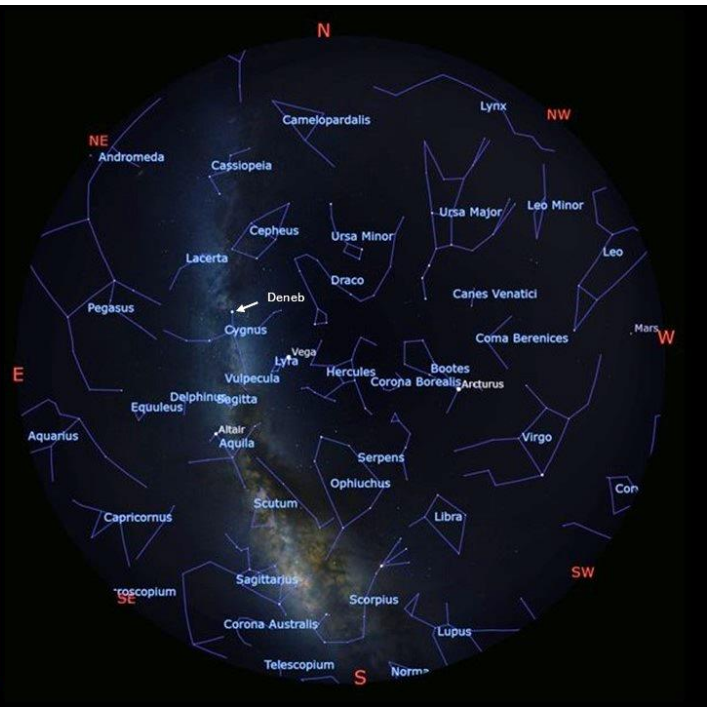
Try to spot predicted passes of the bright Tiangong (Chinese) Space Station on evenings from July 16 to 31. And there are predicted passes for the even brighter International Space Station (ISS) from July 17 to 29.

ENJOY A DARK, SUMMER EVENING SKY! The Milky Way spans the evening sky, from Constellations Scorpius and Sagittarius in the south southeast, through Aquila and Cygnus high in the east, to Cepheus and Cassiopeia in the northeast. Note that the Milky Way is brightest in Sagittarius, the direction of the center of our Galaxy, where stars are most concentrated. The constellations of early spring, Leo, Virgo, and Coma Berenices, are descending in the west as darkness falls, although spring Constellations Boötes and Corona Borealis, remain visible until after midnight. As it rises high in the east, spot the "Summer Triangle" asterism, composed of bright stars Vega (in Lyra), Altair (in Aquila), and Deneb (in Cygnus). Use a planetarium app or the chart below to navigate. If clouds obscure the evening sky, try viewing around midnight or after midnight, when cloudiness sometimes dissipates.

All-Sky View from Colorado's Western Slope for July 17, 2025, 10:30 PM MDT

Spring Constellations, Leo (with visiting Planet Mars) and Virgo are descending low in the west, with Boötes and Corona Borealis following them. Fading Mars is low toward the western horizon. Constellation Hercules is west of the zenith, Draco is high in the north, and the Big Dipper is descending in the northwest. The Milky Way spans the sky, from its bright central regions in Sagittarius and Scutum in the south southeast through Aquila and Cygnus, to its fainter outer regions in Cepheus and Cassiopeia in the northeast. The Summer Triangle asterism, consisting of bright stars Vega, Altair, and Deneb, is high in the east.

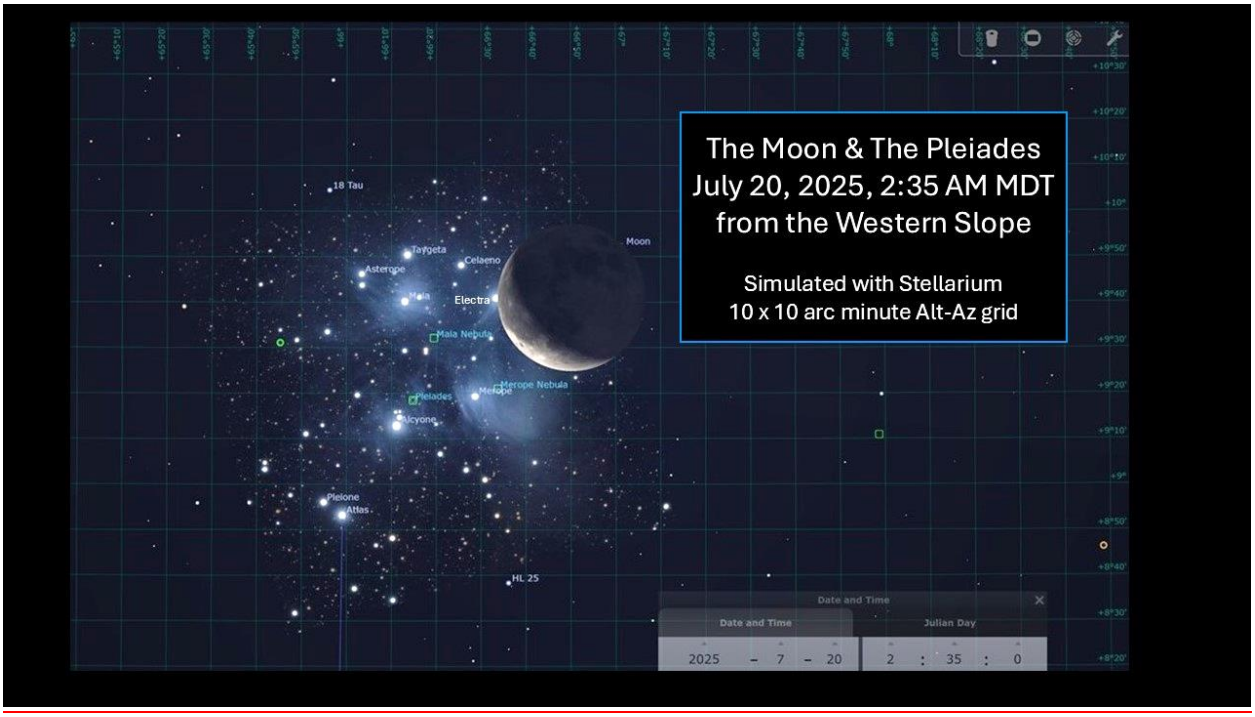
Simulated using Stellarium



THE MOON. The Moon reaches **last quarter on July 17** (exactly at 6:38 PM MDT), and from July 18 to 23 the crescent Moon wanes in the morning sky. The **Moon is new on July 24** (exactly new at 1:11 PM MDT). Watch the crescent Moon wax during evenings from July 25 to 31. The **Moon reaches first quarter on August 1** (exactly at 6:41 AM MDT). On the morning of July 20, the waning crescent Moon moves in front of the Pleiades Star Cluster (see next item for details). In the predawn of July 21, the 14%-illuminated, crescent Moon is about 7 degrees above brilliant Venus. On July 23 at 5:00 AM MDT, look for a skinny, 2%-illuminated, crescent Moon about 6 degrees left of Jupiter, when both are about 5 degrees above an unobstructed east-northeastern horizon. On July 26 at about 9:15 PM MDT, look for the 6%-illuminated, crescent Moon about 3 degrees above the first-magnitude star, Regulus. In the early evening of July 28, the 19%-illuminated lunar crescent is about 5 degrees to the left of reddish Mars. Enjoy seeing earthshine delicately illuminate the nightside of the crescent Moon, especially on mornings from July 19 to 23 and on evenings from July 25 to 29 (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.**

THE MOON COVERS THE PLEIADES – JULY 20 - AM! As seen from the Western Slope, the eastward-moving, crescent Moon will pass directly in front of several bright stars in the famous Pleiades Star Cluster (aka M45) on July 20 between about 2:37 AM and 4:45 AM MDT. Binoculars and telescopes will enable awesome views of these events! The action starts at around 2:37 AM MDT about 10 degrees above our east-northeastern horizon, as the waning lunar crescent occults (covers) 3.7-magnitude Electra, followed by occultations of Merope, Alcyone, and Pleione. Many fainter stars in the Pleiades will also be occulted. From the Western Slope, approximate times of the disappearances and reappearances of four bright Pleiades stars are shown on the table below (times may vary by several minutes, based on your exact location). If you are interested in occultations, the circumstances of this encounter are very favorable for the Western Slope: The action starts when the Pleiades are well above the horizon in a dark sky before morning twilight, and the 24%-illuminated lunar crescent is not

overpoweringly bright, allowing for good views of the stars. Disappearances of the stars occur along the bright, leading edge of the Moon, and reappearances occur along the darker, trailing edge of the Moon, which is faintly illuminated by earthshine.



Star	Magnitude	Disappearnce	Reappearance
Electra	3.7	2:37 AM MDT	3:18 AM MDT
Merope	4.1	3:01 AM MDT	3:43 AM MDT
Alcyone	2.9	3:27 AM MDT	4:16 AM MDT
Pleione	5.1	4:17 AM MDT	4:45 AM MDT
approximate times from Stellarium for the Western Slope			

MARS IN THE EVENING. As twilight fades, **r**eddish (or butterscotch-tinted?) Mars is less than 15 degrees above the western horizon. The Red Planet moves eastward, amidst the stars of Constellation Leo, entering Virgo on July 28. Mars' rapid eastward motion against the stars will keep the Red Planet in our evening sky through the middle of fall. Mars now sets before midnight, at about 11:04 PM MDT on July 17 and 10:26 PM MDT on August 1. The Red Planet shines at magnitude +1.6 during this period, as it gets yet farther from Earth, from 189 million miles distant on July 17 to 198 million miles distant on August 1. Through telescopes, Mars' 94%-illuminated, gibbous disk decreases from 4.6 to 4.4 arc seconds in diameter between July 17 and August 1. Due to its small apparent size, it's now extremely challenging to spot features on the Red Planet. Find more info on observing Mars here: https://www.alpo-astronomy.org/jbeish/2025_MARS.htm

SATURN RISES BEFORE MIDNIGHT. The Ringed Planet now rises before midnight, at about 11:39 PM MDT on July 17, and 10:40 PM MDT on August 1. Saturn brightens from magnitude +0.87 on July 17 to magnitude +0.79 on August 1, as its distance from Earth decreases from 847 million to 827 million miles. Through telescopes Saturn's disk appears 18 to 19 arc seconds wide, and its rings span 43 arc seconds.

During 2025, Saturn's thin rings (150,000 miles wide but only 1000 ft thick!) are nearly "edge-on" from our perspective on Earth. Saturn's rings are not as striking as they have been in the past few years (and will be a few years from now). When seen nearly edge-on, the rings are dimmer, making it easier to spot some of Saturn's mid-sized moons, like Tethys, Dione, Rhea, and Enceladus. Titan, Saturn's largest moon, is bright enough to see with just binoculars. You can follow the changing positions of Saturn's moons by using various planetarium apps and/or visiting 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 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/

TITAN'S SHADOW MOVES ACROSS SATURN – JULY 18 AM! Use a telescope to watch the rare sight of Titan's shadow moving across the Ringed Planet on the morning of July 18! This is a total solar eclipse on Saturn! Titan is Saturn's largest moon, and the second largest moon in the Solar System. Titan has a larger diameter than the Planet Mercury! The July 18 transit begins at 1:00 AM MDT, when Saturn is 15 degrees above the eastern horizon on the Western Slope. But the Ringed Planet rises 42 degrees high in the southeast by the middle of the transit at 3:44 AM MDT (see chart below), and to 50 degrees above the southern horizon by the beginning of civil twilight at 5:30 AM MDT. The transit ends at 6:05 AM MDT, just after local sunrise at about 6:03 AM MDT. Titan's orbital period of Saturn is 1.5 hours short of 16 Earth days, so transits are now occurring every 16 days. After July 18, there will be five more transits of Titan's shadow in 2025 (see table, below). But after the transit on October 5-6, we will have to wait 15 years for the next group of Titan shadow transits! Through the summer, local circumstances for viewing Titan's shadow transits improve, because Saturn rises progressively earlier and gets higher in our sky before the Sun rises. Offsetting that favorable trend, clouds from our "southwest monsoon" may start to interfere by mid-July. In addition to transit times, approximate times for Saturn's rise and sunrise on the Western Slope are shown in the table. Titan's shadow is large. But Saturn is on average about twice the distance of Jupiter. So, the size of Titan's shadow appears roughly the same size as the shadow of Jupiter's moon, Europa, which is smaller than Titan.

Transits of Titan's shadow across Saturn

Date UTC	Date MDT	start MDT	middle MDT	end MDT	Saturn rises MDT	Sunrise MDT
7/18/2025	7/18/2025	1:00 AM	3:44 AM	6:05 AM	17Jul, 11:39 PM	6:03 AM
8/3/2025	8/3/2025	12:25 AM	2:52 AM	5:04 AM	2Aug, 10:36 PM	6:13 AM
8/19/2025	8/18-19/2025	11:52 PM	2:01 AM	4:00 AM	18Aug, 8:26 PM	NA
9/4/2025	9/3-4/2025	11:25 PM	1:09 AM	2:50 AM	3Sep, 8:26 PM	NA
9/20/2025	9/19-20/2025	11:09 PM	12:20 AM	1:34 AM	19Sep, 7:21 PM	NA
10/6/2025	10/5/2025		11:32 PM		NA	NA
transit times from Sky & Telescope (converted to MDT by author)						
times for local Saturn rise and sunrise from Stellarium						

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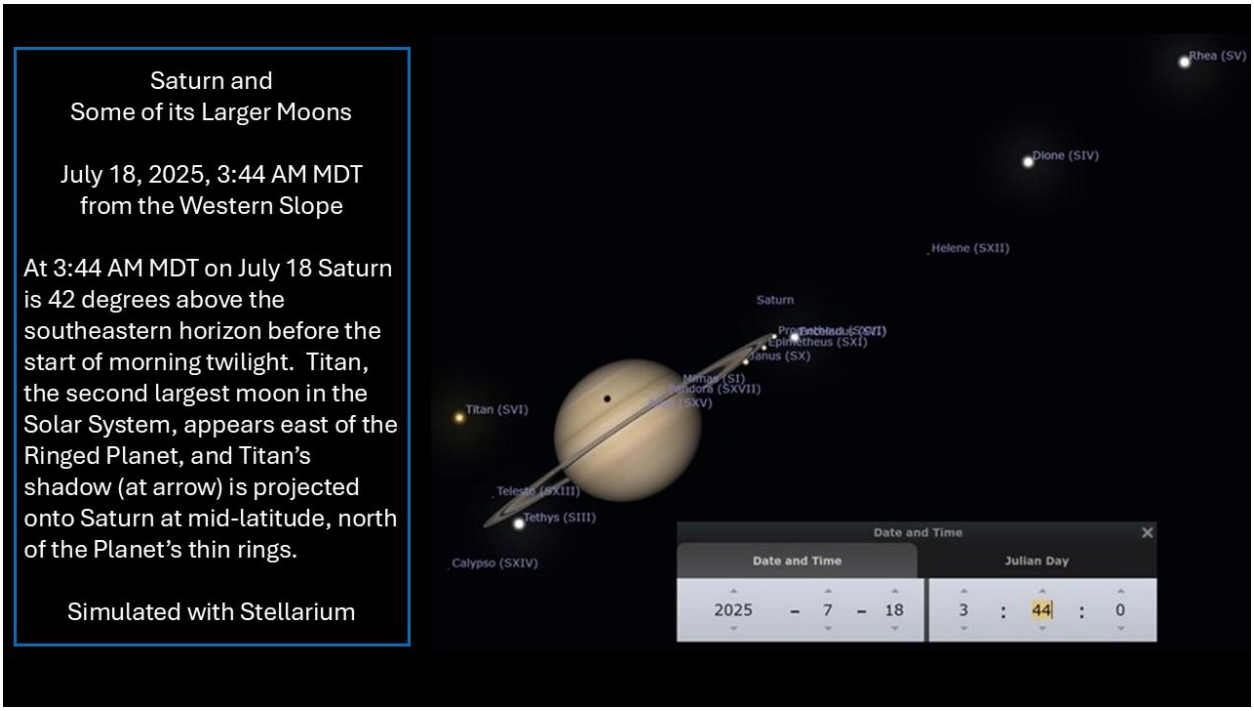


Find more info on Titan shadow transits at this link…
https://skyandtelescope.org/astronomy-news/observing-news/titan-shadow-transit-season-underway/

VENUS – STILL A BRILLIANT "MORNING STAR"! Brilliant Venus rises at about 3:12 AM MDT on July 17 and 3:18 AM MDT on August 1, before the start of morning twilight. Venus is starting to rise a bit later, as its angular separation west of the Sun decreases. Between July 17 and August 1, Venus fades just slightly, from magnitude -4.05 to -3.99, as its distance from Earth increases from 99 million to 108 million miles. As seen through telescopes, Venus' gibbous phase waxes from 70% illuminated on July 17 to 75% illuminated on August 1, as its apparent diameter shrinks from 15.7 to 14.3 arc seconds. **Please do your Venus spotting before sunrise. NEVER chance looking at the Sun without taking proper precautions. Serious eye damage can result.**

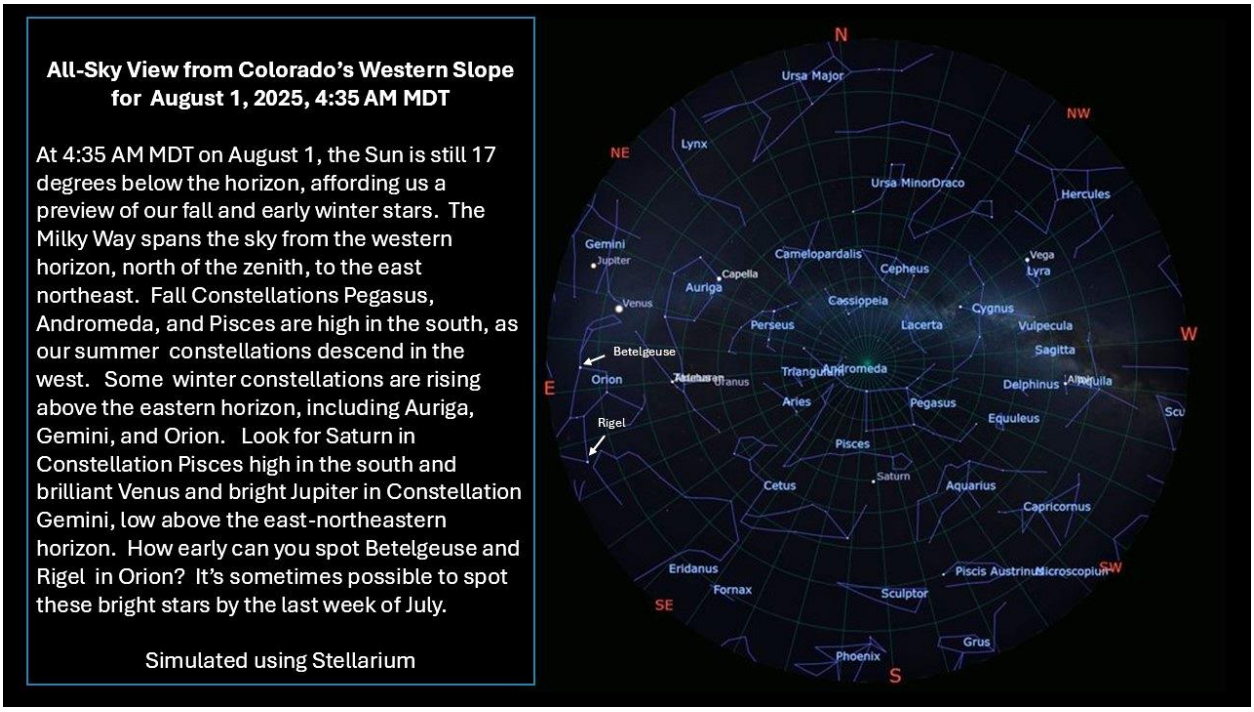
JUPITER AND ITS MOONS BEFORE DAWN. After its solar conjunction on June 24, Jupiter is getting higher in the predawn sky. Jupiter rises in early twilight on July 17 at about 4:44 AM MDT and in dark sky on August 1 at 3:59 AM MDT. Between July 17 and August 1, Jupiter's distance from Earth decreases from 569 million miles to 561 million miles, and the Giant Planet brightens slightly from magnitude -1.90 to -1.92, as its apparent diameter increases from 32.2 to 32.7 arc seconds. Jupiter will get easier to observe in the following weeks and months. Use a telescope or binoculars to spot Jupiter's four bright "Galilean" moons. 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 total solar eclipses on Jupiter, as the shadow of Jupiter's moon, Io, crosses the Giant Planet on the mornings of July 18 and 25. When Jupiter rises higher in our sky before sunrise in the coming weeks and months, we will be able to get good views of more shadow transits of Jupiter's moons, Io, Europa, and Ganymede.

July 18, 2025, 4:00 AM to 6:14 AM MDT, Io's shadow crosses Jupiter (Locally this event begins 40 minutes before Jupiter rises at about 4:40 AM MDT and ends after the Sun rises at about 5:59 AM MDT, when Jupiter is about 13 degrees above the east-northeastern horizon).

July 25, 2025, 5:54 AM to 8:08 AM MDT, Io's shadow crosses Jupiter (Locally this event begins during civil twilight with Jupiter 16 degrees above the eastern horizon and ends long after the Sun rises at about 6:09 AM MDT).

Please do your Jupiter spotting before sunrise. NEVER chance looking at the Sun without taking proper precautions. Serious eye damage can result.

RISE BEFORE DAWN TO PREVIEW OUR FALL AND WINTER STARS! Go outside early and preview our fall and early winter constellations and see brilliant Venus and bright Jupiter! We often experience afternoon and evening cloudiness with thunderstorms on the Western Slope during late July and early August. But sometimes these clouds dissipate by 3 or 4 AM MDT, and we can enjoy a clear, predawn sky. Use a planetarium app or the chart below to help navigate. How early can you see the heliacal rising (first visible rising before the Sun) of Orion's bright stars, Betelgeuse and Rigel? It may be possible to spot these stars against morning twilight by July 26, or even earlier.



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, Corona Borealis is high in the southwest at end of evening twilight and sets below the west-northwestern horizon after 3:30 AM MDT. T Coronae Borealis (T CrB) is a recurrent nova that (based on 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 2026. Then this "new star" may fade rapidly below naked-eye visibility in about a week. As of early on July 16, T CrB had not yet erupted. Astronomer Jean Schneider of Paris Observatory states that eruptions are most likely

every 228 days, a period corresponding with the orbital period of T CrB's red giant and white dwarf components. Schneider suggests that the eruption may be likely around November 10, 2025 or June 25, 2026. For more about T CrB, read the article, "Get Ready for a Nova's Bright Return", by astronomer 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://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 interesting lately, as solar active regions containing sunspots have unleashed numerous flares and coronal mass ejections (CMEs) of charged particles. There have been M-class (moderate) solar flares during recent weeks, and there have been X-class (extreme) solar flares on May 13, 14, 25, June 17 and 19. Also, there have been CMEs that have triggered geomagnetic storms that caused auroras. As of 9 AM MDT on July 16, there are many active regions containing sunspots on the Earth-facing side of the Sun. We may experience more M- and possibly X-class flares and powerful CMEs during the current period. Airglow and SAR arcs also result from high solar activity, and these phenomena have been photographed and/or observed from Colorado. The safest way to monitor sunspots, solar flares, CMEs, and other solar activity safely and in "real time" is by using the internet. Check out 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"). Auroras are triggered by geomagnetic storms that derive from coronal mass ejections (CME) from active regions on the Sun. With continuing high solar activity, more geomagnetic storms may occur, and we may be able to see auroras, like those seen and photographed from the Western Slope earlier this year and last year. 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. But, from late spring to midsummer (in respective hemispheres), it's impossible to see auroras from latitudes above 60 degrees, because it never gets dark there! If we are lucky, we may see auroras from the Western Slope during this period.

EARTH SATELLITE HIGHLIGHTS. The following predictions are for western Colorado, specifically Montrose. Numerous Earth satellites are visible every clear night. Satellites are visible when they reflect sunlight during twilight or nighttime hours. From May through July, space above Earth's northern reaches is awash in sunlight, and it's possible to see satellites all night long, especially in the northern sky. Brighter satellites have smaller magnitude numbers, and the brightest (e.g., the International and Chinese 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 change and these predictions may be inaccurate. This is especially true for the International Space Station (ISS) and the Tiangong Space Station, because they undergo frequent orbital changes. We do not show satellite predictions more than 5 days beyond the distribution date of the current "BCAS Observing Highlights" edition. For accurate predictions of the ISS, Tiangong, and other satellites, 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. For predictions of SpaceX's Starlink satellites, try using this site (Starlink satellite "trains" can be striking sights for a few days after their launch):
https://findstarlink.com/#5431710;3

July 16, 2025. Tiangong (Chinese Space Station). 10:38 to 10:40 PM MDT. WSW to SW. Disappears into Earth's shadow at max altitude 36 deg above SW, max magnitude -1.0 (Passing through Corvus and Virgo). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 17, 2025. International Space Station (ISS). 12:08 to 12:09 AM MDT. NNW to N. Disappears into Earth's shadow at max altitude 18 deg above N, max magnitude -0.9 (Passing through Leo and Camelopardalis). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 17, 2025. Tiangong (Chinese Space Station). 9:43 to 9:46 to 9:48 PM MDT. SW to SSE to E. Max altitude 46 deg above SSE, disappears into Earth's shadow at 15 deg above E, max magnitude -1.8 (Passing through Corvus/Hydra, Libra, Ophiuchus, Aquila-near Altair, Delphinus, and Pegasus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 17, 2025. Tiangong (Chinese Space Station). 11:29 to 11:21 PM MDT. 2nd evening pass of Tiangong on July 17. In the West. Disappears into Earth's shadow at max altitude 19 deg above W, max magnitude +0.3 (Passing through Virgo and Coma Berenices). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 17, 2025. International Space Station (ISS). 11:19 to 11:21 to 11:22 PM MDT. NW to NNW to NNE. Disappears into Earth's shadow at max altitude 15 deg above NNE, max magnitude -1.1 (Passing through Camelopardalis and Cassiopeia/Perseus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 18, 2025. Tiangong (Chinese Space Station). 10:24 to 10:27 to 10:28 PM MDT. W to NNW to ENE. Max altitude 69 deg above NNW, disappears into Earth's shadow 35 deg above ENE, max magnitude -1.9 (Passing through Virgo, Coma Berenices, Boötes/Canes Venatici, Draco, and Cepheus/Cygnus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 18, 2025. International Space Station (ISS). 10:31 to 10:32 to 10:34 PM MDT. N to NNE to NE. Max altitude 12 deg above NNE, disappears into Earth's shadow at max altitude 7 deg above NE, max magnitude -0.9 (Passing through Camelopardalis, Cassiopeia/Perseus, and Andromeda). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 19, 2025. International Space Station (ISS). 12:06 to 12:07 AM MDT. 2nd ISS pass for night of July 18-19. NW to NNW. Disappears into Earth's shadow at max altitude 18 deg above NNW. Max magnitude -0.9 (Passing through Ursa Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 19, 2025. Tiangong (Chinese Space Station). 9:28 to 9:31 to 9:35 PM MDT. WSW to SSE to ENE. Max altitude 86 deg above SSE, max magnitude -2.1 (Passing through Virgo, Boötes, Hercules, Lyra-near Vega, Cygnus, and Pegasus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 19, 2025. Tiangong (Chinese Space Station). 11:05 to 11:08 PM MDT. 2nd evening Tiangong pass of July 19. WNW to NW. Disappears into Earth's shadow at max altitude 38 deg above NW, max magnitude -0.6 (Passing through Leo, Canes Venatici, and Ursa Major-Big Dipper). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 19, 2025. International Space Station (ISS). 11:17 to 11:20 PM MDT. NNW to N. Disappears into Earth's shadow at max altitude 26 deg above N. Max magnitude -1.8 (Passing through Ursa Major and Camelopardalis). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 20, 2025. Tiangong (Chinese Space Station). 10:10 to 10:13 to 10:15 PM MDT. W to N to ENE. Max altitude 51 deg above N, disappears into Earth's shadow 20 deg above ENE, max magnitude -1.3 (Passing through Leo, Ursa Major-Big Dipper, Draco, Ursa Minor, Cepheus, Lacerta, and Pegasus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 20, 2025. International Space Station (ISS). 10:29 to 10:31 to 10:32 PM MDT. NNW to NNE to NE. Max altitude 19 deg above NNE, Disappears into Earth's shadow at 17 deg above NE. Max magnitude -1.6 (Passing through Ursa Major/Lynx, Camelopardalis, Cassiopeia, and Andromeda). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 20, 2025. Tiangong (Chinese Space Station). 11:46 to 11:47 PM MDT. 2nd evening Tiangong pass of July 20. In WNW. Disappears into Earth's shadow at max altitude 12 deg above WNW, max magnitude +1.0 (Passing through Leo/Coma Berenices/Canes Venatici). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 21, 2025. International Space Station (ISS). 12:04 to 12:05 AM MDT. 2nd ISS pass for night of July 20-21. NW to WNW. Disappears into Earth's shadow at max altitude 12 deg above WNW. Max magnitude -0.6 (Passing through Ursa Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 21, 2025. Tiangong (Chinese Space Station). 9:13to 9:17 to 9:20 PM MDT. W to NNW to ENE. Max altitude 62 deg above NNW, max magnitude -1.6 (Passing through Leo, Canes Venatici, Ursa Major-Big Dipper, Draco, Cygnus-near Deneb, and Pegasus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 21, 2025. International Space Station (ISS). 9:40 to 9:42 to 9:44 PM MDT. NNW to NNE to ENE. Max altitude 15 deg above NNE, disappears into Earth's shadow 6 deg above ENE. Max magnitude -1.1

(Passing through Lynx, Camelopardalis, Cassiopeia, and Pegasus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

July 21, 2025. Tiangong (Chinese Space Station). 10:51 to 10:54 PM MDT. 2nd evening Tiangong pass of July 21. WNW to NNW. Disappears into Earth's shadow 47 deg above NNW, max magnitude -1.1 (Passing through Leo, Ursa Major-Big Dipper, Draco, and Ursa Minor). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

July 21, 2025. International Space Station (ISS). 11:16 to 11:18 PM MDT. 2nd evening ISS pass of July 21. In NW. Disappears into Earth's shadow at max altitude 33 deg above NW, max magnitude -2.0 (Passing through Leo Minor and Ursa Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

Additional evening passes of the very bright International Space Station (ISS) are predicted from July 22 to 29. And additional evening predawn passes of the bright Tiangong (Chinese) Space Station are predicted for July 22 to 31. 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.

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

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 July 18 and 23, Kate Fedback of the Western Slope Dark Sky Coalition tells us about "Telluride's Legacy of Light and Dark."

HAPPY OBSERVING!