

**OBSERVING HIGHLIGHTS for June 18 to July 2, 2025, a “dark Moon period”
Black Canyon Astronomical Society (BCAS), western Colorado, USA**

SUMMARY. This dark Moon period is a great time to enjoy the celestial splendors of late spring and early summer (if we can escape smoke from wildfires)! As the sky darkens, our spring constellations are still shining in the west, and the constellations of summer and the Milky Way are rising in the east. With binoculars or a telescope, examine wonders of our Milky Way Galaxy, including its beautiful bright nebulae, dusty dark nebulae, and rich star clusters. With a telescope, spot distant galaxies in the western sky and spectacular globular clusters near the zenith. On the evening of June 20, see the striking Milky Way and enjoy telescopic views of nebulae, star clusters, and distant galaxies with Astronomy Rangers and the BCAS at Black Canyon of the Gunnison National Park/South Rim (near the campground). If conditions are poor, the backup date is June 27.

The solstice arrives on June 20 at 8:42 PM MDT, when the Sun shines directly on the Tropic of Cancer at latitude 23° 26' north. After June 20, our daytime hours shorten, as our nighttime hours expand.

The Moon reaches last quarter on June 18, and from June 19 to June 24 the crescent Moon wanes in the morning sky. The Moon is new on June 25. Watch the crescent Moon wax during evenings from June 27 to July 1. The Moon reaches first quarter on July 2. On the morning of June 19, look for the waning, 43%-illuminated, crescent Moon about 7 degrees east of Saturn. In the predawn of June 22, you can spot a thin (12%-illuminated) crescent Moon about 8 degrees to the left of brilliant Venus. From a place with an unobstructed west-northwestern horizon on June 26 between 9:35 PM and 9:45 PM MDT, look for the “skinny” crescent Moon (4% illuminated) 7 to 6 degrees above the horizon and just 3 degrees to the right of Mercury (likely a great view in binoculars!). On the evening of June 29, the 25%-illuminated crescent Moon is about a degree east of reddish Mars. Enjoy seeing earthshine delicately illuminate the nightside of the crescent Moon, especially on mornings from June 20 to 23 and on evenings from June 26 to 29 (binoculars can provide eye-catching views!).

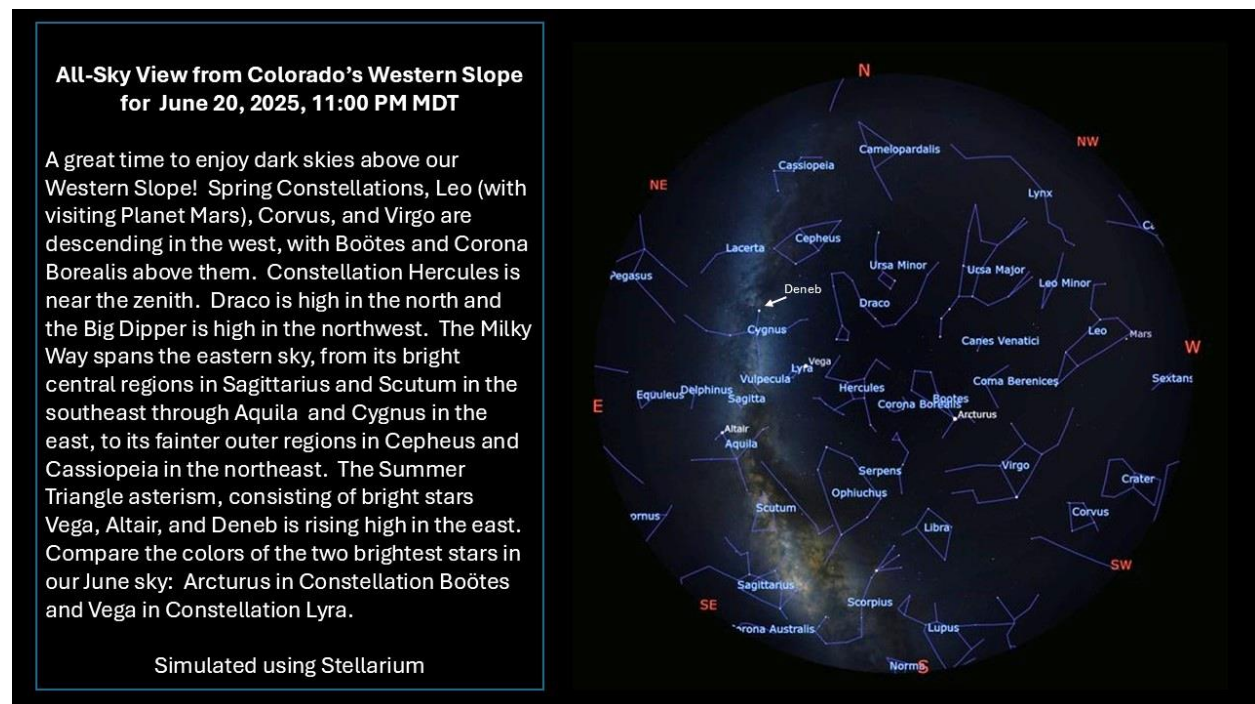
Mercury shines through evening twilight during this entire dark Moon period. Locally, the Innermost Planet may be easiest to spot above an unobstructed west-northwestern horizon between 9:35 PM and 9:45 PM MDT when the Sun is about 9 to 11 degrees below that horizon. As the sky darkens, reddish Mars is about 25 degrees above the western horizon, setting in the west around midnight. From June 17 to 19, the Red Planet is within 2 degrees of the blue-white, first-magnitude star, Regulus. Brilliant Venus rises in a dark sky before 3:30 AM MDT. Saturn is also visible in the morning sky, rising at about 1:35 AM MDT on June 18 and 12:42 AM MDT on July 2. The Ringed Planet has a close conjunction with Neptune on June 29. On the morning of July 2, there's a total solar eclipse on Saturn! With a telescope, watch the shadow of Titan, Saturn's largest moon, move across the Ringed Planet.

The Sun is still very active, and we expect more solar flares and coronal mass ejections (CMEs) that may trigger auroras that could be visible from Colorado, like [the aurora of May 31-June 1, 2025](#) (a beautiful time-lapse by Aaron Watson from near Paonia). Please don't view the Sun without proper eye protection, as serious eye damage can result.

Spot the very bright International Space Station during predicted, predawn passes from June 19 to July 2. Predawn passes are also predicted for the almost-as-bright, Tiangong (Chinese) Space Station from June 30 to July 2.

SOLSTICE – JUNE 20, 8:42 PM MDT. The solstice arrives on June 20 at 8:42 PM MDT, when the Sun shines directly on the Tropic of Cancer at latitude 23° 26' north. After June 20 on the Western Slope, our daytime hours shorten, as our nighttime hours expand.

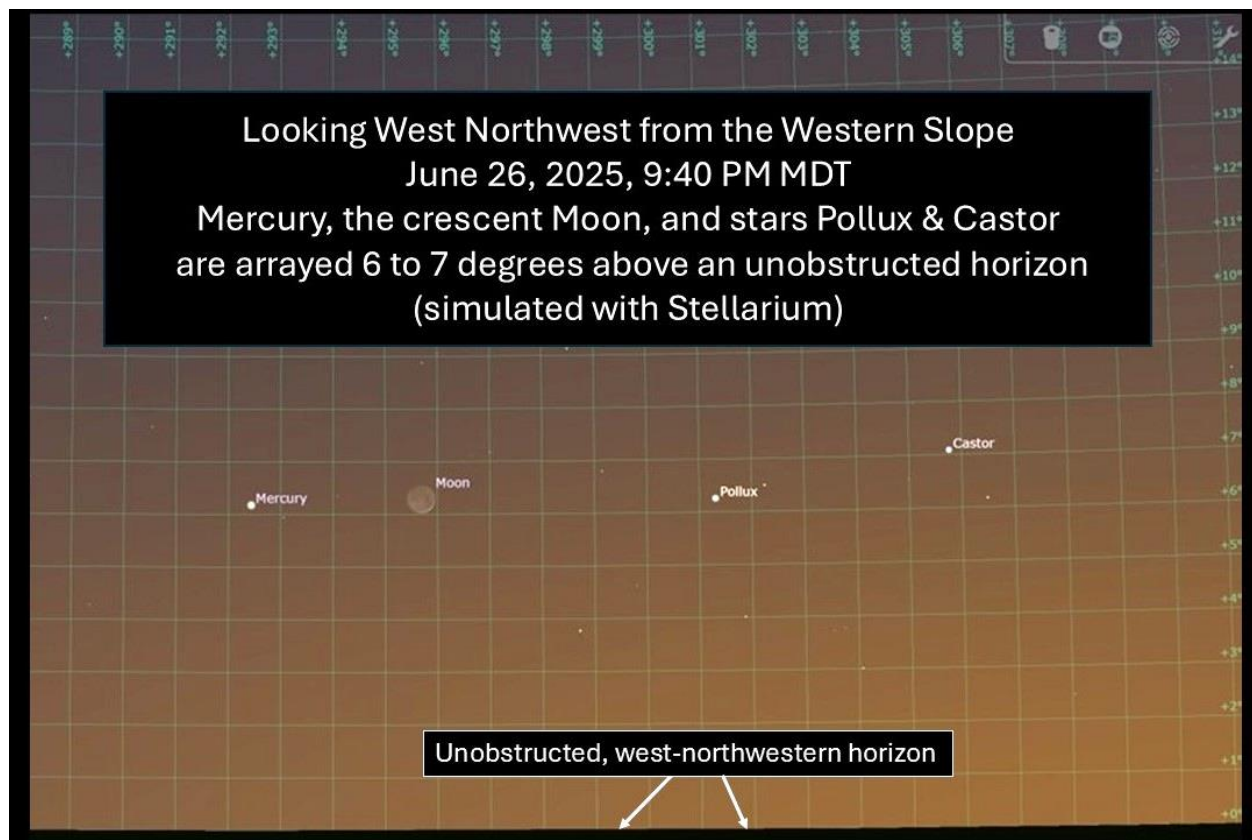
VIEW THE MILKY WAY, STAR CLUSTERS, NEBULAE, AND DISTANT GALAXIES UNDER DARK, WESTERN SLOPE SKIES! Mostly clear skies are forecast locally for this dark Moon period, making it a great time to enjoy the celestial splendors of late spring and early summer (if we can escape wildfire smoke)! To navigate, use a planetarium app, the chart below, and/or the [Constellation Guide from NOIRLab](#). As the sky darkens, our spring constellations are still shining in the west, and the constellations of summer and the Milky Way are rising in the east. Binoculars and telescopes provide awesome views, but you can also explore these Constellations virtually with the provided hotlinks (courtesy of NOIRLab). Examine wonders of our Milky Way Galaxy, including beautiful bright nebulae, dusty dark nebulae, and rich star clusters in Constellations [Sagittarius](#), [Scorpius](#), [Scutum](#), [Aquila](#), [Cygnus](#), and [Cepheus](#). With a telescope, spot distant galaxies in the western sky within Constellations [Leo](#), [Virgo](#), [Coma Berenices](#), [Ursa Major](#), and [Canes Venatici](#). Constellation [Hercules](#), containing two beautiful globular star clusters, is near the zenith, and the “[Summer Triangle](#)” of bright stars, Vega (in Constellation [Lyra](#)), Altair (in [Aquila](#)), and Deneb (in [Cygnus](#)), is rising high in the east. On the evening of June 20, take in the striking Milky Way and enjoy telescopic views of nebulae, star clusters, and distant galaxies with Astronomy Rangers and the Black Canyon Astronomical Society at Black Canyon of the Gunnison National Park/South Rim (near campground). If conditions are poor, the backup date is June 27.



THE MOON. The Moon reaches **last quarter on June 18** (exactly at 1:19 PM MDT), and from June 19 to July 24 the crescent Moon wanes in the morning sky. The **Moon is new on June 25** (exactly new at 4:31 AM MDT). Watch the crescent Moon wax during evenings from June 27 to July 1. The **Moon reaches first quarter on July 2** (exactly at 1:30 PM MDT). On the morning of June 19, look for the waning, 43%-illuminated, crescent Moon about 7 degrees east of Saturn. In the predawn of June 22, you can spot a thin (12%-illuminated) crescent Moon about 8 degrees to the left of brilliant Venus. From a place with an unobstructed west-northwestern horizon on June 26 between 9:35 and 9:45 PM MDT, look for the “skinny” crescent Moon (4% illuminated) 7 to 6 degrees above the horizon and just 3 degrees to the right of Mercury (probably a great view in binoculars!). On the evening of June 29, the 25%-illuminated lunar crescent is about a degree east of reddish Mars. Enjoy seeing earthshine delicately illuminate the

nightside of the crescent Moon, especially on mornings from June 20 to 23 and on evenings from June 26 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.**

MERCURY SHINES THROUGH EVENING TWILIGHT. Mercury shines against evening twilight during this entire dark Moon period. The Innermost Planet may be easiest to spot above an unobstructed west-northwestern horizon between 9:35 and 9:45 PM MDT, when the Sun is 9 to 11 degrees below that horizon. Between June 18 and July 2, Mercury fades from magnitude -0.32 to magnitude +0.46, as it wanes from a 68%-illuminated, gibbous disk to a 43%-illuminated crescent (as seen through telescopes). During this period Mercury's distance from Earth decreases from 101 to 79 million miles, causing its apparent diameter to increase from 6.2 to 7.9 arc seconds. On the evening of June 26, look for a skinny (4%-illuminated) crescent Moon about 3 degrees to the right of Mercury (a nice sight in binoculars!). **Please do your Mercury spotting after sunset. NEVER chance looking at the Sun without taking proper precautions. Serious eye damage can result.**



MARS. As the sky darkens, reddish (or butterscotch-tinted?) Mars is about 25 degrees above the western horizon. The Red Planet is moving eastward, amidst the stars of Leo, having passed about 1 degree north of the first-magnitude star, Regulus, on June 16. Mars' rapid eastward motion against the stars will keep the Red Planet in our evening sky through the middle of fall. Mars remains visible until around midnight, setting in the west northwest at about 12:20 AM MDT on June 18 and 11:42 PM MDT on July 2. The Red Planet fades from magnitude +1.40 on June 18 to +1.49 on July 2, as its distance from

Earth increases from 171 million to 180 million miles. From June 17 to 19, Mars is still within 2 degrees of Leo's brightest star, Regulus. Mars and Regulus are now about equal in brightness. View them in binoculars to enjoy their starkly contrasting colors (defocusing slightly may enhance this effect)! On the evening of June 29, the 25%-illuminated crescent Moon is about a degree east of Mars. Through telescopes, Mars' 92%- to 93%-illuminated, gibbous disk decreases from 5.1 to 4.8 arc seconds in diameter during this period. 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

VENUS – STILL A BRILLIANT “MORNING STAR”! Brilliant Venus rises at about 3:22 AM MDT on June 18 and 3:12 AM MDT on July 2, before the start of morning twilight. Although Venus' greatest angular separation west from the Sun occurred on May 31, our Sister Planet continues to rise earlier in our morning skies during this period. This is due to the northward component in Venus' current northeastward motion against the stars. From June 18 to July 2, brilliant Venus fades just slightly, from magnitude -4.24 to -4.14, as its distance from Earth increases from 78 million to 88 million miles. As seen through telescopes, Venus' gibbous phase waxes from 58% illuminated on June 18 to 64% illuminated on July 2, as its apparent diameter shrinks from 19.9 to 17.6 arc seconds. **Please do your Venus spotting before sunrise. NEVER chance looking at the Sun without taking proper precautions. Serious eye damage can result.**

SATURN AFTER MIDNIGHT. Saturn is visible in the mornings, rising at about 1:35 AM MDT on June 18 and 12:42 AM MDT on July 2. Saturn brightens from magnitude +1.01 on June 18 to +0.95 on July 2, as its distance from Earth decreases from 892 million to 870 million miles. Through telescopes Saturn's disk appears 18 arc seconds wide, and its rings span 41 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...

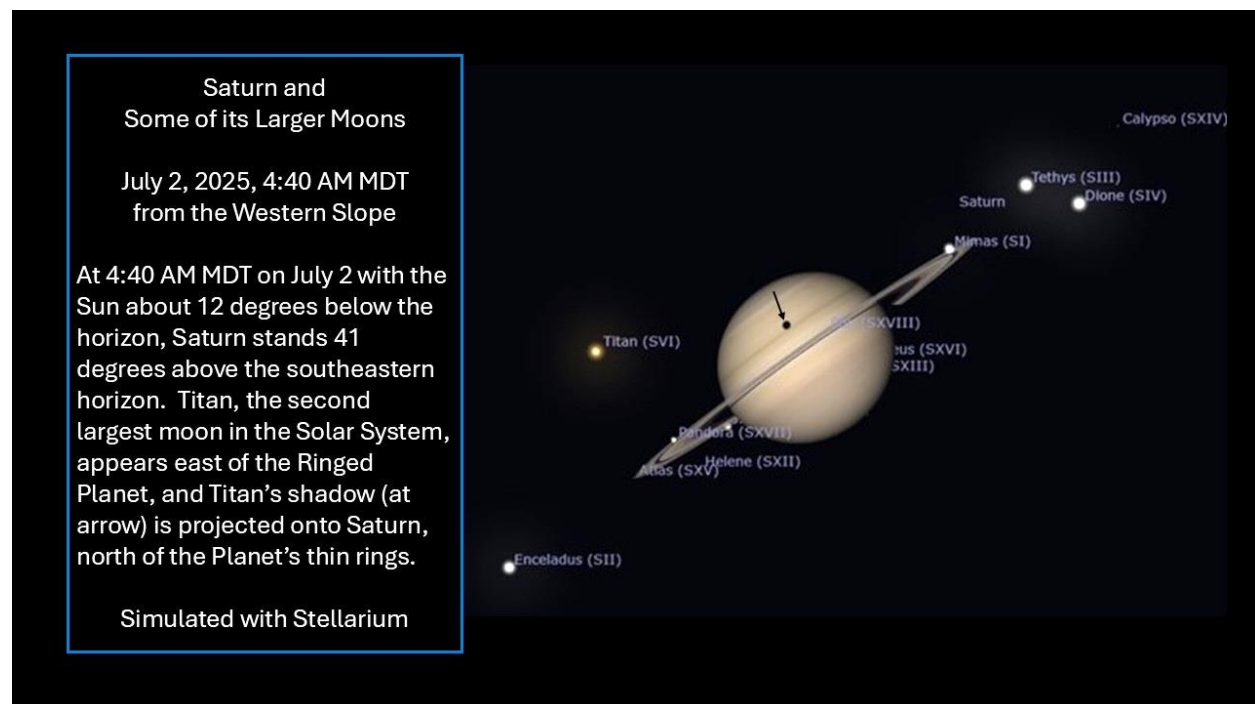
<https://skyandtelescope.org/astronomy-news/observing-news/see-mutual-events-close-approaches-of-saturns-moons/>

SATURN GREET'S NEPTUNE – JUNE 29! On June 29, 2025, Saturn, moving eastward against the starry background, passes just 1 degree south of the Neptune. Saturn shines brightly at magnitude +0.96, but you need a telescope (or at least binoculars) to spot Neptune at magnitude +7.76. Can you see the color contrast between Saturn and Neptune? Through telescopes, many people perceive Neptune to be blue and Saturn to be white or yellow white.

Saturn takes 29.5 years to orbit the Sun and move completely around the starry background from our perspective on Earth. Neptune's orbital period is 164 years, and it takes Saturn 36 years to “lap” Neptune. So, Saturn-Neptune conjunctions should happen only once every 36 years, right? It's not quite that simple! I was surprised to learn that there are three conjunctions of Saturn and Neptune in the next 8 months, when Saturn and Neptune will appear just 1 degree apart! These occur on June 29, 2025, August 6, 2025, and February 15, 2026. To explain this, it helps to understand the phenomenon of [apparent retrograde motion](#). During the June 29 conjunction, eastward-moving Saturn passes Neptune,

which is also moving eastward, but more slowly than Saturn. When outer planets and Earth become nearly aligned on the same side of the Sun (i.e., when they are at or near “opposition”), they appear to “retrograde” or move westward against the starry background. On August 6, Saturn will be moving westward or “retrograding” against the starry background, and Saturn will pass Neptune again while moving to the west. Neptune also will be retrograding on August 6, but Saturn’s westward motion will appear faster to us than Neptune’s westward motion (because Saturn is closer to Earth than Neptune). By February 15, 2026, both Saturn and Neptune will have resumed their eastward (“direct”) motion, and Saturn will appear to pass Neptune yet again, while moving to the east! Between their conjunctions on June 29 and February 15, Saturn and Neptune will never appear more than 4 degrees apart.

TITAN’S SHADOW MOVES ACROSS SATURN – JULY 2, AM! Use a telescope to watch the rare sight of Titan’s shadow moving across the Ringed Planet on the morning of July 2! 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 2 transit begins at 1:40 AM MDT, after Saturn rises on the Western Slope at about 12:42 AM MDT. Locally, you might see Titan’s shadow best between 3:25 AM and 5:15 AM MDT, when Saturn is 30 to 45 degrees above the southeastern horizon and before bright twilight starts to interfere. On July 2, Titan’s shadow is cast north of Saturn’s thin ring system (see simulation, below). Titan’s orbital period of Saturn is about 1.5 hours short of 16 Earth days, so transits are now occurring every 16 days. Locally on July 2, Saturn will appear in the southeastern sky during the shadow transit, and the event will end in daylight, more than an hour after sunrise. After July 2, there will be six 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 will improve, because Saturn will be rising earlier and getting higher in our sky. 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
7/2/2025	7/2/2025	1:40 AM	4:35 AM	7:03 AM	12:42 AM	5:49 AM
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						

Find more info on Titan shadow transits at this link...

<https://skyandtelescope.org/astronomy-news/observing-news/titan-shadow-transit-season-underway/>

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 rises high in sky before the end of evening twilight and remains visible into morning twilight. 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 June 17, 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 is most 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 captivating 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, and 25. Also there have been CMEs that triggered geomagnetic storms that caused auroras. 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. As of 7 AM MDT on June 17, there are several active regions containing large sunspots on the Earth-facing side of the Sun. 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”). Many people in Colorado observed and photographed a strong aurora on the night of May 31-June 1. BCAS member, Aaron Watson, captured a [wonderful time-lapse sequence](#) of this display from near Paonia, Colorado. 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 more auroras. 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. But, during late spring and early summer (in respective hemispheres), it’s not possible to see auroras from latitudes above 60 degrees, because it never gets dark there! The Western Slope may be a good place for spotting auroras during this “dark Moon 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 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.

June 19, 2025. International Space Station (ISS). 5:04 to 5:07 to 5:11 AM MDT. SSW to SE to ENE. Max altitude 42 deg above SE, max magnitude -2.9 (Passing through Corona Australis, Capricornus, Aquarius, Pisces-near Saturn and the Moon, Aries, and Taurus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 20, 2025. International Space Station (ISS). 4:17 to 4:19 to 4:22 AM MDT. S to SE to ENE. Appears from Earth’s shadow 17 degrees above S, max altitude 23 deg above SE, max magnitude -2.0 (Passing through Piscis Austrinus, Cetus, Pisces, and Aries-near Venus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 21, 2025. International Space Station (ISS). 3:31 to 3:32 AM MDT. 1st AM ISS pass of June 21. SE to E. Appears from Earth’s shadow at max altitude 13 degrees above SE, max magnitude

-1.2 (Passing through Cetus, Pisces, and Aries-near Venus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 21, 2025. International Space Station (ISS). 5:04 to 5:07 to 5:10 AM MDT. 2nd AM ISS pass of June 21. WSW to NW to NE. Appears from Earth's shadow 10 degrees above WSW, max altitude 61 deg above NW, magnitude -3.5 (Passing through Serpens/Ophiuchus, Lyra, Cepheus, Camelopardalis/Cassiopeia, and Auriga). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 22, 2025. International Space Station (ISS). 4:17 to 4:18 to 4:22 AM MDT. SW to SE to NE. Appears from Earth's shadow 32 degrees above SW, max altitude 72 deg above SE, max magnitude -3.8 (Passing through Scutum/Sagittarius, Aquila, Delphinus, Pegasus, Andromeda, and Perseus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

Additional predawn passes of the very bright International Space Station (ISS) are predicted from June 23 to July 2. And predawn passes of the bright Tiangong (Chinese) Space Station are predicted for June 30 and July 2. 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, KVN 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 June 20 and 25, Jay Kirkland and Dr. Catherine Whiting of Colorado Mesa University will tell us about "The Real Exoplanets of Star Wars."

HAPPY OBSERVING!