

**OBSERVING HIGHLIGHTS for June 13 to 28, 2024, a “bright Moon” period
Black Canyon Astronomical Society (BCAS), western Colorado, USA**

SUMMARY. June 20 is our summer solstice, when the Sun shines directly on the Tropic of Cancer at 23° 26' north latitude, marking Colorado's longest day and shortest night of the year. During this “bright Moon” period, Mercury begins another evening appearance, which culminates during July. On June 28 at about 9:30 PM MDT, challenge yourself to spot the Innermost Planet in evening twilight low to the west-northwestern horizon. You can see Saturn, Mars, and Jupiter before dawn. Saturn rises before 1:30 AM MDT, and it's easy to spot in the southeast from about 2 AM MDT until morning twilight brightens the sky. Reddish Mars, a bit fainter than Saturn, rises later, becoming prominent in the eastern predawn sky after about 3:35 AM MDT. Jupiter becomes visible low to the east-northeastern horizon in twilight at about 4:50 AM MDT on June 13 and 4:25 AM MDT on June 28. It's possible to see two moderately bright comets during evenings in mid to late June. Try using binoculars or a telescope to spot Comet 13P/Olbers low to the northwestern horizon in late evening twilight, as it moves from Constellation Auriga into Constellation Lynx. Try to find Comet Tsuchinshan-ATLAS (2023/A3) with a telescope after evening twilight ends, as it moves through Constellation Virgo into Leo. For spotting these comets, it may be helpful to wait until after June 22, when the bright, gibbous Moon rises after twilight fades.

The Moon is at first quarter on June 13. From June 14 to 20, watch a gibbous Moon wax. The Moon is full on June 21. From June 22 to 27, we can watch a gibbous Moon wane. The Moon reaches last quarter on June 28. The gibbous Moon is close to the first-magnitude stars Spica on the night of June 15-16 and Antares on the night of June 19-20. Before dawn on June 27, look for the gibbous Moon near Saturn. If you have a telescope of 8 inches or larger aperture, you may be able to see the Moon occult (move in front of) Saturn from western Colorado in daylight on June 27 at about 10:09 AM MDT.

As of June 13, there are several active regions with 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. This high solar activity is triggering geomagnetic storms, auroras (aka “northern lights”), and airglow. Auroras were seen and photographed by people in all 50 states on the night of May 10-11. Keep watch for more of these phenomena!

From Colorado, view evening passes of the bright Tiangong (Chinese) Space Station from June 12 to 17 and predawn passes of the even brighter International Space Station (ISS) from June 19 to 28.

WESTERN SLOPE SKIES. Since 2011, BCAS and KVNF Community Radio have been producing [Western Slope Skies](#) (WSS), a biweekly astronomy feature, which airs every two weeks at about 8:10 AM on Fridays and 7:00 PM on following Wednesdays. On June 12 Carolyn Aldrich, an astronomy student of Dr. Catherine Whiting at Colorado Mesa University tells us about “How Stars Become White Dwarfs.” On June 21 and 26, BCAS President, Bryan Cashion, will follow with the WSS feature, “Planetary Alignment versus Conjunction and how Hollywood Gets it Wrong.”

MID/LATE JUNE OBSERVING EVENTS IN THE BCAS REGION (open to the public)

June 12, after 9:30 PM, Black Canyon of the Gunnison N.P., South Rim, near campground (NPS&BCAS)
June 29, Grand Mesa, County Line parking, Highway 65 (mile marker 30) after 8:30 PM, (SCVHS&BCAS)

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>

SOLSTICE: JUNE 20. On June 20 at 2:51 PM MDT, the Sun shines directly on the Tropic of Cancer at 23° 26' north latitude. This marks the beginning of summer for us in the northern hemisphere and the beginning of winter for the southern hemisphere. In Colorado our days are long, and our nights are short. On the Colorado night of June 20-21, there are only slightly more than 5 hours between the end of [astronomical twilight](#) in the evening and its onset in the morning.

THE MOON. The Moon is at **first quarter on June 13** (exactly at 11:18 AM MDT). From June 14 to 20, watch a gibbous Moon wax. **The Moon is full on June 21** (exactly full at 7:08 PM MDT). From June 22 to 27, we can watch a gibbous Moon wane. The Moon reaches **last quarter on June 28** (exactly at 3:53 PM MDT). After the end of twilight on June 15, look for the 68%-illuminated, waxing gibbous Moon about 9 degrees west from the first-magnitude star, Spica. By end of twilight on June 16, the 77%-illuminated, gibbous Moon is about 6 degrees east of Spica. After twilight's end on June 19, look for the 96%-illuminated gibbous Moon just 4 degrees west of the reddish, first-magnitude star, Antares. By moonset on the morning of June 20, the Moon has closed to within about 1 degree of Antares. On the morning of June 27 at about 5:00 AM MDT, look for the 67%-illuminated, waning, gibbous Moon about 3 degrees west of Saturn. At about 10:09 AM MDT in western Colorado, the Moon occults (moves in front of) Saturn (see next item). NASA has published a [stunning visualization of lunar phases for year 2024](#).

THE MOON HIDES SATURN IN DAYLIGHT: JUNE 27. For western Colorado, the 65%-illuminated, waning, gibbous Moon occults (moves in front) Saturn on the morning of June 27 between about 10:09 AM MDT and 10:53 AM MDT. These times vary a bit, based on your exact location. You will need clear, transparent skies and a telescope 8 inches in aperture (or preferably, larger) to have a decent chance of seeing this event. The Moon will be about 19 degrees above the western horizon at Saturn's disappearance, but only 11 degrees above the horizon at Saturn's reappearance. Saturn will disappear behind the bright eastern limb of the gibbous Moon and reappear from the Moon's dark, western limb. Saturn has low contrast to the daytime sky and can be difficult to spot. But the gibbous Moon may be easy to spot, and you can use the Moon as a guide for finding Saturn. Look for Saturn just east of the Moon's brightly illuminated, eastern limb, between about 9:45 AM MDT and its disappearance at around 10:09 AM MDT.

MERCURY ENTERS THE EVENING SKY. During July, we will be able to see Mercury during its 2nd best evening appearance of 2024 (only its March evening appearance was more favorable for our viewing). Mercury is in conjunction with the Sun on June 14, but the "Speedster Planet" moves rapidly into the evening sky by late June. On June 28 at 9:30 PM MDT, find a place with an unobstructed west-northwestern horizon (not always easy in Colorado!) and try to spot Mercury, shining at magnitude -0.74 about 3 degrees above the horizon. The Sun is only 8 degrees below the horizon at that time, and binoculars may help you spot the Innermost Planet in bright twilight. Pollux and Castor, the brightest stars in Constellation Gemini, will be several degrees above and to the right of Mercury. Of those three, Mercury is by far the brightest and the easiest to spot. Pollux (magnitude +1.15) and Castor (magnitude +1.90) may be challenging to see in bright twilight, even with binoculars. Mercury will get even easier to spot through much of July. **Please do your Mercury spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

AN EVENING COMET FOR BINOCULARS. Using binoculars (or a telescope), challenge yourself to spot periodic Comet 13P/Olbers low to the northwestern horizon during late evening twilight. Comet 13P moves from Constellation Auriga and into Constellation Lynx on June 19. You may have better luck spotting the Comet after June 22, when the Moon rises after twilight has faded. For finder charts, photos, brightness info, and other info on 13P/Olbers, see these links...

<https://skyandtelescope.org/astronomy-news/comet-13p-olbers-juices-up-june-skies/>
[13P/Olbers | astro.vanbuitenen.nl](https://astro.vanbuitenen.nl/13P/Olbers)

AN EVENING COMET FOR TELESCOPES. When it enters the inner Solar System next fall, Comet Tsuchinshan-ATLAS (C/2023 A3) may become a spectacular sight, especially during evenings in mid-to-late October. It's not super bright now, but C/2023 A3 is well placed for viewing in the evenings with a telescope. Several of us BCAS members have viewed and/or photographed this Comet at about magnitude +10, and we've even detected its tail. If you have a telescope, this Comet may be worth a look! Good times to search for C/2023 A3 may be after evening twilight ends and before the bright gibbous Moon rises between June 23 and 28. You can find images, brightness info, finder charts, and an ephemeris for C/2023 A3 at these links...

<http://astro.vanbuitenen.nl/comet/2023A3>
<http://www.aerith.net/comet/catalog/2023A3/2023A3.html>

SATURN IN THE MORNING. Saturn rises just south of east at around 1:24 AM MDT on June 13 and 12:26 AM MDT on June 28. The Ringed Planet is easy to spot in the southeast from about 2:00 AM MDT until morning twilight brightens the sky. Saturn is drawing nearer, from 890 million miles distant on June 13 to 867 million miles distant on June 28. Saturn brightens slightly from magnitude +0.98 on June 13 to magnitude +0.92 on June 28. Through telescopes, the Ringed Planet appears 18 arc seconds wide, and its rings span 41 arc seconds. Earth's Moon moves in front of Saturn on the late morning of June 27, and this daytime event may be visible in telescopes 8 inches and larger in aperture (see item above for details). With a telescope or high-magnification binoculars, it's possible to spot Titan, Saturn's largest moon. Telescopes with apertures 6 inches or larger may reveal several other moons of the Ringed Planet. From Earth's perspective during 2024, Saturn's rings are less inclined than they have been during the past several years, so they may appear less impressive in telescopes. These thin rings will appear nearly edge-on and almost disappear during 2025, so view Saturn with a telescope soon! Because Saturn's rings now appear less inclined, and therefore 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 referring to various planetarium apps and/or this site:

<https://skyandtelescope.org/observing/interactive-sky-watching-tools/saturns-moons-javascript-utility/>

MARS BEFORE DAWN. Reddish Mars rises in the east at about 3:07 AM MDT on June 13 and 2:38 AM MDT on June 28. Look for Mars low in the eastern sky after about 3:35 until morning twilight starts interfering. Mars brightens from magnitude +1.09 to +1.02 during this period. The Red Planet is 168 million miles distant on June 13 and 163 million miles distant on June 28. Between June 13 and 28, Mars is still on the far side of the Sun from our perspective, and its disk appears tiny, less than 5.4 arc seconds wide. **Please do your Mars spotting before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.**

JUPITER ENTERS THE PREDAWN SKY. At around 4:50 AM MDT on June 13, you might try to spot Jupiter from a place with an unobstructed east-northeastern horizon when it's only 1.5 degrees above the horizon with the Sun about 10 degrees below that horizon. By June 28, Jupiter rises earlier, at about 3:54 AM MDT, near the start of astronomical twilight. At 4:25 AM MDT on June 28 (when the Sun is still

13 degrees below the horizon) Jupiter (shining at magnitude -2.02) may be easy to spot about 5 degrees above the east-northeastern horizon. **Please do your Jupiter spotting before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.**

KEEP WATCHING THE NORTHERN CROWN! Will there soon be a bright “new” star in Constellation Corona Borealis (the “Northern Crown”), at least briefly? Corona Borealis now stands high in the south as evening twilight fades. T Coronae Borealis (T CrB) is a recurrent nova that may rapidly increase in brightness 1500-fold (to second magnitude) to become the brightest star (or 2nd brightest star) in Corona Borealis sometime between now and next September. Then it may fade rapidly below naked-eye visibility in about a week. As of 6 AM MDT on June 12, CrB had not yet detonated. 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://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
<https://skyandtelescope.org/observing/whats-up-with-t-crb04202016/>

THE SUN. The Sun has been very active over the past year, and intensely so in the past 6 weeks, 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 during May and early June. There also have been CMEs of charged particles that have triggered geomagnetic storms that caused auroras. Many folks in Colorado and elsewhere viewed and photographed auroras during the night of May10-11. As of June 12, there are several active regions on the Earth-facing side of the Sun, so we can expect continuing M- and possibly even X-class flares and powerful CMEs. Airglow also results from high solar activity, and this phenomenon has been photographed and 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://halph.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 night of May 10-11, many of us were able to see and photograph some amazing auroras from Colorado! A coronal mass ejection (CME) from solar Active Region 3664 was aimed toward our planet. Charged particles from the CME were captured by Earth’s magnetic field, energizing the ionosphere, thereby triggering a geomagnetic storm and the widespread aurora of May 10-11. Our nights in Colorado are now short, reducing the time when we may spot auroras. But we have an advantage over far northerly locations, which have even fewer hours between evening and morning twilight (or no dark time at all). As of June 12, there are several active regions on the Earth-facing side of the Sun, so 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>

EARTH SATELLITE HIGHLIGHTS. The following predictions are for western Colorado, specifically Montrose, in Mountain Daylight Time (MDT). 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 for satellite passes may be inaccurate by up to many minutes, especially after June 16. For more accurate predictions of these 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. During May, June, and July, space above the northern hemisphere is awash in sunlight, and we can see many Earth satellites (visible only from sunlight they reflect) through much of the night, especially in the northern sky.

June 12, 2024. Tiangong (Chinese Space Station). 9:40 to 9:43 to 9:46 PM MDT. WNW to N to E. Max altitude 52 deg above N. Disappears into Earth's shadow 11 deg above E, max magnitude -1.5 (Passing through Gemini, Lynx, Ursa Major, Ursa Minor, Draco, Lyra, and Aquila). **Tiangong's orbit may change frequently. Check for updates.**

June 13, 2024. Tiangong (Chinese Space Station). 10:17 to 10:20 to 10:21 PM MDT. WNW to SSW to ESE. Max altitude 82 deg above SSW. Disappears into Earth's shadow 47 deg above ESE, max magnitude -2.3 (Passing through Cancer, Leo Minor, Canes Venatici/Coma Berenices, Boötes, Hercules, and Ophiuchus). **Tiangong's orbit may change frequently. Check for updates.**

June 14, 2024. Tiangong (Chinese Space Station). 9:16 to 9:19 to 9:23 PM MDT. WNW to NNE to E. Max altitude 68 deg above NNE. Disappears into Earth's shadow 8 deg above E, max magnitude -1.9 (Passing through Gemini, Lynx, Ursa Major-Big Dipper, Draco, Hercules, and Aquila). This pass happens in bright twilight and may be difficult to observe. **Tiangong's orbit may change frequently. Check for updates.**

June 15, 2024. Tiangong (Chinese Space Station). 9:53 to 9:56 to 9:57 PM MDT. W to SSW to SE. Max altitude 49 deg above SSW. Disappears into Earth's shadow 26 deg above SE, max magnitude -1.8 (Passing through Cancer, Leo-near Regulus, Virgo, Libra, and Ophiuchus/Scorpius). **Tiangong's orbit may change frequently. Check for updates.**

June 16, 2024. Tiangong (Chinese Space Station). 10:29 to 10:31 PM MDT. WSW to SW. Disappears into Earth's shadow at max altitude 16 deg above SW, max magnitude 0.0 (Passing through Sextans/Hydra, Crater, and Corvus). **Tiangong's orbit may change frequently. Check for updates.**

June 17, 2024. Tiangong (Chinese Space Station). 9:29 to 9:31 to 9:34 PM MDT. W to SSW to SSE. Max altitude 29 deg above SSW. Disappears into Earth's shadow 13 deg above SSE, max magnitude -0.8 (Passing through Hydra, Sextans, Crater, Corvus, Hydra again, Libra/Centaurus, and Scorpius). **Tiangong's orbit may change frequently. Check for updates.**

June 19, 2024. International Space Station (ISS). 5:00 to 5:03 to 5:05 AM MDT. S to SE to E. Max altitude 18 deg above SE, max magnitude -1.5 (Passing through Grus, Piscis Austrinus, Sculptor, Cetus,

and Taurus-near Aldebaran and Jupiter). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 21, 2024. International Space Station (ISS). 4:58 to 5:01 to 5:05 AM MDT. SW to SE to ENE. Appears from Earth's shadow 11 deg above SW, max altitude 53 deg above SE, max magnitude -3.3 (Passing through Sagittarius, Capricornus, Aquarius, Pisces, Pegasus, Aries/Triangulum, and Perseus/Taurus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 22, 2024. International Space Station (ISS). 4:11 to 4:12 to 4:15 AM MDT. S to SE to ENE. Appears from Earth's shadow 22 deg above S, max altitude 28 deg above SE, max magnitude -2.4 (Passing through Piscis Austrinus/Aquarius, Cetus, Pisces, and Aries-near Mars, and Taurus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 23, 2024. International Space Station (ISS). 4:57 to 5:00 to 5:03 AM MDT. WSW to NW to NE. Appears from Earth's shadow 12 deg above WSW, max altitude 50 deg above NW, max magnitude -3.2 (Passing through Ophiuchus, Hercules/Lyra, Draco, Cepheus/Ursa Minor, Camelopardalis, and Auriga). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 24, 2024. International Space Station (ISS). 4:09 to 4:10 to 4:14 AM MDT. SW to SSE to NE. Appears from Earth's shadow 39 deg above SW, max altitude 88 deg above SSE, max magnitude -3.9 (Passing through Aquila, Cygnus, Lacerta, Cassiopeia/Andromeda, and Perseus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 25, 2024. International Space Station (ISS). 3:22 to 3:25 AM MDT. 1st AM ISS pass of June 25. E to ENE. Appears from Earth's shadow at max altitude 39 deg above E, max magnitude -2.8 (Passing through Pegasus, Aries/Triangulum, and Taurus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 25, 2024. International Space Station (ISS). 4:55 to 4:58 to 5:01 AM MDT. 2nd AM ISS pass of June 25. W to NNW to NNE. Appears from Earth's shadow 7 deg above W, max altitude 22 deg above NNW, max magnitude -1.8 (Passing through Hercules/Serpens, Corona Borealis, Boötes, Draco, Camelopardalis/Ursa Major, and Auriga). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 26, 2024. International Space Station (ISS). 4:07 to 4:09 to 4:12 AM MDT. W to NNW to NE. Appears from Earth's shadow 22 deg above W, max altitude 34 deg above NNW, max magnitude -2.5 (Passing through Hercules/Corona Borealis, Draco, Ursa Minor, Camelopardalis, and Auriga-near Capella). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 27, 2024. International Space Station (ISS). 3:19 to 3:23 AM MDT. 1st AM ISS pass of June 27. N to NE. Appears from Earth's shadow at max altitude 55 deg above N, max magnitude -3.2 (Passing through Cepheus, Cassiopeia, and Perseus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

June 27, 2024. International Space Station (ISS). 4:54 to 4:56 to 4:58 AM MDT. 2nd AM ISS pass of June 27. WNW to NNW to NNE. Appears from Earth's shadow at 2 deg above WNW, max altitude 13 deg above NNW, max magnitude -1.1 (Passing through Boötes and Ursa Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions**

June 28, 2024. International Space Station (ISS). 4:05 to 4:07 to 4:09 AM MDT. WNW to NNW to NNE. Appears from Earth's shadow 10 deg above WNW, max altitude 18 deg above NNW, max magnitude -1.3 (Passing through Boötes, Ursa Major/Draco, Camelopardalis, and Auriga). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions**

HAPPY OBSERVING!