

**OBSERVING HIGHLIGHTS for August 26 to September 11, 2024, a “dark Moon period”
Black Canyon Astronomical Society (BCAS), western Colorado, USA**

SUMMARY. After twilight ends, the striking star clouds of the Milky Way extend from the south southwest across the zenith to the northeast. The Milky Way is brightest in Constellation Sagittarius in the south southwest, the direction of our galaxy’s center. It’s a bit fainter in Constellation Cygnus overhead, and fainter still toward Cassiopeia and Perseus in the northeast. Use binoculars or a telescope to explore the many star clusters and nebulae of the summer Milky Way! The constellations of autumn, including Pegasus, Pisces, and Andromeda, are now rising in the east as spring Constellations Boötes and Corona Borealis descend in the west. Shortly after sunset, you can spot Venus in bright twilight, just above the western horizon. Saturn is opposite the Sun in our sky on September 8, and the Ringed Planet is now visible all night long. Bright Jupiter rises in the east northeast around midnight MDT and is followed by reddish Mars, rising around 1 AM MDT. Mercury departed our evening sky in early August, but now you can watch the speedy Innermost Planet steadily brighten low to the east-northeastern horizon during morning twilight.

The Moon is at last quarter on August 26. On mornings from August 27 to September 1, the crescent Moon wanes. On the morning of August 27, the crescent Moon is about 5 degrees north of Jupiter, and on August 28, a thinner crescent Moon is about 10 degrees left and below reddish Mars. Then on September 1 at about 5:42 AM MDT, look for the very thin lunar crescent about 5 degrees above the eastern horizon and 4 degrees left from Mercury (binoculars may help). The Moon is new, and consequently invisible, on September 2. On evenings from September 4 to 10, we can watch a crescent Moon wax. The Moon reaches first quarter on September 11. On September 4 at about 8:05 PM MDT, look for a very thin crescent Moon about 3 degrees above the western horizon and just 4 degrees below brilliant Venus. Use binoculars to spot earthshine on the nightside of the crescent Moon, especially on mornings from August 28 to September 1 and on evenings from September 4 to 8. Please do your crescent Moon spotting before sunrise and after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.

The Sun has been very active recently. There were X-class (extreme) solar flares on July 14, 16, and 29 and on August 5, 8, and 14. There have also been many coronal mass ejections (CMEs) of charged particles. As of August 25, there are large active regions with sunspots on the Earth-facing side of the Sun. So, moderate and even extreme solar flares and powerful CMEs are likely during this period. CMEs may trigger geomagnetic storms and auroras. You can monitor solar activity safely in real time on the internet. You can also find online the likelihood for auroras.

From western Colorado, try to spot evening passes of the Bluewalker 3 satellite (a direct to mobile phone prototype) on August 25 and 26. You can spot morning passes of the bright International Space Station (ISS) from August 26 through September 9, and evening passes of the ISS on September 9, 10, and 11. And you can spot morning passes of the almost-as-bright Tiangong (Chinese) Space Station from August 27 to September 10. Attend public, night-sky events at Ridgway State Park on August 31 and at 3 AstroFest venues on September 5, 6, and 7 (details in full report – PDF file).

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 August 30 and September 4, BCAS President, Bryan Cashion, presents “What is Solar Maximum and what does it mean for us?”

LATE AUGUST-EARLY SEPTEMBER OBSERVING EVENTS IN THE BCAS REGION (open to the public)

August 31, 8:00 PM, Ridgway State Park, Dutch Charlie Visitor Center

September 5, 8:30 PM, AstroFest 2004, Gunnison Gorge NCA, Flat Top parking area

September 6, 8:30 PM, AstroFest 2004, Black Canyon of the Gunnison NP, S. Rim Amphitheater (Road construction may impact this. Visit Black Canyon NP website Calendar of Events for updates)

September 7, 8:30 PM, AstroFest 2004, Curecanti NRA, Elk Creek area

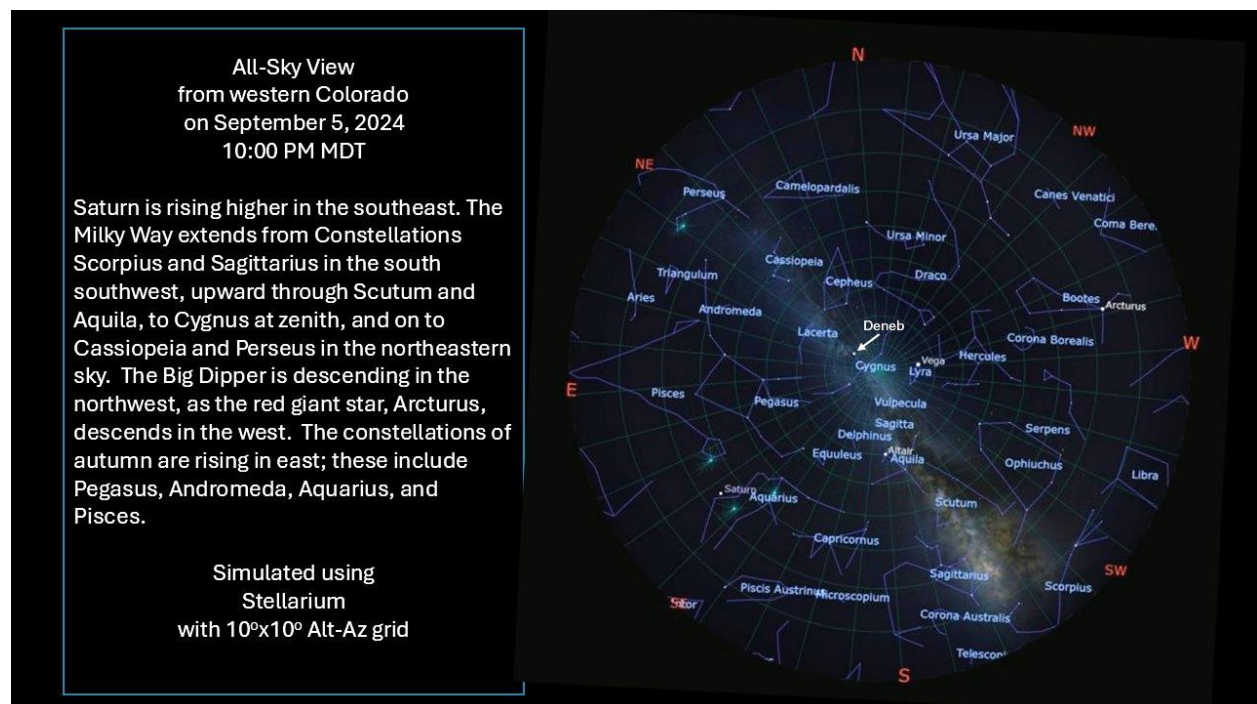
AstroFest 2024 is being presented jointly by Black Canyon of the Gunnison National Park, Curecanti National Recreation Area, and Gunnison Gorge National Conservation Area with assistance from Black Canyon Astronomical Society, Gunnison Valley Observatory, DarkSky International, Colorado Canyons Association, and Western National Parks Association. For more info on AstroFest 2024 see:

<https://www.nps.gov/blca/planyourvisit/astrofest.htm>

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>

A DARK SEPTEMBER SKY: THE MILKY WAY, FROM HORIZON TO HORIZON! After twilight ends, the Milky Way extends from the Constellations Scorpius and Sagittarius in the south southwest, upward through Scutum and Aquila, to Cygnus at Zenith, and on to Cassiopeia and Perseus in the northeast. The Milky Way is brightest in Sagittarius, where star clouds are relatively dense in the direction of the galactic center. The “Summer Triangle”, comprised of the bright stars Vega (in Lyra), Altair (in Aquila), and Deneb (in Cygnus), is nearly overhead. Autumn constellations, including Pegasus, Pisces, and Andromeda, are rising in the east. Saturn, currently in Constellation Aquarius, is rising higher in the southeast. To help navigate the late-August early-September sky, use a planetarium app or the chart below.



THE MOON. The Moon reaches **last quarter on August 26** (exactly at 3:26 AM MDT). On mornings from August 27 to September 1, the crescent Moon wanes. On the morning of August 27, the 38%-illuminated crescent Moon is about 5 degrees north of Jupiter. On the following morning, August 28, the 28%-illuminated crescent Moon is about 10 degrees to the left and below reddish Mars. Then on September 1 at about 5:42 AM MDT, look for a thin (2%-illuminated) lunar crescent about 5 degrees above the east-northeastern horizon and about 4 degrees left and slightly above Mercury (magnitude +0.38). **The Moon is new, and consequently invisible, on September 2** (exactly new at 7:55 PM MDT). On evenings from September 4 to 10, we can watch a crescent Moon wax. The Moon reaches **first quarter on September 11** (at exactly 12:05 AM MDT). On September 4 at about 8:05 PM MDT, look for a thin (2.5%-illuminated), crescent Moon about 3 degrees above an unobstructed, western horizon and 4 degrees below brilliant Venus. Enjoy seeing earthshine on the dark, nightside of the crescent Moon, especially on mornings from August 28 to September 1 and on evenings from September 4 to 8 (binoculars can provide eye-catching views). NASA has published a [stunning visualization of lunar phases for year 2024](#). 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 AS AN "EVENING STAR." On August 26 at 8:15 PM MDT (with the Sun 6 degrees below the horizon), try to spot Venus about 6 degrees above an unobstructed western horizon. By September 11 at 7:52 PM MDT (again with the Sun about 6 degrees below the horizon), look for Venus about 7 degrees above the horizon, 13 degrees south of due west. Venus, at magnitude -3.9, is very bright, but its luster is diminished by glaring evening twilight. Venus' angular separation from the Sun is increasing. But Venus will take many more weeks to rise above the glare of twilight for us in Colorado, because it's moving to the southeast. That circumstance makes Venus prominent in a darker sky for southern-hemisphere dwellers, while it's immersed in bright twilight for us northerners. Venus is still on the opposite side of the Sun from our perspective, 143 million miles distant on August 26 and 136 million miles distant on September 11. Through telescopes, Venus' gibbous phase wanes from 92% to 89% illuminated, as its apparent diameter increases from 10.8 to 11.4 arc seconds during this period. Venus will get easier to spot very gradually through the following weeks and months, as, evening-by-evening, our Sister Planet appears farther from the Sun. **Please do your Venus spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

SATURN AT ITS BRIGHTEST AND CLOSEST. Saturn appears opposite the Sun in our sky on September 8, so it's visible all night long. As evening twilight fades, look for Saturn above the east-southeastern horizon. By 1 AM MDT, Saturn is high in the southern sky, about 40 degrees above the horizon. The Ringed Planet descends low in the west southwest as morning twilight starts brightening the sky. Saturn is 807 million miles distant on August 26 and 805 million miles distant on September 11. Saturn now shines at magnitude +0.6, and that's as bright as the Ringed Planet gets this year. Through telescopes, the Ringed Planet appears 19 arc seconds wide, and its rings span 45 arc seconds. With a telescope or high-magnification binoculars, it's possible to spot Titan, Saturn's largest moon. Telescopes with apertures 5 inches or larger may reveal several other moons of the Ringed Planet. Saturn's rings now appear nearly "edge-on", so they may seem less impressive in telescopes than they did during the past several years. These thin rings will nearly disappear from our perspective during 2025. Because Saturn's rings now appear less inclined, and 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/>

JUPITER RISING AROUND MIDNIGHT. Bright Jupiter rises in the east northeast at about 12:42 AM MDT on August 26 and 11:42 PM MDT on September 11. The Giant Planet is prominent from shortly after it rises until moderate morning twilight. During this period Jupiter brightens from magnitude -2.23 to -2.33, as its distance from Earth decreases from 484 to 460 million miles. Through telescopes or binoculars, the Giant Planet's apparent equatorial diameter increases from 37.9 to 39.8 arc seconds between August 26 and September 11. 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, there are no transits of Ganymede's shadow that are observable from Colorado during this period. Io's shadow is larger than Europa's but smaller than Ganymede's shadow. Callisto's shadow does not cross Jupiter during this period. As Jupiter becomes visible through much of the night in the following weeks, many more of these Jovian solar eclipses will be visible.

August 30, 2024, 12:54 to 3:08 AM MDT, Io's shadow crosses Jupiter (Locally, Jupiter rises at about 12:28 AM MDT).

August 31-September 1, 2024, 10:00 PM to 12:34 AM MDT, Europa's shadow crosses Jupiter (Locally, Jupiter rises at 12:20 AM MDT on September 1. This event will be difficult to observe from western Colorado, as it begins well before Jupiter rises and ends with Jupiter only 2 degrees above the east-northeastern horizon).

September 6, 2024, 2:48 to 5:00 AM MDT. Io's shadow crosses Jupiter.

September 8, 2024, 12:36 to 3:10 AM MDT, Europa's shadow crosses Jupiter (Locally, Jupiter rises at 11:56 PM MDT on the night September 7-8. This event begins with Jupiter only 7 degrees above the east-northeastern horizon and ends when Jupiter is 36 degrees high in the sky).

MARS IN THE MORNING. Reddish Mars rises in the east northeast at about 1:04 AM MDT on August 26 and 12:40 AM MDT on September 11. Mars is prominent in the eastern sky after about 2 AM MDT until morning twilight starts interfering. Between August 26 and September 11, Mars brightens from magnitude +0.81 to +0.64, as its distance from Earth decreases from 136 to 127 million miles. During this period, Mars is still on the far side of the Sun from our perspective, and through telescopes its 88%-illuminated, gibbous disk appears small, less than 7 arc seconds wide.

MERCURY IN MORNING TWILIGHT. During midsummer, we enjoyed seeing Mercury as an "evening star." Now the speedy, Innermost Planet is becoming visible in morning twilight, after appearing to pass near the Sun (at "inferior solar conjunction") on August 18. On August 26 at 5:58 AM MDT Mercury is relatively faint (magnitude +2.22) and difficult to spot, only 3 degrees above an unobstructed eastern horizon with the Sun 8 degrees below that horizon. But Mercury brightens rapidly as it retrogrades westward from the Sun, rising earlier each morning until September 5, when it appears at a maximum "elongation" west of the Sun. On September 5 at about 5:50 AM MDT, look for Mercury shining brightly (magnitude -0.28) about 6 degrees above the horizon with the Sun still 11 degrees below that horizon. Mercury continues to brighten to magnitude -0.92 on September 11, when at around 6:00 AM MDT you

may easily spot the “Speedster Planet” about 5 degrees above an unobstructed horizon with the Sun still 10 degrees below that horizon. Through telescopes, Mercury’s phases wax from a slender, 10%-illuminated crescent on August 26, to a “fat”, 47%-illuminated crescent on September 5, to a 72%-illuminated, gibbous disk on September 11. During this period, Mercury’s apparent size through telescopes decreases from 9.6 to 6.1 arc seconds, as the Innermost Planet’s distance from Earth increases from 65 to 103 million miles. On the morning of September 1 at about 5:42 AM MDT (with the Sun still 12 degrees below the horizon), look for a very thin (2%-illuminated), crescent Moon about 5 degrees above an unobstructed, east-northeastern horizon and 4 degrees left from +0.38-magnitude Mercury (binoculars may provide a very nice view!).

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 is descending in the west 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 early 2025. Then this “new star” may then fade rapidly below naked-eye visibility in about a week. As of early on August 25, 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

WAITING FOR COMET TSUCHINSHAN-ATLAS (C/2023 A3). When it enters the inner Solar System in early fall, Comet [Tsuchinshan-ATLAS \(C/2023 A3\)](#) may become a striking sight, especially during evenings in mid-to-late October. But that’s only if it survives its perihelion pass about 36 million miles from the Sun on September 27. C/2023 A3 is now shining at magnitude +8, but it’s fully engulfed in bright evening twilight. By the last week of September, C/2023 A3 may shine brightly low to the eastern horizon before dawn. For a few days in early October, C/2023 A3 may become visible in images from the [C3 coronagraph on the SOHO satellite](#). For the best viewing, we hope that this Comet survives its late September brush with the Sun and then re-emerges into the evening sky as a striking object during mid to late October. You can find updates, 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>

<https://skyandtelescope.org/astronomy-news/status-report-and-expectations-for-comet-tsuchinshan-atlas/>

Please do your C/2023 A3 spotting after sunset (or before sunrise in late September). NEVER chance looking at the Sun directly; serious eye damage can result.

THE SUN. The Sun has been very active over the past year, and intensely so in the past several months, when solar active regions have unleashed numerous flares and coronal mass ejections (CMEs) of charged particles. There have been M-class (moderate) solar flares each week for the past year, and there have been many X-class (extreme) solar flares, including X-class flares on July 14, 16, and 29 and

on August 5, 8, and 14. There also have been CMEs that have triggered geomagnetic storms that caused auroras. Many folks in Colorado and elsewhere viewed and/or photographed auroras during the night of May 10-11. As of August 25, there are many active regions containing large sunspots on the Earth-facing side of the Sun, so we may experience more M- and possibly even X-class flares and powerful CMEs. [Airglow](#) and “SARs” also result from high solar activity, and these phenomena also have been photographed and/or observed from Colorado. You can monitor sunspots, solar flares, CMEs, and other solar activity safely and in “real time” at the following sites:

<https://sdo.gsfc.nasa.gov/data/>

<https://stereo.gsfc.nasa.gov/beacon/>

<http://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/or photograph some amazing auroras from Colorado! A coronal mass ejection (CME) from the Sun 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 a widespread aurora. As of August 25, there are many large 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 August 29. 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.

August 25, 2024. Bluewalker 3 (a direct-to-mobile-phone, telecommunications prototype). 8:47 to 8:50 to 8:54 PM MDT. SW to NW to NE. Max altitude 74 deg above NW, max magnitude +2.0 (Passing through Libra/Virgo, Serpens, Corona Borealis, Hercules, Draco, Cepheus, Cassiopeia, and Andromeda).

August 26, 2024. International Space Station (ISS). 4:15 to 4:17 AM MDT. 1st AM ISS pass of August 26. N to NNE. Appears from Earth’s shadow at max altitude, 22 deg above N, max magnitude -1.5 (Passing through Draco and Ursa Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 26, 2024. International Space Station (ISS). 5:48 to 5:51 AM MDT. 2nd AM ISS pass of August 26. WNW to N. Appears from Earth’s shadow 2 deg above WNW, max altitude 10 deg above N, max

magnitude -0.8 (Passing through Cygnus, Draco, and Ursa Major-Big Dipper). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 26, 2024. Bluewalker 3 (a direct-to-mobile-phone, telecommunications prototype). 8:20 to 8:23 to 8:27 PM MDT. SW to NW to NE. Max altitude 82 deg above NW, max magnitude +1.9 (Passing through Libra/Virgo, Serpens, Corona Borealis, Hercules, Draco, Cepheus, Cassiopeia/Lacerta, and Andromeda).

August 27, 2024. International Space Station (ISS). 5:01 to 5:02 to 5:04 AM MDT. NW to NNW to N. Appears from Earth's shadow 10 deg above NW, max altitude 12 deg above NNW, max magnitude -1.1 (Passing through Draco and Ursa Major-Big Dipper). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 27, 2024. Tiangong (Chinese Space Station). 5:24 to 5:26 to 5:27 AM MDT. S to SE. Appears from Earth's shadow 7 deg above S, max altitude 11 deg above SE, max magnitude +0.6 (Passing through Eridanus, Columba, and Canis Major-near Sirius). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

August 28, 2024. International Space Station (ISS). 4:14 to 4:16 AM MDT. N to NNE. Appears from Earth's shadow at max altitude 14 deg above N, max magnitude -1.0 (Passing through Draco and Ursa Major-Big Dipper). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 28, 2024. Tiangong (Chinese Space Station). 5:59 to 6:02 to 6:05 AM MDT. SW to SSE to E. Appears from Earth's shadow 8 deg above SW, max altitude 33 deg above SSE, max magnitude -0.9 (Passing through Sculptor, Eridanus, Orion, Monoceros, Canis Minor, and Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

August 29, 2024. Tiangong (Chinese Space Station). 5:01 to 5:04 AM MDT. SSE to E. Appears from Earth's shadow 19 deg above SSE at max altitude, max magnitude -0.1 (Passing through Eridanus, Lepus, Monoceros, and Canis Minor). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

August 30, 2024. International Space Station (ISS). 4:13 to 4:14 AM MDT. 1st AM ISS pass of August 30. N to NE. Appears from Earth's shadow at max altitude 10 deg above N, max magnitude -0.6 (Passing through Draco and Ursa Major-Big Dipper). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 30, 2024. Tiangong (Chinese Space Station). 5:36 to 5:37 to 5:40 AM MDT. SW to SSE to ENE. Appears from Earth's shadow 23 deg above SW, max altitude 56 deg above SSE, max magnitude -1.8 (Passing through Cetus, Taurus, Orion, Gemini, and Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

August 30, 2024. International Space Station (ISS). 5:51 to 5:52 AM MDT. 2nd AM ISS pass of August 30. in N. Appears from Earth's shadow near max altitude 10 deg above N, max magnitude -0.5 (Passing through Draco and Ursa Major-Big Dipper). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

August 31, 2024. Tiangong (Chinese Space Station). 4:38 to 4:39 AM MDT. 1st AM Tiangong pass of August 31. ESE to E. Appears from Earth's shadow at max altitude 24 deg above ESE, max magnitude -0.1 (Passing through Orion and Canis Minor). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

August 31, 2024. Tiangong (Chinese Space Station). 6:10 to 6:13 to 6:16 AM MDT. 2nd AM Tiangong pass of August 31. W to NNW to ENE. Appears from Earth's shadow 8 deg above W, max altitude 63 deg above NNW, max magnitude -1.9 (Passing through Pegasus, Cassiopeia, Camelopardalis, Ursa Major, and Leo). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 1, 2024. Tiangong (Chinese Space Station). 5:11 to 5:12 to 5:15 AM MDT. WSW to SSE to ENE. Appears from Earth's shadow 63 deg above WSW, max altitude 89 deg above SSE, max magnitude -2.3 (Passing through Pegasus, Triangulum, Perseus, Auriga, Gemini, and Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 1, 2024. International Space Station (ISS). 5:49 to 5:51 to 5:53 AM MDT. NNW to NNE to NE. Max altitude 14 deg above NNE, max magnitude -0.9 (Passing through Draco, Ursa Major-Big Dipper, Leo Minor, and Leo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 2, 2024. International Space Station (ISS). 4:59 to 5:02 to 5:03 AM MDT. NNW to NNE to NE. Appears from Earth's shadow 5 deg above NNW, max altitude 11 deg above NNE, max magnitude -0.7 (Passing through Draco, Ursa Major-Big Dipper, and Leo Minor). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 2, 2024. Tiangong (Chinese Space Station). 5:46 to 5:48 to 5:51 AM MDT. W to N to ENE. Appears from Earth's shadow 17 deg above W, max altitude 50 deg above N, max magnitude -1.6 (Passing through Pegasus, Lacerta, Cepheus/Cassiopeia, Camelopardalis, Ursa Major, and Leo). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 3, 2024. Tiangong (Chinese Space Station). 4:47 to 4:50 AM MDT. NE to ENE. Appears from Earth's shadow at max altitude 45 deg above NE, max magnitude -1.1 (Passing through Lynx and Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 3, 2024. International Space Station (ISS). 5:47 to 5:50 to 5:53 AM MDT. NNW to NNE to E. Max altitude 25 deg above NNE, max magnitude -1.6 (Passing through Draco, Ursa Minor, Draco again, Ursa Major, Leo Minor, and Cancer/Leo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 4, 2024. International Space Station (ISS). 4:58 to 5:01 to 5:03 AM MDT. NNW to NNE to ENE. Max altitude 18 deg above NNE, max magnitude -1.0 (Passing through Draco, Ursa Major-Big Dipper, Leo Minor, and Cancer/Leo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 4, 2024. Tiangong (Chinese Space Station). 5:21 to 5:22 to 5:25 AM MDT. NW to N to ENE. Appears from Earth's shadow 30 deg above NW, max altitude 45 deg above N, max magnitude -1.4 (Passing through Cygnus, Cepheus, Camelopardalis, Ursa Major/Lynx, and Leo/Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 5, 2024. International Space Station (ISS). 4:12 to 4:14 AM MDT. 1st AM ISS pass of September 5. NNE to NE. Appears from Earth's shadow at max altitude 14 deg above NNE, max magnitude -0.7 (Passing through Ursa Major-Big Dipper and Cancer). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 5, 2024. International Space Station (ISS). 5:44 to 5:49 to 5:52 AM MDT. 2nd AM ISS pass of September 5. NW to NE to ESE. Max altitude 61 deg above NE, max magnitude -3.2 (Passing through Cygnus, Cepheus, Camelopardalis, Gemini, Canis Minor, and Monoceros). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 5, 2024. Tiangong (Chinese Space Station). 5:55 to 5:58 to 6:01 AM MDT. WNW to N to E. Appears from Earth's shadow 11 deg above WNW, max altitude 53 deg above N, max magnitude -1.6 (Passing through Cygnus, Lacerta, Cepheus/Cassiopeia, Camelopardalis, Ursa Major/Lynx, and Cancer/Leo). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 6, 2024. Tiangong (Chinese Space Station). 4:56 to 4:59 AM MDT. NNE to ENE. Appears from Earth's shadow at max altitude 45 deg above NNE, max magnitude -1.3 (Passing through Camelopardalis, Ursa Major/Lynx, and Cancer). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 6, 2024. International Space Station (ISS). 4:58 to 4:60 to 5:03 AM MDT. NNW to NNE to E. Appears from Earth's shadow 21 deg above NNW, max altitude 35 deg above NNE, max magnitude -2.2 (Passing through Draco, Ursa Minor, Camelopardalis, Lynx, Gemini/Cancer, and Canis Minor). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 7, 2024. Tiangong (Chinese Space Station). 5:30 to 5:31 to 5:34 AM MDT. WNW to NNE to E. Appears from Earth's shadow 28 deg above WNW, max altitude 68 deg above NNE, max magnitude -2.0 (Passing through Lacerta, Cassiopeia, Perseus/Camelopardalis, Auriga, Gemini, Cancer/Canis Minor, and Leo). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 7, 2024. International Space Station (ISS). 5:45 to 5:47 to 5:50 AM MDT. WNW to SW to SSE. Appears from Earth's shadow 16 deg above WNW, max altitude 43 deg above SW, max magnitude -3.4 (Passing through Pegasus, Pisces, Cetus, Eridanus, and Columba). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 8, 2024. International Space Station (ISS). 4:59 to 5:01 AM MDT. in SE. Appears from Earth's shadow at max altitude 45 deg above SE, max magnitude -3.0 (Passing through Orion, Lepus, and Canis Major). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 8, 2024. Tiangong (Chinese Space Station). 6:04 to 6:06 to 6:00 AM MDT. W to SSW to SE. Appears from Earth's shadow 12 deg above W, max altitude 49 deg above SSW, max magnitude -1.9 (Passing through Pegasus, Pisces, Cetus, Eridanus, Orion, and Canis Major-near Sirius). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 9, 2024. Tiangong (Chinese Space Station). 5:05 to 5:08 AM MDT. In ESE. Appears from Earth's shadow at max altitude 59 deg above ESE, max magnitude -1.8 (Passing through Taurus, Orion, and Monoceros). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 9, 2024. International Space Station (ISS). 5:46 to 5:47 AM MDT. in SSW. Appears from Earth's shadow at max altitude 13 deg above SSW, max magnitude -1.6 (Passing through Fornax, Eridanus, and Caelum). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 9, 2024. International Space Station (ISS). 8:46 to 8:49 PM MDT. SSW to SSE. Disappears into Earth's shadow at max altitude 35 deg above SSE, max magnitude -3.1 (Passing through Scorpius, Sagittarius, and Capricornus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 10, 2024. Tiangong (Chinese Space Station). 5:39 to 5:42 AM MDT. SW to SSW to SE. Appears from Earth's shadow 29 deg above SW, max altitude 30 deg above SSW, max magnitude -1.3 (Passing through Cetus, Eridanus, Columba, and Canis Major). **Predictions for the Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

September 10, 2024. International Space Station (ISS). 7:58 to 8:00 to 8:03 PM MDT. 1st PM ISS pass of September 10. S to SE to E. Disappears into Earth's shadow 9 deg above E, max altitude 19 deg above SE, max magnitude -2.3 (Passing through Scorpius, Sagittarius/Corona Australis, Capricornus, Aquarius, Pisces, and Pegasus). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 10, 2024. International Space Station (ISS). 9:34 to 9:36 PM MDT. 2nd PM ISS pass of September 10. WSW to WNW. Disappears into Earth's shadow at max altitude 32 deg above WNW, max magnitude -2.0 (Passing through Libra and Boötes). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

September 11, 2024. International Space Station (ISS). 8:44 to 8:47 to 8:49 PM MDT. WSW to NW to NE. Max altitude 73 deg above NW, disappears into Earth's shadow 22 deg above NE, max magnitude -3.6 (Passing through Libra, Serpens, Hercules, Draco, Cepheus, and Cassiopeia). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

HAPPY OBSERVING!