

**OBSERVING HIGHLIGHTS for October 24 to November 8, 2024, a “dark Moon period”  
Black Canyon Astronomical Society (BCAS), western Colorado, USA**

**SUMMARY.** Wow! It’s a great time for comets! After putting on a wonderful show in mid-October (even under a bright Moon!), Comet C/2023 A3 “(Tsuchinshan-ATLAS) is fading but still visible high in the western evening sky (try using binoculars). Meanwhile, a new Sun-grazing comet, C/2024 S1 (ATLAS), will approach within 0.74 million miles of the Sun on October 28. That’s less than 1 solar diameter! C/2024 S1 could become very bright, if (a big “if”?) it survives its solar encounter.

The current, extremely active solar maximum is triggering auroras, aka “northern lights.” Even under bright moonlight, many people in Colorado viewed and photographed a colorful auroral display on the night of October 10-11. It’s possible that more auroras will be visible, as the Sun remains very active.

As twilight fades during this dark Moon period, the Milky Way crosses the sky from Sagittarius in the southwest, through Cygnus and Cepheus near the zenith to Cassiopeia, Perseus, and Auriga in the northeast. Brilliant Venus is becoming more prominent in the southwest during late evening twilight, as its angular distance from the Sun increases. On November 8 at about 5:40 PM MST, challenge yourself to spot Mercury in bright twilight only 3 degrees above an unobstructed west-southwestern horizon. Always look for Venus, Mercury, and comets after sunset (or before sunrise), because directly viewing the Sun can cause severe eye damage. As the sky darkens, Saturn is 25 to 30 degrees high in the southeast. Bright Jupiter is rising earlier in the east northeast, before 9 PM MDT on October 24 and before 7 PM MST on November 8. Mars follows Jupiter, rising at about 11:30 PM MDT on October 24 and a bit before 10 PM MST on November 8. Using binoculars or a telescope, challenge yourself to find the “Seventh Planet”, Uranus, which is now visible in Constellation Taurus all night long.

The Moon is at last quarter on the night of October 23-24, when it’s just east of reddish Mars. On mornings from October 25 to October 31, the crescent Moon wanes. The Moon is new, and consequently invisible, on November 1. On the evening of November 4 at about 6:10 PM MST, look for the 4%-illuminated, waxing crescent Moon about 4 degrees below brilliant Venus. The Moon reaches first quarter on November 8. Enjoy seeing earthshine on the dark, nightside of the crescent Moon, especially on mornings from October 26 to 30 and on evenings from November 3 to 6 (binoculars can provide eye-catching views).

From western Colorado, view passes of interesting satellites, including predawn passes of the bright International Space Station (ISS) on October 24 and from October 29 to November 7 and the almost-as-bright, Tiangong (Chinese) Space Station from October 24 to 31. Evening passes for Tiangong are predicted for November 7 and 8.

Remember to set those non-web-connected clocks back by 1 hour on the morning of November 3, as we in Colorado transition from MDT to MST.

**WESTERN SLOPE SKIES.** Since 2011, BCAS and KVN 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 October 25 and 30, Michael T. Williams presents “Man’s Mementos on the Moon.”

**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>

**REMEMBER:** In Colorado we change from Mountain Daylight Time (MDT) to Mountain Standard Time (MST) on November 3, 2024 at 2 AM MDT. Move non-internet-connected clocks and watches back by 1 hour.

**COMET TSUCHINSHAN-ATLAS – STILL WORTH A LOOK IN THE EVENING!** During the past 10 days, we hope you got to see Comet [Tsuchinshan-ATLAS \(C/2023 A3\)](#), the brightest comet of the past several years. “A3” is now fading as it heads back into the outer Solar System, away from the Earth and Sun. But the early evening sky is now free from moonlight, allowing us to see and photograph the Comet in darker conditions. Try using binoculars to view C/2023 A3. 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>

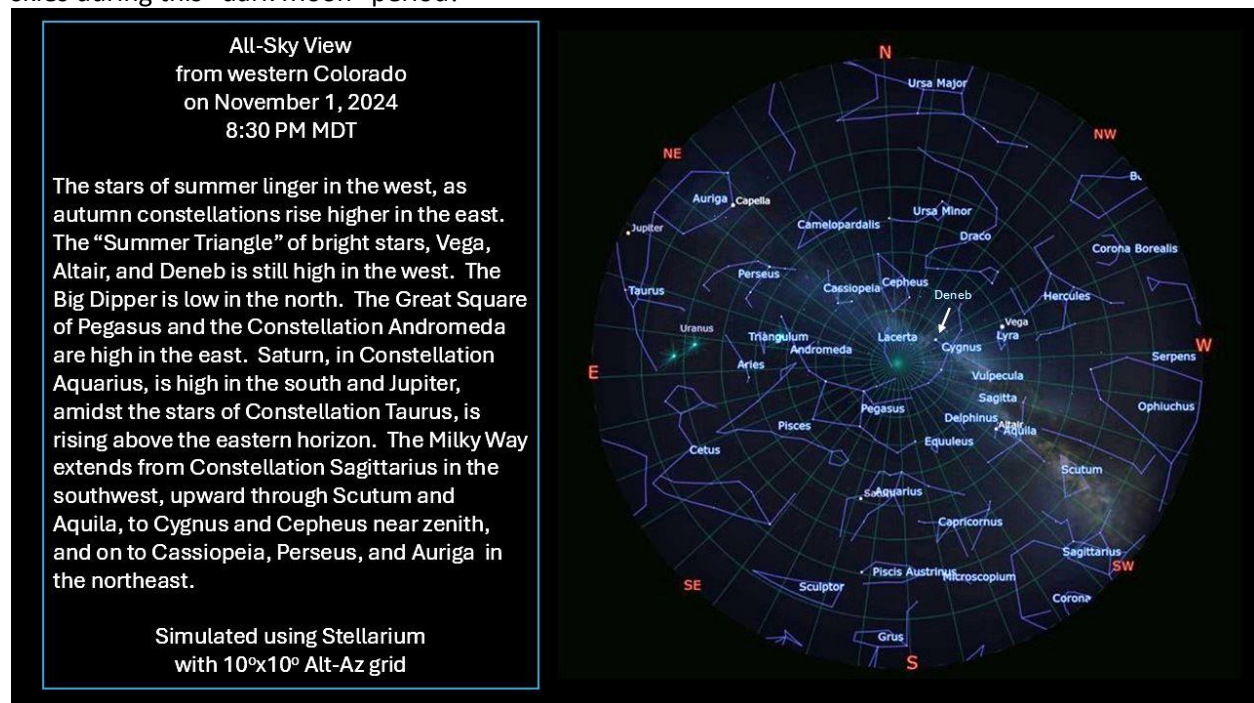
<http://www.aerith.net/comet/catalog/2023A3/2023A3.html>

<https://apod.nasa.gov/apod/ap241018.html>

<https://skyandtelescope.org/astronomy-news/comet-tsuchinshan-atlas-climbs-brightens-and-delights/>

**Please do your C/2023 A3 spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

**A DARK FALL SKY.** In early November at about 8:30 PM MDT (7:30 PM MST), we can still see the stars of summer lingering in the western sky, as the constellations of fall become prominent high in the east. Saturn, passing through Constellation Aquarius, is high in the south, as Jupiter rises with the stars of Taurus in the east northeast. As the Big Dipper is skimming the northern horizon, the Milky Way crosses the sky from Sagittarius in the southwest, through Cygnus and Cepheus near the zenith to Cassiopeia, Perseus, and Auriga in the northeast. Use a planetarium app or the chart below to help navigate our skies during this “dark Moon” period!



**THE MOON.** The moon reaches last quarter on the night of October 23-24 (exactly at 2:55 AM MDT on October 24), when it's just east of reddish Mars. The Moon is new, and consequently invisible, on November 1 (exactly new at 6:45 AM MDT). On November 4 at about 6:10 PM MST, look for the 4%-illuminated, crescent Moon about 4 degrees below brilliant Venus. The Moon reaches first quarter on November 8 (exactly at 10:55 PM MST). Enjoy seeing earthshine on the dark, nightside of the crescent Moon, especially on mornings from October 26 to 30 and on evenings from November 3 to 6 (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: A BRILLIANT EVENING STAR.** On October 24 at 7:00 PM MDT, you'll find brilliant Venus in twilight about 10 degrees above the southwestern horizon, when the Sun is 8 degrees below the horizon. Venus is moving east from the Sun in our sky, and by November 8 at 5:40 PM MST, you can find Venus 13 degrees above the horizon in nautical twilight (with the Sun, again, 8 degrees below the horizon). Venus now sets after the end of evening twilight at about 8:05 PM MDT on October 24 and at 7:15 PM MST on November 8. Venus is getting closer to Earth: Our Sister Planet is 113 million miles distant on October 24 and 104 million miles distant on November 8. Through telescopes, Venus' gibbous phase wanes from 79% to 75% illuminated, as its apparent diameter increases from 13.7 to 14.9 arc seconds during this period. From western Colorado, Venus will get even easier to spot through the fall, as, evening-by-evening, our Sister Planet appears even farther from the Sun. **Please do your Venus spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

**MERCURY: AN EVENING CHALLENGE ON NOVEMBER 8.** By November 8 at about 5:40 PM MST, you may be able to spot Mercury, shining at magnitude -0.3, just 3 degrees above an unobstructed west-southwestern horizon (with the Sun 8 degrees below that horizon), when the Innermost Planet is 107 million miles distant. Through telescopes, Mercury's 77%-illuminated, gibbous disk appears 5.8 arc seconds wide. Mercury will get a bit easier to spot by mid-November, as its angular distance from the Sun increases. This is Mercury's third evening appearance of 2024, and the most challenging one for viewing from the northern hemisphere. **Please do your Mercury spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

**SATURN IN THE EVENING SKY.** As twilight fades, Saturn is prominent about 25 to 30 degrees above the southeastern horizon. The Ringed Planet is highest in the southern sky (at about 40 degrees altitude) at about 8 to 9 PM MDT (= 7 to 8 PM MST) and sets in the west at about 3:28 AM MDT on October 24 and 1:33 AM MST on November 8. Saturn is 833 million miles distant on October 24 and 852 miles distant on November 8. Saturn fades from magnitude +0.76 to +0.84 during this period.

Through telescopes, the Ringed Planet appears 18 arc seconds wide, and its rings span 43 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 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/>  
For more info on the appearance of Saturn's rings in 2024 and 2025 and phenomena associated with Saturn's moons, see this article...

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

**FIND URANUS, THE SEVENTH PLANET!** The Planet Uranus will be opposite the Sun in our sky on November 17, and by late October it's already visible all night long in Constellation Taurus, about 7 degrees southwest of the Pleiades Star Cluster (M45). Uranus is shining at magnitude +5.6, and you may be able to see it with eyes unaided under dark skies. However, it helps to use binoculars or a telescope to find the "Seventh Planet" with the aid of a planetarium app or a finder chart, like the one at this link... <https://theskylive.com/uranus-info>

If you have a telescope, can you resolve Uranus' 4 arc second-wide disk? Does the Planet look colorful? Through a telescope, most people perceive Uranus as various shades of green or blue.

**JUPITER: RISING EARLIER NOW.** Look for bright Jupiter rising in the east northeast at about 8:57 PM MDT on October 24 and by 6:52 PM MST on November 8. The Giant Planet is prominent from shortly after it rises in the east northeast, until it descends toward the west-northwestern horizon in moderate morning twilight. During this period Jupiter brightens from magnitude -2.64 to -2.73, as its distance from Earth decreases from 404 to 391 million miles. Through telescopes or binoculars, the Giant Planet's apparent equatorial diameter increases from 45.3 to 46.9 arc seconds from October 24 to November 8.

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](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. From Colorado, there is a "primetime" transit of Ganymede's shadow on the evening of November 2.** Io's shadow is larger than Europa's but smaller than Ganymede's shadow. Callisto's shadow does not cross Jupiter during this period. Because Jupiter will be visible through most of the night in the following weeks, many more of these Jovian solar eclipses will be visible.

October 23, 2024, 9:34 PM to 11:48 PM MDT, Io's shadow crosses Jupiter (Locally, this event begins with Jupiter only 6 degrees above the east-northeastern horizon and ends with Jupiter 30 degrees high).

October 24, 2024, 5:34 AM to 8:08 AM MDT. Europa's shadow crosses Jupiter (Locally this event begins with Jupiter high in the sky before morning twilight begins, but it ends after the Sun rises at 7:33 AM MDT).

October 27, 2024, 6:52 to 9:26 PM MDT. Europa's shadow crosses Jupiter (Locally Jupiter rises at 8:43 PM MDT, just before the end of this transit, and it's only 7 degrees above the east-northeastern horizon at event's end).

October 29, 2024, 5:00 AM to 7:12 AM MDT, Io's shadow crosses Jupiter (Locally, this event begins with Jupiter high in a dark western sky but ends in bright morning twilight).

October 30-31, 2024, 11:28 PM to 1:42 AM MDT, Io's shadow crosses Jupiter.

**November 2, 2024, 8:30 PM MDT to 10:48 PM MDT, Ganymede's shadow crosses Jupiter at a very high southern latitude on Jupiter (Locally, this event begins with Jupiter only 2 degrees above the east-northeastern horizon and ends with Jupiter 27 degrees above the horizon).**

November 3, 2024, 8:28 PM MST to 11:02 PM MST. Europa's shadow crosses Jupiter (Locally, this event begins with Jupiter 13 degrees above the east-northeastern horizon and ends with Jupiter 42 degrees above the horizon).

November 5, 2024, 5:54 AM MST to 8:06 AM MST, Io's shadow crosses Jupiter (Locally, this event begins in nautical twilight with Jupiter 43 degrees above the western horizon and ends well after sunrise, which occurs at about 6:46 AM MST).

November 7, 2024, 12:22 AM to 2:36 AM MST, Io's shadow crosses Jupiter (Locally, Jupiter is high in the sky for this event).

November 8, 2024, 6:52 PM to 9:04 PM MST, Io's shadow crosses Jupiter (Locally, this event begins just as Jupiter rises at 6:52 PM MST and ends with Jupiter 24 degrees above the eastern horizon).

**MARS: RISING BEFORE MIDNIGHT.** Reddish Mars rises in the east northeast at about 11:30 PM MDT on October 24 and 9:56 PM MST on November 8. Mars is prominent in the eastern sky from about half an hour after it rises until morning twilight starts interfering. Between October 24 and November 8, Mars brightens from magnitude +0.12 to -0.05, as its distance from Earth decreases from 99 to 89 million miles. Through telescopes Mars' 88%- to 89%-illuminated, gibbous disk appears 8.8 to 9.8 arc seconds wide. Earth is getting closer to Mars, leading up to Mars' opposition on January 16. From late fall through winter, prominent surface features on Mars may be visible in amateur telescopes.

**A BRIGHT, NEW SUN-GRAZING COMET?** On September 27, the ATLAS survey in Hawaii discovered a sun-grazing Comet, C/2024 S1 ATLAS (its preliminary designation was A11bP71). There's an (unlikely?) chance that this Comet may become brilliant during very late October and early November. But that's only if it survives a very close brush with the Sun on October 28 (perihelion distance of 0.74 million miles, less than one solar diameter!). For a few days around October 28, try to observe this Comet virtually with [C3 Coronagraph images from the SOHO satellite](#). You can find updated info about this Comet here...

<http://astro.vanbuitenen.nl/comet/2024S1>

<http://www.aerith.net/comet/catalog/2024S1/2024S1.html>

**Please do your Comet spotting before sunrise and after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

**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? Corona Borealis is getting low in the west-northwestern sky as evening twilight fades. So, try to find "The Northern Crown" shortly after dark. T Coronae Borealis (T CrB) is a recurrent nova that (based on its past behavior) may rapidly increase in brightness 1500-fold (to second magnitude) to become the brightest star (or 2<sup>nd</sup> brightest star) in Corona Borealis between now and sometime in 2025. Then this "new star" may fade rapidly below naked-eye visibility in about a week. As of early on October 23, 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://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://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://www.aanda.org/articles/aa/full_html/2023/12/aa48372-23/aa48372-23.html)

**THE SUN.** The Sun has been very active over the past year, and intensely so in the past 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, August 5, 8, and 14, September 12 and 14, and October 1, 3, 7, and 9. There also have been CMEs that have triggered geomagnetic storms that caused auroras. Many folks in Colorado and elsewhere viewed and/or photographed striking auroras during the nights of May 10-11 and October 10-11. As of October 23, some very large sunspots have appeared on the eastern limb of the Sun, and these are now rotating into view. So, we may experience more M- and possibly even X-class flares and powerful CMEs. [Auroraglow](#) 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/beamon/>

<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 nights of May 10-11 and October 10-11, many of us were able to see and/or photograph some amazing auroras from Colorado! Coronal mass ejections (CMEs) from the Sun were aimed towards our planet. Charged particles from CMEs were captured by Earth’s magnetic field, energizing the ionosphere, thereby triggering geomagnetic storms and widespread auroras. As of October 23, there are several large active regions on the eastern limb of the Sun that are now facing the Earth. So, the chances for geomagnetic storms are good and spotting auroras may be possible. You can get predictions and updates for auroras, their intensity, and geographic extent from NOAA’s Space Weather Prediction Center:

<https://www.swpc.noaa.gov/products/aurora-viewline-tonight-and-tomorrow-night-experimental>

Auroras are most frequently seen from high latitudes, e.g., from Canada, Alaska, Iceland, northernmost Europe, southern New Zealand and Antarctica. We can watch auroras in real-time from Yellowknife, Northwest Territories on an all-sky camera at the [Canadian Space Agency’s AuroraMax website](#). Like Colorado, Yellowknife is in the Mountain Time Zone. An aurora webcam at the University of Alaska-Fairbanks is two hours behind the Mountain Time Zone...

<https://www.youtube.com/watch?v=O52zDyxg5QI>

**EARTH SATELLITE HIGHLIGHTS.** The following predictions are for western Colorado, specifically Montrose, 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 40 minutes, especially after October 27. 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.

**October 24, 2024. Tiangong (Chinese Space Station). 5:28 to 5:29 AM MDT. 1<sup>st</sup> AM Tiangong pass of October 24.** In ENE. Appears from Earth's shadow at max altitude 24 deg above ENE, max magnitude +0.1 (Passing through Canes Venatici and Coma Berenices). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 24, 2024. International Space Station (ISS). 6:07 to 6:08 AM MDT.** NNW to N. Appears from Earth's shadow at max altitude 11 deg above NNW, max magnitude -1.3 (Passing through Cepheus and Draco). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**October 24, 2024. Tiangong (Chinese Space Station). 7:00 to 7:03 to 7:06 AM MDT. 2<sup>nd</sup> AM Tiangong pass of October 24.** WNW to NNE to E. Appears from Earth's shadow 10 deg above WNW, max altitude 61 deg above NNE, max magnitude -1.9 (Passing through Triangulum, Perseus, Camelopardalis, Ursa Major, Coma Berenices and Virgo). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions. This pass is in bright twilight and may be challenging to see.**

**October 25, 2024. Tiangong (Chinese Space Station). 5:59 to 6:02 AM MDT.** N to E. Appears from Earth's shadow near max altitude 47 deg above N, max magnitude -1.7 (Passing through Camelopardalis, Ursa Major-Big Dipper, Canes Venatici, and Coma Berenices). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 26, 2024. Tiangong (Chinese Space Station). 6:29 to 6:31 to 6:34 AM MDT.** WNW to NNE to ESE. Appears from Earth's shadow 24 deg above WNW, max altitude 78 deg above NNE, max magnitude -2.2 (Passing through Triangulum, Perseus, Camelopardalis/Auriga, Lynx, Leo Minor, Leo, and Virgo). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 27, 2024. Tiangong (Chinese Space Station). 5:28 to 5:30 AM MDT. 1<sup>st</sup> AM Tiangong pass of October 27.** In E. Appears from Earth's shadow at max altitude 25 deg above E, max magnitude +0.1 (Passing through Leo and Virgo). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 27, 2024. Tiangong (Chinese Space Station). 7:00 to 7:03 to 7:06 AM MDT. 2<sup>nd</sup> AM Tiangong pass of October 27.** W to SSW to SE. Appears from Earth's shadow 9 deg above W, max altitude 41 deg above SSW, max magnitude -1.5 (Passing through Taurus, Orion, Monoceros, and Hydra). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions. This pass occurs in bright twilight and may be challenging to see.**

**October 28, 2024. Tiangong (Chinese Space Station). 5:59 to 6:02 AM MDT.** SSE to ESE. Appears from Earth's shadow at max altitude 74 deg above SSE, max magnitude -2.2 (Passing through Gemini-near Mars, Cancer/Leo/Hydra, and Sextans). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 29, 2024. Tiangong (Chinese Space Station). 6:30 to 6:31 to 6:33 AM MDT.** WSW to SSW to SSE. Appears from Earth's shadow 22 deg above WSW, max altitude 27 deg above SSW, max magnitude -0.9 (Passing through Eridanus, Orion/Lepus, Canis Major, Puppis, Pyxis, Antlia, and Hydra). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 29, 2024. International Space Station (ISS). 6:53 to 6:55 to 6:57 AM MDT.** NNW to NNE to NE. Appears from Earth's shadow 4 deg above NNW, max altitude 14 deg above NNE, max magnitude -1.3 (Passing through Cepheus, Draco, and Boötes). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**October 30, 2024. Tiangong (Chinese Space Station). 5:28 to 5:29 AM MDT.** In SE. Appears from Earth's shadow at max altitude 16 deg above SE, max magnitude +0.6 (Passing through Hydra). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 30, 2024. International Space Station (ISS). 6:05 to 6:06 to 6:07 AM MDT.** N to NNE to NE. Appears from Earth's shadow 10 deg above N, max altitude 11 deg above NNE, max magnitude -1.1 (Passing through Draco and Boötes). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**October 31, 2024. Tiangong (Chinese Space Station). 5:59 to 5:60 AM MDT.** S to SSE. Appears from Earth's shadow at max altitude 14 deg above S, max magnitude +0.2 (Passing through Puppis, Pyxis, and Antlia). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**October 31, 2024. International Space Station (ISS). 6:51 to 6:54 to 6:57 AM MDT.** NNW to NNE to E. Appears from Earth's shadow 7 deg above NW, max altitude 26 deg above NNE, max magnitude -2.0 (Passing through Cepheus, Draco, and Boötes). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 1, 2024. International Space Station (ISS). 6:04 to 6:05 to 6:08 AM MDT.** N to NNE to ENE. Appears from Earth's shadow 15 deg above N, max altitude 18 deg above NNE, max magnitude -1.6 (Passing through Draco and Boötes). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 2, 2024. International Space Station (ISS). 5:17 to 5:18 AM MDT. 1<sup>st</sup> AM ISS pass of November 2.** In NE. Appears from Earth's shadow at max altitude 12 deg above NE, max magnitude -0.6 (Passing through Boötes/Canes Venatici/Ursa Major, and Coma Berenices). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 2, 2024. International Space Station (ISS). 6:50 to 6:53 to 6:56 AM MDT. 2<sup>nd</sup> AM ISS pass of November 2.** NW to NE to ESE. Appears from Earth's shadow 11 deg above NW, max altitude 64 deg above NE, max magnitude -3.5 (Passing through Andromeda, Cassiopeia, Camelopardalis, Ursa Major,



Coma Berenices, and Leo/Virgo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 3, 2024. International Space Station (ISS). 5:03 to 5:04 to 5:07 AM MST.** N to NNE to ESE. Appears from Earth's shadow 31 deg above N, max altitude 36 deg above NNE, max magnitude -2.6 (Passing through Ursa Minor, Draco, Ursa Major-Big Dipper, Canes Venatici, Coma Berenices, and Virgo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 4, 2024. International Space Station (ISS). 4:16 to 4:18 AM MST. 1<sup>st</sup> AM ISS pass of November 4.** ENE to E. Appears from Earth's shadow at max altitude 16 deg above ENE, max magnitude -0.8 (Passing through Coma Berenices and Virgo). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 4, 2024. International Space Station (ISS). 5:49 to 5:52 to 5:55 AM MST. 2<sup>nd</sup> AM ISS pass of November 4.** WNW to SW to SSE. Appears from Earth's shadow 17 deg above WNW, max altitude 40 deg above SW, max magnitude -3.2 (Passing through Taurus, Orion, Monoceros, Puppis, and Hydra/Pyxis/Antlia). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 5, 2024. International Space Station (ISS). 5:03 to 5:06 AM MST.** S to SE. Appears from Earth's shadow at max altitude 76 deg above S, max magnitude -3.9 (Passing through Gemini-near Mars, Cancer, Sextans, and Hydra). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 6, 2024. International Space Station (ISS). 5:49 to 5:51 AM MST.** WSW to SW to SSW. Appears from Earth's shadow 13 deg above WSW, max altitude 14 deg above SW, max magnitude -1.8 (Passing through Eridanus, Lepus, Canis Major, Puppis, and Vela). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 7, 2024. International Space Station (ISS). 5:02 to 5:03 AM MST.** S to SSE. Appears from Earth's shadow at max altitude 17 deg above S, max magnitude -1.6 (Passing through Puppis and Pyxis). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

**November 7, 2024. Tiangong (Chinese Space Station). 6:37 to 6:38 PM MST.** SSW to S. Disappears into Earth's shadow at max altitude 18 deg above S, max magnitude -0.1 (Passing through Corona Australis/Sagittarius, Microscopium, and Piscis Austrinus). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**November 8, 2024. Tiangong (Chinese Space Station). 7:06 to 7:08 PM MST.** In SW. Disappears into Earth's shadow at max altitude 21 deg above SW, max magnitude +0.2 (Passing through northern Sagittarius). **Predictions for Tiangong are subject to change due to orbital adjustments. Check for updated predictions.**

**HAPPY OBSERVING!**