

**OBSERVING HIGHLIGHTS for August 5 to 19, 2022, a “bright Moon” Period.**  
**Black Canyon Astronomical Society (BCAS), western Colorado, USA.**

**SUMMARY.** The Moon is at first quarter on August 5, and from August 6 to 10 we can watch a gibbous Moon wax to full on the evening of August 11. From August 12 to 17, a gibbous Moon wanes. The Moon reaches last quarter on the night of August 18-19. Saturn is closest to Earth (at “opposition” from the Sun) on August 14 and visible all night long. Bright Jupiter is now rising in the east slightly earlier each night, between 10:38 and 9:42 PM MDT. If you have a telescope, watch a rare “double solar eclipse” on Jupiter between 10 PM and 11:30 PM MDT on August 15, as shadows of Io and Ganymede, two of its many moons, cross the face of the Giant Planet. Mars rises just after midnight, and Venus is still shining brilliantly in morning twilight. Mercury appears in bright evening twilight, although it is close to the horizon and may be challenging to spot. The predicted peak of the annual Perseid meteor shower between August 11 and 14 is marred by bright moonlight this year, but some bright Perseids may still be visible. The Sun has been getting active in recent months, as the new solar cycle “ramps up.” Many sunspots have been present, and there have been solar flares and coronal mass ejections of charged particles. You can monitor the Sun safely via “real-time” images on the internet or join BCAS President, Bryan Cashion, to see the Sun “in person.” Bryan plans to have solar telescopes at Black Canyon of the Gunnison National Park’s South Rim Visitor Center between 10 AM MDT and noon on August 11, 15, and 25. Recent solar activity is triggering auroras (aka “northern lights”), which may be visible from Colorado if we get very lucky. And some bright and interesting Earth satellites are passing over our region. During this period there are many high passes of the Chinese Tiangong Space Station: In the early mornings from August 5 through 10, and then on evenings from August 15 to 19. Tiangong’s brightness increased considerably after a large module was added on July 24, and now it can rival the International Space Station (ISS) in brightness.

**WESTERN SLOPE SKIES.** Since 2011, the BCAS and KVN Community Radio have been producing Western Slope Skies (WSS), a biweekly astronomy feature. On August 5 and 10, ranger Savannah Zigic of Black Canyon of the Gunnison N. P. will present on “Astrobiology in National Parks.” Audio, scripts, and images from Western Slope Skies features are linked here:  
<https://www.kvnf.org/programs/western-slope-skies#stream/0>

**BCAS PUBLIC OBSERVING EVENTS.** The BCAS is holding public observing events at various venues during August and September. In cooperation with the National Park Service, BCAS President, Bryan Cashion, plans to set up solar telescopes at the South Rim Visitor Center of Black Canyon of the Gunnison N. P. from 10 AM to noon on August 11, 15, and 25. Come visit Bryan at Black Canyon to get a personal look and interpretation of what’s happening on the Sun! During the upcoming “dark Moon” period, the BCAS plans to offer telescopic, night-sky events on August 20 and 22 between 9:30 and 10:30 PM MDT near the South Rim Campground at Black Canyon of the Gunnison N. P. (again, in cooperation with the National Park Service) and on the evening of August 26 at Ridgway State Park’s Dutch Charlie Visitor Center (in cooperation with Colorado State Parks and Wildlife). Also, the BCAS will be at Top of the Pines, a new International Dark Sky Park in Ouray County, on the evening of September 16. Then stay tuned for the September 22-24 Astro-fest of Black Canyon of the Gunnison National Park. Black Canyon has been an International Dark Sky Park since 2015. Hope you can join us at these events!

**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 the unaided eye 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., Jupiter at -2 to -3 magnitude: Venus at -4 to -5 magnitude, the full

Moon at -12 to -13 magnitude, 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>

**THE MOON.** The Moon is at **first quarter** on August 5 at 5:06 AM MDT. On evenings from August 5 to 10, watch a gibbous Moon wax. The **Moon is full** on the evening of August 11 at 7:36 PM MDT. From August 12 to 17, a gibbous Moon wanes. The Moon reaches **last quarter** on the night of August 18-19 at 10:36 PM MDT. The full Moon passes about 5 degrees below Saturn on the night of August 11-12. On the night of August 14-15, the 86%-illuminated, gibbous Moon passes about 3 degrees south of Jupiter. And in the early morning of August 19, the 48%-illuminated, last-quarter Moon is about 2 degrees north of Mars and 4 degrees south of the Pleiades Star Cluster (M45). You can find a stunning visualization of lunar phases for all of 2022 here:

<https://apod.nasa.gov/apod/ap220201.html>

<https://svs.gsfc.nasa.gov/4955>

**SATURN AT ITS CLOSEST!** Saturn is opposite the Sun in our skies (“at opposition”) and closest to Earth on August 14, when the Ringed Planet will be “only” 823 million miles distant. Saturn rises in the east southeast in bright twilight at about 8:42 PM MDT on August 5 and before sunset at 7:48 PM MDT on August 19. The Ringed Planet is now visible all night long. Look for an “opposition surge” during mid-August, as [Saturn brightens](#) from about magnitude +0.4 to about +0.3 or even +0.2. This [opposition surge](#) is a temporary increase in the brightness of Saturn’s rings at the time of opposition. It’s caused by shadow hiding and coherent backscattering of sunlight from the rings. Telescopes of any size will show Saturn’s impressive rings. Saturn’s disk appears 19 arc seconds wide, and its rings span 44 arc seconds. With a telescope or high-magnification binoculars, it’s possible to spot Titan, Saturn’s largest moon. Telescopes with apertures larger than about 6 inches may reveal several other moons of the Ringed Planet. You can follow the changing positions of Saturn’s moons by referring to various planetarium apps and/or this site:

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

**MERCURY IN THE EVENING.** Mercury is now drawing closer to Earth, from 113 million miles on August 5 to 96 million miles on August 19, as its gibbous disk wanes from 80% to 64% illuminated. During this period, the Innermost Planet fades from magnitude -0.36 to +0.14. Try to spot Mercury about 4 degrees above the west-northwestern horizon in bright evening twilight on August 5 at about 8:50 PM MDT. The Speedster Planet gains angular separation from the Sun during this period. But Mercury is also moving south and fading, so it may not get easier to spot from Colorado. By August 19, Mercury will be about 5 degrees above the western horizon at 8:32 PM MDT. To locate Mercury, find a place with unobstructed west-northwestern to western horizon and use binoculars. Through telescopes on August 5, Mercury’s gibbous disk will appear 5.5 arc seconds wide, and its apparent size will increase to 6.5 arc seconds by August 19. **Please do your Mercury spotting after sunset. NEVER chance looking at the Sun directly; serious eye damage can result.**

**JUPITER RISES IN THE EVENING.** Bright Jupiter rises in the east at about 10:38 PM MDT on August 5 and 9:42 PM MDT on August 9. The “King of the Planets” is now farther north than it’s been in about 6 years, so it’s rising higher in our northern hemisphere skies. Consequently, telescopic views may be getting better. Jupiter brightens during this period, from magnitude -2.69 to -2.80, as its distance from Earth decreases from 400 to 385 million miles. Using binoculars or a telescope, you can resolve Jupiter as a disk, which increases from 44.8 to 47.5 arc seconds wide between August 5 and 19. You may also spot Jupiter’s four, bright “Galilean” moons with binoculars or a telescope. You can identify these

moons by their changing positions near Jupiter, night-by-night, by using various astronomy apps, or the following link:

<https://skyandtelescope.org/observing/jupiters-moons-javascript-utility/#>

If you have a telescope, try viewing shadow transits (Jovian solar eclipses!) of Jupiter's moons on the nights listed below. Ganymede casts the largest shadow of Jupiter's moons, and its shadow is the easiest to spot crossing Jupiter. Europa's smaller shadow is more challenging to see. Io's shadow is larger than Europa's but smaller than Callisto's shadow. **On the evening of August 15, there will be a rare, double-shadow transit involving Io and Ganymede (see details, below\*).**

August 5, 2022, 8:02 PM to 10:46 PM MDT, Europa's shadow crosses Jupiter (locally, Jupiter rises at 10:39 PM MDT).

August 7, 2022, 1:00 AM to 3:16 AM MDT, Io's shadow crosses Jupiter.

August 12 to 13, 2022, 10:38 PM to 1:20 AM MDT, Europa's shadow crosses Jupiter (locally, Jupiter rises at about 10:10 PM MDT).

August 14, 2022, 2:54 AM to 5:10 AM MDT, Io's shadow crosses Jupiter.

**\*August 15-16. Rare, double-shadow transit during prime time!** 9:22 PM to 11:38 PM MDT, Io's shadow crosses Jupiter. 10:00 PM to 1:00 AM MDT, Ganymede's shadow crosses Jupiter. **Two moon shadows are cast on Jupiter from 10:00 PM to 11:38 PM MDT on August 15!** (locally, Jupiter rises at about 10:02 PM MDT and may be high enough for viewing both moon shadows by about 10:40 PM MDT).

**MARS RISING JUST AFTER MIDNIGHT.** Mars rises in the eastern sky at about 12:35 AM MDT on August 5 and 12:07 AM MDT on August 19. The Red Planet brightens from magnitude +0.09 to +0.04, as its distance from Earth decreases from 103 to 96 million miles. Mars now appears brighter than Saturn. Through telescopes Mars' reddish disk increases from 8.5 to 9.1 arc seconds wide during this period.

**VENUS: STILL BRILLIANT IN MORNING TWILIGHT!** Venus rises during morning twilight in the east northeast, by about 4:34 AM MDT on August 5 and 5:04 AM MDT on August 19. Venus shines brilliantly at magnitude -3.9. Through telescopes, Venus appears at nearly full phase, its gibbous disk waxing from 93% to 96% illuminated, as our Sister Planet moves toward the far side of the Sun from our perspective. Venus' apparent diameter diminishes from 10.6 to 10.3 arc seconds, as it recedes from 146 to 151 million miles. **Please do your Venus spotting before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.**

**HELICAL RISING OF SIRIUS.** The term "heliacal rising" refers to the year's first visible rising of a star above the eastern horizon before sunrise. Sirius, our sky's brightest star (after the nearby Sun), has been hidden in the solar glare through early summer. But Earth continues to move in its orbit about the Sun, and by the middle of August it will be possible to glimpse Sirius in morning twilight. How early can you spot the "Dog Star" above the east-southeastern horizon? Given clear morning skies, Sirius should be easy to spot by August 16, but can you see Sirius even earlier? Sightings of Sirius by August 11, or slightly earlier, are possible from our latitude. Ancient Egyptians used the heliacal rising of Sirius to forecast the annual flood of the Nile. As our summer days shorten as Earth moves along its orbit, twilight begins later each morning, and by late August, Sirius will rise in a darker sky, portending the

coming fall and winter. **If you try to spot Sirius in the early morning, please do so before sunrise. NEVER chance looking at the Sun directly; serious eye damage can result.**

**PERSEID METEORS PEAK UNDER BRIGHT MOONLIGHT.** Bright moonlight will interfere with the predicted August 11-14 peak of the annual Perseid meteor shower this year, rendering fainter meteors invisible. But brighter Perseids may be easy to see, even in strong moonlight. And some Perseid meteors appear as early as late July, so all is not lost. Skies are fairly dark between moonset and the onset of nautical twilight (when the Sun is still 12 degrees below the horizon), and it may be possible to see many Perseid meteors during those times, especially on the mornings of August 9 and 10, just days before the predicted maximum. Here are approximate times for moonset and the onset of nautical twilight for western Colorado:

<b>Date</b>	<b>Moonset</b>	<b>Start of Nautical Twilight</b>
5-Aug	12:01 AM MDT	5:11 AM MDT
6-Aug	12:32 AM MDT	5:13 AM MDT
7-Aug	1:11 AM MDT	5:14 AM MDT
8-Aug	2:00 AM MDT	5:15 AM MDT
9-Aug	3:02 AM MDT	5:16 AM MDT
10-Aug	4:13 AM MDT	5:17 AM MDT

For spotting meteors, no equipment is necessary - just dark skies and a comfortable reclining chair. Meteors may be visible over all parts of the sky. You can learn more about meteor showers from the 2022 calendar of the International Meteor Organization at this link:

<https://www.imo.net/files/meteor-shower/cal2022.pdf>

**THE SUN.** Solar activity has been increasing this year, and it can be interesting to monitor the Sun as the new solar cycle “ramps up.” Many M-class (“moderate”) solar flares have been occurring, and **there were several X-class (“extreme”) flares in late March through early May.** There also have been coronal mass ejections (“CMEs”) of charged particles that have triggered auroras in the past two weeks. As of August 4, sunspots and active regions are visible on the face of the Sun, so keep an eye out for more solar flares and CMEs during this period. 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/beamcon/>

<http://halph.nso.edu/>

<https://www.swpc.noaa.gov/>

<https://sohowww.nascom.nasa.gov/data/realtime-images.html>

<http://www.sidc.be/silso/ssngraphics>

In cooperation with the National Park Service, BCAS President, Bryan Cashion, plans to set up solar telescopes at the South Rim Visitor Center of Black Canyon of the Gunnison N. P. from 10 AM to noon on August 11, 15, and 25. Come visit Bryan at Black Canyon for a personal look and discussion of what’s happening on the Sun! **Do not look at the Sun directly without safe, specialized solar filters. Looking at the Sun is very dangerous; 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, especially when the Moon is bright, but “northern lights” have been seen from our region this year. Solar magnetic storms, when directed toward Earth, can cause auroras.

With current high solar activity, chances for auroras are good. You can get predictions for auroras, their intensity, and geographic extent from NOAA's Space Weather Prediction Center:

<https://www.swpc.noaa.gov/>

**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. Note that brighter satellites have smaller magnitude numbers, and the brightest (e.g., the International and Tiangong Space Stations) have negative magnitudes. These predictions are for selected passes of some bright and/or interesting satellites (as summarized from Heavens-Above.com).

**August 5, 2022.** Tiangong (Chinese Space Station launched in April 2021). 5:08 to 5:11 to 5:14 AM MDT, WNW to N to E, max magnitude -1.2, appears from Earth's shadow 11 deg above WNW, maximum altitude 46 deg above N (Passing through Lyra, Draco/Ursa Minor/Cepheus, Camelopardalis, Auriga, and Gemini). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 6, 2022.** X-37B (U.S. Space Force "not-so-secret" Space Plane). 4:36 to 4:37 to 4:40 AM MDT, NW to NNW to ENE, appears from Earth's shadow at 65 deg above NW, max altitude 68 deg above NNW, max magnitude +0.4 (Passing through Lacerta, Cassiopeia, Camelopardalis, Auriga, and Gemini-near Venus). **X37B's orbit may change, or it may land. Check for updates.**

**August 6, 2022.** Tiangong (Chinese Space Station launched in April 2021). 5:44 to 5:48 to 5:51 AM MDT, WNW to NNE to E, max magnitude -1.9, maximum altitude 72 deg above NNE (Passing through Cygnus, Cepheus, Cassiopeia, Perseus, Auriga, Taurus, and Orion). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 7, 2022.** Tiangong (Chinese Space Station launched in April 2021). 4:46 to 4:48 to 4:51 AM MDT, WNW to N to E, max magnitude -1.5, appears from Earth's shadow 23 deg above WNW, maximum altitude 54 deg above N (Passing through Lyra-near Vega, Cepheus, Camelopardalis, Auriga, and Orion). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 7, 2022.** Hubble Space Telescope (HST). 9:42 to 9:45 PM MDT. SW to S, maximum brightness mag. +2.4, disappears into Earth shadow at maximum altitude of 19 deg above S (Passing through Hydra/Libra, Scorpius, and Sagittarius). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.**

**August 8, 2022.** Tiangong (Chinese Space Station launched in April 2021). 5:21 to 5:24 to 5:28 AM MDT, WNW to SSW to ESE, max magnitude -2.2, appears from Earth's shadow 9 deg above WNW, maximum altitude 77 deg above SSW (Passing through Vulpecula, Cygnus, Pegasus, Andromeda, Aries, Taurus, and Orion-near Rigel). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 8, 2022.** Hubble Space Telescope (HST). 9:30 to 9:33 to 9:34 PM MDT. SW to S to SSE, maximum altitude 20 deg above S, maximum brightness mag. +2.3, disappears into Earth shadow 19 deg

above SSE (Passing through Hydra/Libra, Scorpius, and Sagittarius-near Moon). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.**

**August 9, 2022. Tiangong (Chinese Space Station launched in April 2021). 4:24 to 4:27 AM MDT, NE to E, max magnitude -2.0, appears from Earth's shadow 70 deg above NE at maximum altitude of 70 deg (Passing through Cassiopeia/Perseus, Taurus, and Orion). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.****

**August 9, 2022. Hubble Space Telescope (HST). 9:18 to 9:21 to 9:23 PM MDT. SW to S to SSE, maximum altitude 20 deg above S, maximum brightness mag. +2.3, disappears into Earth shadow 17 deg above SSE (Passing through Hydra/Libra, Scorpius, and Sagittarius-near Moon). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.****

**August 10, 2022. Tiangong (Chinese Space Station launched in April 2021). 5:00 to 5:01 to 5:04 AM MDT, WSW to SSW to SE, max magnitude -1.9, appears from Earth's shadow 36 deg above WSW, maximum altitude 45 deg above SSW (Passing through Pegasus, Pisces, Cetus, and Eridanus). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.****

**August 10, 2022. Hubble Space Telescope (HST). 9:06 to 9:09 to 9:11 PM MDT. SW to S to SE, maximum altitude 20 deg above S, maximum brightness mag. +2.4, disappears into Earth shadow 14 deg above SE (Passing through Hydra/Libra, Scorpius, and Sagittarius). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.****

**August 11, 2022. Hubble Space Telescope (HST). 8:54 to 8:57 to 8:59 PM MDT. SW to S to SE, maximum altitude 20 deg above S, maximum brightness mag. +2.5, disappears into Earth shadow 11 deg above SE (Passing through Corvus, Hydra/Libra, Scorpius, and Sagittarius). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.****

**August 12, 2022. Hubble Space Telescope (HST). 8:42 to 8:45 to 8:48 PM MDT. SW to S to SE, maximum altitude 19 deg above S, maximum brightness mag. +2.6, disappears into Earth shadow 8 deg above SE (Passing through Corvus, Hydra/Libra, Scorpius, and Sagittarius). **Note: maximum brightness may vary, depending on orientation of the elongated HST to observer's line of sight.****

**August 13, 2022. X-37B (U.S. Space Force "not-so-secret" Space Plane). 5:23 to 5:25 to 5:28 AM MDT, NW to NNE to E, max altitude 40 deg above NNE, max magnitude +1.6 (Passing through Lyra-near Vega, Draco, Ursa Minor-near Polaris, Camelopardalis, and Auriga/Gemini). **X37B's orbit may change, or it may land. Check for updates.****

**August 14, 2022. X-37B (U.S. Space Force "not-so-secret" Space Plane). 5:43 to 5:46 to 5:49 AM MDT, WNW to SSW to ESE, max altitude 85 deg above SSW, max magnitude +0.3 (Passing through Cygnus, Lacerta, Andromeda, Triangulum, Taurus-near Mars, Orion, and Canis Major). **X37B's orbit may change, or it may land. Check for updates.****

**August 15, 2022. Tiangong (Chinese Space Station launched in April 2021). 9:18 to 9:22 to 9:24 PM MDT, SW to SSE to ESE, max magnitude -2.0, disappears into Earth's shadow 34 deg above ESE, maximum altitude 50 deg above SSE (Passing through Libra, Ophiuchus, Aquila, Equuleus/Delphinus, and**

Pegasus). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 16, 2022. X-37B (U.S. Space Force "not-so-secret" Space Plane).** 4:51 to 4:52 to 4:54 AM MDT, WNW to SSW to ESE, appears from Earth's shadow at 74 deg above WNW, max altitude 86 deg above SSW, max magnitude +0.2 (Passing through Andromeda, Triangulum, Taurus, Orion-near Rigel, and Lepus). **X37B's orbit may change, or it may land. Check for updates.**

**August 16, 2022. Tiangong (Chinese Space Station launched in April 2021).** 9:56 to 9:59 PM MDT, W to NW, max magnitude -1.8, disappears into Earth's shadow 62 deg above NW at maximum altitude of 62 deg (Passing through Virgo, Boötes, and Hercules/Draco). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 17, 2022. Tiangong (Chinese Space Station launched in April 2021).** 8:56 to 8:59 to 9:02 PM MDT, WSW to SSE to ENE, max magnitude -2.3, disappears into Earth's shadow 12 deg above ENE, maximum altitude of 83 deg above SSE (Passing through Virgo, Serpens, Hercules, Lyra, Cygnus, and Pegasus). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 18, 2022. Tiangong (Chinese Space Station launched in April 2021).** 9:32 to 9:36 to 9:37 PM MDT, W to N to NE, max magnitude -1.5, disappears into Earth's shadow 32 deg above NE, maximum altitude of 52 deg above N (Passing through Coma Berenices, Canes Venatici, Ursa Major-Big Dipper, Draco/Ursa Minor, and Cepheus). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 19, 2022. Tiangong (Chinese Space Station launched in April 2021).** 8:32 to 8:35 to 8:38 PM MDT, W to NNW to ENE, max magnitude -1.9, disappears into Earth's shadow 5 deg above ENE, maximum altitude of 68 deg above NNW (Passing through Coma Berenices, Boötes, Draco, Cygnus/Cepheus, Lacerta, and Pegasus). **Note: Tiangong's orbit may change frequently. Check for updates. Tiangong has brightened considerably after addition of the Wentian Laboratory Module on July 24, 2022.**

**August 19, 2022. International Space Station (ISS).** 6:00 to 6:01 to 6:03 AM MDT, SSE to SE to ESE, max altitude 11 deg above SE, max magnitude -0.8 (Passing through Eridanus, Columba, Canis Major-near Sirius, and Canis Minor). **Predictions for the ISS are subject to change due to orbital adjustments. Check for updated predictions.**

Satellite orbits can change. **These predictions for satellite passes may be inaccurate by up to several minutes, especially after August 10.** 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. Check out the "Live Sky View" feature at Heavens-Above.com. "Live Sky View" shows positions of visible satellites, their changing brightness (magnitude), and their motion in "real time." Be sure to set application(s) for your location and time zone.

**HAPPY OBSERVING!**