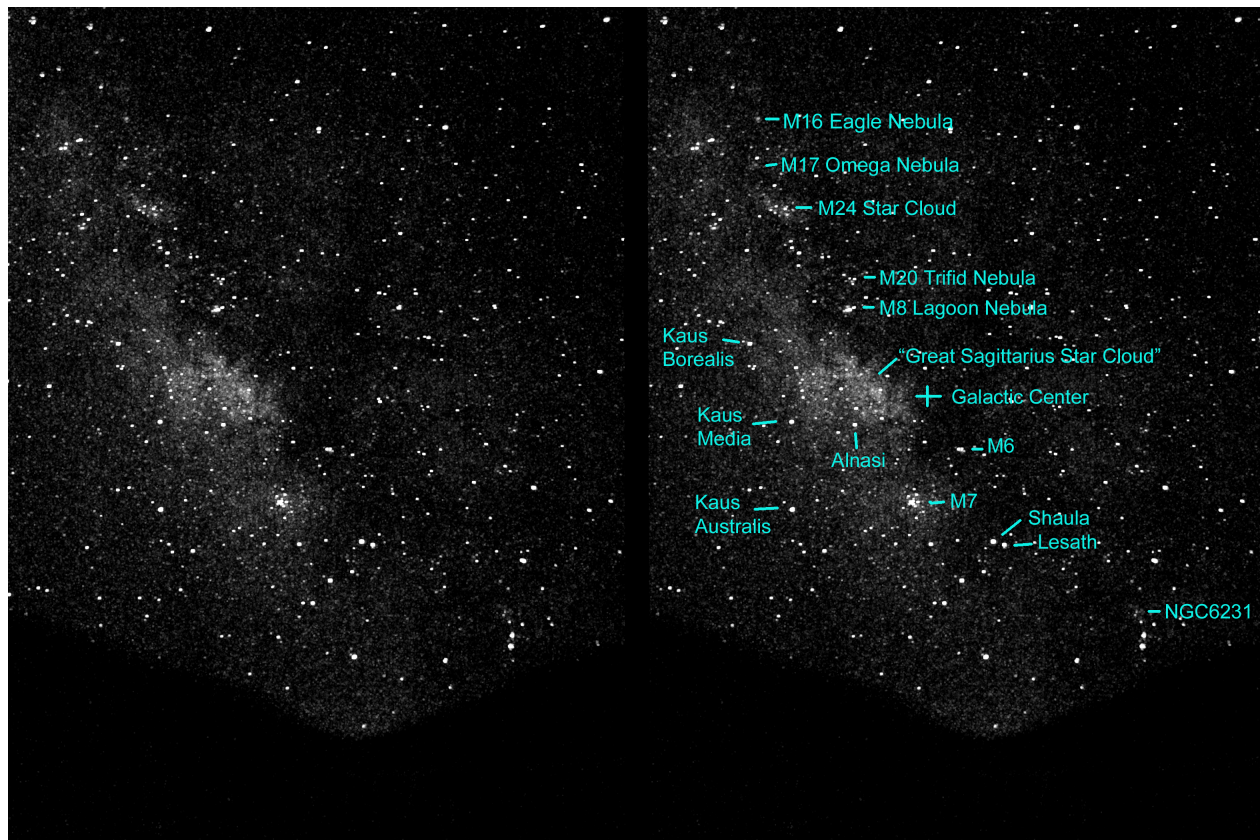


Sky WAA tch



Rocky Mountain High

Larry Faltz snapped this shot of the Milky Way in Sagittarius and Scorpio with a 6" Orion f/5 reflector while observing with his wife Elyse near Tennessee Pass, Colorado. Taken at an altitude of 9,200 feet under magnitude 7 skies, Larry used a point-and-shoot camera, 30 sec at ISO 800 (stacked 5 images with DeepSky Stacker). Notes Larry: Although a rough and noisy image, it gives some idea of the night-time view. The image on the right labels the most distinctive stars and features. I didn't label the very prominent dark nebulae. It's a view utterly unobtainable in light-contaminated skies. The live view was even brighter and more inspiring.

More on Larry's trip on page 3.

Events for August 2010

WAA Lectures

Meeting Notice

There will no WAA lecture for the month of August at Pace University. See below for information on the Starway to Heaven at Ward Pound Ridge Reservation. Monthly lectures will resume in September.

“WAA Amateur Night”

Friday September 10th, 8:00pm
Miller Lecture Hall, Pace University
Pleasantville, NY

WAA members will showcase their astrophotos, equipment and other insights. Let us know if you have something to show or tell. Please email the club with a brief idea of what you will be presenting.

Starway to Heaven

Saturday August 7th, 9:00-11:00PM
Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

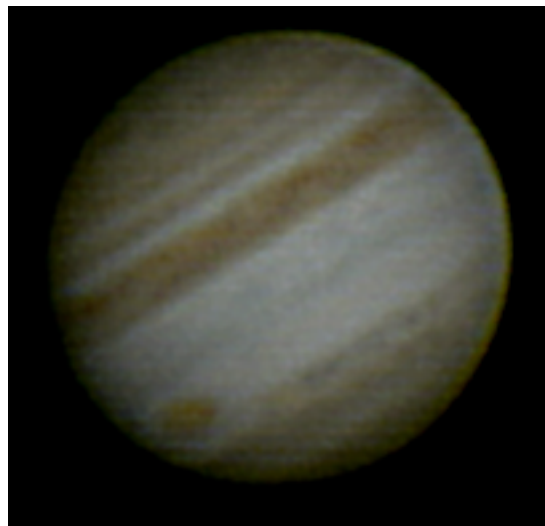
This is our scheduled Starway to Heaven observing date for August, weather permitting. Free and open to the public. The scheduled rain/cloud date is August 14th. Participants and guests should read our [General Observing Guidelines](#).

New Members. . .

Joel Vargas - Stamford, CT
 David Fox - Scarsdale

Renewing Members. . .

Jose Castillo - Pelham Manor
 Matt Ganis - Carmel
 Ihor Szkolar - White Plains
 Charles and Darlene Ekholm - Lake Peekskill



Did Someone Take Jupiter's Belt

John Paladini took this image of Jupiter with a C8 and a neximager, in which one of the planet's belts appears to have gone AWOL.

WANTED: Individual to help edit the WAA newsletter. Initial responsibilities to be proof-reading, but eventually seeking someone to co-edit newsletter. Knowledge of Apple Pages would be helpful. Contact:

tom.boustead@westchesterastronomers.org

CALL: 1-877-456-5778 (toll free) for announcements, weather cancellations, or questions. Also, don't forget to periodically visit the WAA website at:

<http://www.westchesterastronomers.org/>

Westchester Amateur Astronomers, Inc., a 501(c)(3) organization, is open to people of all ages with the desire to learn more about astronomy. The Mailing address is: P.O. Box 44, Valhalla, New York 10595. Phone: 1-877-456-5778. Observing at Ward Pound Ridge Reservation, Routes 35 and 121 South, Cross River. Annual membership is \$25 per family, and includes discounts on *Sky & Telescope* and *Astronomy* magazine subscriptions. Officers: President: Mike Virsinger; Vice President: Charlie Gibson; Vice President Programs (lectures): Pat Mahon; Treasurer: Doug Baum; Vice President Membership: Paul Alimena; Vice President Field Events: David Butler; Newsletter: Tom Boustead.

Articles and Photos

Viewing Report: Vail and Camp Hale, Colorado, July 2010

by Larry Faltz

Elyse and I got to Vail, Colorado on July 3rd for a week's vacation, and after dinner I collimated my new Orion 6" f/5 Starblast reflector, which was delivered in March but hadn't yet seen first light. Using a sight tube and verifying with my artificial star I easily got the collimation spot-on, with perfectly symmetrical diffraction rings at 150x. I mounted the scope on an AstroTech Voyager using a slotted dovetail, rather than using the table-top mount that came with the scope, since I wouldn't have a table where I was going to observe! I sight with a laser pointer in lieu of a finderscope and I use 32mm Plossl to acquire the objects and brought Antares W70 14mm, Televue Nagler T6 9mm and 5mm eyepieces for viewing. The latter two eyepieces have 82 degree fields, wonderful for deep sky viewing considering there's no tracking. This is basic, "push-to" observing.

For first light we observed from in the town of Vail, a developed and (locally) light-polluted area in the mountains 100 miles west of Denver, and so the sky was at best visual mag 4.5 with bright lights all around. The Milky Way was visible but hardly impressive, even at Vail's elevation of 8,150 ft. Temperatures started out around 70 at 9 pm and dropped to the low 60's as the evening went on. It had been warm and a little humid with clouds in the daytime but the sky cleared by 9 pm and no humidity.



First light was Venus, showing a nice phase with the 9mm. Saturn was nice and sharp with both Naglers, and three moons could be seen. When it got



dark enough, by about 10, I made the usual rounds: M57, M51, M81 and M82, M13, M3, Albireo, Alcor and Mizar. There was light to the south from some buildings close by, but I did get a nice look at M17.

The scope was fantastic, perfect for my plans out west. M13 was the absolute highlight, looking grand at all magnifications but a totally spectacular sight with the 5mm Nagler. Seemingly thousands of glittering stars were resolved, a much more dramatic sight than in my 8" SCT at Ward Pound Ridge, where the stars just didn't pop like they did in the reflector at altitude. M51 didn't exactly have structure, but the halo of stars surrounding the main galaxy was quite prominent and the link to NGC 5195 was easy.

On July 5th we headed out to Camp Hale, on US 24 about 30 minutes away from Vail. The 10th Mountain Division trained there in WWII. The elevation is 9,200 ft and the skies are 7th magnitude, with no towns or even stray lights within miles. The Milky Way there is like a bright white streak that someone painted on the sky. When we arrived, we were surprised to find that our viewing location was occupied by about 3,000 sheep! They didn't bother us, keeping a 12-foot minimum distance, and eventually they were herded by a very friendly border collie and the herder about half a mile to the south (and downwind) and we got down to business.

The sky was utterly fantastic. By 11:00 pm the Milky Way blazed across the sky, from north to south on the eastern half of the celestial sphere. The

North American Nebula was a naked eye object. There were so many stars it was sometimes difficult to pick out the usual markers. An astronomy-naïve friend was with us, so we had the pleasure of introducing him with naked eye, binocular and telescopic views of our favorites. Whatever was good from Vail Saturday night was even better from Camp Hale. In addition to what we looked at Saturday, we bagged M101, bunches of open clusters in Cygnus, Vulpecula, Ophiuchus, Sagittarius and Scorpio, including of course M6, M7, M20, M8, M11, and M16, as well as a grand view of M17 and globulars M4 and M22. The pair of globulars NGC6528 and 6522, right next to Gamma Sagittarii (Alnasl) made a beautiful field. Scanning with binoculars, Elyse found the open cluster combination of NGC 6231 and Cr316 in the tail of Scorpius.

Right above M7, the dark nebula B283 was very prominent. At the end of the evening we looked at Cassiopeia rising in the north and viewed some of the open clusters there, particularly M52 and NGC7510. The scope did not have enough aperture to resolve some of the faint astrophotography-favorite nebulosities in that area, but nevertheless there were stars and clusters galore. We finished with a quick look at Herschel's Garnet Star in Cepheus. By the time we finished at midnight, the temperature was 41 degrees (it was about 65 when we got there at 8:15). We had layers, including our skiwear, so it was tolerable, but we didn't want to be too tired for the drive back to Vail across twisty Battle Mountain Pass on US 24. We bade farewell to the sheep and headed home.

On July 6th, we set up near town so the skies were not as dark, but it was a wise move since by 10:15 there were flashes of lightning to the east where the clouds concentrate along the high passes of the Continental Divide. We were only able to see a few things before the clouds became intolerable in our location. Our best direction was northwest so we concentrated on the area between Cor Caroli and the Big Dipper. M51 was not as good as it was on Saturday night from town (and much worse than Monday's view from Camp Hale). We looked for and found the Whale Galaxy (NGC 4631) but I couldn't find the Hockey Stick (NGC 4656) which is about 1 mag dimmer. It should have been in the same low-power field (2.2 degrees with the 32mm Plossl) but I couldn't see it. We found M106, M108 and M97 (the

Owl) but then the transparency really deteriorated and so things like M94, M109 and some of the brighter NGC galaxies in that region weren't attainable.

After two more days of evening clouds (we substituted some fine dining for astronomy), we went out to dinner on July 8th in Edwards, CO, about 15 miles west of Vail, packing the scope just in case. We were rewarded with clearing skies after dinner, so we drove back to Camp Hale. The sheep were gone, much to our disappointment. High clouds dissipated as twilight ended, leaving a perfectly clear sky (which was not in the forecast, either from weather.com or from Attila Danko's ClearDarkSky site).

The temperature started out around 52F and dropped to 41 with a breeze that added a significant wind chill factor. In spite of the temperature drop, the atmosphere was dry and dew-free. We spent some time scanning Cygnus just looking at the rich star fields. I tried to find NCG 6888, the Crescent Nebula, but couldn't pick it out. At nominal mag 10 it should have been visible in the area I was scanning, but perhaps it's too subtle for the scope because of low surface brightness. Then we went over to Coma Berenices and managed to see about half a dozen faint (mag 12) NGC galaxies, but exactly which ones they were impossible to tell. I just scanned around to the northeast of Coma at high magnification and every few fields another one would come into view. We checked a few easy-to-find Messier objects and noted the spiral arms of M51 could be seen with averted vision with the 9mm T6 at 83x. We then moved over to the Milky Way in the south, and compared naked eye, binocular and telescopic views of the major objects in Ophiuchus, Sagittarius and Scorpio. Ultimately we concluded that as good as the scope was the true glory of observing from this very dark and clear location was simply to scan the Milky Way with binoculars. The enormous number of open and globular clusters, dark nebulae, star fields and even emission nebulae like M17, M8 and M20 made this viewing experience utterly unlike what can be achieved on the east coast. It is endlessly fascinating to simply wander in the Milky Way. We had a few bright meteors and lots of satellites as well.

One of the remarkable things about viewing at Camp Hale is that there are transparent 7th magnitude skies but it's not pitch black: with dark

adaptation it's clear that the Milky Way itself throws off just enough light to faintly illuminate the environment! I could see the scope from a few feet away without difficulty.

Every amateur astronomer owes him or herself the opportunity to spend a few nights under the dark skies of the western US each year. Whether

it's in the Rockies or on the Colorado Plateau, in places like Camp Hale, Monument Valley or the Grand Canyon, it's great to get away from city and suburban lights and experience the glory of the heavens. Get some of the atmosphere under your feet by getting up to elevation, dress warmly, bring some water and relax. Binoculars are enough. You just won't believe your eyes!

The Sun Can Still Remind Us Who's Boss **by Dr. Tony Phillips**

Grab your cell phone and take a good long look. It's indispensable, right? It tells time, surfs the web, keeps track of your appointments and, by the way, also makes phone calls. Modern people can hardly live without one. One good solar flare could knock it all out.

"In the 21st century, we're increasingly dependent on technology," points out Tom Bogdan, director of NOAA's Space Weather Prediction Center in Boulder, Colorado. "This makes solar activity an important part of our daily lives." Indeed, bad space weather can knock out power systems, telecommunications, financial and emergency services—basically, anything that needs electronics to work. That's why NOAA is building a new fleet of "space weather stations," the GOES-R satellites.

"GOES-R will bring our existing fleet of weather satellites into the 21st century," says Bogdan. "They're designed to monitor not only Earth weather, but space weather as well." NOAA's existing fleet of Geostationary Operational Environmental Satellites (GOES) already includes some space weather capabilities: solar ultraviolet and X-ray telescopes, a magnetometer and energetic particle sensors. GOES-R will improve upon these instruments and add important new sensors to the mix.

One of Bogdan's favorites is a particle detector named "MPS-Low," which specializes in sensing low-energy (30 eV – 30 keV) particles from the sun. Who cares about low-energy particles? It turns out they can be as troublesome as their high-energy counterparts. Protons and other atomic nuclei accelerated to the highest energies by solar flares can penetrate a satellite's exterior surface, causing all kinds of problems when they reach

internal electronics. Low-energy particles, particularly electrons, can't penetrate so deeply. Instead, they do their damage on the outside.

As Bogdan explains, "Low-energy particles can build up on the surfaces of spacecraft, creating a mist of charge. As voltages increase, sparks and arcs can zap electronics—or emit radio pulses that can be misinterpreted by onboard computers as a command." The Galaxy 15 communications satellite stopped working during a solar wind storm in April 2010, and many researchers believe low-energy particles are to blame. GOES-R will be able to monitor this population of particles and alert operators when it's time to shut down sensitive systems. "This is something new GOES-R will do for us," says Bogdan.

The GOES-R magnetometer is also a step ahead. It will sample our planet's magnetic field four times faster than its predecessors, sensing vibrations that previous GOES satellites might have missed. Among other things, this will help forecasters anticipate the buildup of geomagnetic storms. And then there are the pictures. GOES-R will beam back striking images of the sun at X-ray and extreme UV wavelengths. These are parts of the electromagnetic spectrum where solar flares and other eruptions make themselves known with bright flashes of high-energy radiation. GOES-R will pinpoint the flashes and identify their sources, allowing forecasters to quickly assess whether or not Earth is in the "line of fire." They might also be able to answer the question, Is my cell phone about to stop working?

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Constellation Corner

by Matt Ganis

In writing these columns over the years I frequently discuss the size a star, or its brightness and maybe the distance from us here on Earth. I thought it might be interesting this month, to look a little closer at three stars – but compare them with each other. The stars in our heavens are so far away, that really, when you think about it, they all look the same to us – at least with our naked eye viewing (and telescopically as well). So let's spend some time with a few stars, so when we look up, we can think about just how different they really are.

So since it's summertime, I thought we'd use three stars that are "sort of" related to each other, the stars of the Summer Triangle: Vega, Altair and Deneb.

Let's start with the brightest of these, since that's the first visible difference between these stars. Vega is the 5th brightest star in the sky as seen from Earth – for those of us in the North Hemisphere (I'd venture to say all of us reading this) – it's the 2nd brightest star in our skies shining at a magnitude of zero (which you'll remember is really quite bright). The other two in this triad aren't slackers either; Deneb is the 19th brightest (a magnitude of +1.25) with Altair coming in at 12th at a magnitude of +0.77. So these are pretty bright stars relatively speaking. I think it's interesting that they are 2nd, 12th and 19th so you can visually compare them and get a feel for the difference.

A better way to look at how bright objects are relative to each other is to study their Absolute Magnitudes (as opposed to the Apparent magnitude I typically use in these columns). An apparent magnitude is how bright an object looks in the sky – how bright it looks to us, just looking at it. The absolute magnitude on the other hand is the apparent magnitude, that an object would have if it

were at a standard distance away from us (typically 10 parsecs or about 33 lightyears). This allows the overall brightness of objects to be compared without regard to distance – in other words, if we took the two objects and placed them same distance away from us.

So in terms of Absolute Magnitude, Vega (the second brightest star in our sky) would have a magnitude of +0.58, with Altair shining at a dim +2.21 and believe it or not, Deneb blasting away at a whopping -6.95 – what's the moral of this story?

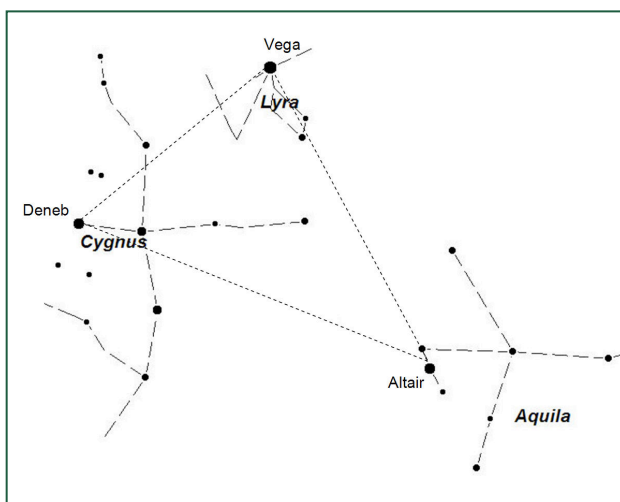
Never a judge a star by its cover (or its apparent magnitude).

How about size? Altair has an estimated equatorial radius of about 2.03 solar radii (or about twice the size of our Sun). Interestingly, it has a polar radius of about 1.63 times that of our Sun – making it kind of "squished". The assumption is that the star is rotating so rapidly that it flattens out as it spins at such a great rate. Vega also has a rapid rotation that

produces a pronounced equatorial bulge (again, the radius of the equator is 23% larger than the polar radius). Overall, the current estimates have Vega "clocking in" at about 2.5 to 2.75 times the size of Sun.

So what about Deneb? The Estimates for Deneb's radius range from 200 to 300 times that of our Sun! If Deneb were placed at the center of our Solar System, it would extend to the orbit of the Earth! All things being equal, that increased surface area of the star is what gives it that high absolute magnitude – there's more surface area to radiate light!

So next time you're out under the stars, enjoy the view – but realize this: what you see isn't what you get. There is MUCH more than meets the eye.



Almanac

For August 2010 by Bob Kelly

A passel of lesser planets scurry off the sky stage soon after sunset, perhaps fleeing before the rise of the King of the Planets, Jupiter. At mid-month, debris from the distant comet Swift-Tuttle gives us the Perseid meteor shower, a good year for viewing these fast-moving, bright meteors.

First, there are four planets conveniently located in the western twilight sky an hour after sunset. Venus gets our attention at once. It's beyond dazzling at magnitude minus $3\frac{1}{2}$. In a telescope, Venus looks like a half moon (without the craters). But it helps to look as soon as you can find Venus. The brighter the sky, the easier it is to see the phases of Venus. In a dark sky, Venus is a blazing light without shape.

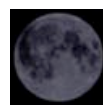
Venus has good company this month. If you watch the sky, you'll notice that it looks like Venus is going to run over Mars and Saturn. Saturn (mag +1 $\frac{1}{2}$) sidesteps the on-rushing Venus, passing about 3 degrees above Venus around the 7th. Mars, a little brighter at magnitude +1) appears to slow down as it lingers in the vicinity of Venus all month. For the first half of the month, you can cover all three planets with your outstretched fist. Our gang of three are closest together for our WAA Observing Night on the 7th. Mercury is way down to the lower right of Venus, then, and for the next week or so.

Visitors to our "Dome Night Under the Stars" on July 17th were excited to see Saturn, its thin rings, its largest moon Titan, and at least one smaller moon. They will be harder to make out in August, as Saturn glides deeper into the murky skies near the horizon. (And if they loved Saturn, wait until we show them Jupiter in September!)

Do you tilt your umbrella forward when you run in the rain? That's a classic demonstration of why we see more meteors on the morning side of midnight than during the 'prime time' evening hours. The Earth sunrise line is in 'front', that is, in the direction of travel, as we move around the sun. So, we advise sky watchers to get up early in the morning for the most meteors. This year, the



Aug 3



Aug 9



Aug 16



Aug 24

Perseid meteor shower has two features that may encourage those who are disheartened at an 0200 wake up call (as in oh-too-early in the morning for me). First, the shower is predicted to peak at 1 UT (9pm EDT) on August 12th. Second, the Perseids have many bright meteors. If your goal is to see some bright meteors, you should be just fine with whichever of the nights near the 12th will be clear. Just lay out flat so you can see a large part of the sky comfortably, preferably with a sleeping bag to protect you from the mosquitoes and the dew, and you should get your share of 'OMG' meteors.

Jupiter, the King, enters the sky stage after 10 o'clock early in the month. At almost magnitude minus 3, it's hard to miss his entrance. Viewing Jupiter and his retinue of 4 bright moons will be better in the morning sky as Jupiter is half-way up in the southwest at the start of twilight. While you're in the neighborhood, Uranus is available for viewing with any optical aid, just 3 degrees to the upper right of Jupiter.

For those who go deeper in the sky, the Earth is making its annual pass in front of Neptune, which is found near the eastern point of Capricorn. But we still need a good finder chart and a telescope to tell it apart from the surrounding stars. If you do find it, you have a chance to see all eight major planets during this month. Anyone spot Pluto when it crossed the dark nebulae recently?

The Milky Way continues to soar higher into clearer skies away from the murky horizon. Can you make out the 'steam' from the teapot asterism in Sagittarius? There are many star clouds and clusters in the area. They can be easier to see if you get to visit someone's beach house with a shoreline that gives you an open, dark view to the south.

Overhead, the sky and your imagination can transport you millions of miles or tens of light-years away. Vega is almost overhead on these August nights. Vega's north pole points nearly to Earth, so the Sun (mag 4 $\frac{1}{2}$ at Vega's 25 light year distance) could be a pole star for Vega's possible planets. Nearby, the top of the Northern Cross points like

an arrow to a spot 7 degrees away that would mark the pole star - if you were on Mars. For a great sky scene that you can't see from Earth, go to NASA Solar System Simulator this month and ask it to give you a view of Venus from Mars. Start with a 60 degree field of view. Earth is part of a striking scene with Venus and Jupiter. Mercury joins the scene about mid-month.

The Moon is a great sight with binoculars or telescope. For August:

Last Quarter 8/3

New Moon 8/9

First Quarter 8/16

Full Moon 8/24

Last Quarter 9/1

You can see lots of detailed craters and mountain ranges, especially from the 15th through the 18th. Around August 5th, early risers can see a little more of Mare Orientale than usual. The periodic wobble of the moon tips this region a bit more toward Earth, so we get a peek at this giant

impact basin with its rings of mountains and seas on the edge of the Moon as seen from Earth.

As our planet heads toward the Autumnal Equinox, sunrise moves forward past the 6 o'clock hour and sunset backs up past the 8 o'clock. Astronomical twilight lasts 1 ³/₄ hours before sunrise and after sunset.

The International Space Station makes overflights of our area in the dawn skies from August 4th through 24th and in the evening skies from August 23rd through September 15th. Check nasa.gov, spaceweather.com or heavens-above.com for times when you can see the ISS and many other bright satellites for your location. The ISS is often as bright as Venus, so it's easy to spot as it appears to lazily drift over us while orbiting the Earth at 18,000 miles per hour.

Send comments or questions to Bob's blog at bkellysky.wordpress.com where he posts his monthly Heads UP! guide to bright objects in the sky and his astro-photos.

Members Classified

The members classified is a new feature of the WAA newsletter intended to foster communication between WAA members. The guidelines are as follows:

Send classified ad requests to tom.boustead@westchesterastronomers.org. Ads will only be accepted from WAA members and must relate to amateur astronomy. Please keep to 25 words, include contact info and provide by 20th of month for inclusion in next issue. The newsletter is subject to space limits; so ads may be held to subsequent issues. WAA may refuse an ad at its sole discretion. In particular, price information will not be accepted. The Member classified is a service to members; parties use it at their own risk. WAA and its officers accept no responsibility for contents of any ad or for any related transaction.