



Outdoors

# Stargazing in Upstate NY in August: See the Milky Way, Perseid meteor shower

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milk way for NYUP stargazin.JPG

The Milky Way center is visible this month in Upstate New York. Photo by Patrick Manley of Kopernik Astronomical Society in Vestal.

*(Special to Syracuse.com)***By Damian Allis | Contributing writer**

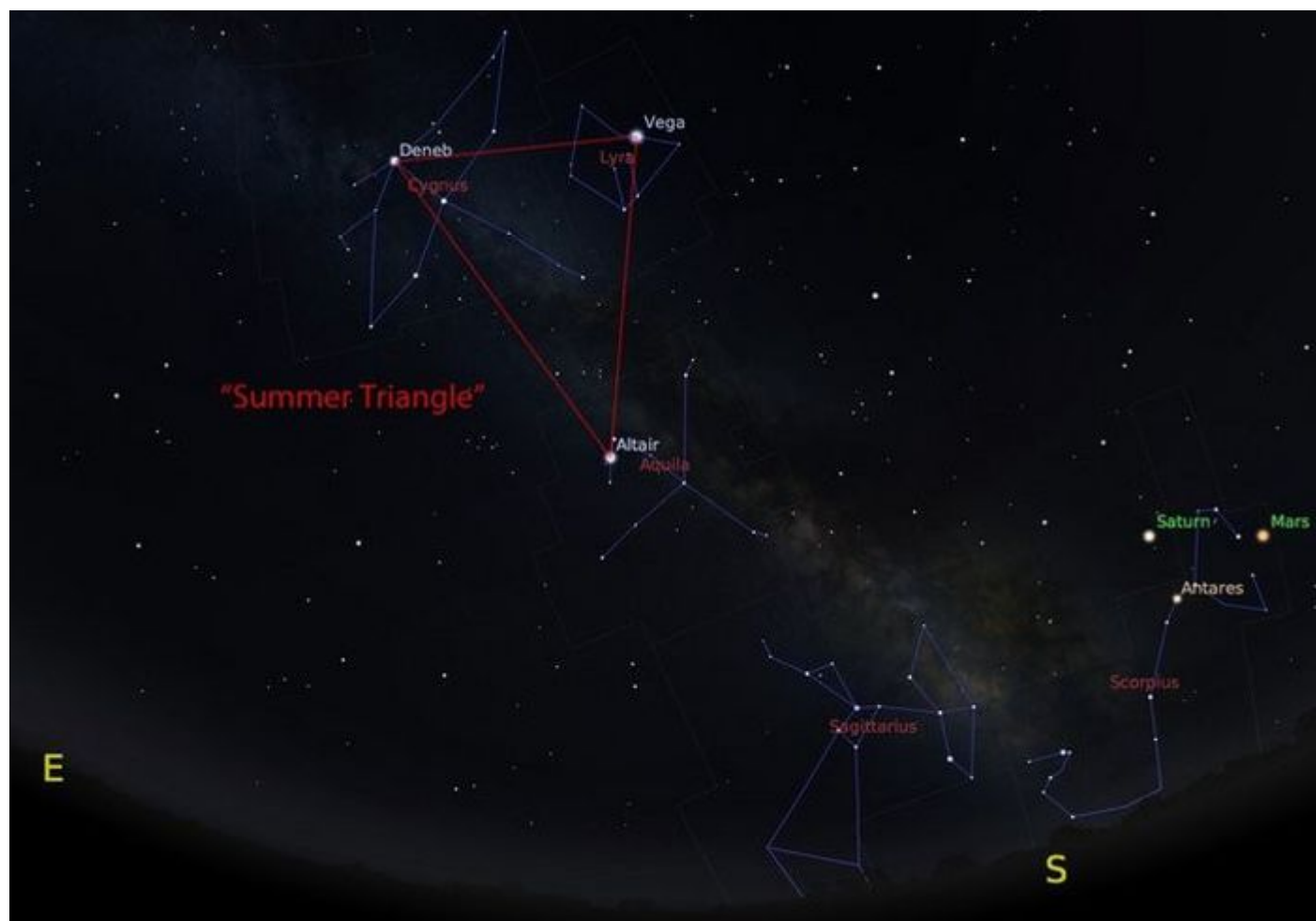
Syracuse, N.Y. — In August, the core of our Milky Way galaxy rises soon after sunset and is visible in the south-southwest sky for pre-midnight observers. At first sight, you might mistake our fair galaxy as a cloud band moving slowly to the west. This cloud band is not made of tiny water droplets, but instead the light from the estimated 300 billion stars that are too far away for us to resolve as pinpoints of light.

Unlike Upstate New York cloud cover, which occasionally goes away, this Milky Way cloud band has been a constant in our nighttime sky since the Solar System's formation nearly 5 billion years ago, and will remain the most constant feature in our sky well beyond the time when the Sun exhausts its fuel 5 billion years from now.

The sky may still be a little too bright before 10 p.m. to see the cloudiness, or nebulosity, if you're near city lights or if you have a bright city to your south. Depending on your lighting, you may more easily see our local galactic arm extending above you and to the northeast, which is also mistakable for a cloud band at first viewing. If you have the chance, find a dark location with a clear view to the south, then stare and wonder at the tens of billions of stars directly between us and the supermassive black hole at our galaxy's center.

August also marks the return of the Perseids, one of the most consistent - and consistently impressive - meteor showers of the year. The quality of this show will be diminished for some of us, as the moon is between first-quarter and full during peak Perseid nights. If you're interested in the best predicted sights of shooting stars, you should shoot for a nap on the early evening of Aug. 11. If you don't mind the lost productivity on the 12th, the moon will drop below the western horizon soon after midnight, after which the darker sky will make even the dim streaks stand out to dark-adapted eyes. If you're a weekend astro-warrior, the nights of the 12th and 13th should still yield some great sights.

## Your First Steps Outside:



The crescent Moon, Jupiter, Mercury, and Venus on Aug. 6.

Items and events listed below assume you're outside and observing between 9 p.m. and midnight throughout August anywhere in New York state. The longer you're outside and away from indoor or bright lights, the better your dark adaption will be. If you have to use your smartphone, find a red light app or piece of red acetate, else set your brightness as low as possible.





This is the view through binoculars on Aug. 27 of the Venus-Jupiter conjunction through binoculars.

Jupiter, which has been brilliant in our pre-midnight sky since January, finally sets to the west in the late-evening. You'll need a low, clear horizon to catch it at all by the end of August, but its grouping with Venus and Mercury at this time will be worth it. The loss of Jupiter at night makes Mars all the more pronounced. Mars continues to slowly glide between the red-orange star Antares and Saturn, crossing the imaginary line between them on Aug. 23/24.

Prominent in the nighttime sky right now is the aptly-named Summer Triangle. The three stars of this asterism are among the brightest in the nighttime sky, making it one of the very first objects you'll be able to see after sunset. Vertices are pointed roughly north, west, and south right now and are each the most prominent stars in their similarly prominent constellations - once you find this triangle, try star-hopping your way through each mythological character.

\* The brightest of these corners is the star Vega in the constellation Lyra the Harp. At 25 light years away, it rounds out the top-five closest stars to us (sixth if you count the sun). Those who read the book or saw the movie "Contact" will know Vega as the "actual" star in the story.

\* The southern vertex is the star Altair in the constellation Aquila the Eagle. Altair is not as visibly bright as Vega despite being eight light years closer to us, ranking in as the 12th brightest star in our sky overall. As it happens, we also know that Altair and Jupiter share a similar shape - both are being squeezed at the poles, bulging at their equators like slightly compressed water balloons.

\* The north-pointing vertex is an absolute scorcher. Deneb marks the tail of the constellation Cygnus the Swan, known by some as the "Northern Cross" both for its

shape and because, in December skies, it stands prominent on the northwest horizon. We don't know the distance to Deneb with great accuracy, but we estimate it as being (very) roughly 2,500 light years away. To be that far away yet still as bright as it is, you know it is literally burning the midnight oil - estimates place it between 50,000 and 250,000 times that of our own sun. It's not only blindingly bright, it's also wondrously wide. If we replaced the sun with Deneb, we'd be observing Deneb from the inside.

### ISS And Other Bright Flyovers:

Satellite flyovers are commonplace, with several bright passes per hour, yet a thrill to new observers of all ages. Few flyovers compare in brightness or interest to the International Space Station. The flyovers of the football-sized craft with its massive solar panel arrays can be predicted to within several seconds and take several minutes to complete. The first two weeks of August are full of flyovers, with all 26 bright, pre-midnight flyovers for Upstate NY listed below. In many cases, there are two flyovers each night before midnight, each separated by about 90 minutes - the amount of time it takes for the ISS to go once around the Earth. Simply go out a few minutes before the start time, orient yourself, and look for what will at first seem like a distant plane.

Day	Brightness	Approximate Start Time	Direction	Approximate End Time	Direction
8/1	very	9:01 PM	W	9:07 PM	NE
8/1	medium	10:39 PM	NW	10:43 PM	NE
8/2	bright	11:22 PM	NW	11:25 PM	N/NE
8/2	bright	9:45 PM	W/NW	9:50 PM	NE
8/3	bright	8:52 PM	W/NW	8:57 PM	NE
8/3	bright	10:29 PM	NW	10:34 PM	NE
8/4	very	11:13 PM	NW	11:15 PM	N
8/4	bright	9:36 PM	NW	9:41 PM	NE
8/5	very	10:19 PM	NW	10:23 PM	NE
8/5	medium	11:55 PM	NW	11:56 PM	NW
8/6	very	11:02 PM	NW	11:04 PM	N/NW
8/6	bright	9:26 PM	NW	9:31 PM	NE
8/7	very	10:09 PM	NW	10:13 PM	NE
8/7	medium	11:45 PM	W/NW	11:46 PM	W/NW

8/8	very	10:52 PM	W/NW	10:54 PM	NW
8/8	very	9:16 PM	NW	9:21 PM	E/NE
8/9	extremely	9:59 PM	NW	10:03 PM	E/NE
8/10	very	9:06 PM	NW	9:12 PM	E
8/10	very	10:42 PM	W/NW	10:44 PM	W
8/11	extremely	9:49 PM	W/NW	9:53 PM	SE
8/12	extremely	8:56 PM	NW	9:02 PM	E/SE
8/12	bright	10:33 PM	W	10:34 PM	W/SW
8/13	extremely	9:39 PM	W/NW	9:43 PM	S
8/14	extremely	8:46 PM	W/NW	8:52 PM	SE
8/15	bright	9:30 PM	W	9:34 PM	S
8/16	very	8:36 PM	W/NW	8:42 PM	S.SE

Predictions courtesy of heavens-above.com.

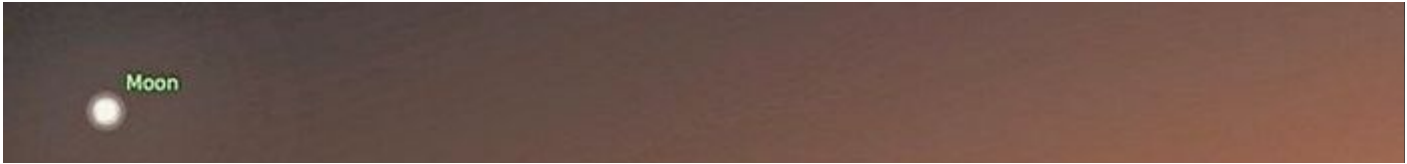
**Moon:**

New:	First-Quarter:	Full:	Third-Quarter
August 2nd	August 10th	August 18th	August 25th

The moon's increasing brightness as full moon approaches washes out fainter stars, meteors, and other celestial objects - this is bad for most observing, but excellent for new observers, as only the brightest stars (those that mark the major constellations) and planets remain visible for your easy identification. If you've never tried it, the moon is a wonderful binocular object.

**Planets:**

Provided you know where to look and how to find them, you can catch glimpses of all eight planets this month before midnight. Those with exceptional telescopes and observing skills might even be able to take a peak at distant Pluto to fill out their punch card for the original nine. We'll highlight the brightest five below.





The view looking south at 10 p.m. Aug. 15. Except for the changing moon position, this view is accurate for all of August.

**Mars:** Mars is the unmissable planet this month, glowing bright red-orange in the south-southwest sky. It'll even be directly underneath the Moon on August 11th if you need another observing marker. Mars has just left the constellation Libra the Scales and will move from the claws to the jaws of Scorpius this month. August 23rd/24th will make for the very pleasant bright-orange pairing of Mars (above) and the star Antares (below) under the watchful gaze of Saturn (above both).

**Saturn:** Saturn remains at the western border of the constellation Ophiuchus and will slowly make its way east until settling into Sagittarius in 2018. If you can see Mars, Saturn is the bright star just above and to the left of it. In good binoculars, Saturn and its rings appear as a small oval. With big binoculars or a small telescope, you should be able to distinguish between the planet and its rings, and maybe even see the dark Cassini Division within the rings.

**Jupiter:** Jupiter sets early this month to the west, gone completely by 10 p.m. early on and soon after sunset by month's end. Those with a high elevation and low tree line are in for a real treat on Aug. 27 when Venus, Jupiter, and all four of Jupiter's largest moons put on a very close approach. Aug. 27 also marks the next pass of the NASA probe Juno around Jupiter. If all goes well, expect another remarkable image to make its way around social media on Aug. 28.

**Venus:** Venus is exceptionally bright and low on the western horizon this month, but sets before 9 p.m. each night. Jupiter and Venus are going to make a remarkably close

pairing in the sky on Aug. 27 - well worth a look just after sunset. Those with low-power binoculars should be able to fit Jupiter and Venus into the same field of view, catching sights of all four Galilean moons as well. Astronomers refer to this close passing of one planet by another as a conjunction. While this bright conjunction on the 27th will be impressive, you may appreciate it even more by going outside on the 26th and 28th as well to see just how far Venus appears to move with respect to the Jovian reference point.

**Mercury:** Mercury glows dimmer than Jupiter and Venus, but is still bright enough to stand out after sunset. Your best chance to find it easily might be soon after sunset on Aug. 5 and 6, when a double-double pairing of the moon with Jupiter and Mercury with Venus occurs close to the western horizon.

**Perseid Meteor Shower** (Peak nights are Aug. 11 and 12, with up to 150 meteors per hour)

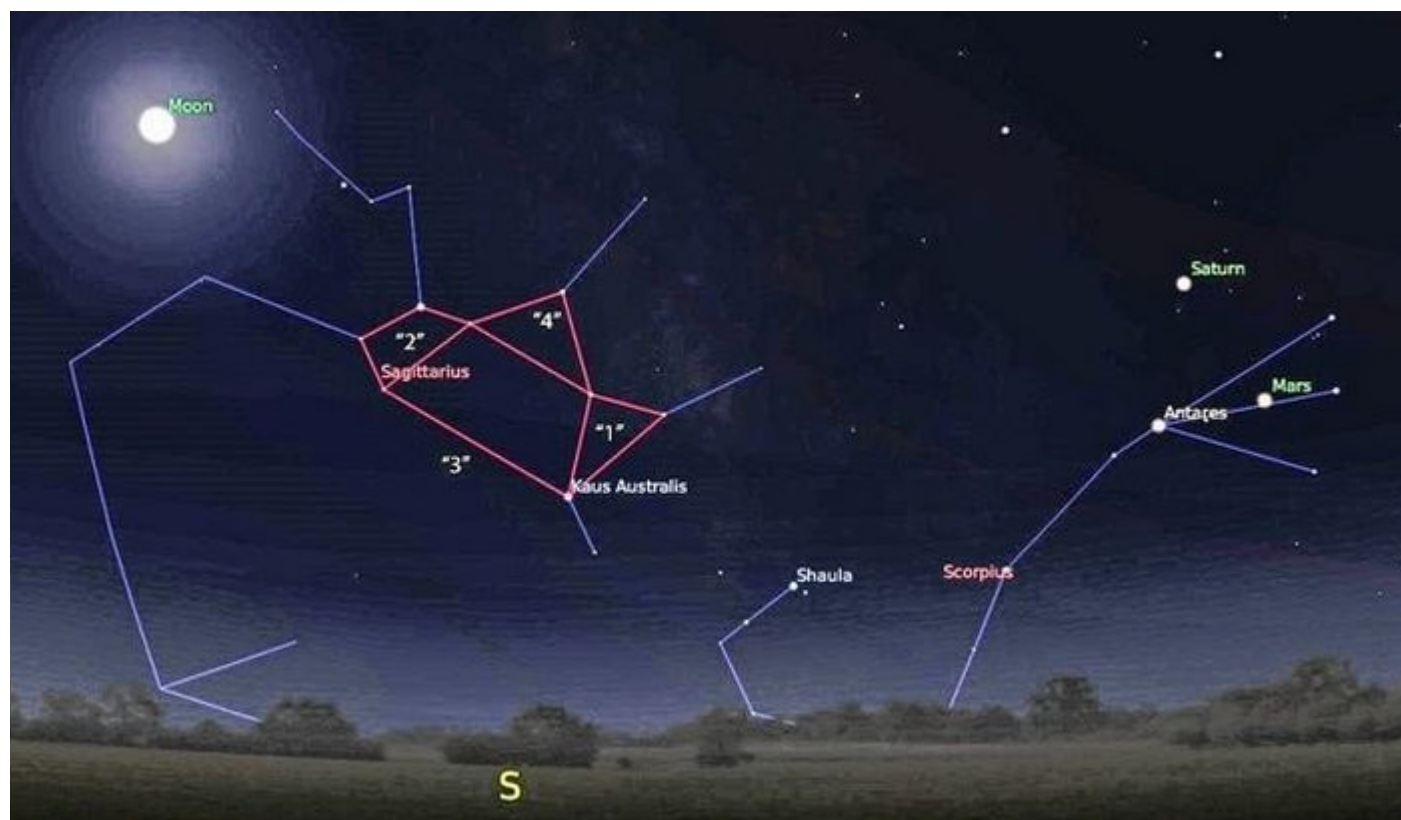
Meteor showers are the result of the Earth passing through the debris field of a comet or asteroid. As these objects approach the warming sun in their long orbits, they leave tiny bits behind - imagine pebbles popping out the back of a large gravel truck on an increasingly bumpy road. In the case of meteor showers, the brilliant streaks you see are due to particles no larger than grains of sand. The Earth plows through the swarm of these tiny particles at up-to 12 miles-per-second. High in the upper atmosphere, these particles burn up due to friction and ionize the air around them, producing the long light trails we see. We can predict the peak observing nights for a meteor shower because we know when and where in Earth's orbit we'll pass through the same part of the Solar System - this yearly periodicity in meteor activity is what let us identify and name meteor showers well before we ever had evidence of what caused them.

The name of each meteor shower is based on the constellation from which the shooting stars appear to radiate - a position in the sky we call the radiant. In the case of the Perseids, the meteor shower radiant appears to be just off the head of Perseus, which rises from the northeast just after 9 p.m. this month. The meteor shower itself is provided to us by Comet 109P/Swift-Tuttle, which last made its dramatic pass in 1992 and which will return again to replenish the debris field in 2126.

**How to observe:** Perseus marks the position of the meteor shower radiant, meaning the meteors themselves will seem to shoot roughly from the northeast to the southwest. To optimize your experience, lie flat on the ground with your feet pointed northeast - meteors will then appear to fly right over you. Counts and brightness tend to increase the later you stay out, with peak observing times usually between midnight and 4 a.m. The swarm of tiny particles is distributed broadly in orbit, meaning some



## Learn A Constellation: Sagittarius



The constellation Saggitarius marks the center of the Milky Way.

As long as you're staring south to see the Milky Way center, your eyes are already in the right direction for Scorpius' neighbor to the east. Not all of the stars in the constellation Sagittarius are prominent without decently dark skies, but one feature will jump right out at you that will make finding the rest much easier.

Find Mars and use that as your marker for Scorpius, sliding down the tail from Antares and looping up to end on the bright tail star Shaula. Looking to the east, the first prominent star you'll see is Kaus Australis. From that star, make a triangle out of the two slightly dimmer stars above it ("1"). To the east of this triangle, you'll run into a prominent sideways trapezoid ("2"). Now, imagine a line connecting Kaus Australis with the bottom-most star of the trapezoid ("3"). Go half-way along that line and look up to a final bright star ("4"). That whole structure will, hopefully, jump out to you as a tea pot. With that structure firmly in place in your mind, you can look just to the west of the spout of the tea pot to see the galactic center.

From the tea pot, the less prominent features of Sagittarius make their presence known in a star chart. We lose a bit of the bottom of this constellation because we're too far north, but most of us should be able to see all but the bottom-most two stars.

*Damian Allis is the director of CNY Observers and a NASA Solar System Ambassador*

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## **How to spend summer nights in Upstate NY**

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