

Meteor Activity Outlook for September 16-22, 2023

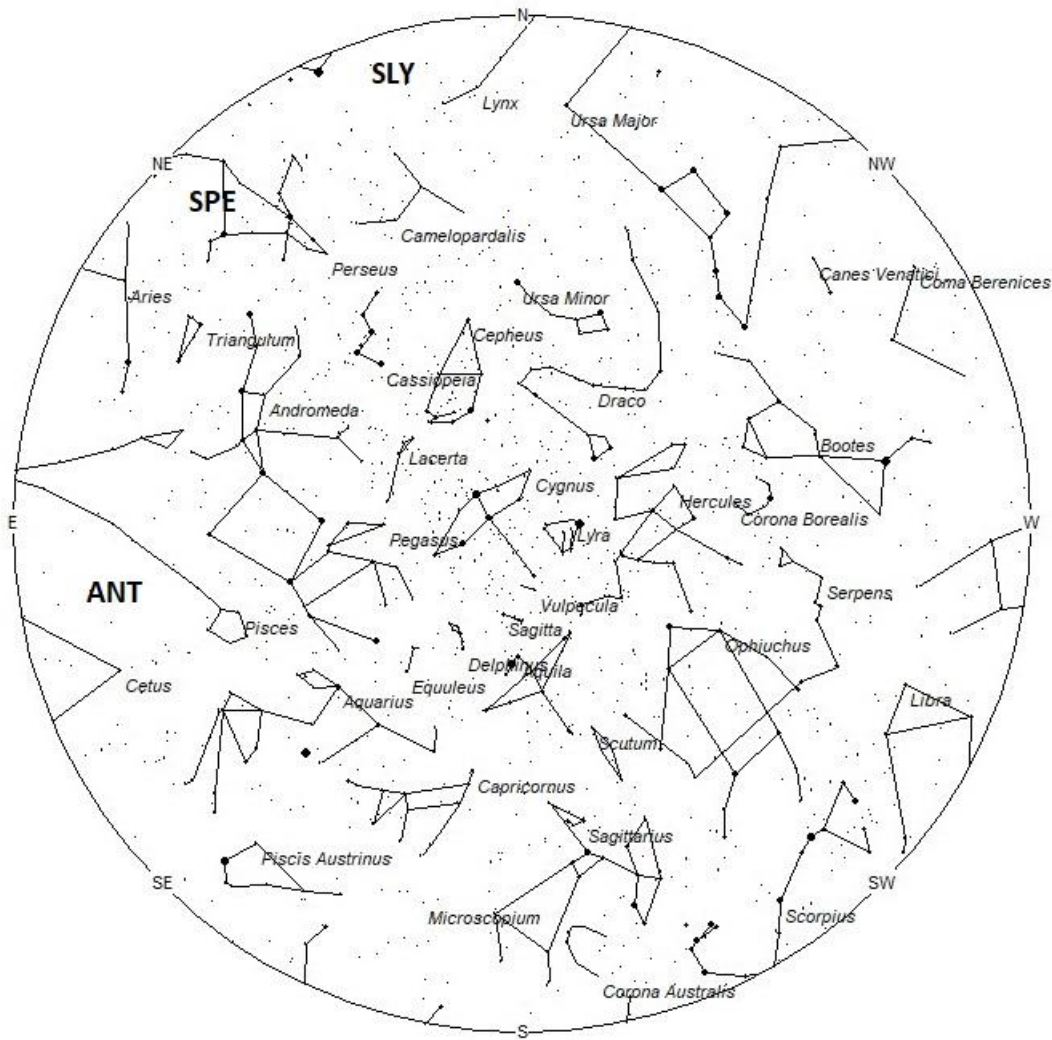


Daniel Bush captured this extremely bright fireball at 23:43 CST on December 22, 2022 from Albany, Missouri. Although this occurred near the maximum of the Ursid shower, this fireball was not a member of that display. ©Daniel Bush

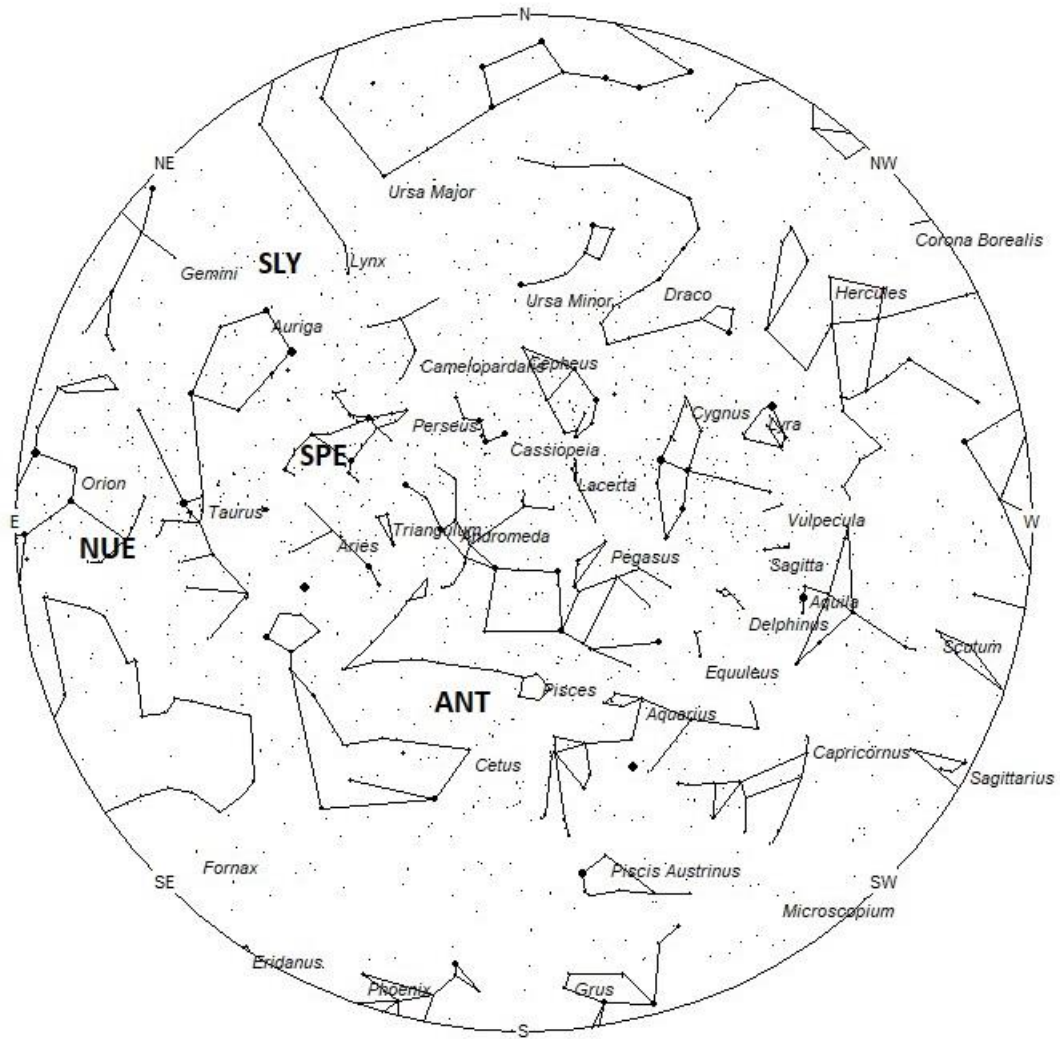
During this period, the moon reaches its first quarter phase on Friday September 22nd. On that date the moon will be located 90 degrees east of the sun and will set near 22:00 local Daylight-Saving time (LDST). This weekend the waxing crescent moon will set during dusk and will not interfere with meteor observing. The estimated total hourly rates for evening observers this week should be near 3 as seen from mid-northern latitudes (45N) and 2 as seen from tropical southern locations (25S) For morning observers, the estimated total hourly rates should be near 12 as seen from mid-northern latitudes (45N) and 9 as seen from tropical southern locations (25S). The actual rates seen will also depend on factors such as personal light and motion perception, local weather conditions, alertness, and experience in watching meteor activity. Note that the hourly rates listed below are estimates as viewed from dark sky sites away from urban light sources. Observers viewing from urban areas will see less activity as only the brighter meteors will be visible from such locations.

The radiant (the area of the sky where meteors appear to shoot from) positions and rates listed below are exact for Saturday night/Sunday morning September 16/17. These positions do not change greatly day to day so the listed coordinates may be used during this entire period. Most star atlases (available at science stores and planetariums) will provide maps with grid lines of the celestial coordinates so that you may find out exactly where these positions are located in the sky. I have also included charts of the sky that display the radiant positions for evening, midnight, and morning. The center of each chart is the sky directly overhead at the appropriate hour. These charts are oriented for facing south but can be used for any direction by rotating the charts to the desired direction. A planisphere or computer planetarium program is also useful in showing the sky at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach

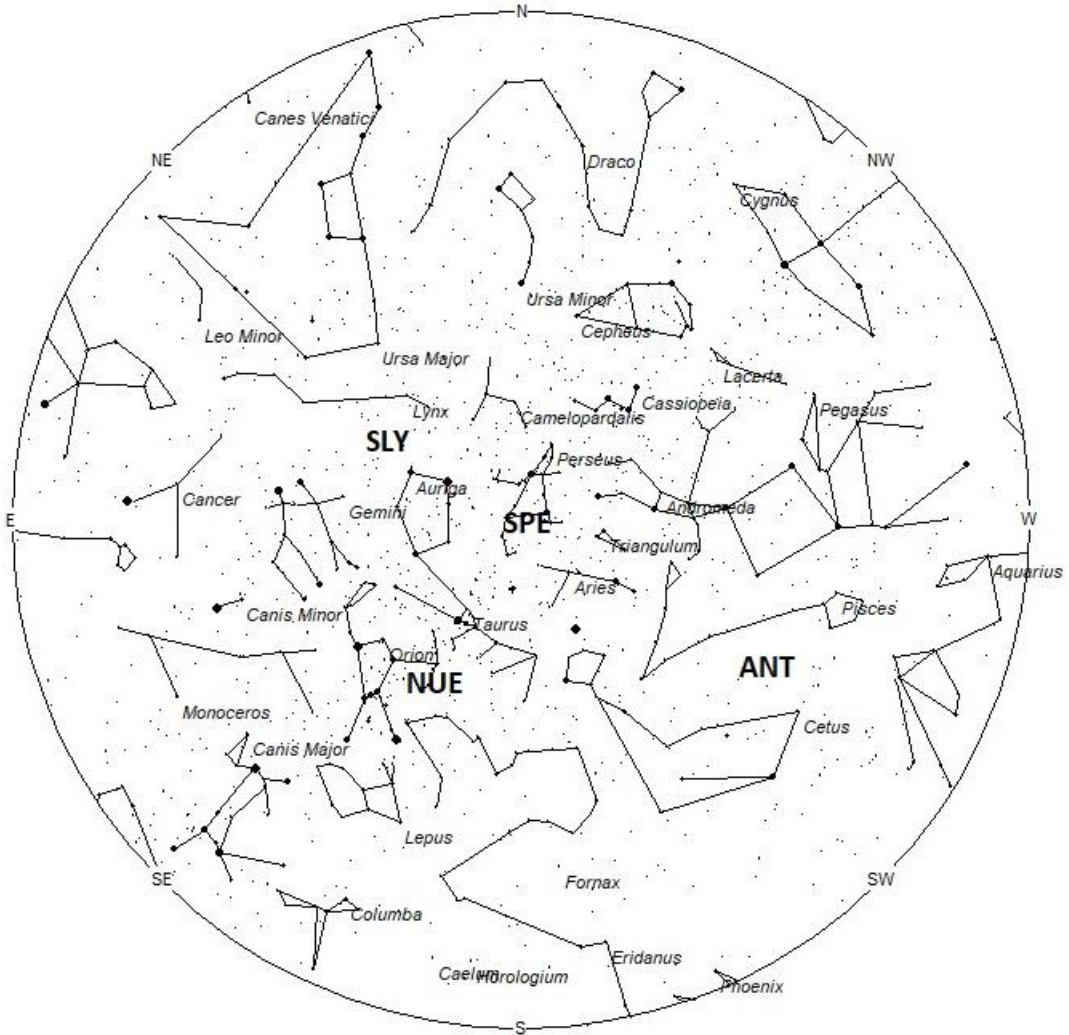
their highest point in the sky until daylight. For these radiants, it is best to view them during the last few hours before dawn. It must be remembered that meteor activity is rarely seen at its radiant position. Rather they shoot outwards from the radiant, so it is best to center your field of view so that the radiant lies toward the edge and not the center. Viewing there will allow you to easily trace the path of each meteor back to the radiant (if it is a shower member) or in another direction if it is sporadic. Meteor activity is not seen from radiants that are located far below the horizon. The positions below are listed in a west to east manner in order of right ascension (celestial longitude). The positions listed first are located further west therefore are accessible earlier in the night while those listed further down the list rise later in the night.



Radiant Positions at 9pm Local Daylight-Saving Time



Radiant Positions at 1am Local Daylight-Saving Time



Radiant Positions at 5am Local Daylight-Saving Time

These sources of meteoric activity are expected to be active this week.

The large **Anthelion (ANT)** radiant is currently centered at 00:28 (007) +01. This position lies in western Pisces, 7 degrees southwest of the 4th magnitude star known as delta Piscium. This radiant is best placed near 02:00 LDST when it lies on the meridian and is highest in the southern sky. Rates at this time should be near 2 per hour no matter your location. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of medium-slow velocity.

The **September epsilon Perseids (SPE)** are active from September 2-23, with maximum activity occurring on the 10th. The current position of the radiant lies at 03:34 (056) +40. This area of the sky lies in central Perseus, 3 degrees south of the 4th magnitude star known as nu Persei. To best see these meteors, face half-way up toward the north during the last hour prior to dawn. Rates at this time are expected to be less than 1 no matter your location. With an entry velocity of 65 km/sec., the average meteor would be of swift velocity.

The last of the **nu Eridanids (NUE)** are expected this week from a radiant located at 04:53 (073) +03. This area of the sky lies in western Orion, 1 degree north of the 4th magnitude star known as pi⁵ Orionis. Observers concentrating on this activity should face half-way up in the southeastern sky during the last dark hour prior to dawn to best view these meteors. Current rates are expected to be less than 1 per hour during this period no matter your location. With an entry velocity of 66 km/sec., the average meteor from this source would be of swift velocity.

The **September Lyncids (SLY)** are composed of two weak showers active throughout September. The later branch is active from September 16 through October 3 with maximum activity occurring on September 28th. The radiant is located at 06:36 (099) +50, This position lies in northeastern Auriga, 7 degrees northeast of the 2nd magnitude star known as Menkalinan (beta Aurigae). To best see these meteors, view half-way up in the eastern sky during the last hour prior to dawn. Rates are expected to be less than 1 per hour. With an entry velocity of 64 km/sec., the average meteor from this source would be of swift velocity. The meteors are not readily visible from the southern hemisphere as the radiant does not rise high enough before the onset of dawn.

As seen from the mid-northern hemisphere (45N) one would expect to see approximately 10 **sporadic** meteors per hour during the last hour before dawn as seen from rural observing sites. Evening rates would be near 2 per hour. As seen from the tropical southern latitudes (25S), morning rates would be near 7 per hour as seen from rural observing sites and 2 per hour during the evening hours.

You can keep track of the activity of these meteor showers as well as those beyond the limits of visual observing by visiting the [NASA Meteor Shower Portal](#). You can move the sky globe to see different areas of the sky. Colored dots indicate shower meteors while white dots indicate sporadic (random) activity. The large orange disk indicates the position of the sun so little activity will be seen in that area of the sky.

The list below offers the information in tabular form of the showers that I feel are within reach of the visual observer to discern. Hourly rates are often less than 1 but noting parameters such as the radiant distance and the elevation of each meteor, one can compute the probability of shower

association. Most showers discovered by video means have rates less than 1 meteor per **night** away from maximum, so the showers listed in these articles are not as weak as they seem. Rates and positions are exact for Saturday night/Sunday morning except where noted in the shower descriptions.

SHOWER	DATE OF MAXIMUM ACTIVITY	CELESTIAL POSITION	ENTRY VELOCITY	CULMINATION	HOURLY RATE	CLASS
		RA (RA in Deg.) DEC	Km/Sec	Local Daylight- Saving Time	North- South	
Anthelion (ANT)	-	00:28 (007) +01	30	02:00	2 - 2	II
Sept. epsilon Perseids (SPE)	Sep 10	03:34 (056) +40	65	05:00	<1 - <1	II
nu Eridanids (NUE)	Sep 11	04:53 (073) +03	66	06:00	<1 - <1	IV
September Lyncids (SLY)	Sep 11	06:36 (099) +50	64	08:00	<1 - <1	IV

Class Explanation: A scale to group meteor showers by their intensity:

- **Class I:** the strongest annual showers with Zenith Hourly Rates normally ten or better.
- **Class II:** reliable minor showers with ZHR's normally two to ten.
- **Class III:** showers that do not provide annual activity. These showers are rarely active yet have the potential to produce a major display on occasion.
- **Class IV:** weak minor showers with ZHR's rarely exceeding two. The study of these showers is best left to experienced observers who use plotting and angular velocity estimates to determine shower association. These weak showers are also good targets for video and photographic work. Observers with less experience are urged to limit their shower associations to showers with a rating of I to III.