Meteor Activity Outlook for September 2-8, 2023

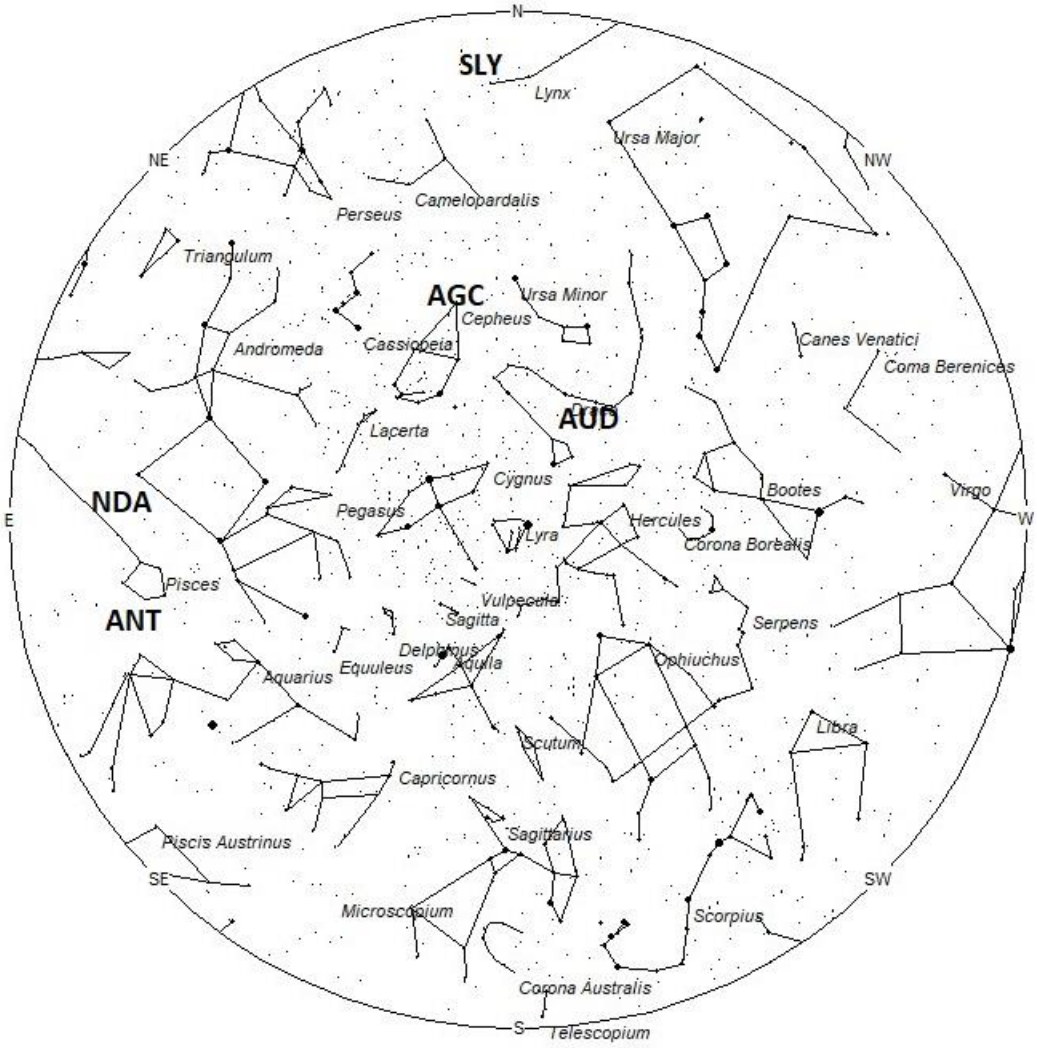
Mike Lewinski captured this beautiful fireball from Crestone, Colorado, USA on November 28, 2022 at 0231 MST (9:31 UT). The blue colored terminal flash is an impressive example of this phenomena. ©Mike Lewinski

September offers longer nights in the northern hemisphere that tend to be less hazy than those experienced in mid-summer. In the sky, no major showers are visible from either hemisphere, but the northern hemisphere enjoys the advantage of higher sporadic rates. Most of the shower activity this month is produced from the Perseus-Aurigid complex active this time of year. These showers rarely produce more than 5 meteors per hour but still manage to produce most of the shower activity seen this month. Unfortunately, the Perseus-Aurigid complex lies too low in the northern sky for southern hemisphere observers to view very well. Video studies have shown that the Taurids are visible as early as September 28th, therefore after this date the Anthelion radiant will no longer be listed until the Taurid showers end in December. The Anthelion meteors are still active but their radiant is superimposed upon that of the more numerous Taurids, therefore it is impossible to properly separate these meteors. Observers in the southern hemisphere suffer from some of their lowest rates of the year this month. The Taurid radiants are not too badly placed so observers south of the equator can expect to see a little of this activity from this source this month.

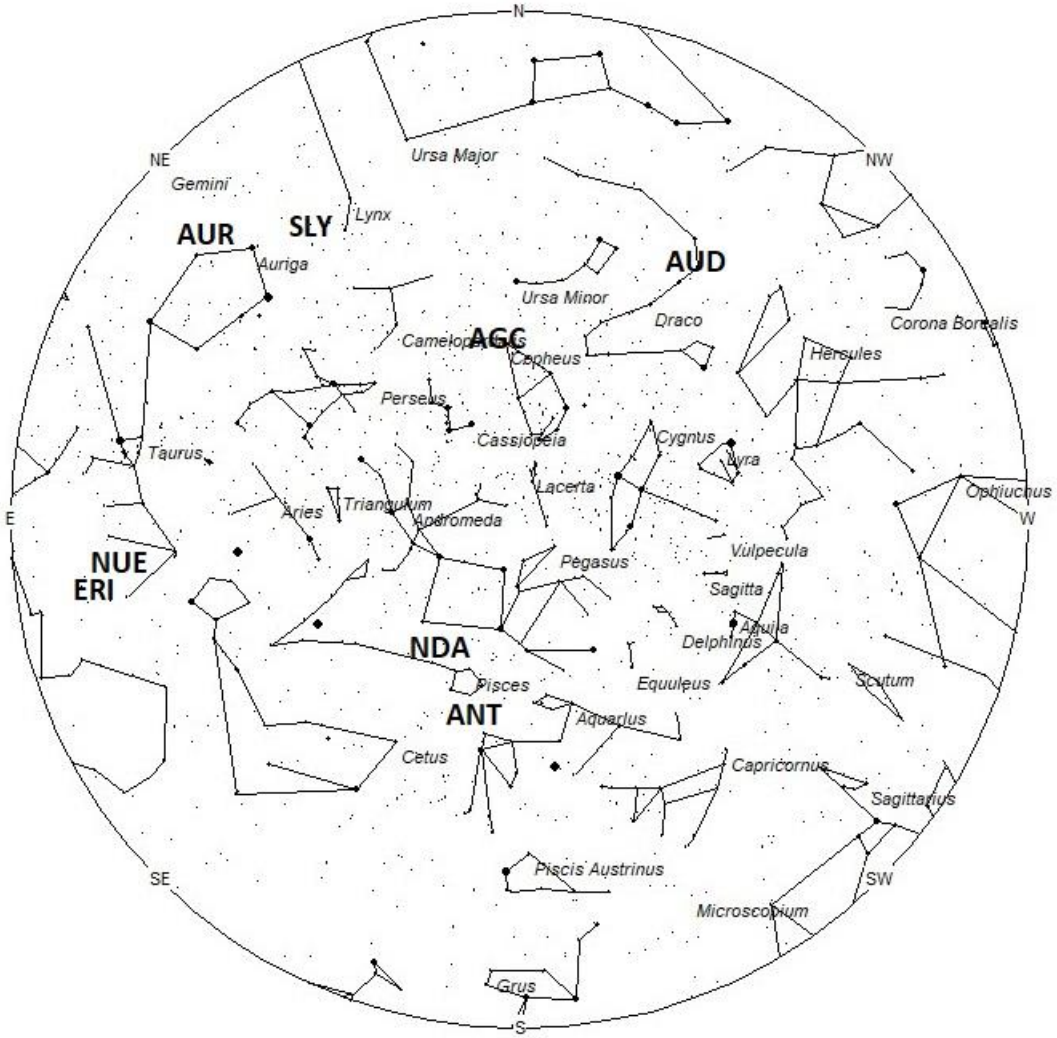
During this period, the moon reaches its last quarter phase on Thursday September 7th. On that date the half-illuminated moon will be located 90 degrees west of the sun and will rise between 23:00 and midnight Local Daylight-Saving Time (LDST) on the previous evening. This weekend

the waning gibbous moon will rise during the late evening hours, spoiling the remainder of the night when meteor activity normally peaks. The estimated total hourly rates for evening observers this week should be near 2 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 7 as seen from mid-northern latitudes (45N) and 5 as seen from tropical southern locations (25S). Morning rates are reduced due to moonlight. 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.

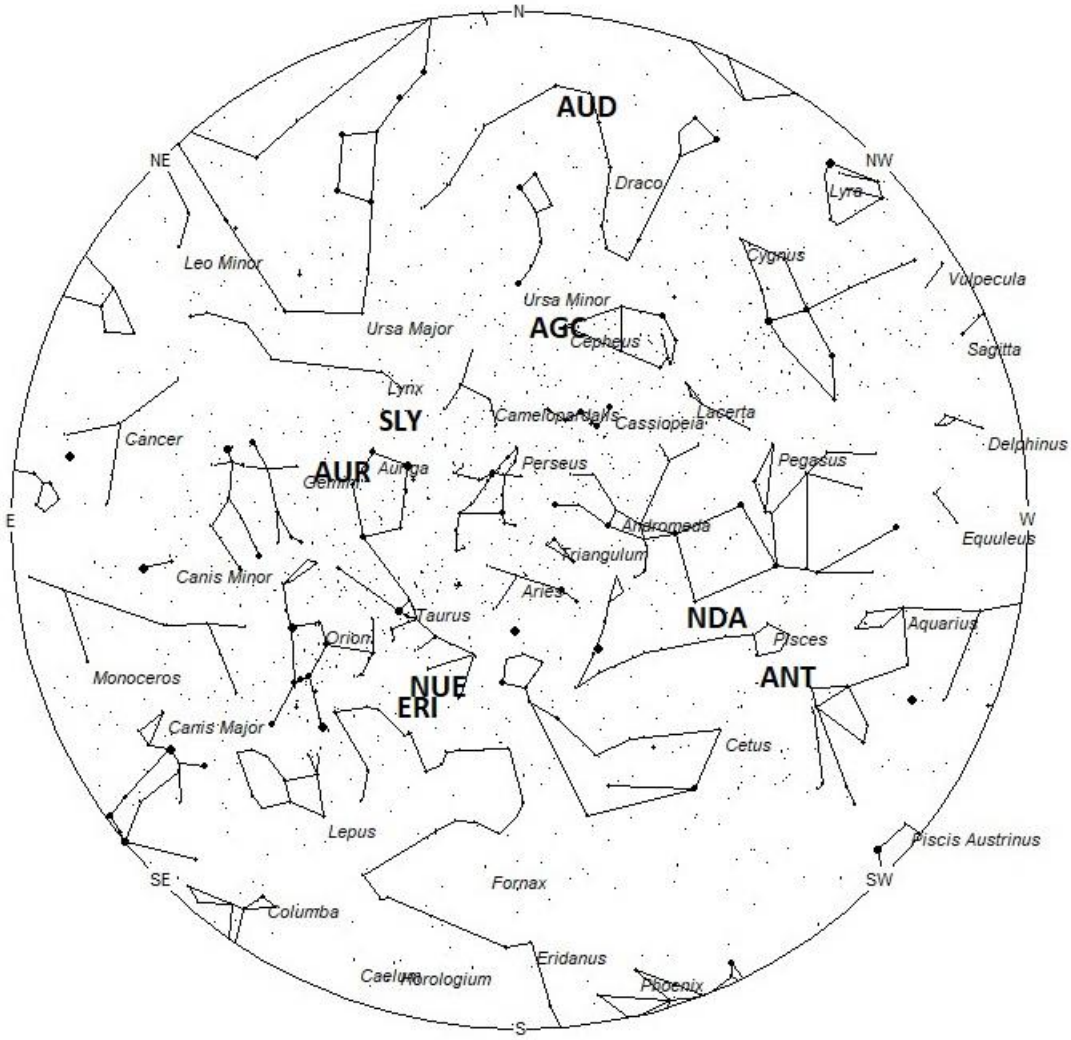
The radiant (the area of the sky where meteors appear to shoot from) positions and rates listed below are exact for Saturday night/Sunday morning September 2/3. These positions do not change greatly day to day so the listed coordinates may be used during this entire period. Most star atlases (available 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.

Details of each source will continue next week when viewing conditions are more favorable.

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	
zeta Draconids (AUD)	Aug 26	16:00 (240) +59	20	18:00	<1 - <1	IV
Anthelion (ANT)	-	23:32 (353) -03	30	02:00	1 - 1	II
August gamma Cepheids (AGC)	Aug 17	23:57 (359) +78	44	02:00	<1 - <1	IV
August beta Piscids (NDA)	Aug 21	00:08 (002) +09	37	02:00	<1 - <1	IV
Sept. epsilon Perseids	Sep 10	02:34 (040) +39	64	04:00	<1 - <1	II
nu Eridanids (NUE)	Sep 11	04:06 (062) -02	65	06:00	<1 - <1	II

eta Eridanids (ERI)	Aug 07	04:14 (064) -06	64	06:00	<1 - <1	II
Aurigids (AUR)	Sep 01	06:11 (093) +39	65	08:00	<1 - <1	II
September Lyncids (SLY)	Sep 11	06:13 (093) +54	61	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.