

Meteor Activity Outlook for November 25-December 1, 2023

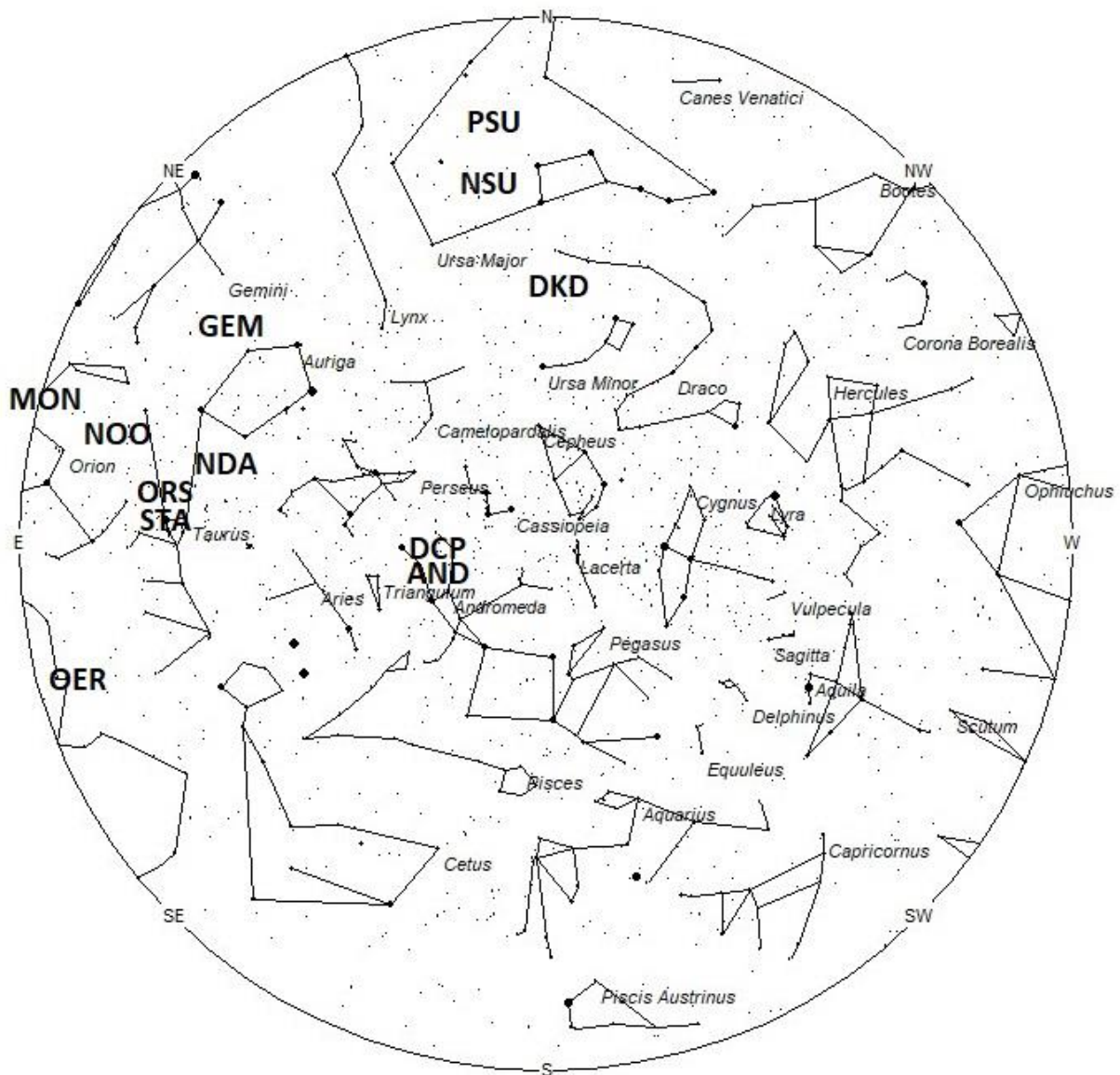


Andrea Cappelletto captured this impressive fireball on July 15, 2023, at 00:24 CEST from Dondenaz, Italy. The cloud trailing the fireball is just a chance alignment and has nothing to do with this event. ©Andrea Cappelletto

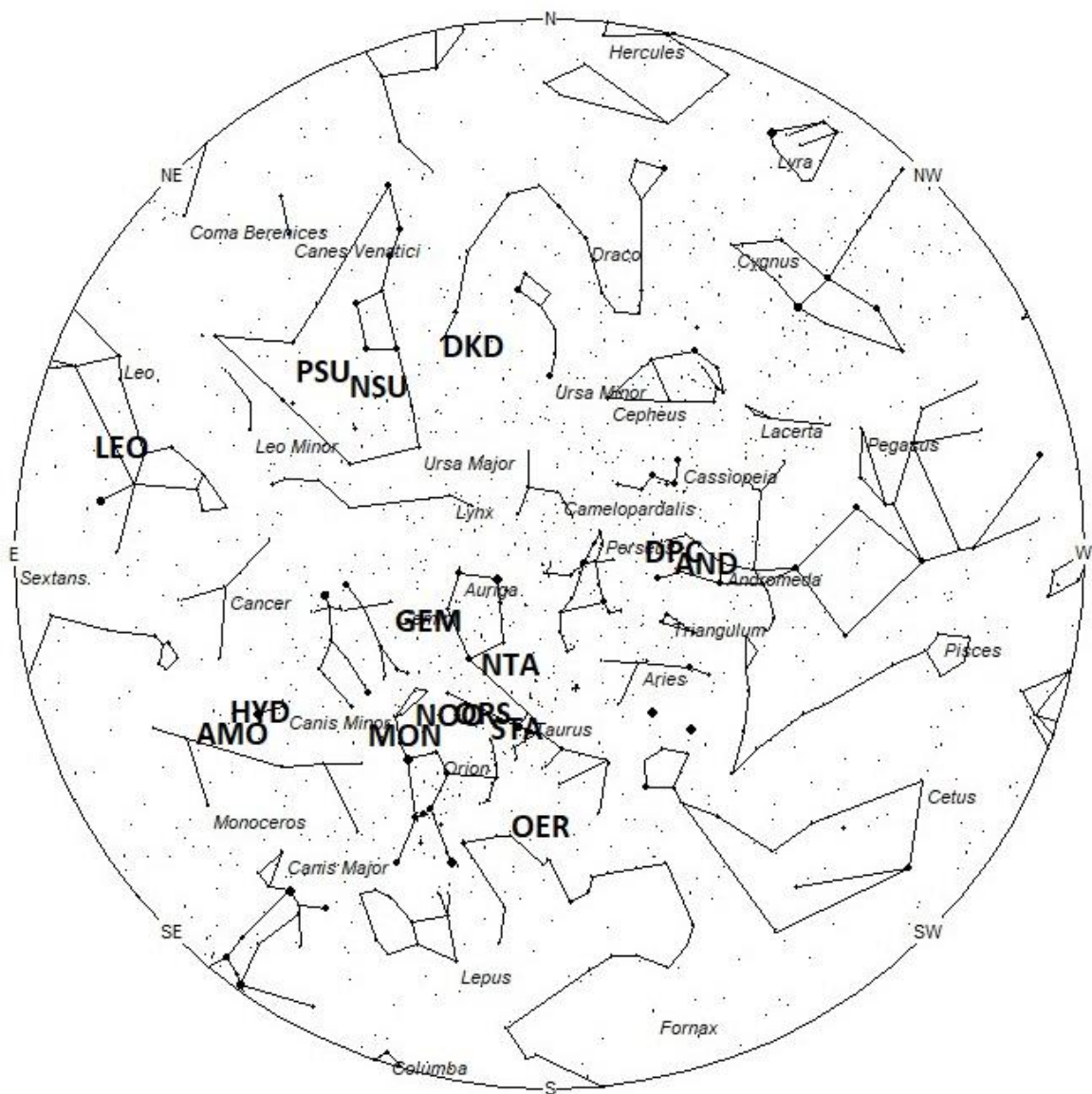
During this period, the moon reaches its full phase on Monday November 27th. On that night the moon will be located opposite the sun and will lie above the horizon all night long. As the week progresses, the waning gibbous moon will rise later in the evening, allowing a small window of opportunity to view under dark skies between dusk and moonrise. The estimated total hourly rates for evening observers this weekend should be near 2 as seen from mid-northern latitudes (45N) and 1 as seen from tropical southern locations (25S). For morning observers, the estimated total hourly rates should be near 5 as seen from mid-northern latitudes (45N) and 3 as seen from tropical southern locations (25S). 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 November 25/26. 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. Radianths that rise after midnight will not reach their highest point in the sky until daylight. For these radiant, it is best to view them during the last few hours before dawn. It must be remembered that meteor activity is

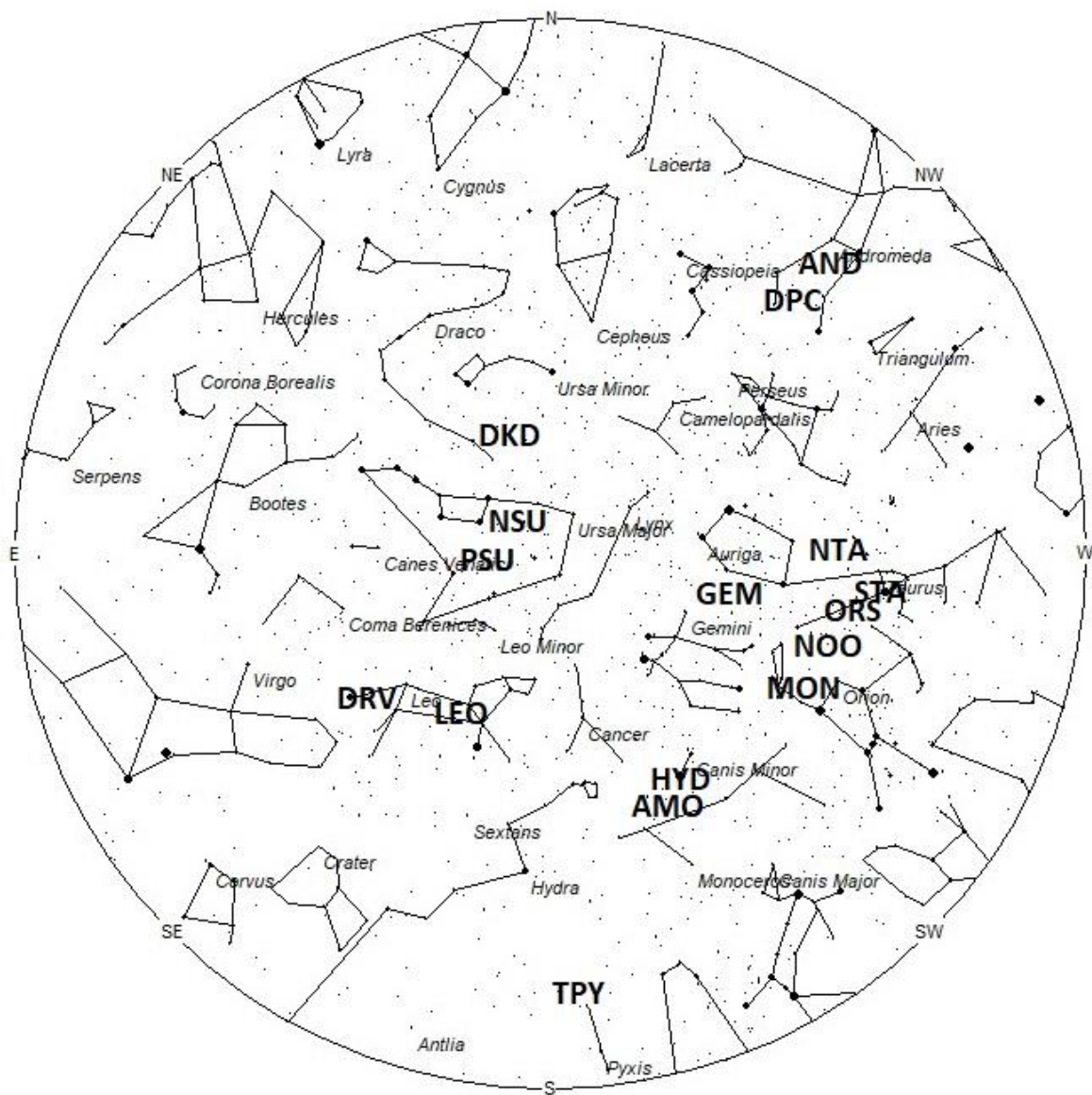
rarely seen at its radiant position. Rather they shoot outwards from the radiant, so it is best to center your field of view so that the radiant lies toward the edge and not the center. Viewing there will allow you to easily trace the path of each meteor back to the radiant (if it is a shower member) 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 7pm Local Standard Time



Radiant Positions at Midnight Local Standard Time



Radiant Positions at 5am Local Standard 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 duration, 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.

SHOWER	DATE OF MAXIMUM ACTIVITY	CELESTIAL POSITION	ENTRY VELOCITY	CULMINATION	HOURLY RATE	CLASS
		RA (RA in Deg.) DEC	Km/Sec	Local Standard Time	North- South	
December phi Cassiopeiids (DPC)	Dec 02	01:29 (022) +45	13	21:00	<1 - <1	III
Andromedids (AND)	Nov 07	01:41 (025) +41	14	21:00	<1 - <1	IV
omicron Eridanids (OER)	Nov 14	04:29 (067) -03	26	00:00	<1 - <1	IV
Southern Taurids (STA)	Nov 07	04:36 (069) +17	22	00:00	<1 - <1	II
Northern Taurids (NTA)	Nov 12	04:39 (070) +25	26	00:00	1 - <1	II
Southern chi Orionids (ORS)	Dec 02	04:56 (074) +18	27	00:00	<1 - <1	IV
November Orionids (NOO)	Nov 30	05:34 (089) +16	43	01:00	1 - <1	II
Monocerotids (MON)	Dec 11	06:03 (091) +10	44	01:00	<1 - <1	II
Geminids (GEM)	Dec 14	06:18 (095) +35	32	02:00	<1 - <1	I

sigma Hydrids (HYD)	Dec 07	07:40 (115) +05	60	03:00	<1- <1	II
alpha Monocerotids (AMO)	Nov 22	08:01 (120) +01	62	04:00	<1 - <1	III
theta Pyxidids (TPY)	Dec 01	08:58 (135) -26	58	05:00	<1- <1	IV
Nov. sigma Ursae Majorids (NSU)	Nov 24	10:38 (160) +49	59	07:00	<1 - <1	IV
Leonids (LEO)	Nov 18	10:36 (159) +18	71	07:00	1 - <1	I
psi Ursa Majorids (PSU)	Dec 04	10:38 (160) +49	59	07:00	<1- <1	IV
December kappa Draconids (DKD)	Dec 03	11:34 (174) +74	43	08:00	<1 - <1	IV
December rho Virginids (DRV)	Dec 05	11:47 (177) +14	69	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.