

Meteor Activity Outlook for December 30, 2023-January 5, 2024



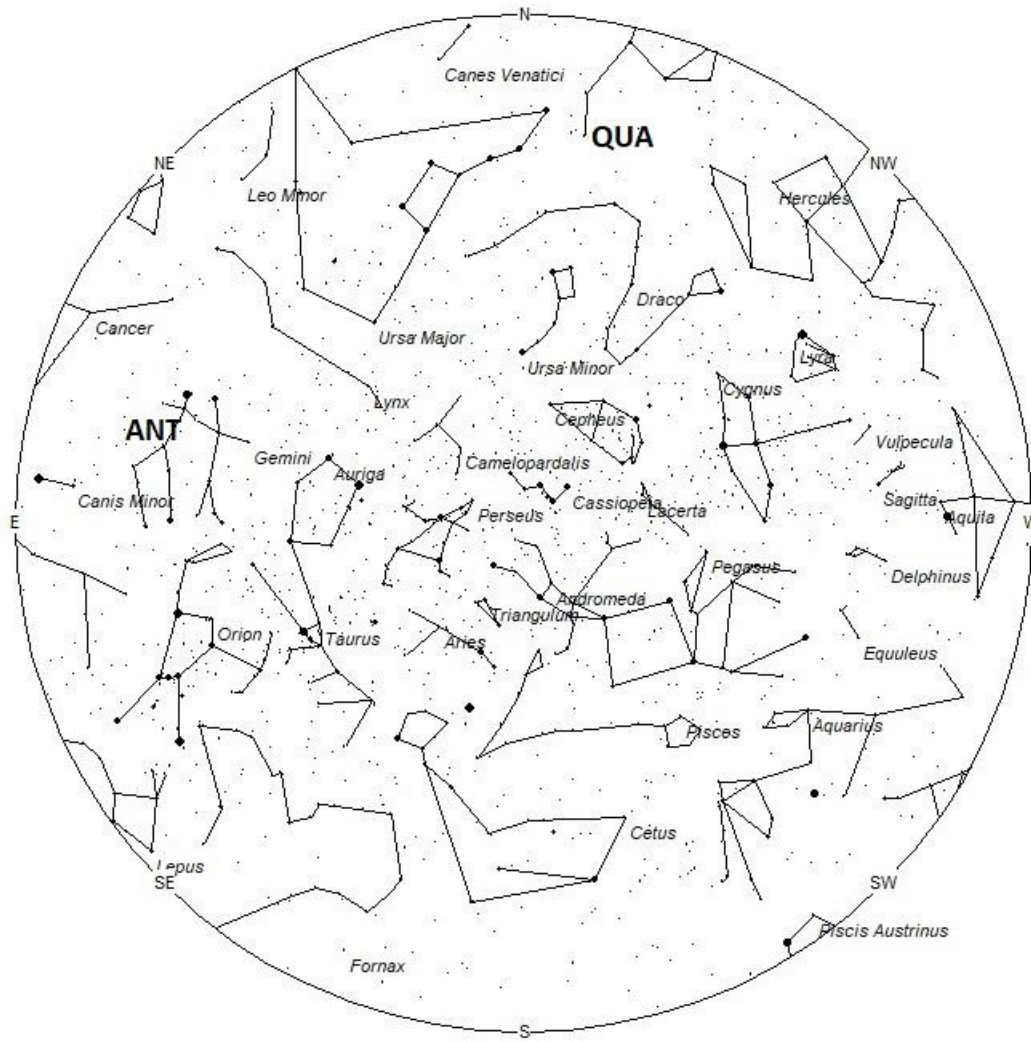
Jordan Ragsdale captured this multi-bursting fireball using his [AllSky Camera System](#) on April 16, 2023, at 05:56 MDT (11:56 UT) from Eagle, Idaho, USA. ©Jordan Ragsdale

January is best known for the Quadrantids, which have the potential to be the best shower of the year. Unfortunately, this shower is short lived and occurs during some of the worst weather in the northern hemisphere. Due to the high northern declination (celestial latitude) and short summer nights, little of this activity can be seen south of the equator. There are many very minor showers active throughout the month. Unfortunately, most of these produce less than 1 shower member per hour and do not add much to the overall activity total. Activity gets interesting as seen from the southern hemisphere as ill-defined radiants in Vela, Carina, and Crux become active this month. This activity occurs during the entire first quarter of the year and moves eastward into Centaurus in February and ends in March with activity in Norma and Lupus. Sporadic rates are generally similar in both hemispheres this month. Sporadic rates are falling though for observers in the northern hemisphere and rising as seen from the southern hemisphere.

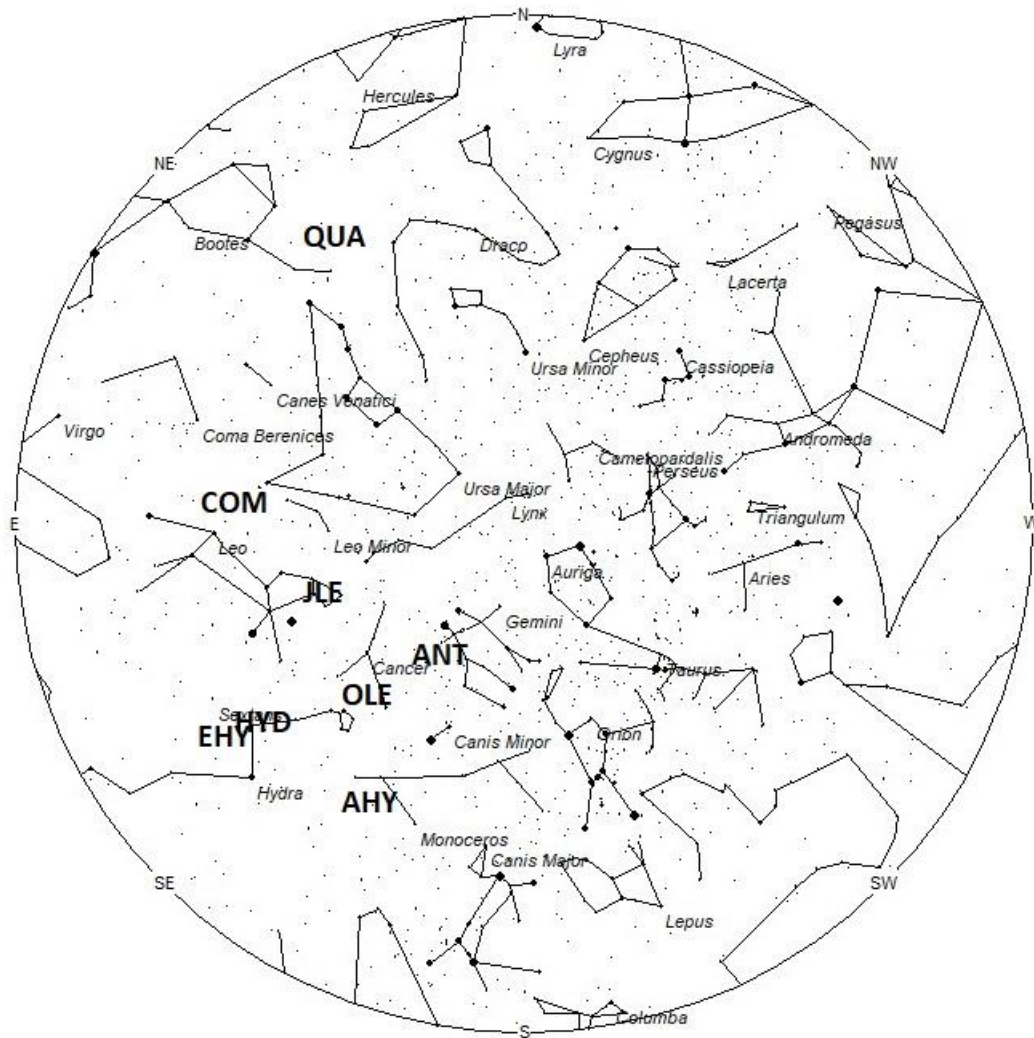
During this period, the moon reaches its last quarter phase on Thursday January 4th. On that night the moon will lie 90 degrees west of the sun and will rise near midnight local standard time (LST). This weekend the waning gibbous moon will rise during the late evening hours and will be a major nuisance to those trying to view meteor activity. The estimated total hourly rates for evening observers this weekend 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 13 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. Rates during this period are reduced due to moonlight. 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.

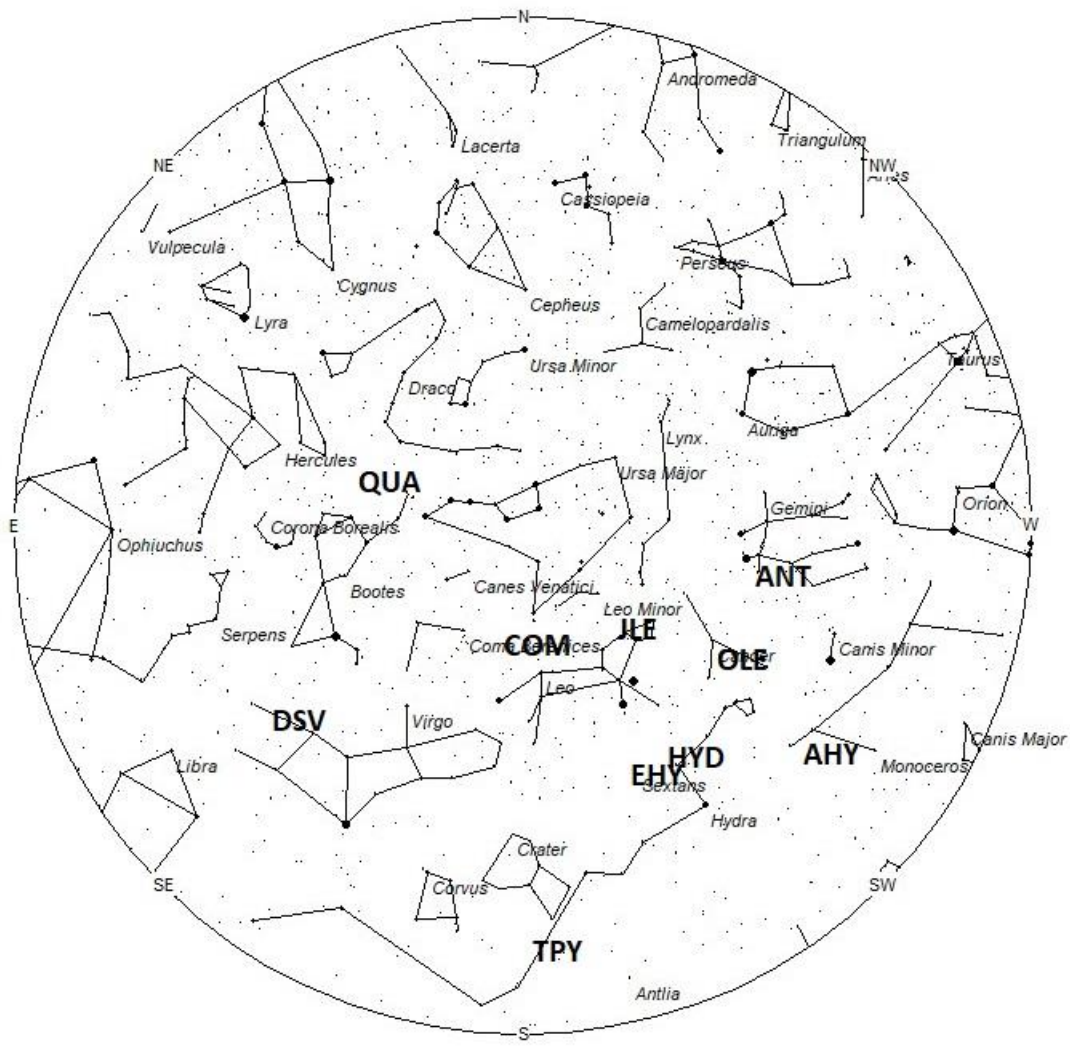
The radiant (the area of the sky where meteors appear to shoot from) positions and rates listed below are exact for Saturday night/Sunday morning December 30/31. These positions do not change greatly day to day so the listed coordinates may be used during this entire period. Most star atlases (available 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 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	
Anthelions (ANT)	-	07:28 (112) +21	30	01:00	2 -1	II
Volantids (VOL)	Dec 31	08:02 (121) -72	28	02:00	<1- <1	III
alpha Hydrids (AHY)	Jan 06	08:16 (124) -07	44	02:00	<1 - <1	IV
omicron Leonids (OLE)	Jan 10	08:33 (128) +11	40	02:00	<1 - <1	IV
c-Velids (CVE)	Dec 29	09:20 (140) -54	39	03:00	<1 - <1	IV
sigma Hydrids (HYD)	Dec 07	09:35 (144) -03	57	03:00	<1- <1	II
January Leonids (JLE)	Jan 03	09:42 (146) +25	52	03:00	<1 - <1	IV

eta Hydrids (EHY)	Dec 12	10:03 (151) -02	61	04:00	<1- <1	IV
theta Pyxidids (TPY)	Dec 18	11:07 (167) -27	64	05:00	<1 - <1	IV
Comae Berenicids (COM)	Dec 16	11:24 (171) +26	64	05:00	1- <1	II
December sigma Virginids (DSV)	Dec 21	14:18 (215) +03	66	08:00	<1 - <1	IV
Quadrantids (QUA)	Jan 04	15:04 (226) +50	41	09:00	<1 - <1	I

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.