Meteor Activity Outlook for February 3-9, 2024

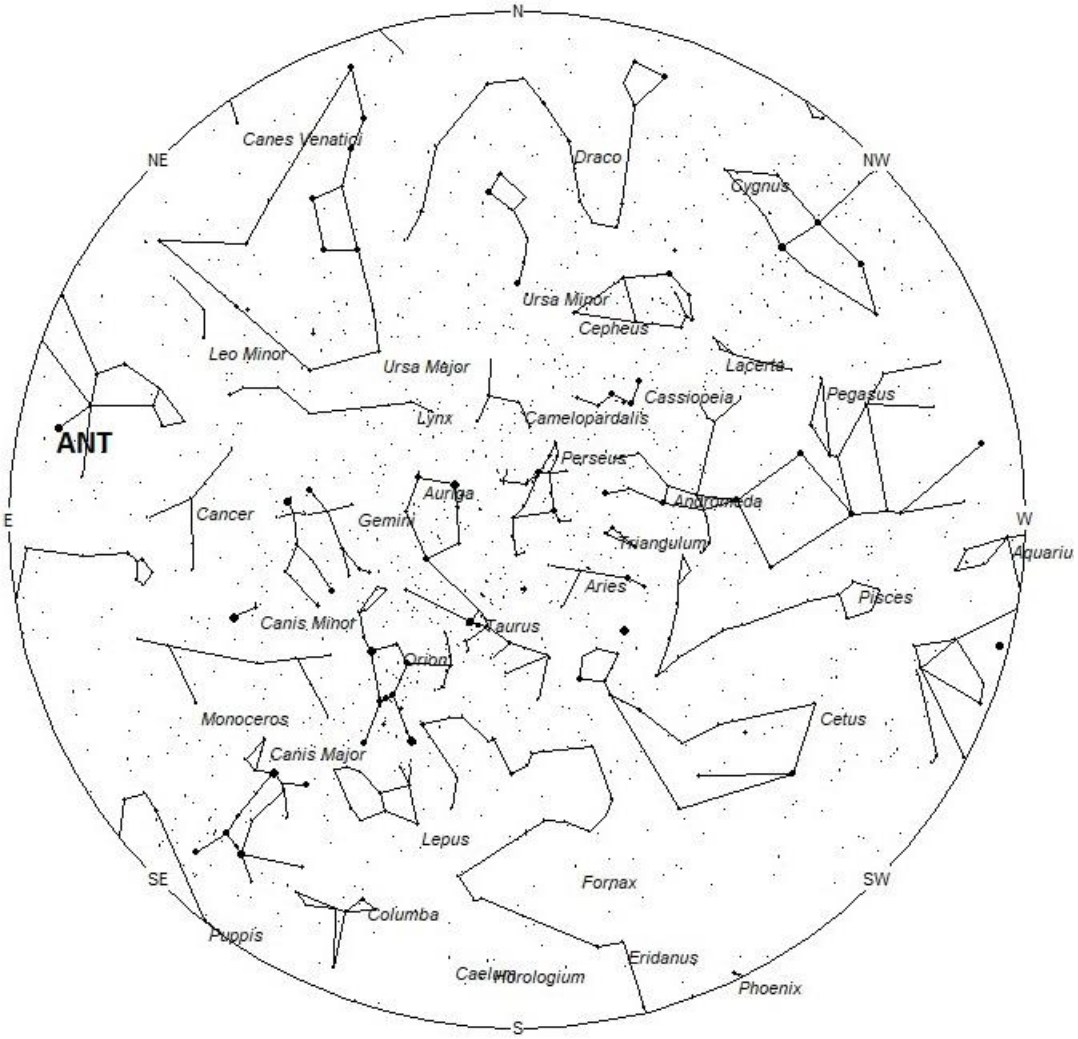
Richard Bassom captured this multi-bursting fireball passing close to Polaris on August 7, 2023, at 22:51 BST (22:51 UT) from Ringwood, England. ©Richard Bassom

February offers the meteor observer in the Northern Hemisphere a couple of weak showers plus falling sporadic rates. This may not seem too exiting but you never know when surprises are in store. An errant earthgrazer from the Centaurid complex may shoot northward. Better yet, a bright fireball may light up the sky. February is the start of the evening fireball season, when an abundance of fireballs seems to occur as seen from the northern hemisphere. This lasts well into April. Sporadic rates are near maximum for those viewing from the southern hemisphere. There are no strong showers this month, but sporadic rates are in excess of 10 per hour as seen from mid-southern latitudes.

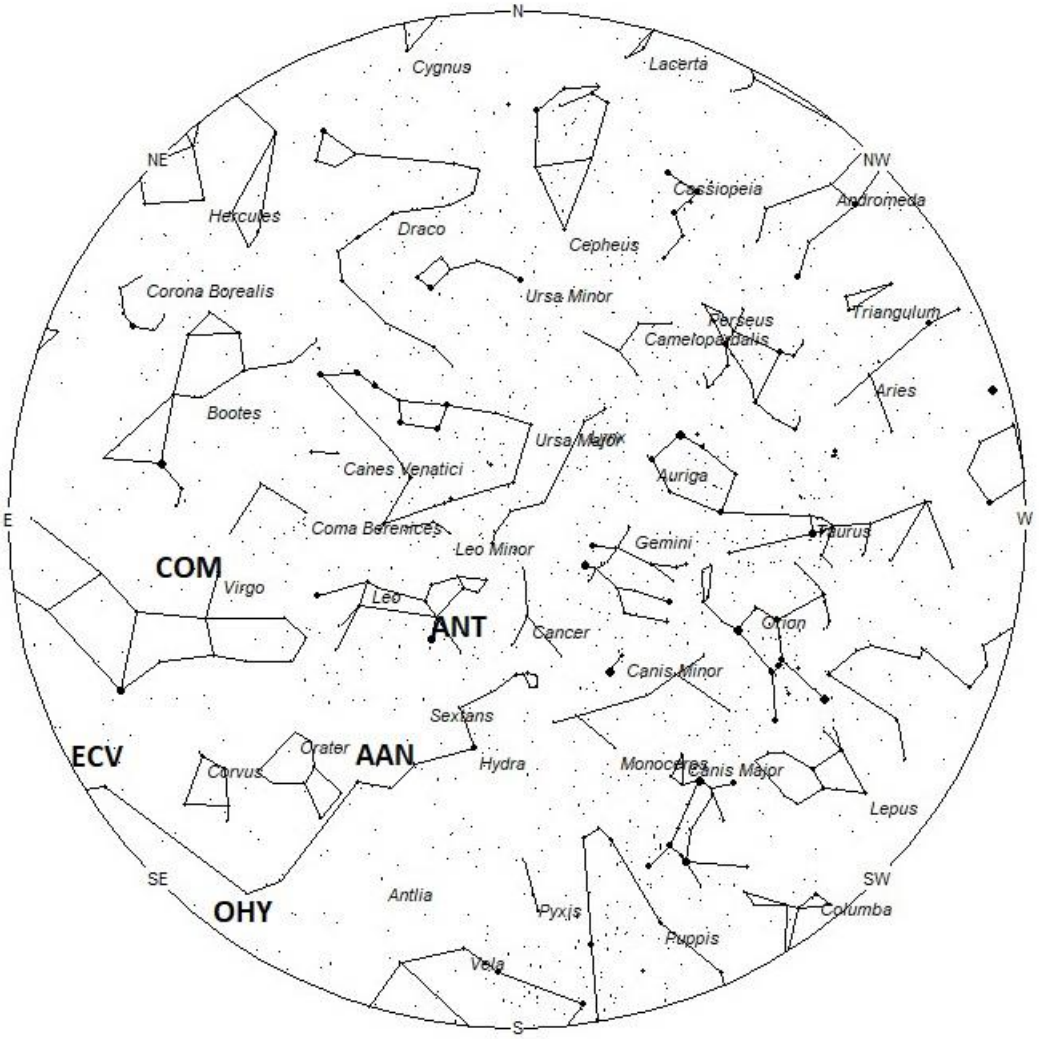
During this period, the moon wanes from half-illuminated to a very slender crescent phase. This weekend the last quarter moon will rise near midnight, illuminating the morning sky with moonlight. Meteor observations can still be successful during this time by keeping the moon out of your field of view. The estimated total hourly rates for evening observers this weekend should be near 3 as seen from mid-northern latitudes (45N) and 4 as seen from tropical southern locations (25S) For morning observers, the estimated total hourly rates should be near 8 as seen from mid-northern latitudes (45N) and 11 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. Morning rates 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 February 3/4. 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

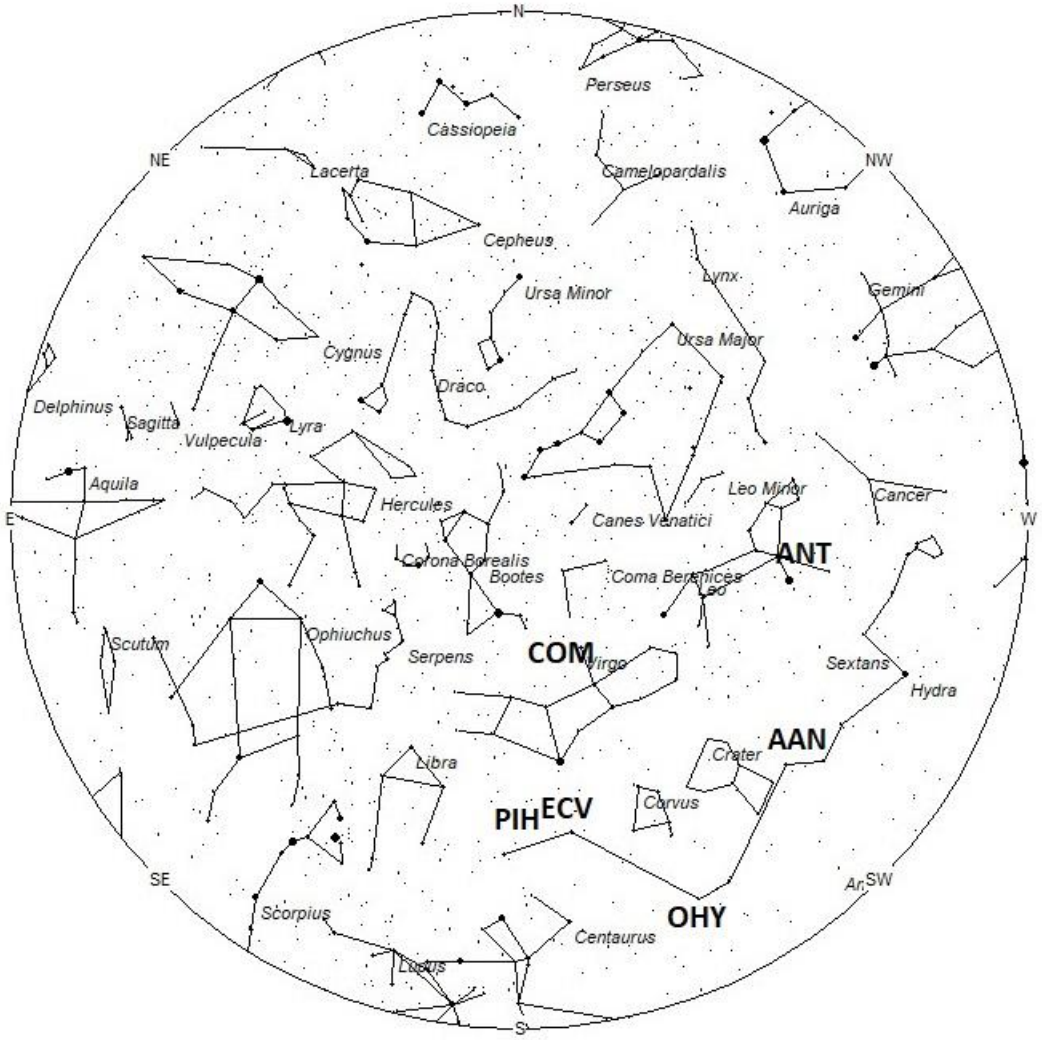
planetarium program is also useful in showing the sky at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach 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.

The large **Anthelion (ANT)** is currently centered at 09:52 (148) +13. This position lies in southwestern Leo, 3 degrees northwest of the 1st magnitude star known as Regulus (alpha Leonis). Due to the large size of this radiant, these meteors may also be seen from Cancer, northern Sextans, and northwestern Hydra as well as Leo. This radiant is best placed near 01:00 local standard time (LST) when it lies on the meridian and is highest in the sky. Rates at this time should be near 2 per hour as seen from the northern hemisphere and 1 per hour as seen from south of the equator. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of slow velocity.

The **alpha Antliids (AAN)** were discovered by D. P. Galligan and W. J. Baggaley by using the Advanced Meteor Orbit Radar in New Zealand*. This very weak display is active from January 20 through February 10. There are two weak maximums occurring near January 27 and February 2. On January 27, the radiant lies at 10:40 (160) -11. This position lies in southeastern Sextans, 6 degrees northwest of the 3rd magnitude star known as nu Hydrae. I'm not certain why these meteors were called alpha Antliids as this position lies 20 degrees north of the constellation of Antlia. These meteors are best seen near 0200 LST when the radiant lies highest above the southern horizon. At 44 km/sec. the alpha Antliids produce meteors of medium velocity. Expected rates this week are less than 1 per hour no matter your location.

*Gary Kronk, Meteor Showers-An Annotated Catalog, 2nd Edition Page 45

The **omicron Hydrids (OHY)** were discovered by Željko Andreić and the Croatian Meteor Network team based on studying SonotaCo and CMN observations (SonotaCo 2007-2011, CMN 2007-2010). These meteors are active from January 26-February 8 with maximum activity occurring on February 2nd. The radiant is currently located at 12:00 (180) -35, which places it in southern Hydra, 2 degrees southeast of the 4th magnitude star known as beta Hydrae. This area of the sky is best located near 3:00 LST when it lies highest in the southern sky. Rates at this time are expected to be less than 1 per hour no matter your location. At 58km/sec. these meteors are of a swift velocity. Due to its southern location, these meteors are poorly seen from the northern hemisphere.

The last of the **Comae Berenicids (COM)** is expected this weekend from a radiant located at 13:24 (201) +10. This position lies in northern Virgo, 4 degrees east of the 3rd magnitude star known as Vindemiatrix (epsilon Virginis). These meteors are best seen near 0500 LST when the radiant lies highest above the southern horizon. Rates are expected to be less than 1 no matter your location. At 63 km/sec. the Comae Berenicids produce mostly swift meteors.

The **eta Corvids (ECV)** were recently discovered by Sirko Molau and the IMO Video Meteor Network Team. This stream is active from January 7-February 5, with maximum activity occurring on January 21st. The current position of the radiant is 13:30 (203) -20, which places the radiant in southern Virgo, 9 degrees south of the 1st magnitude star known as Spica (alpha Virginis). These meteors are best seen near 0500 LST when the radiant lies highest above the southern horizon. Current hourly rates would be less than 1 per hour no matter your location. At 68 km/sec. these meteors would be fast.

The **alpha Centaurids (ACE)** are active from February 3-20, with maximum activity occurring on February 9th. The radiant is currently located at 13:40 (205) -57. This position lies in southeastern Centaurus, 4 degrees south of the 2nd magnitude star known as epsilon Centauri. Due to the southern declination of this radiant, these meteors are not well seen in the northern hemisphere. Current hourly rates are expected to be less than 1 as seen from the northern hemisphere and 1 as seen from south of the equator. These meteors are best seen near 05:00 LST when the radiant lies highest above the horizon. At 56 km/sec. the alpha Centaurids would produce mostly swift meteors. These meteors are not visible north of 30 degrees north latitude.

The **pi Hydrids (PIH)** were discovered in Dr. Peter Jenniskens and mentioned in his book *Meteor Showers and their Parent Comets.* Studies of the IMO video database by Sirko Molau and Juergen Rendtel confirmed the existence of this shower. These meteors are active from February 3-9, with maximum activity occurring on the 6th. The radiant is currently located at 13:55 (210) -21. This area of the sky is located in extreme southeastern Virgo, 6 degrees northwest of the 3rd magnitude star known as pi Hydrae. These meteors are best seen during the last dark hour prior to dawn when the radiant lies highest above the horizon in a dark sky. Current rates are expected to be near 1 per hour no matter your location. These meteors are visible over most of the Earth, with the southern hemisphere having slightly better viewing conditions. At 55 km/sec. the pi Hydrids would produce mostly swift meteors.

Sporadic meteors are those meteors that cannot be associated with any known meteor shower. All meteor showers are evolving and disperse over time to the point where they are no longer recognizable. Away from the peaks of the major annual showers, these sporadic meteors make up the bulk of the activity seen each night. As seen from the mid-Northern Hemisphere (45N) one would expect to see during this period approximately 5 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 8 per hour as seen from rural observing sites and 3 per hour during the evening hours. Locations between these two extremes would see activity between these listed figures.

Those interested in detecting meteors via radio waves may start noticing activity from the **Capricornid/Sagittarids (DCS)**. These meteors can be detected from January 13 through February 4, with maximum activity occurring near February 1st. These meteors would be best detected during the morning hours of 8-10am, when the radiant lies approximately half-way up in the sky. It should be noted that meteors do not emit radio waves, but they act as mirrors and reflect radio waves from distant transmitters which aren't heard otherwise. This is called forward scatter, opposed to backscatter where the transmitter and receiver are at the same place (radar). For practical reasons the frequency range 50 – 150 MHz (wavelength 6 m – 2 m) is used. This includes amongst others the FM band and TV transmitters which haven't switched yet to digital. Most reflections are short (less than a second), but brighter meteors can cause reflections lasting minutes. The shortest radio reflections are caused by faint meteors, fainter than visual ones. Radio reflections can be observed regardless of daylight or clouds, allowing more complete views of streams. For those interested in meteor observing via radio waves we invite you to visit RMOB.

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 one, so these sources are rarely listed as visual targets in most meteor shower lists. If you are like me though and wish to associate as many meteors as possible with known sources, then you will appreciate these listings. Before listing meteors from these obscure sources, you should attempt to prove these meteors belong to them and are not chance alignments of sporadic meteors. You can note parameters such as duration, length, radiant distance and the elevation of each meteor to help compute the probability of shower association. It should be remembered that slow meteors can be seen from fast showers, but fast meteors cannot be produced from slow showers. Slower showers are those with velocities less than 35/km per second. Slow meteors can appear from fast showers when they appear close to the radiant or low in the sky. The table located on page 22 of the IMO's 2024 Meteor Shower Calendar is a big help in aiding in the identification of meteors. If you record the length and duration of each meteor, you can use this chart to check the probability of the meteor belonging to a shower of known velocity. If the angular velocity is similar to the figure in the table, then your meteor probably belongs to that shower. 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)	-	09:52 (148) +13	30	01:00	2 - 1	II
alpha Antliids (AAN)	Jan 27	10:40 (160) -11	44	02:00	<1 - <1	IV
omicron Hydrids (OHY)	Feb 02	12:00 (180) -35	58	03:00	<1 - <1	IV
Comae Berenicids (COM)	Dec 16	13:24 (201) +10	63	05:00	<1- <1	II
eta Corvids (ECV)	Jan 21	13:30 (203) -20	68	05:00	<1- <1	IV

alpha Centaurids (ACE)	Feb 09	13:40 (205) -57	56	05:00	<1 - 1	II
pi Hydrids (PIH)	Feb 06	13:55 (210) -21	55	06:00	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.