Meteor Activity Outlook for March 2-8, 2024

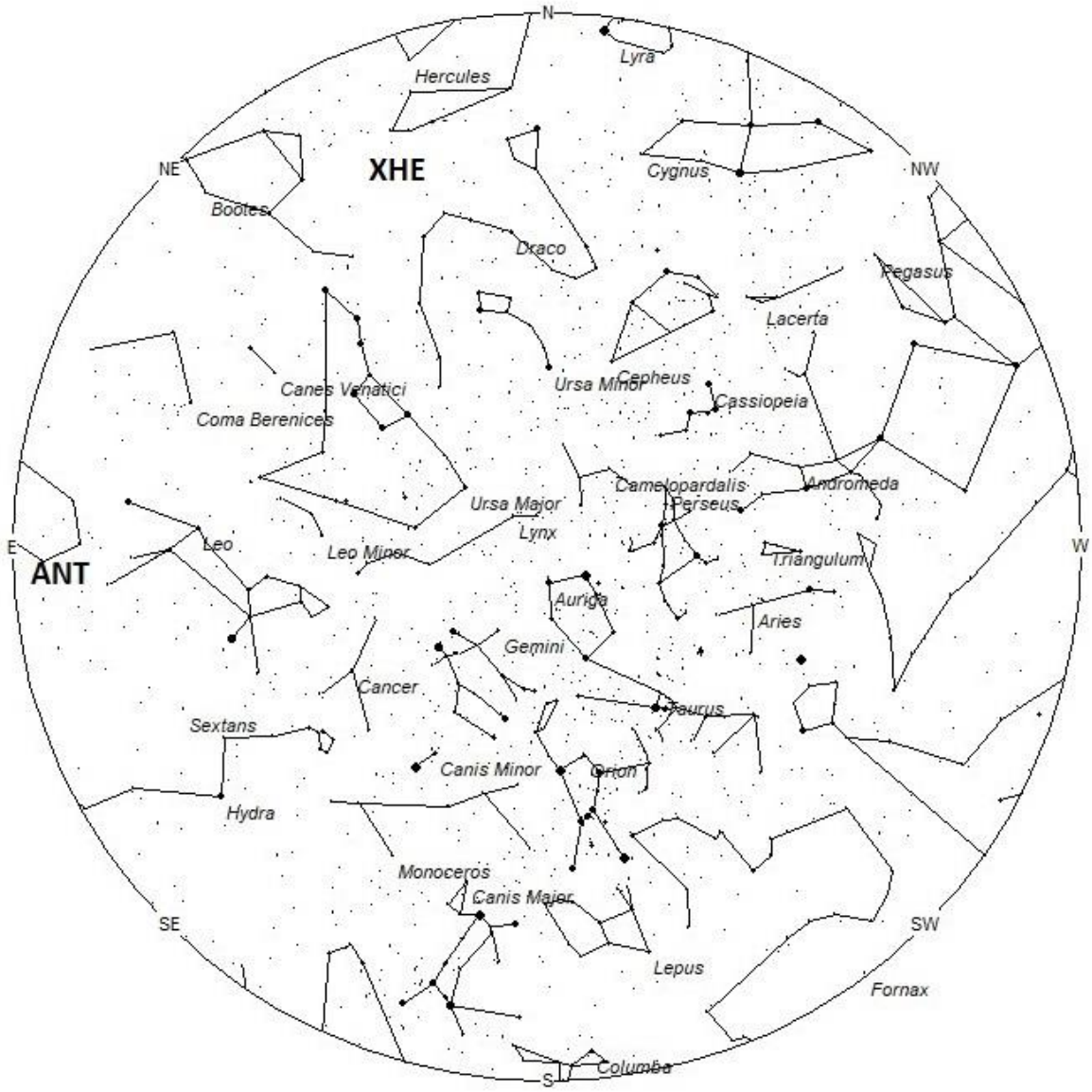
Grant Birley captured this double bursting fireball on August 2, 2022, at 22:56 NZDT (10:56 UT) from Whangaparāoa, New Zealand. ©Grant Birley

As seen from the northern hemisphere, March is the slowest month of the year for meteor activity. No major annual showers are active and only a few very weak minor showers produce activity this month. The sporadic rates are also near their annual minimum so there is not much to look forward to this month except for the evening fireballs that seem to peak this time of year. This could be due to the fact the Antapex radiant lies highest above the horizon this time of year during the evening hours as seen from the northern hemisphere. From the southern hemisphere, activity from the Centaurid complex begins to wane with only the weak activity visible from Norma and perhaps others nearby areas. At least southern sporadic rates are still strong to make the late summer viewing a bit more pleasurable.

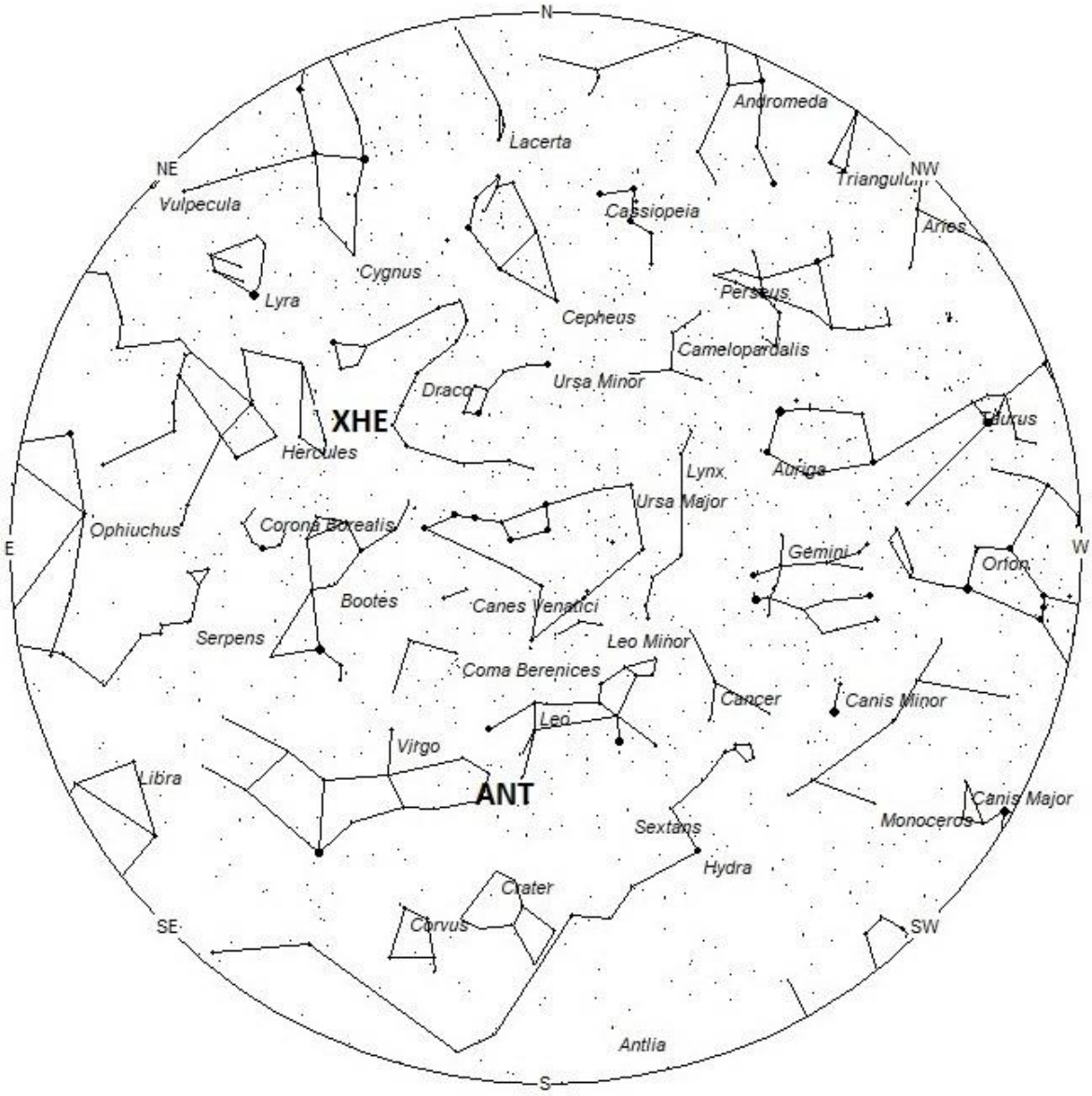
During this period, the moon reaches its last quarter phase on Sunday March 3rd. At that time, it lies 90 degrees west of the sun and rises near 01:00 local standard time (LST). Successful meteor observing can be undertaken at this time by either observing prior to moonrise or keeping the moon out of you field of view if it lies above the horizon. 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 6 as seen from mid-northern latitudes (45N) and 10 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 during this period 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.

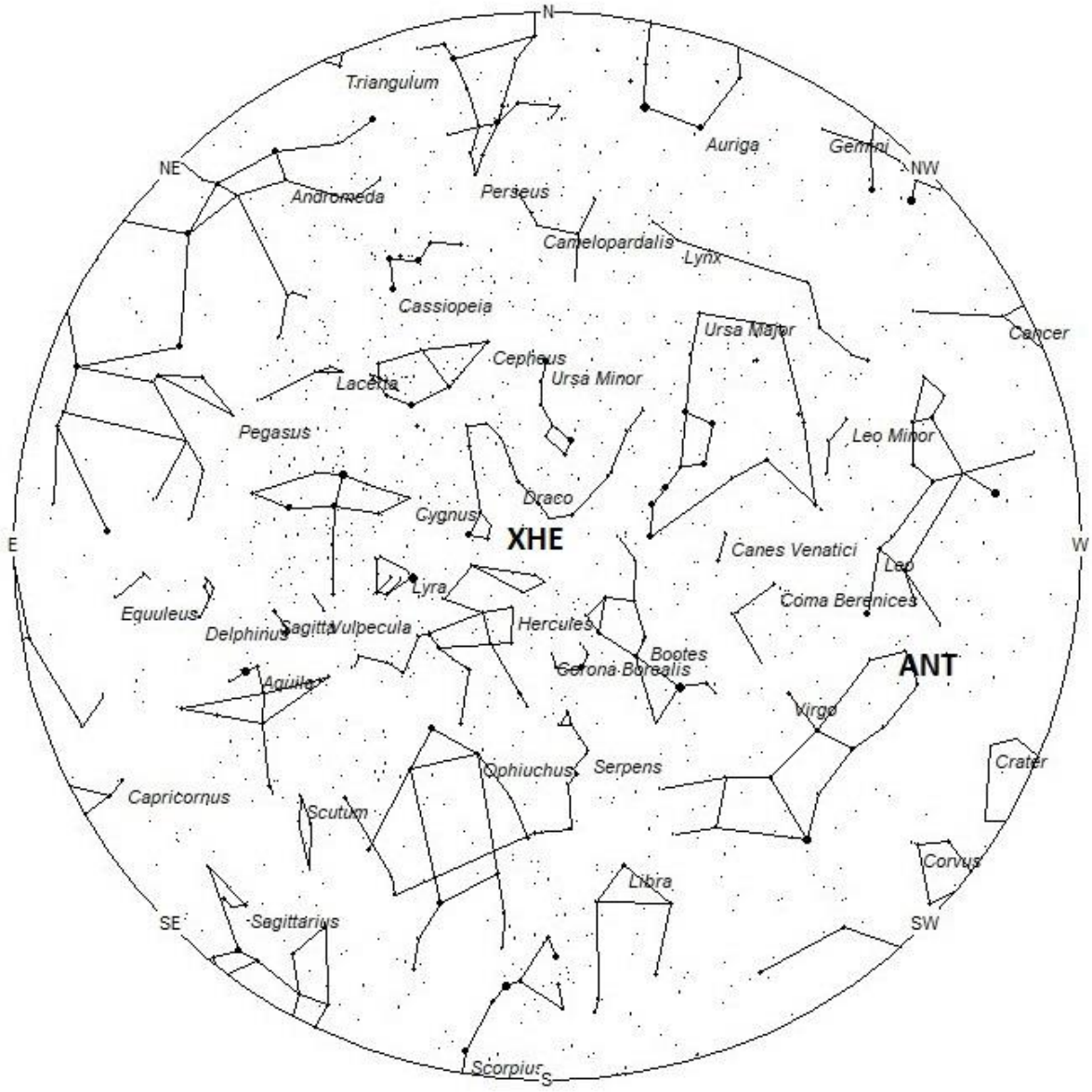
The radiant (the area of the sky where meteors appear to shoot from) positions and rates listed below are exact for Saturday night/Sunday morning March 2/3. These positions do not change greatly day to day so the listed coordinates may be used during this entire period. Most star atlases (available at 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 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 **beta Tucanids (BTU)** produced outbursts in 2020 and 2021 on March 12th of those years. This was unexpected as activity of around one per night is more common for this display. If the outburst re-occurs again in 2024, it should occur on a 20-hour time frame centered on 18:00 Universal Time on March 12th. Early members of this shower may appear as early as 2 March, but rates would be extremely low. On the night of March 12/13, the radiant is located at 04:07 (062) -77. The current location should not be much different due to the high southern declination. This area of the sky is located in western Mensa, two degrees southeast of the 3rd magnitude star known as gamma Hydri. These meteors are best seen as soon as it becomes dark in the deep southern hemisphere. They are not visible from the northern hemisphere. With an entry velocity of 31 km/sec., these meteors would be of slow velocity.

The center of the large **Anthelion (ANT)** radiant is currently located at 11:40 (175) +02. This position lies in western Virgo, 3 degrees west of the 4th magnitude star known as Zaniah (eta Virginis). Due to the large size of this radiant, Anthelion activity may also appear from southeastern Leo and northeastern Crater as well as Virgo. This radiant is best placed near 0100 local standard time (LST), when it lies on the meridian and is located highest in the sky. Rates at this time should be near 3 per hour no matter your location. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of slow velocity.

The **xi Herculids (XHE)** were discovered by Sirko Molau and Javor Kac using video data from the IMO Video Network. This weak shower is active from March 6-20 with a peak on March 11. The radiant is currently located at 16:53 (253) +49, which places it in northern Hercules, 7 degrees southwest of the 3rd magnitude star known as Rastaban (beta Draconis). These meteors are best seen during the last hour prior to dawn when it lies highest above the northern horizon. Rates are expected to be less than 1 per hour no matter your location. With an entry velocity of 36 km/sec., these meteors would have a medium velocity.

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 9 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. Morning rates are reduced due to moonlight.

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	
beta Tucanids (BTU)	Mar 12	04:07 (062) -77	310	18:00	?	III
Anthelions (ANT)	-	11:40 (175) +02	30	01:00	2 - 2	II
xi Herculids (XHE)	Mar 11	15:26 (247) +50	36	05:00	<1 - <1	IV

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.

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.