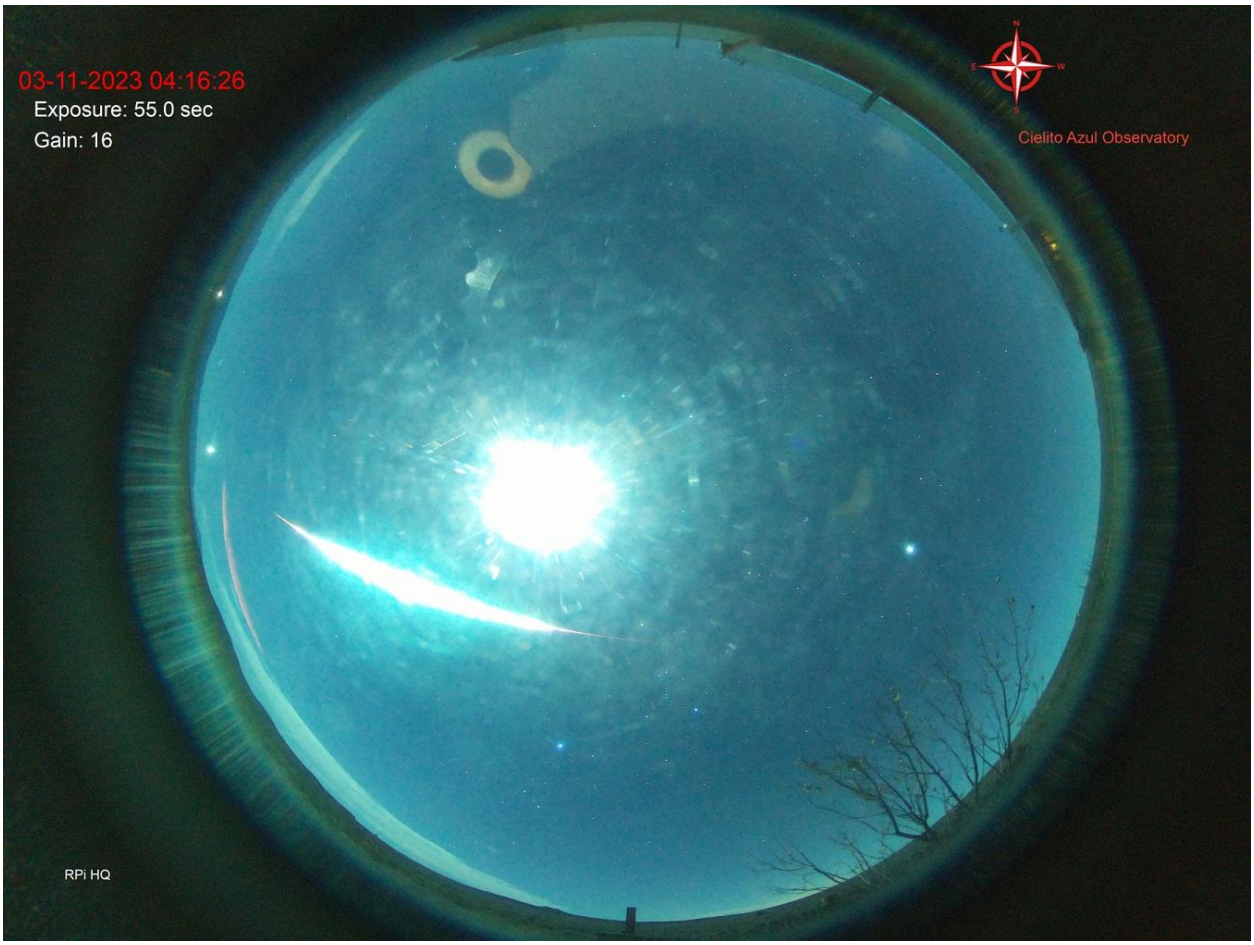
Meteor Activity Outlook for 30 March-5 April 2024



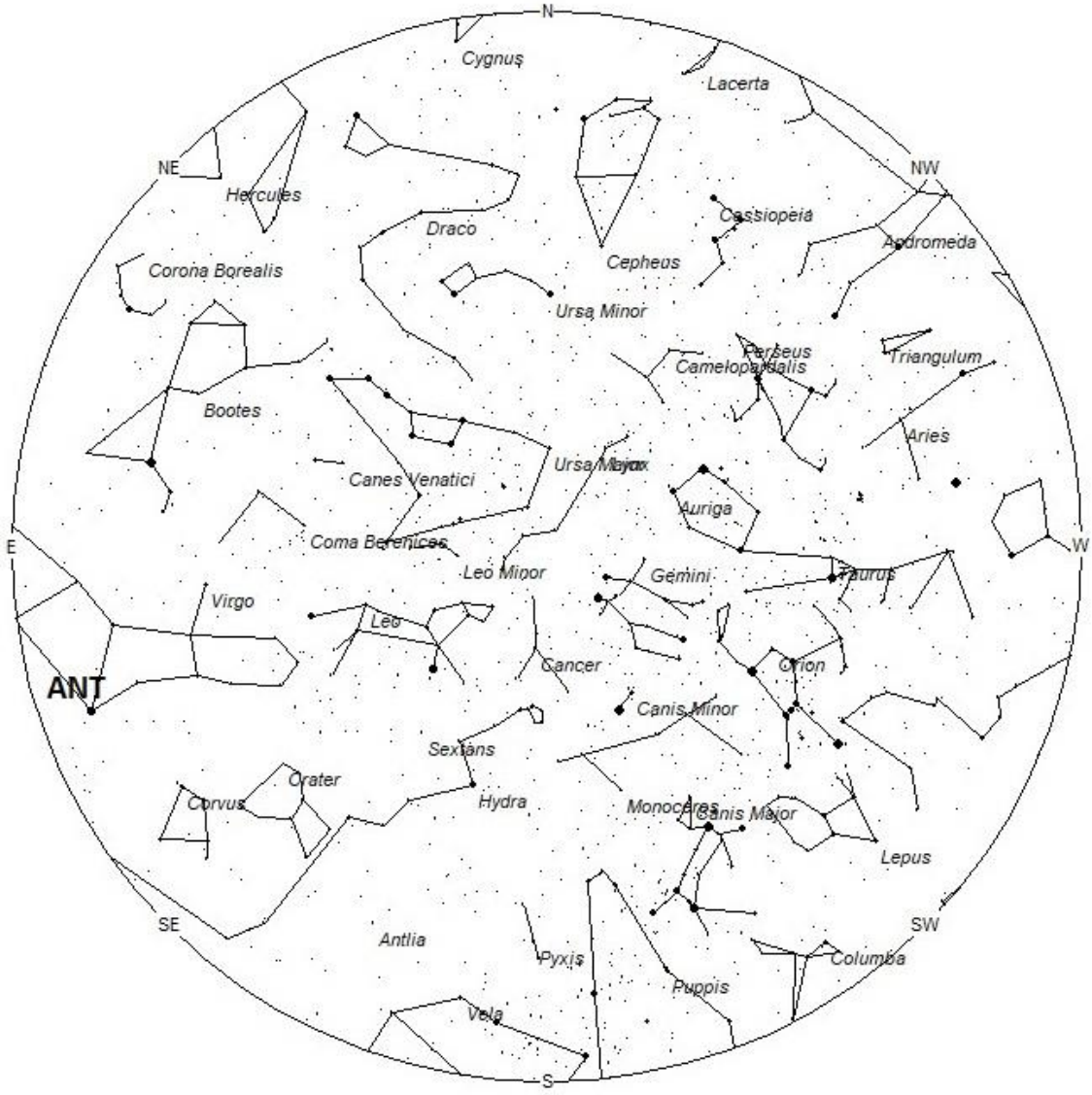
Jay Shaffer captured this impressive fireball passing near the moon on November 3, 2023, at 04:16 MDT (10:16 UT) from Tres Piedras, NewMexico, USA. ©Jay Shaffer

Meteor activity picks up a bit during April as the Lyrids become active during the month. The Lyrids are active from the 15th through the 29th, with a pronounced maximum on the 22nd. Sporadic rates during April are steady as seen from both hemispheres with southern observers enjoying more activity than can be seen from the mid-northern hemisphere. The eta Aquariids will become active the second half of the month, adding a few swift meteors to the late morning scene.

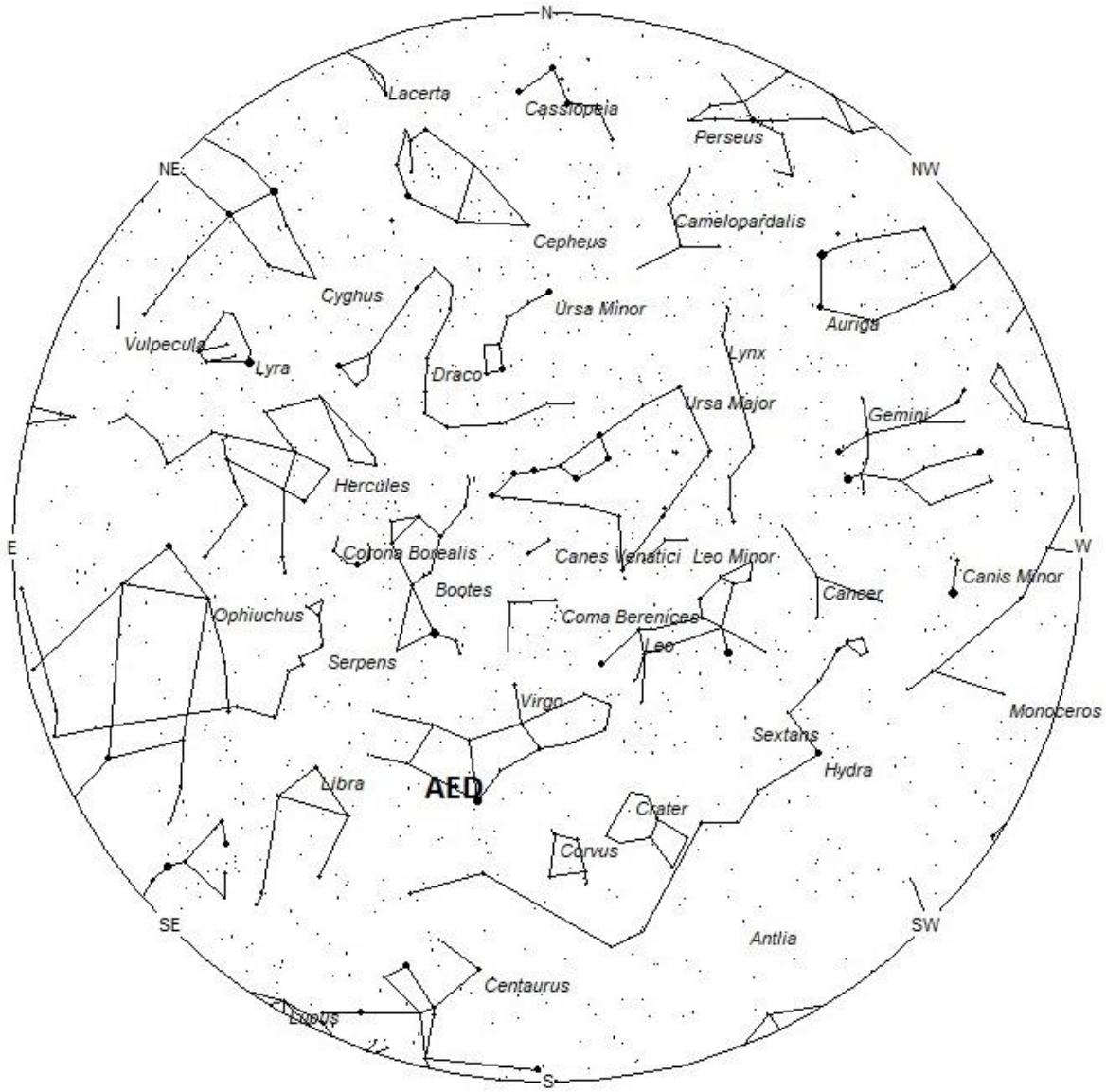
During this period, the moon reaches its last quarter phase on Tuesday April 2nd. At that time, the moon will be located 90 degrees west of the sun and will rise near 03:00 local daylight-saving time. As the week progresses the waning crescent moon will rise later in the morning allowing a larger window of opportunity to view the sky under dark conditions between dusk and moon rise. 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 5 as seen from mid-northern latitudes (45N) and 8 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 are reduced during the morning hours 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 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

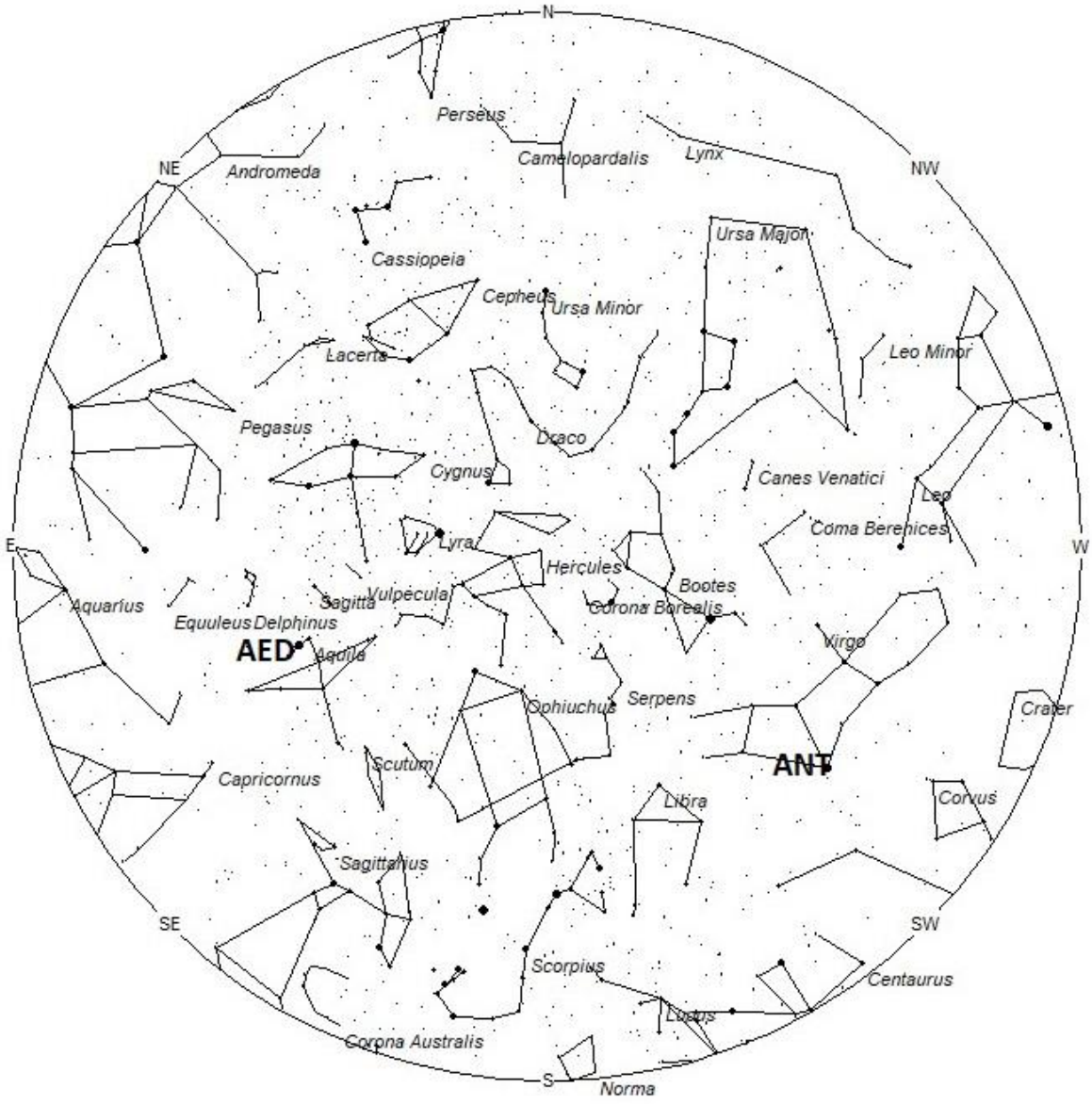
program is also useful in showing the sky at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach their highest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

The large **Anthelion (ANT)** radiant is currently centered at 13:32 (203) -10. This position lies in southern Virgo, 2 degrees northeast of the 1st magnitude star known as Spica (alpha Virginis). Due to the large size of this radiant, these meteors may also be seen from western Libra as well as Virgo. This radiant is best placed near 02:00 LST when it lies on the meridian and is highest in the southern sky. Rates at this time should be near 2 per hour no matter your location. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of slow velocity.

The **April epsilon Delphinids (AED)** were discovered by P. Jenniskens and R. Rudawska from CAMS and SonotaCo meteoroid orbit surveys published in 2014.This weak source is active from March 31 through April 20, with maximum activity occurring on April 9th. The radiant currently lies at 19:58 (300) +07. This position lies in northeastern Aquila, 1 degree east of the 1st magnitude star known as Alshain (beta Aquilae A). With an entry velocity of 61km/sec., the average meteor from this source would be of fast velocity. These meteors are best seen during the last dark hour prior to morning twilight when the radiant lies highest in the eastern sky. Current hourly rates would be less than 1.

The **delta Pavonids (DPA)** were discovered by Michael Buhagiar from Australia in the 1970's. These meteors are active from March 11 through April 16, with maximum activity occurring on March 30th. The current position of the radiant lies near 20:38 (310) -63. This area of the sky lies in eastern Pavo, 4 degrees north of the 3rd magnitude star known as beta Pavonis. These meteors are best seen during the last dark hour prior to dawn when the radiant lies in the southeastern sky. With an entry velocity of 58km/sec., the average meteor from this source would be of fast velocity. Expected rates are less than 1 per hour during this period. These meteors are poorly seen from the northern hemisphere.

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 4 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 7 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 during this period 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 Daylight-Saving Time	North-South	
Anthelions (ANT)	-	13:32 (203) -10	30	02:00	2 - 2	II
April epsilon Delphinids (AED)	Apr 09	19:58 (300) +07	61	09:00	<1 - <1	IV
delta Pavonids (DPA)	Mar 30	20:38 (310) -63	58	10:00	?	III

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.