

# Meteor Activity Outlook for August 3-9, 2024

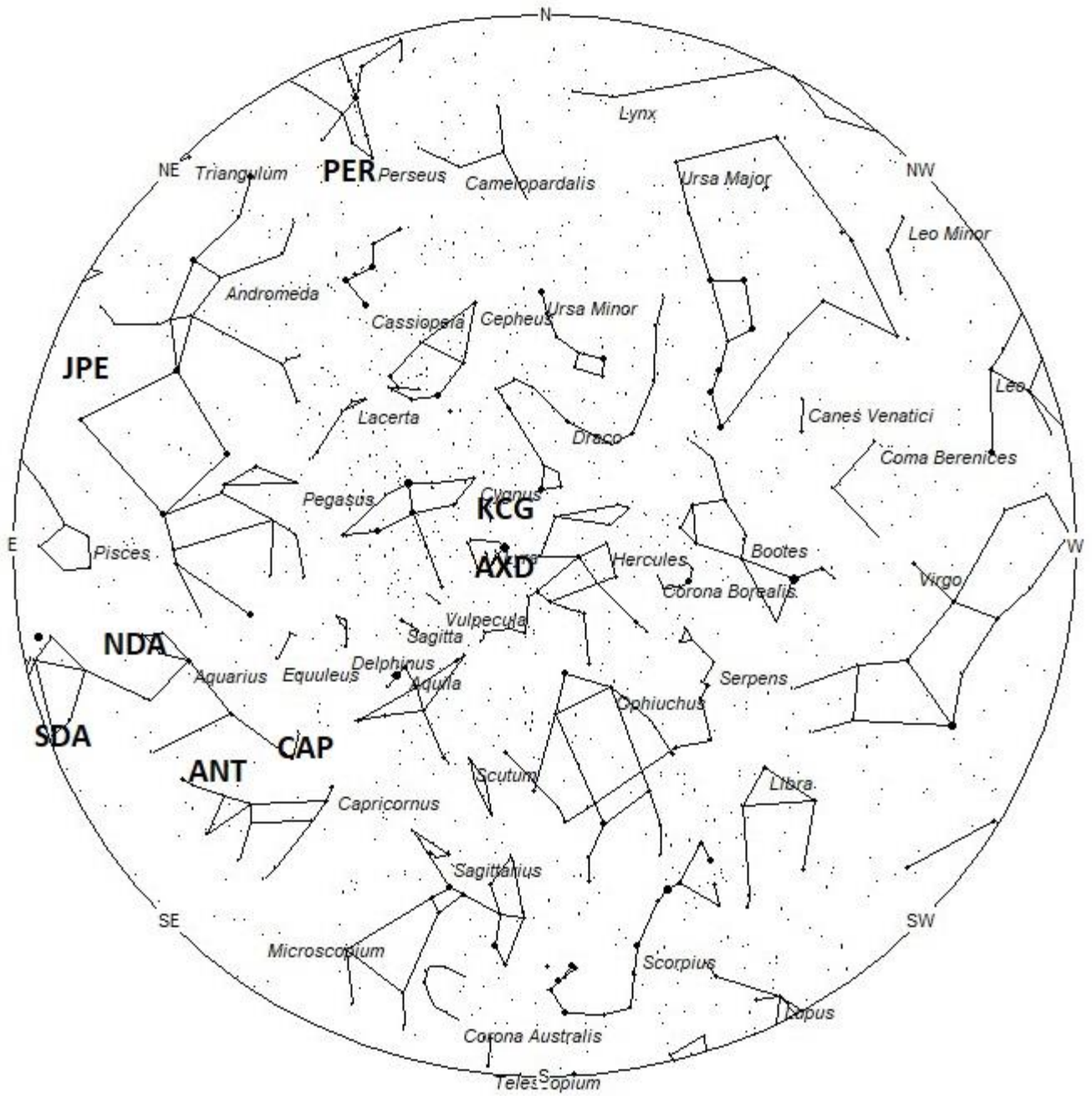


Grant Birley captured this brilliant fireball with a terminal burst on February 8, 2024, at 02:30 NZDT (13:30 UT on Feb.7) from Tutukaka, New Zealand . ©Grant Birley

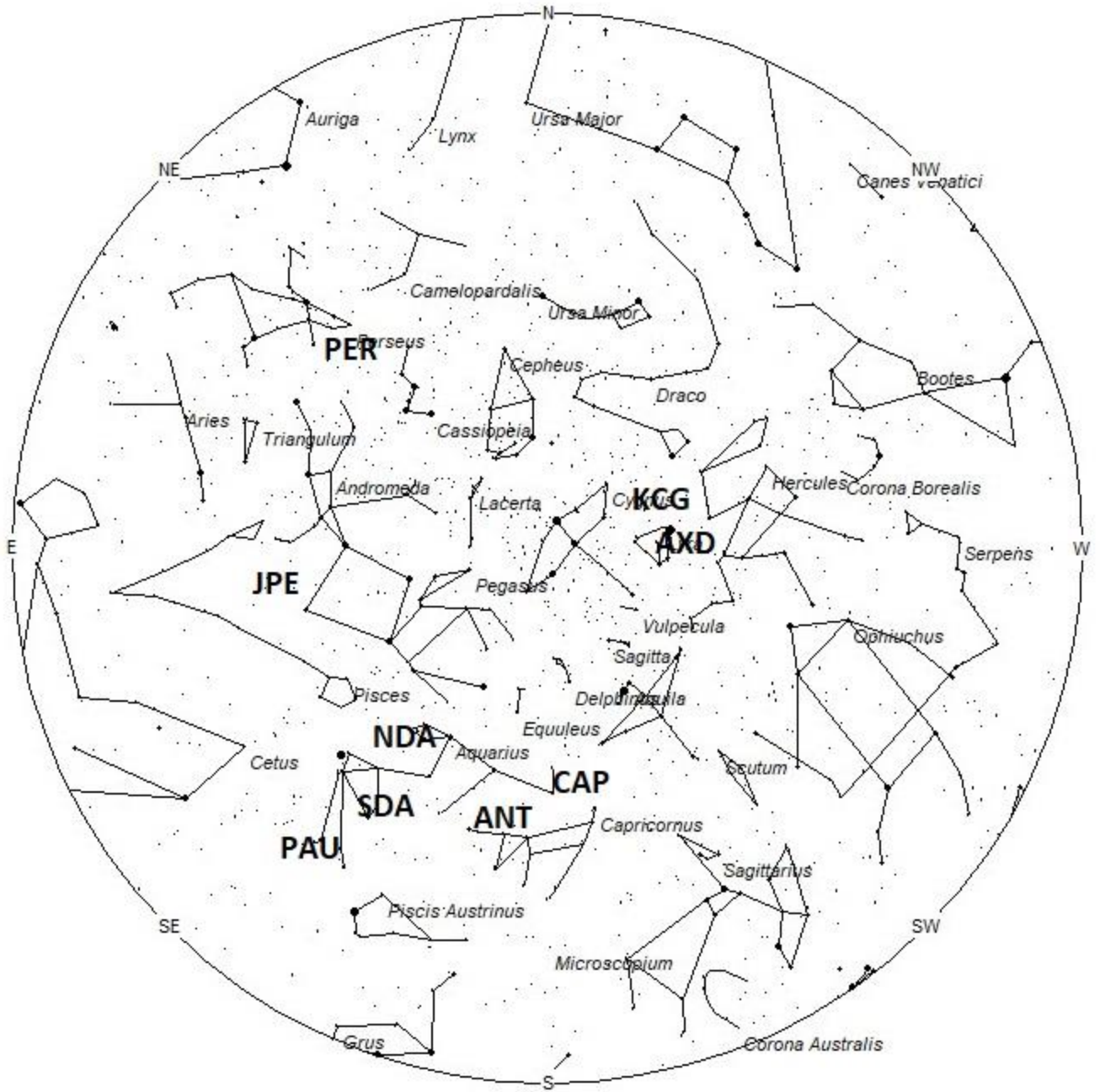
Meteor activity kicks into high gear in August as seen from the northern hemisphere. The main reason for all this activity is the Perseid shower that peaks on August 12th. This shower is active most of the month and remains above the level of the sporadic background for a week centered on August 12th. The sporadic activity is also near maximum as seen from the northern hemisphere and is now more than double the rates from just three months ago. As seen from the southern hemisphere, meteor rates are still decent but falling rapidly. The sporadic rates continue their downward slide plus the Perseid radiant does not rise high into the sky as seen in the southern hemisphere. Therefore, rates for the Perseids are greatly reduced when compared to those seen from the northern hemisphere.

During this period, the moon reaches its new phase on Sunday August 4th. At that time the moon will lie near the sun and will be invisible at night. As the week progresses the waxing crescent moon will enter the evening skies but will set before the more active morning hours arrive. The estimated total hourly rates for evening observers this weekend should be near 2 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 24 as seen from mid-northern latitudes (45N) and 21 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. 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 July 27/28. 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.

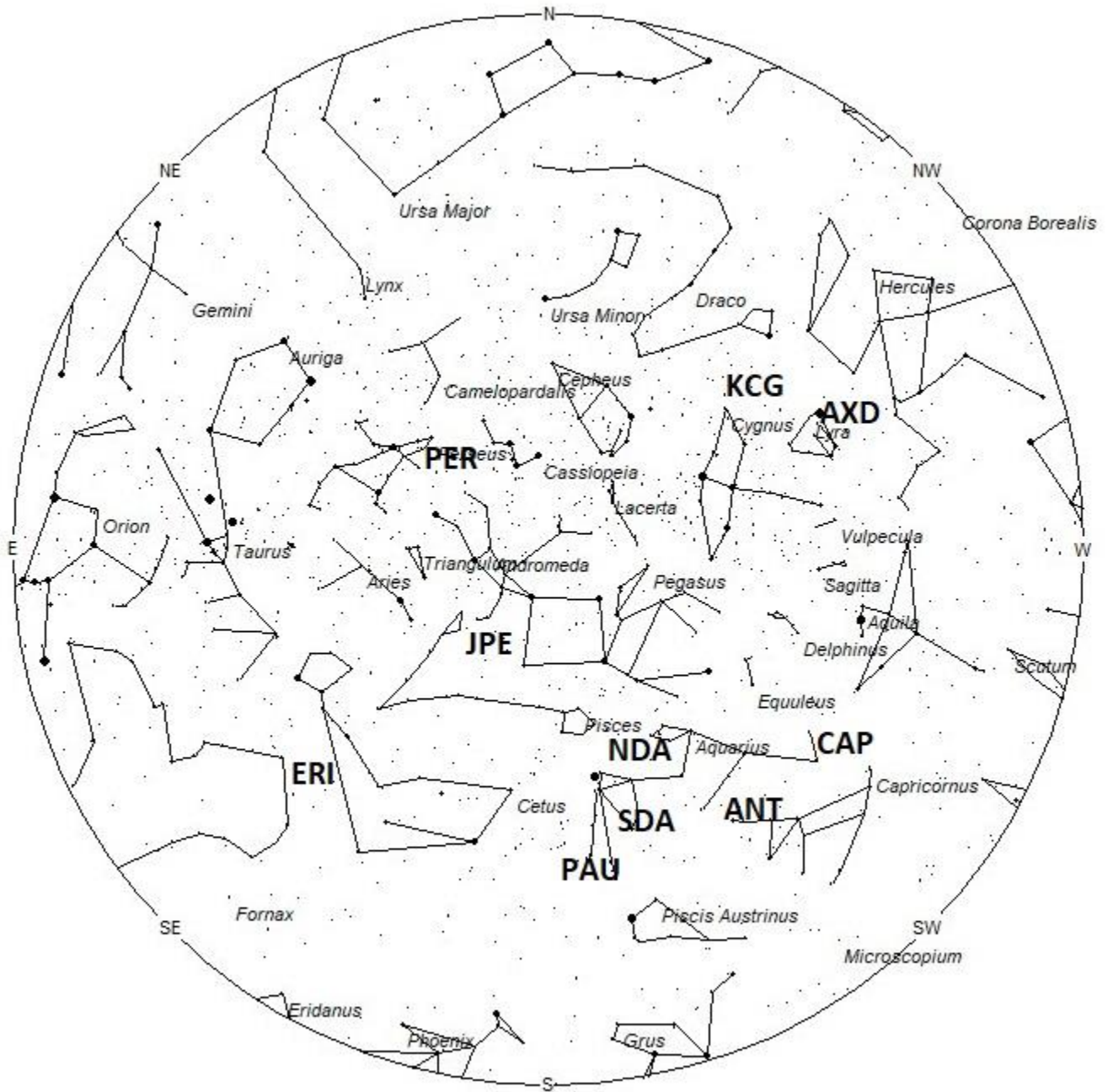


Radiant Positions at 22:00 Local Daylight-Saving Time



Radiant Positions at 01:00 Local Daylight-Saving Time





Radiant Positions at 04:00 Local Daylight-Saving Time

## **These sources of meteoric activity are expected to be active this week**

The **August xi Draconids (AXD)** was discovered by Masahiro Koseki in his study of SonotaCo video observations 2007–2018. These meteors were long considered part of the kappa Cygnids but Koseki states that they are clearly distinct\*. This stream is active from August 4-28 with maximum activity occurring on the 15th. The radiant is currently located at 18:29 (277) +36, which places it in western Lyra, 3 degrees southwest of the zero-magnitude star known as Vega (alpha Lyrae). To best see these meteors, face overhead near 2300 Local Daylight-Saving Time (LDST), when it lies on the meridian and is located highest in the sky. With an entry velocity of 19 km/sec., the average August Draconid meteor would be of slow velocity. Rates this week are expected to be less than 1 no matter your location. Due to the high northern declination these meteors are difficult to observe from the southern hemisphere.

\*The activity of meteor showers recorded by SonotaCo video observations 2007–2018, Masahiro Koseki, 2021, Page 147

The **kappa Cygnids (KCG)** are active from August 1-27, with maximum occurring on the 14<sup>th</sup>. The radiant is currently located at 18:41 (277) +43. This area of the sky is located in northern Lyra, 4 degrees north of the zero magnitude star known as Vega (alpha Lyrae). To best see these meteors face overhead near 2300 LDST when it lies on the meridian and is located highest in the sky. With a high northern declination, these meteors are difficult to view from the southern hemisphere. Expected hourly rates this week are less than 1 no matter your location. With an entry velocity of 21 km/sec., the average meteor from this source would be of slow velocity.

The **alpha Capricornids (CAP)** are active from July 7 through August 15, peaking on July 31<sup>st</sup>. The radiant is currently located at 20:34 (309) -08. This position lies in southeastern Aquila, 4 degrees northeast of the naked eye double star known as Algedi (Alpha<sup>2</sup> Capricornii). Current rates are expected to be near 3 per hour no matter your location. These meteors are best seen near 01:00 LDST, when the radiant lies highest in the southern sky. With an entry velocity of 21 km/sec., the average meteor from this source would be of medium-slow velocity. In 2023, there were several early fireballs from this source, so we encourage observers to monitor this shower for continued fireball activity.

The large **Anthelion (ANT)** radiant is currently centered at 21:36 (324) -14. This position lies in northern Capricornus, 3 degrees northwest of the 4th magnitude star known as Nashira (gamma Capricorni). This location is fairly close to the alpha Capricornid radiant so care should be taken when reporting these meteors. This radiant is best placed near 02:00 LDST when it lies on the meridian and is highest in the southern sky. Rates at this time should be near 2 per hour as seen from the northern hemisphere and 3 as seen from south of the equator. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of medium-slow velocity.

The **Northern delta Aquariids (NDA)** are a conglomeration of at least two weak radiants that peak 10 days apart. These meteors were first mentioned by Luigi G. Jacchia in his book *The Moon, Meteorites and Comets*. The NDA's are active from August 2-17, with the first peak occurring on the 12th. The radiant currently is located near 22:39 (340) -02. This area of the sky is located in northern Aquarius, 2 degrees southeast of the 4th magnitude star known as eta Aquarii. To best

see these meteors look in the southern sky near 0300 LDST, when it lies on the meridian and is located highest in the sky. Hourly rates at this time should be less than 1 no matter your location. With an entry velocity of 40 km/sec., the average meteor from this source would be of medium velocity.

The **Southern delta Aquariids (SDA)** are active from a radiant located at 22:54 (344) -17. This area of the sky is located in central Aquarius, 1 degree southwest of the 3rd magnitude star known as Skat (delta Aquarii). This radiant is best placed near 0400 LDST, when it lies on the meridian and is located highest in the southern sky. Hourly rates at this time should be near 2 as seen from the northern hemisphere and near 4 as seen from south of the equator. With an entry velocity of 40 km/sec., the average meteor from this source would be of medium velocity.

The **Piscids Austrinids (PAU)** are an obscure shower, not well seen from the northern hemisphere. Recent studies by the IMO Video Network shows little activity. Other studies have indicated that this shower is active later than previously thought. We will go along with that idea until more information is available. It is now thought that this radiant is active from August 1<sup>st</sup> through the 10th, with maximum activity occurring on the 8th. Using these parameters, the current position of the radiant would be 23:24 (351) -21. This area of the sky is located in southeastern Aquarius, just southwest of the the faint star known as 98 Aquarii. This position is also 10 degrees northeast of the bright star known as Fomalhaut (alpha Piscis Austrini). To best see these meteors look in the southern sky near 04:00 LDST, when it lies highest in the sky. Current hourly rates should be less than 1 no matter your location. With an entry velocity of 43km/sec., most activity from this radiant would be of medium velocities.

The last of the **July Pegasids (JPE)** are expected from a radiant located at 00:31 (008) +18. This area of the sky is located in central Pisces, 4 degrees northwest of the 3rd magnitude star known as Algenib (gamma Pegasi). This radiant is best placed or viewing during the last dark hour before dawn when it lies highest in the southern sky. Rates are expected to be less than 1 per hour this week no matter your location. With an entry velocity of 63 km/sec., the average meteor from this source would be of swift velocity.

The **Perseids (PER)** are active from a radiant located at 02:28 (037) +56. This position lies in northwestern Perseus, 3 degrees west of the 4th magnitude star known as Miram (eta Persei). This area of the sky is best placed for viewing during the last dark hour before dawn when it lies highest in the northern sky. Maximum activity is not until August 12th so current rates are expected to be near 5 as seen from the northern hemisphere and 2 as seen from southern tropics. With an entry velocity of 59 km/sec., the average meteor from this source would be of swift velocity. Viewers in the southern hemisphere have a limited view of this shower as the radiant only rises just before dawn.

The **eta Eridanids (ERI)** are active from a radiant near 02:37 (039) -14. This position lies in southeastern Cetus, 2 degrees northwest of the 4th magnitude star known as pi Ceti. This source is active until September 10<sup>th</sup>, with maximum activity occurring on August 7<sup>th</sup>. Current rates are expected to be near 1 per hour no matter your location. These meteors are best seen during the last dark hour prior to dawn when the radiant lies highest above the southeastern horizon in a dark sky. With an entry velocity of 64 km/sec., the average meteor from this source would be of swift speed.

**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 12 sporadic meteors per hour during the last hour before dawn as seen from rural observing sites. Evening rates would be near 4 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.

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 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 |       |
| August xi Draconids (AXD) | Aug 15                   | 18:29 (277)<br>+36  | 19             | 23:00                      | <1 - <1     | IV    |
| kappa Cygnids (KCG)       | Aug 13                   | 18:41 (277)<br>+43  | 21             | 23:00                      | <1 - <1     | II    |
| alpha Capricornids (CAP)  | Jul 31                   | 20:34 (309)<br>-08  | 21             | 01:00                      | 3 - 3       | II    |
| Anthelions (ANT)          | -                        | 21:36 (324)<br>-14  | 30             | 02:00                      | 2 - 3       | II    |



|                                |        |                    |    |       |         |    |
|--------------------------------|--------|--------------------|----|-------|---------|----|
| Northern delta Aquariids (NDA) | Aug 12 | 22:39 (340)<br>-02 | 40 | 03:00 | <1 - <1 | IV |
| Southern delta Aquariids (SDA) | Jul 30 | 22:54 (344)<br>-17 | 40 | 03:00 | 2 - 4   | I  |
| July Pegasids (JPE)            | Jul 10 | 00:31 (008)<br>+18 | 63 | 05:00 | <1 - <1 | II |
| Perseids (PER)                 | Aug 12 | 02:28 (037)<br>+56 | 59 | 07:00 | 5 - 2   | I  |
| eta Eridanids (ERI)            | Aug 06 | 02:37 (039)<br>-14 | 64 | 07:00 | 1 - 1   | II |

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.