

# Meteor Activity Outlook for July 22-28, 2023



Dr. Tony Cecala captured this bright multi-bursting Taurid fireball on November 6, 2022, at 05:51 CST (10:51 UT) from Lone Grove, Oklahoma, USA. © Dr. Tony Cecala ([tonycecala.com](http://tonycecala.com))

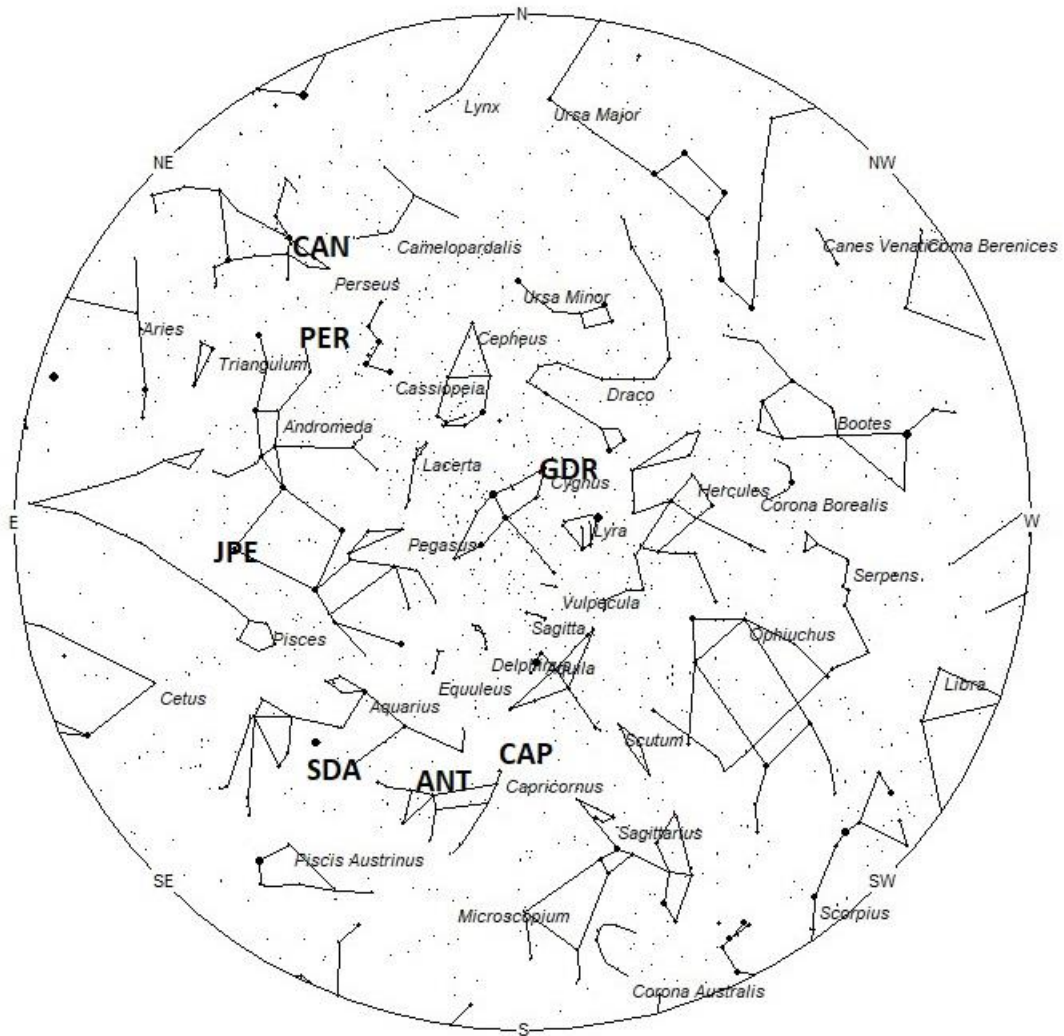
During this period, the moon reaches its first quarter phase on Tuesday July 25th. At that time, the half-illuminated moon will set near midnight (on July 26<sup>th</sup>). This will allow the more active morning hours to be free of interfering moonlight. As the week progresses the gibbous moon will begin to encroach upon the early morning hours and will begin to interfere with meteor observations during that time. This weekend the viewing conditions will be favorable as the crescent moon will set during the evening hours and will not interfere with the more active morning hours. The estimated total hourly rates for evening observers this week should be near 3 as seen from mid-northern latitudes (45N) and 3 as seen from tropical southern locations (25S). For morning observers, the estimated total hourly rates should be near 20 as seen from mid-northern latitudes (45N) and 18 as seen from tropical southern locations (25S). Evening rates are reduced due to moonlight. 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 22/23. 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

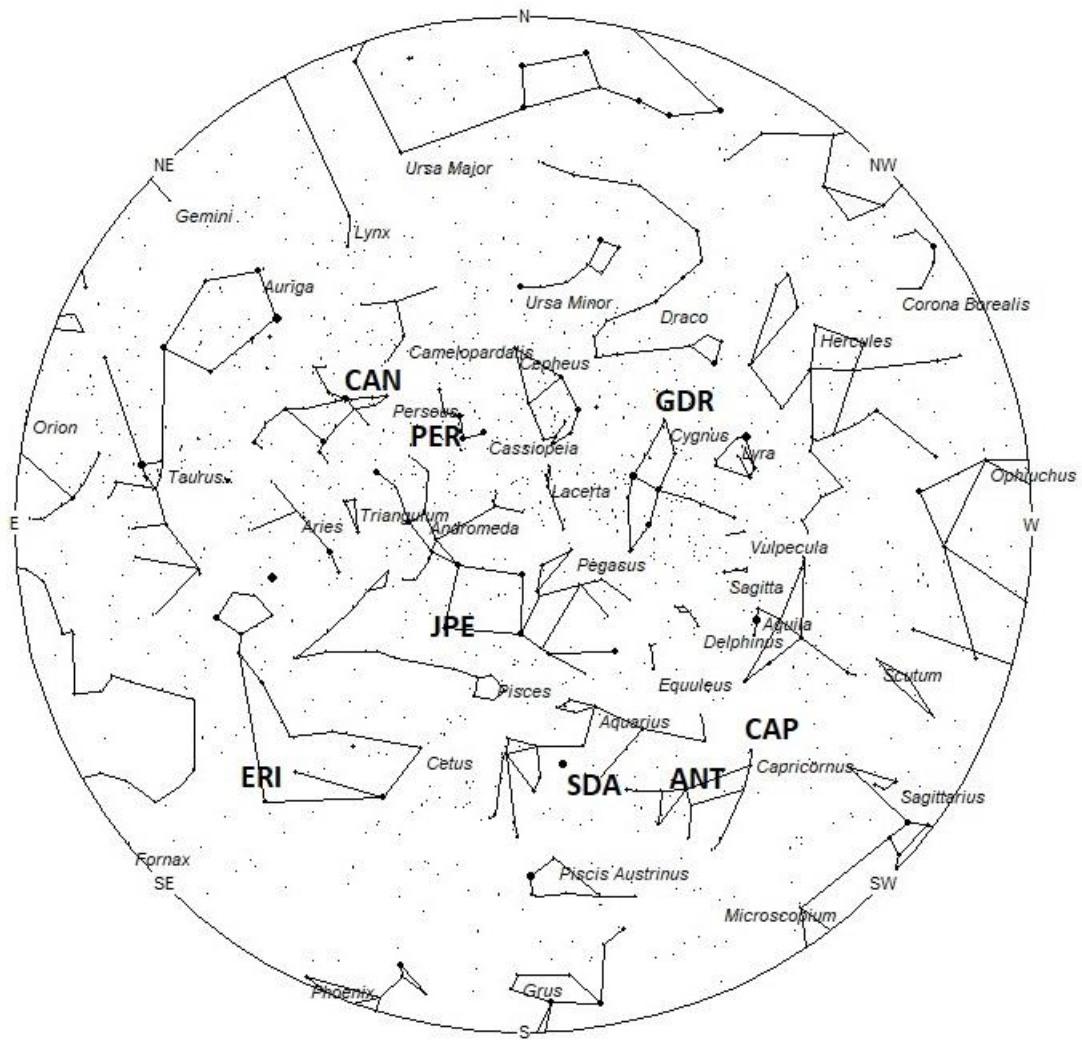
best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach their highest point in the sky until daylight. For these radiants, it is best to view them during the last few hours before dawn. 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 10pm Local Daylight-Saving Time



**Radiant Positions at 1am Local Daylight-Saving Time**



**Radiant Positions at 4am Local Daylight-Saving Time**

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

The **July gamma Draconids (GDR)** were first noticed by Japanese observers of SonotoCo and the IMO's network team of Sirko Molau and Juergen Rendtel in 2009. This stream is active from July 23-August 3 with maximum activity occurring on July 28. The radiant is currently located at 18:46 (281) +50, which places it in southeastern Draco, 7 degrees east of the 2nd magnitude star known as Eltanin (gamma Draconis). The radiant also lies 12 degrees due north of the brilliant zero magnitude star Vega (alpha Lyrae). These meteors are not well seen from the southern hemisphere as the radiant does not rise very high in their northern sky. Observers concentrating on this activity should face toward the northern sky as soon as it becomes dark to best view these meteors. With an entry velocity of 29 km/sec., the average July gamma Draconid meteor would be of medium-slow velocity. In 2016, this stream produced a strong outburst that lasted approximately one hour. Nothing unusual has occurred since 2016. Some researchers feel these meteors are related to the kappa Cygnids, which are active in August. Normal rates for this shower is less than 1 shower member per hour no matter your location and perhaps 1 per hour at maximum as seen from northern latitudes.

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 20:10 (303) -11. This position lies in northwestern Capricornus, 2 degrees northwest of the naked eye double star known as (alpha Capricornii). Current rates are expected to be near 2 per hour no matter your location. These meteors are best seen near 01:00 local summer time (LST), when the radiant lies highest in the southern sky. With an entry velocity of 23 km/sec., the average meteor from this source would be of medium-slow velocity.

The large **Anthelion (ANT)** radiant is currently centered at 20:52 (313) -18. This position lies in northern Capricornus, 3 degrees west of the 4th magnitude star known as Dorsum (theta 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 LST 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 **Southern delta Aquariids (SDA)** are active from a radiant located at 22:22 (336) -17. This area of the sky is located in southwestern Aquarius, 7 degrees west of the 3rd magnitude star known as Skat (delta Aquarii). This radiant is best placed near 0400 LST, 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 41 km/sec., the average meteor from this source would be of medium velocity.

The **July Pegasids (JPE)** are active from July 4<sup>th</sup> through August 8<sup>th</sup> with maximum activity occurring on July 11<sup>th</sup>. The radiant is currently located at 23:54 (358) +14. This area of the sky is located in southeastern Pegasus, 3 degrees west of the 3rd magnitude star known as Algenib (gamma Pegasi). This radiant is best placed during the last dark hour before dawn when it lies highest in the southern sky, when it lies on the meridian and is located highest in the sky. Rates are expected to be near 1 per hour this week as seen from the northern hemisphere and less than 1

as seen from south of the equator. 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 01:32 (023) +53. This position lies in extreme northwestern Perseus, 3 degrees southeast of the 4th magnitude star known as Marfak (theta Cassiopeiae). This area of the sky is best placed for viewing during the last dark hour before dawn when it lies highest in the northeastern sky. Maximum activity is not until August 13th so current rates are expected to be near 3 as seen from the northern hemisphere and 1 as seen from south of the equator. 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 01:59 (030) -19. This position lies in southern Cetus, 2 degrees north of the 4th magnitude star known as nu 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 less than 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.

The **c-Andromedids (CAN)** were discovered by Sirko Molau and Juergen Rendtel using video data from the IMO network. Activity from this source is seen from June 21 through July 28 with maximum activity occurring on July 12. The radiant currently lies at 03:05 (046) +52, which places it in extreme northwestern Perseus, only 1 degree north of the 3rd magnitude star known as gamma Persei. This area of the sky is best seen during the last dark hour before dawn when the radiant lies highest in the northeastern sky. Observers in the northern hemisphere are better situated to view this activity as the radiant rises much higher in the sky before dawn compared to southern latitudes. Current rates would be less than 1 per hour no matter your location. With an entry velocity of 57 km/sec., the average meteor from this source would be of medium-swift velocity. The Perseid radiant lie just to the west so one should be cautious when separating these two meteor showers.

As seen from the mid-northern hemisphere (45N) one would expect to see approximately 10 **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 2 per hour during the evening hours. Evening rates are reduced due to moonlight.

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 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 except where noted in the shower descriptions.

SHOWER	DATE OF MAXIMUM ACTIVITY	CELESTIAL POSITION	ENTRY VELOCITY	CULMINATION	HOURLY RATE	CLASS
July gamma Draconids (GDR)	Jul 28	18:46 (281) +50	29	00:00	<1 - <1	II
alpha Capricornids (CAP)	Jul 31	20:10 (303) -11	23	01:00	2 - 2	II
Anthelion (ANT)	-	20:52 (313) -18	30	02:00	2 - 3	II
Southern delta Aquariids (SDA)	Jul 31	22:22 (336) -17	41	04:00	2 - 4	I
July Pegasids (JPE)	Jul 11	23:54 (358) +14	63	05:00	1 - <1	II
Perseids (PER)	Aug 13	01:32 (023) +53	59	06:00	3 - 1	I
eta Eridanids (ERI)	Aug 07	01:59 (030) -19	64	07:00	<1 - <1	II
c- Andromedids (CAN)	Jul 12	03:05 (046) +52	57	08:00	<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.