

# Meteor Activity Outlook for July 15-21, 2023

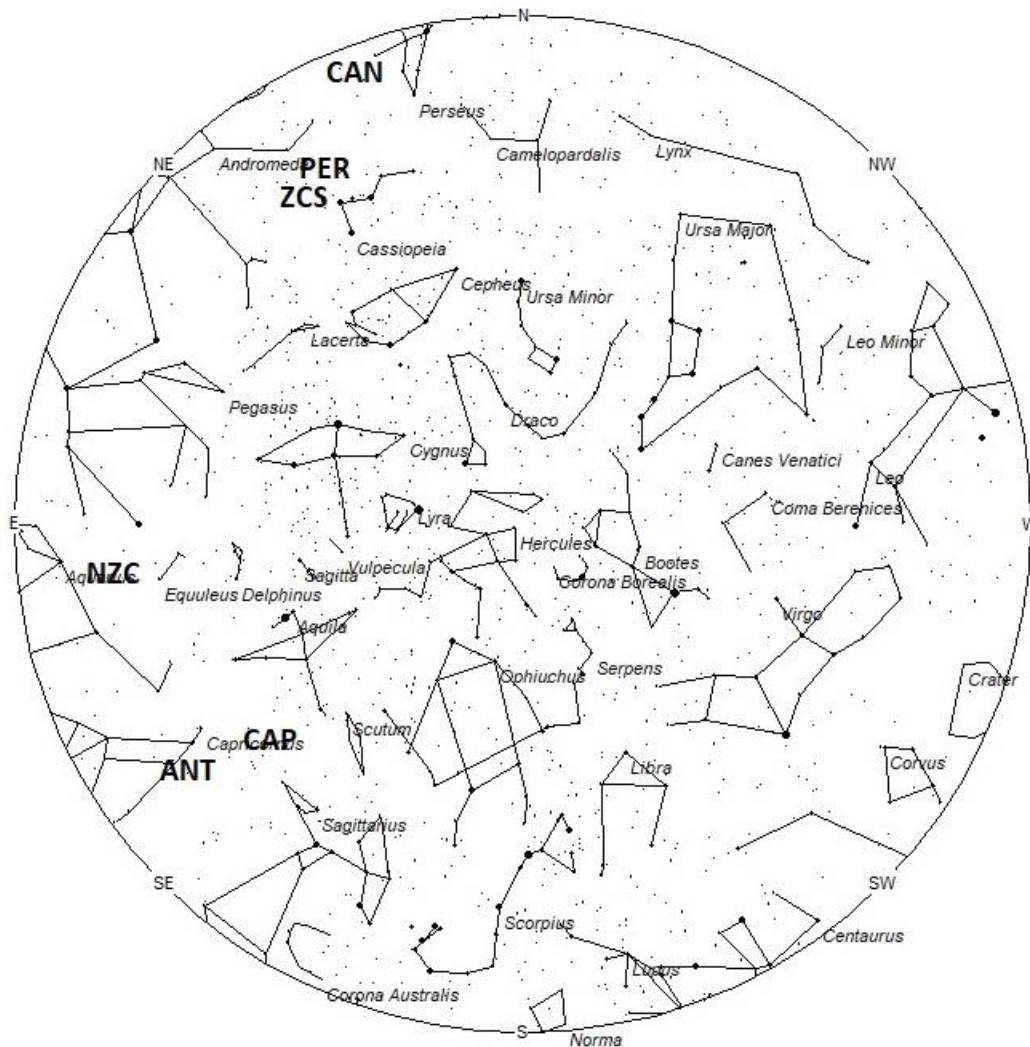


Eliot Herman captured this bright multi-bursting Taurid fireball on November 5, 2022, at 02:08 MST (9:08 UT) from Tucson, Arizona, USA. Eliot comments: " All sky photo shows clearly Taurid <https://flic.kr/p/2nXoqg8> more green than I have seen in a Taurid before" ©Eliot Herman

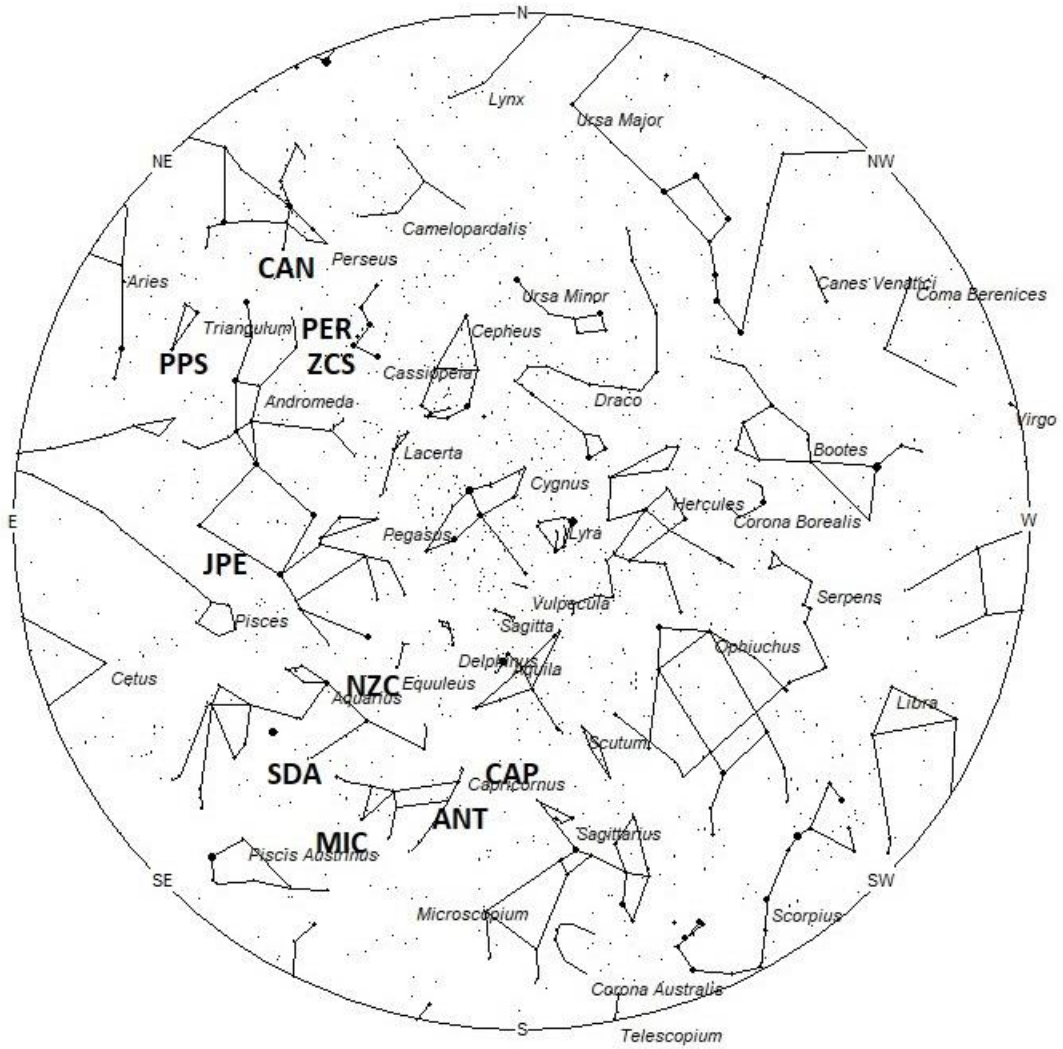
During this period, the moon reaches its new phase on Monday July 17th. At that time, the moon will lie near the sun and will be invisible at night. As the week progresses the crescent moon will enter the evening sky but will be too thin to interfere with observing meteors. The estimated total hourly 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 12 as seen from mid-northern latitudes (45N) and 13 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 15/16. 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

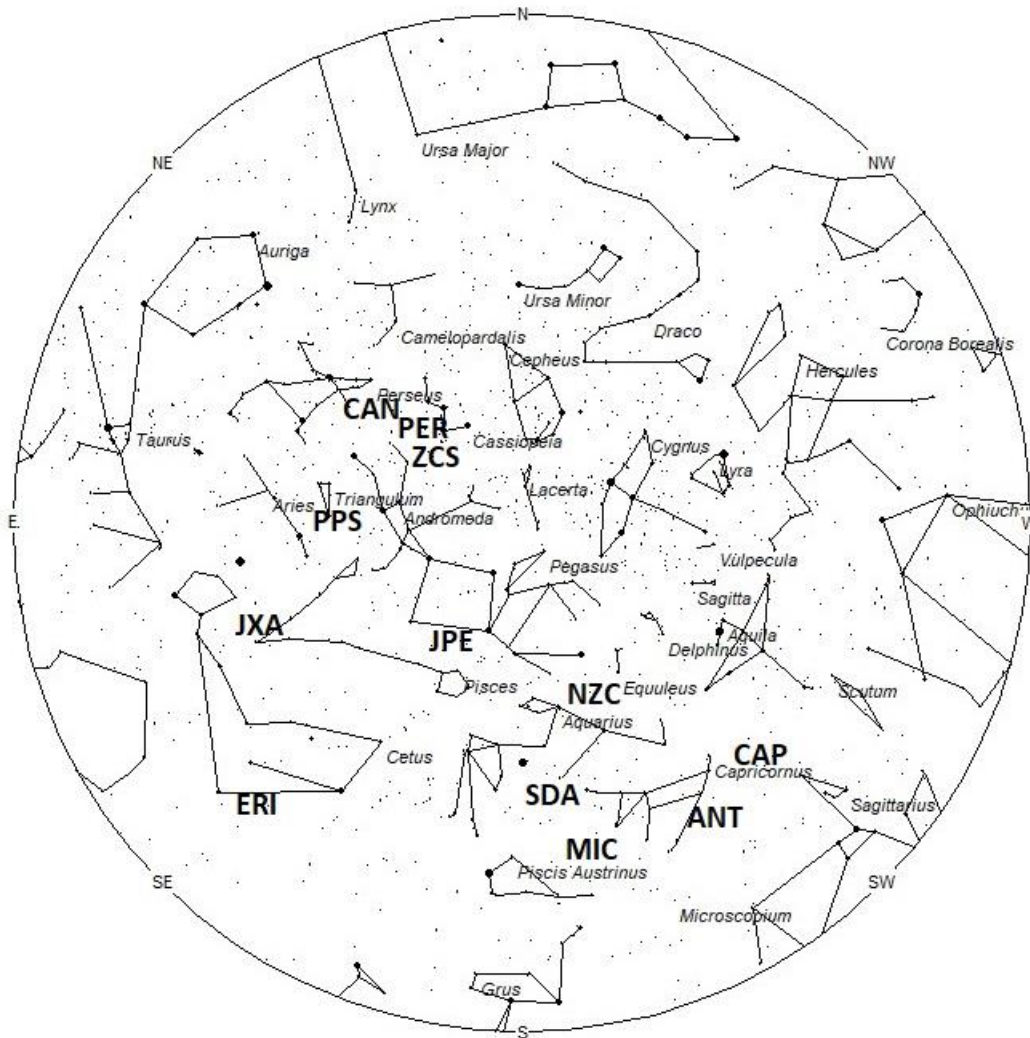
it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach their highest point in the sky until daylight. For these radiants, it is best to view them during the last few hours before dawn. It must be 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 **alpha Capricornids (CAP)** are active from July 7 through August 15, peaking on July 31<sup>st</sup>. The radiant is currently located at 19:55 (299) -12. This position lies on the Aquila/Sagittarius border, 4 degrees west of the naked eye double star known as (alpha Capricornii). Current rates are expected to be near 1 per hour no matter your location. These meteors are best seen near 02:00 local daylight saving time (LDST), when the radiant lies highest in the southern sky. With an entry velocity of 25 km/sec., the average meteor from this source would be of medium-slow velocity.

The large **Anthelion (ANT)** radiant is currently centered at 20:24 (306) -19. This position lies in western Capricornus, 4 degrees south of the 3<sup>rd</sup> magnitude star known as Dabih (beta Capricorni Aa). This location is 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 northern sky. Rates at this time should be near 2 per hour as seen from the southern 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 June Aquilids (NZC)** were discovered by Zdenek Sekanina in 1976. These meteors are active from June 26 through July 22 with maximum activity occurring on July 15. The radiant is currently located at 21:21 (320) -02. This area of the sky is located in western Aquarius, 4 degrees northwest of the 3<sup>rd</sup> magnitude star known as Sadalsuud (beta Aquarii). This radiant is best placed near 0300 LDST, when it lies on the meridian and is located highest in the southern sky. Hourly rates at this time should be less than 1 no matter your location. With an entry velocity of 38 km/sec., the average meteor from this source would be of medium velocity.

The last of the **Microscopiids (MIC)** are expected this weekend from a radiant located at 21:53 (328) -26. This area of the sky is located in the northwestern Piscis Austrinus, 6 degrees southwest of the 4<sup>th</sup> magnitude star known as zeta Capricornii. 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 less than 1 no matter your location. With an entry velocity of 39 km/sec., the average meteor from this source would be of medium velocity. This shower is synonymous with the Southern June Aquilids (SZC).

The **Southern delta Aquariids (SDA)** are now active from a radiant located at 22:02 (330) -18. This area of the sky is located in southwestern Aquarius, 4 degrees south of the 4<sup>th</sup> magnitude star known as iota Aquarii A. 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 less than 1 as seen from the northern hemisphere and near 1 as seen from south of the equator. With an entry velocity of 42 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 23:30 (352) +12. This area of the sky is located in southern Pegasus, 5 degrees southeast of the 2<sup>nd</sup> magnitude star known as Markab (alpha Pegasi). This radiant is best placed during the last hour prior to dawn when it lies high in the southern sky. Rates are expected to be near 1 per hour this week no matter your location. With an entry velocity of 64 km/sec., the average meteor from this source would be of swift velocity.

The **zeta Cassiopeiids (ZCS)** were discovered by Przemysław Żoładek and Mariusz Wisniewski during a Polish meteor workshop in 2005 and also by members of the Croatian Meteor Network. These meteors are active from July 7-22 with maximum activity occurring on July 16. The current position of the radiant is 00:33 (008) +51. This position lies in southern Cassiopeia, 3 degrees southeast of the 4<sup>th</sup> magnitude star known as Fulu (zeta Cassiopeiae). Rates are currently expected to be near 1 per hour as seen from the northern hemisphere and less than 1 as seen from south of the equator. These meteors are best seen near during the last dark hour of the night when the radiant lies highest in the northern 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. With an entry velocity of 57 km/sec., the average zeta Cassiopeiid meteor would be of medium-swift speed.

The first **Perseids (PER)** of the year should be sighted this week from a radiant located at 01:00 (015) +51. This position is not in Perseus, rather it lies in southern Cassiopeia, 4 degrees northwest of the 4<sup>th</sup> magnitude star known as phi Andromedae. 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. When reporting these meteors be careful to differentiate them from the zeta Cassiopeiids as the radiants are only separated by 7 degrees. Maximum is not until August 13<sup>th</sup> so current rates are expected to be less than 1 no matter your location. 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 01:36 (024) -21. This position lies in southern Cetus, 4 degrees west of the 4<sup>th</sup> 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 would 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 **phi Piscids (PPS)** have been found to be comprised of two components with separate activity periods. Component B is active from July 3-23 with maximum activity occurring on July 12<sup>th</sup>. The radiant currently lies at 01:43 (026) +29. This position lies on the Pisces/Triangulum border, 2 degrees southwest of the 3<sup>rd</sup> magnitude star known as Mothallah (alpha Trianguli). Current rates should be less than 1 meteor per hour no matter your location. This area of the sky lies highest in the southern sky during the last hour prior to dawn. The mean velocity of 67km/sec. would produce swift meteors.

The **July chi Arietids (JXA)** were discovered by two investigating teams in Europe using video data from European video Meteor Network Database (EDMOND), SonotaCo, 2013; and CMN, 2013. Activity from this stream is seen from June 26 through July 22 with maximum activity occurring on July 7. The radiant currently lies at 02:27 (037) +10, which lies on the Cetus/Aries border, 2 degrees north of the 4<sup>th</sup> magnitude star known as Xi<sup>2</sup> Ceti. This area of the sky is best seen during the last dark hour before dawn when the radiant lies highest in the eastern sky. Current rates are expected to be less than 1 no matter your location. With an entry velocity of 69 km/sec., the average meteor from this source would be of swift velocity.

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 02:30 (037) +50, which places it in extreme northeastern Andromeda, 2 degrees southwest of the 4th magnitude star known as theta Persei. This area of the sky is best seen during the last dark hour before dawn when the radiant lies highest in the eastern 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.

As seen from the mid-northern hemisphere (45N) one would expect to see approximately 9 **sporadic** meteors per hour during the last hour before dawn as seen from rural observing sites. Evening rates would be near 3 per hour. As seen from the tropical southern latitudes (25S), morning rates would also be near 9 per hour as seen from rural observing sites and 3 per hour during the evening hours.

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
		RA (RA in Deg.) DEC	Km/Sec	Local Daylight-Saving Time	North-South	
alpha Capricornids (CAP)	Jul 31	19:55 (299) -12	25	02:00	1 - 1	II
Anthelion (ANT)	-	20:24 (306) -19	30	02:00	2 - 3	II
Northern June Aquilids (NZC)	Jul 15	21:21 (320) -02	38	03:00	<1 - <1	IV

Microscopiids (MIC)	Jul 06	21:25 (321) -27	40	03:00	<1 - 1	IV
Southern delta Aquariids (SDA)	Jul 31	22:02 (330) -18	42	04:00	<1 - 1	I
July Pegasids (JPE)	Jul 11	23:30 (352) +12	64	05:00	1 - 1	II
zeta Cassiopeiids (ZCS)	Jul 16	00:33 (008) +51	57	06:00	1 - <1	IV
Perseids (PER)	Aug 13	01:00 (015) +51	59	06:00	<1 - <1	I
eta Eridanids (ERI)	Aug 07	01:36 (024) -21	64	07:00	<1 - <1	IV
phi Piscids (PPS)	Jul 12	01:43 (026) +29	67	07:00	<1 - <1	IV
July chi Arietids (JXA)	Jul 07	02:07 (032) +07	68	08:00	<1 - <1	IV
c-Andromedids (CAN)	Jul 12	02:30 (037) +50	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.