

Meteor Activity Outlook for July 8-14, 2023

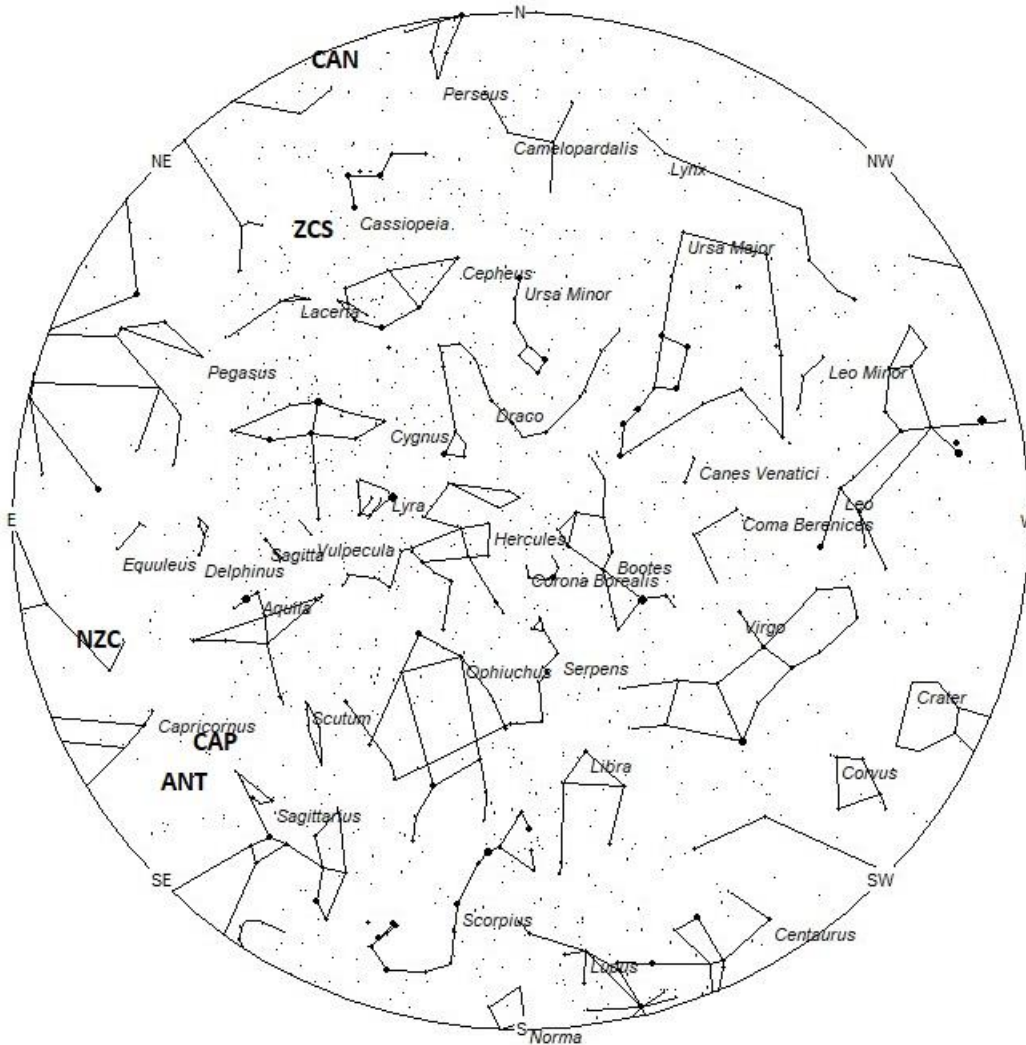


Jordan Ragsdale captured this bright fireball near the moon using his [AllSky Camera System](#) on November 4, 2022, at 00:58 MDT (6:58 UT) from Eagle, Idaho, USA. ©Jordan Ragsdale

During this period, the moon reaches its last quarter phase on Sunday July 9th. At that time, the moon will lie 90 degrees west of the sun and will rise near 01:00 local daylight-saving time (on July 10th). As the week progresses the crescent moon will rise later in the morning, allowing a longer window of opportunity to view under dark skies during the evening and early morning hours. The estimated total hourly rates for evening observers this week should be near 2 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 10 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 due to interfering 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 July 8/9. 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

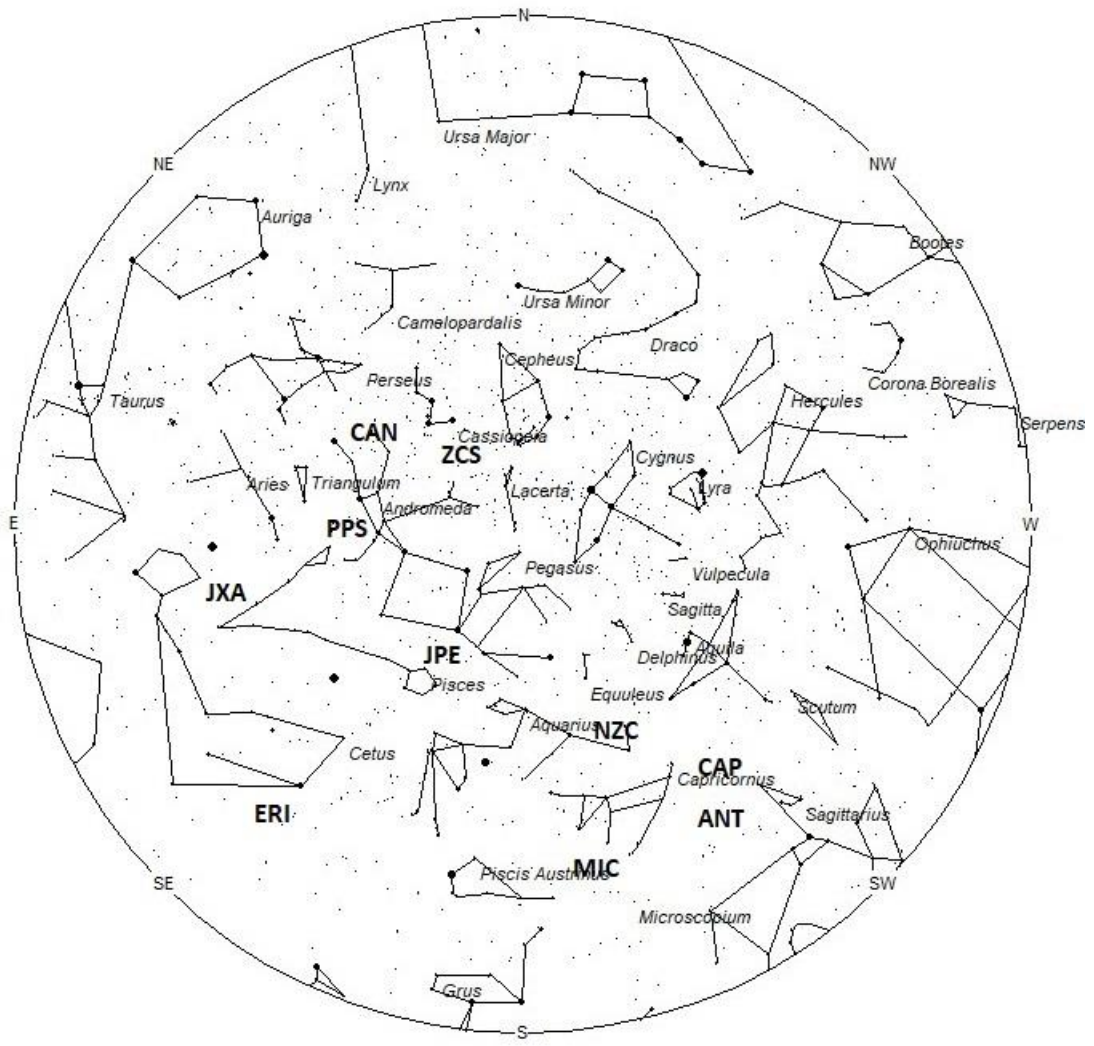
direction. A planisphere or computer planetarium program is also useful in showing the sky at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants 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 at 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 31st. The radiant is currently located at 19:42 (295) -14. This position lies in northwestern Sagittarius, 6 degrees west of the naked eye double star known as (alpha Capricornii). Current rates are expected to be less than 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 26 km/sec., the average meteor from this source would be of medium-slow velocity.

The large **Anthelion (ANT)** is currently centered at 19:56 (299) -20. This position lies in northeastern Sagittarius, 9 degrees southwest of the 3rd magnitude star known as Dabih (beta Capricorni Aa). 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 1 per hour as seen from the northern hemisphere and 2 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 20:58 (315) -04. This area of the sky is located on the Aquila/Aquarius border, 3 degrees northeast of the faint star known as 3 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 39 km/sec., the average meteor from this source would be of medium velocity.

The **Microscopiids (MIC)** were discovered by G. Gartrell and W. G. Elford, in their study of Southern Hemisphere meteor streams. This stream is active from June 25 through July 16 with maximum activity occurring on July 6. The radiant is currently located at 21:25 (321) -27. This area of the sky is located in the northwestern Piscis Austrinus, 4 degrees southwest of the 4th magnitude star known as zeta Capricornii. 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 as seen from the northern hemisphere and near 1 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. This shower is synonymous with the Southern June Aquilids (SZC).

The **July Pegasids (JPE)** are active from July 4th through August 8th with maximum activity occurring on July 11th. The radiant is currently located at 23:06 (347) +10. This area of the sky is located in southern Pegasus, 4 degrees southwest of the 2nd magnitude star known as Markab (alpha Pegasi). This radiant is best seen near during the last dark hour of the night when the radiant lies highest 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 Przemysław Zoładek 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 23:52 (358) +49. This position lies on the Cassiopeia/Andromeda border, 2 degrees northeast of the faint star known as psi Andromedae. Rates are currently expected to be less than 1 per hour no matter your location. 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 55 km/sec., the average zeta Cassiopeiid meteor would be of medium-swift velocity.

The first **eta Eridanids (ERI)** of the year may be seen this week from a radiant near 01:12 (018) -23. This position lies in southern Cetus, 9 degrees southwest of the 4th magnitude star known as nu Ceti. This source is active until September 10th, with maximum activity occurring on August 7th. 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. It should be noted that this radiant rises during twilight for the northern half of the northern hemisphere. Therefore, these meteors are not visible until later in the activity period when nights become longer for the northern hemisphere. 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 12th. The radiant currently lies at 01:20 (020) +28. This position lies in northeastern Pisces, 5 degrees west of the 3rd magnitude star known as Mothallah (alpha Trianguli). Current rates should be near 1 meteor per hour no matter your location. This area of the sky lies highest in the eastern sky during the last hour prior to dawn. The mean velocity of 66km/sec. would produce swift meteors.

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 01:56 (029) +47, which places it on the Andromeda/Perseus border, 6 degrees north of the famous 2nd magnitude double star known as Almach (gamma Andromedae A). 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.

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 02:07 (032) +07, which places it in extreme northwestern Cetus, 2 degrees southwest of the 4th magnitude star known as xi¹ 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 68 km/sec., the average meteor from this source would be of swift velocity.

As seen from the mid-northern hemisphere (45N) one would expect to see approximately 6 **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 also be near 6 per hour as seen from rural observing sites and 2 per hour during the evening hours. Locations between these two extremes would see activity between the listed figures. Morning rates are reduced during this period 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	CLASS
					RATE	
		RA (RA in Deg.) DEC	Km/Sec	Local Daylight- Saving Time	North- South	
alpha Capricornids (CAP)	Jul 31	19:42 (295) -14	26	02:00	<1 - <1	II
Anthelion (ANT)	-	19:56 (299) -20	30	02:00	1 - 2	II
Northern June Aquilids (NZA)	Jul 15	20:58 (315) -04	39	03:00	<1 - <1	IV
Microscopiid s (MIC)	Jul 06	21:25 (321) -27	40	03:00	<1 - 1	IV
July Pegasids (JPE)	Jul 11	23:06 (347) +10	64	05:00	1 - 1	II
zeta Cassiopeiids (ZCS)	Jul 16	23:52 (358) +49	55	06:00	<1 - <1	IV

eta Eridanids (ERI)	Aug 07	01:12 (018) -23	64	07:00	<1 - <1	IV
phi Piscids (PPS)	Jul 12	01:20 (020) +28	66	07:00	1 - <1	IV
c- Andromedids (CAN)	Jul 12	01:56 (029) +47	57	08:00	<1 - <1	IV
July chi Arietids (JXA)	Jul 07	02:07 (032) +07	68	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.