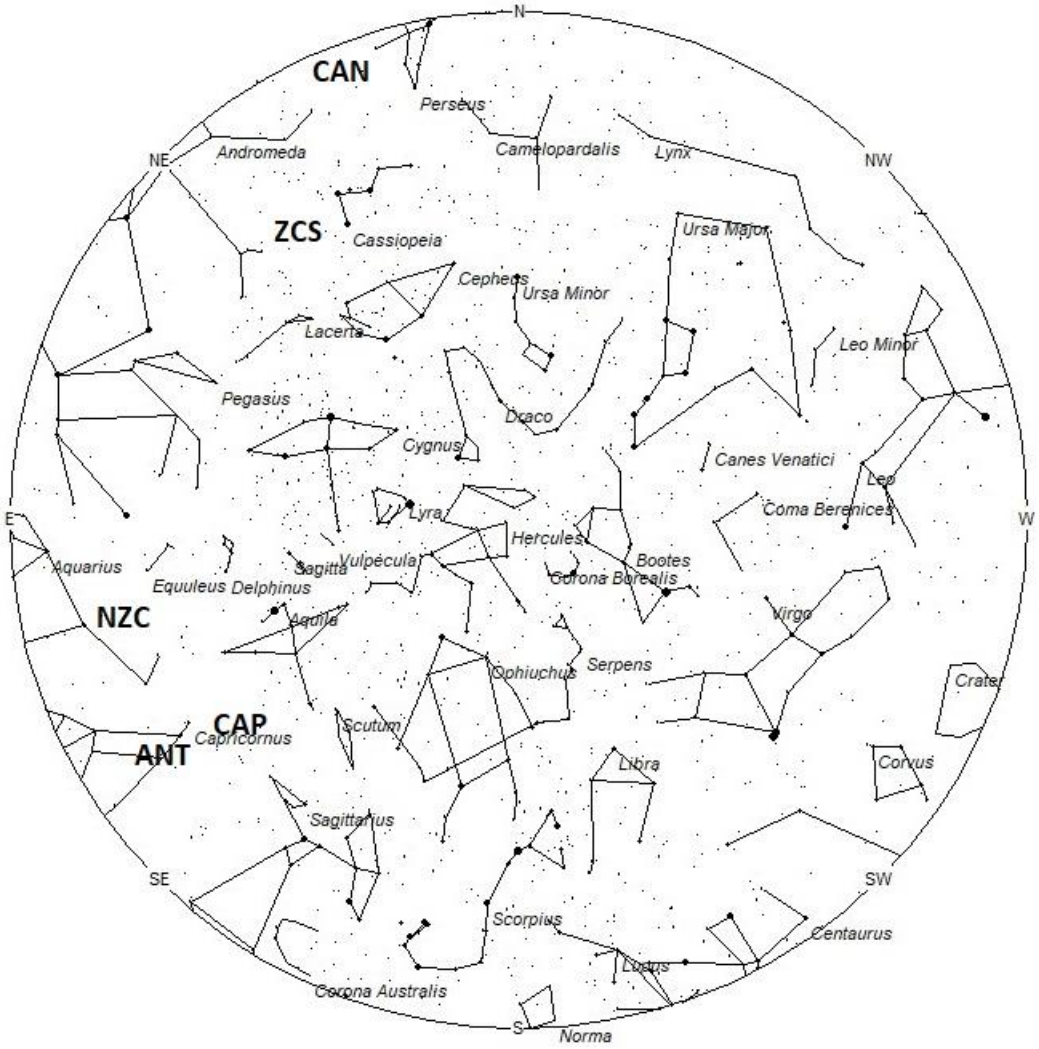
Meteor Activity Outlook for July 13-19, 2024

Nicolas Rossetto captured this colorful fireball on January 30, 2024, at 23:04 CET (22:04 UT) from Jouhe, France. ©Nicolas Rossetto

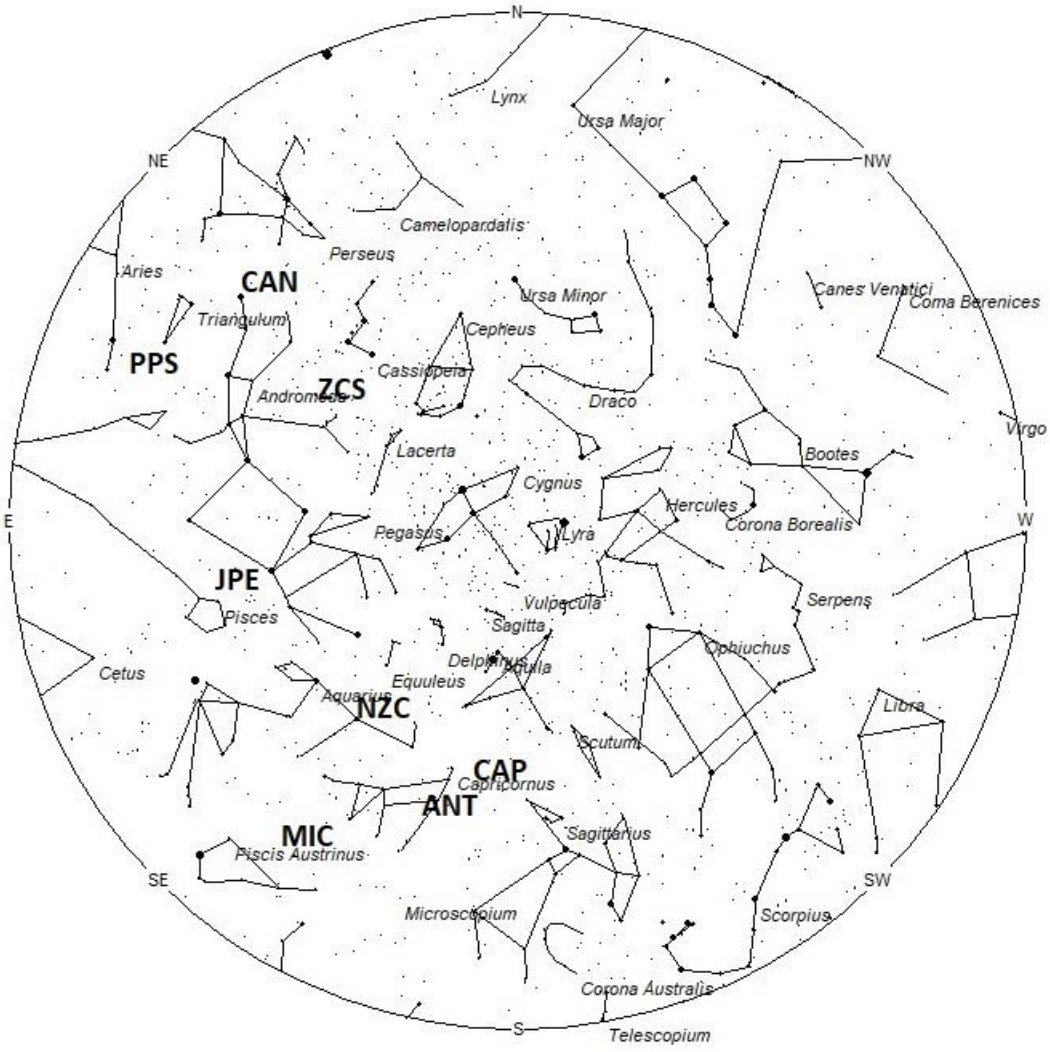
During this period, the moon reaches its first quarter phase on Sunday July 14th. At that time the moon will lie 90 degrees east of the sun and will set near midnight local daylight-saving time (LDST). As the week progresses the waxing gibbous moon will set later during the morning hours, limiting the amount of time available to view under dark skies. 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 15 as seen from mid-northern latitudes (45N) and 12 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. Evening rates are reduced during this period 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 July 13/14. 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

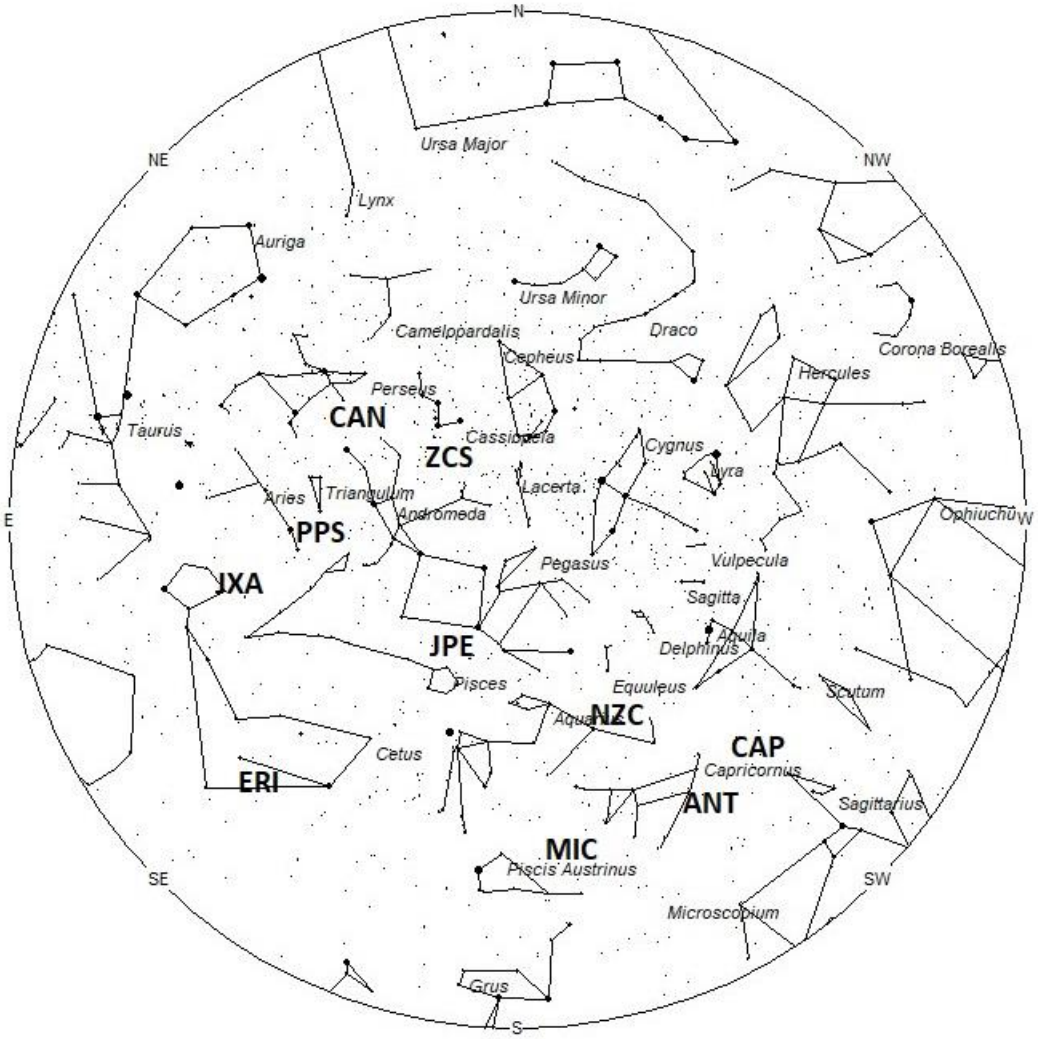
at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach their highest point in the sky until daylight. For 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 31st. The radiant is currently located at 19:51 (298) -13. This position lies in northeastern Sagittarius, 5 degrees west of the 4th magnitude double star known as alpha Capricorni. Current rates are expected to be near 1 per hour no matter your location. These meteors are best seen near 02:00 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 center of the large **Anthelion (ANT)** radiant is currently located at 20:16 (304) -21. This position lies in western Capricornus, 5 degrees south of the 3rd magnitude star known as Dabih (beta Capricornii Aa). This radiant is best placed near 0200 LDST, when it lies on the meridian and is located highest in the southern sky. Rates at this time should be near 1 per hour as seen from the northern hemisphere and 2 per hour as seen from south of the equator. With an entry velocity of 30 km/sec., the average Anthelion meteor would be of 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 21:14 (319) -03. This area of the sky is located in northwestern Aquarius, 5 degrees northwest of the 3rd magnitude star known as Sadalsuud (beta Aquarii). This radiant is best placed near 0300 LST, when it lies on the meridian and is located highest in the southern sky. Hourly rates at this time should be near than 1 no matter your location. With an entry velocity of 38 km/sec., the average meteor from this source would be of medium-slow velocity. An interesting fact about this source is that it may be related to the Northern delta Aquariids of August. Where and when this source ends coincides with the start and position of the Northern delta Aquariids.

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 21:45 (326) -26. This area of the sky is located in northwestern Piscis Austrinus, 6 degrees southeast of the 4th magnitude star known as zeta Capricornii. This radiant is best placed near 0300 LST, 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-slow velocity. This shower is synonymous with the Southern June Aquilids (SZC).

The **July Pegasids (JPE)** are active from July 4th through August 9th with maximum activity occurring on July 10th. The radiant is currently located at 23:23 (351) +12. This area of the sky is located in southern Pegasus, 4 degrees southeast of the 2nd magnitude star known as Markab (alpha Pegasi). This radiant is best seen during the last dark hour of the night when the radiant lies highest in the southern sky. Rates are expected to be near than 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 15. The current position of the radiant is 00:21 (355) +51. This position lies in southwestern Cassiopeia, 6 degrees southwest of the 2nd magnitude star known as alpha Cassiopeiae. Rates are currently expected to be near 1 per hour as seen from the northern hemisphere. 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 velocity.

The **eta Eridanids (ERI)** may be seen this week from a radiant near 01:29 (022) -21. This position lies in southern Cetus, 1 degree north of the faint star known as 48 Ceti (see chart). This source is active until September 10th, with maximum activity occurring on August 6th. 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 eastern 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. The later component is active from July 3-23 with maximum activity occurring on July 11th. Current rates are expected to be near 1 meteor per hour just before dawn. The position of the radiant lies near 01:36 (024) +29. This position lies in western Triangulum, 3 degrees west of the 3rd magnitude star known as Mothallah (alpha Trianguli). This area of the sky lies highest in the eastern sky during the last hour prior to dawn. With an entry velocity of 66km/sec., these meteors are swift.

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 02:20 (035) +49, which places it in northeastern Andromeda. The nearest star of note would be 4th magnitude theta Persei, which lies 4 degrees east of the radiant. 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 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 02:20 (035) +09, which places it in northwestern Cetus, 1 degree northeast of the 4th magnitude star known as xi[1] 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.

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 9 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 2 per hour during the evening hours. Locations between these two extremes would see activity between these listed figures. Evening rates are reduced 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 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	
alpha Capricornids (CAP)	Jul 31	19:51 (298) -13	25	02:00	1 - 1	II
Anthelions (ANT)	-	20:16 (304) -21	30	02:00	1 - 2	II
Northern June Aquilids (NZC)	Jul 15	21:14 (319) -03	38	03:00	1 - 1	IV
Microscopiids (MIC)	Jul 05	21:45 (326) -26	39	03:00	<1 - <1	IV

July Pegasids (JPE)	Jul 10	23:23 (351) +12	64	05:00	1 - 1	II
zeta Cassiopeiids (ZCS)	Jul 15	00:21 (355) +51	57	06:00	1 - <1	IV
eta Eridanids (ERI)	Aug 06	01:29 (022) -21	64	08:00	<1 - <1	II
phi Piscids (PPS)	Jul 11	01:36 (024) +29	66	08:00	1 - <1	IV
c-Andromedids (CAN)	Jul 12	2:20 (035) +49	57	09:00	<1 - <1	IV
July chi Arietids (JXA)	Jul 07	02:20 (035) +09	69	09:00	<1 - <1	IV

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.