

# Meteor Activity Outlook for July 17-23, 2021

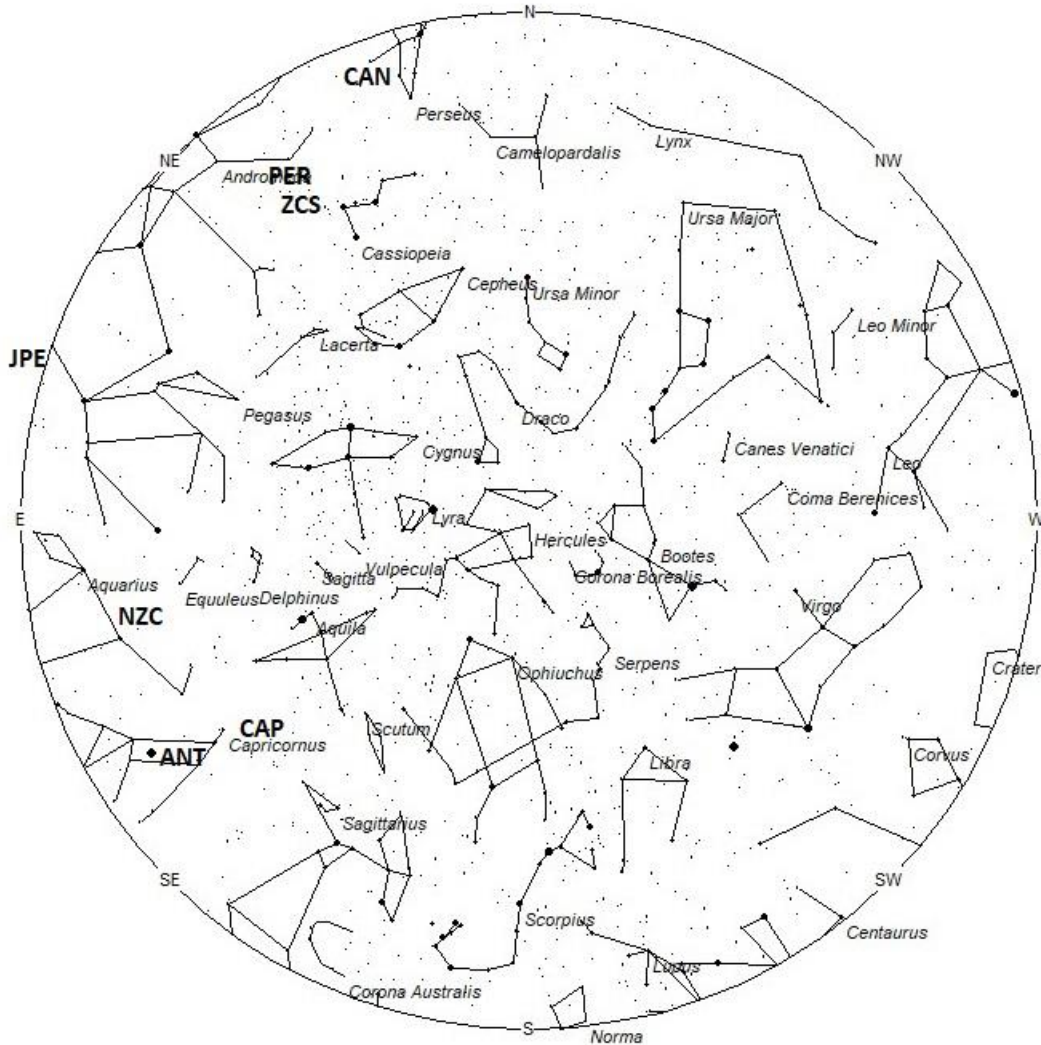


Gaurav Tanwar was capturing night lapse in video mode on his Go Pro hero 9. At 23:59 IST (18:29 UT), this double bursting fireball happened to shoot through the field of view. The date was July 9, 2021, and the location was Indore, Madhya Pradesh, India. The Go Pro settings were: resolution-4k; Lens-Wide; Interval-60s; Shutter-30s; WB-4000K; ISO-400 ©Gaurav Tanwar

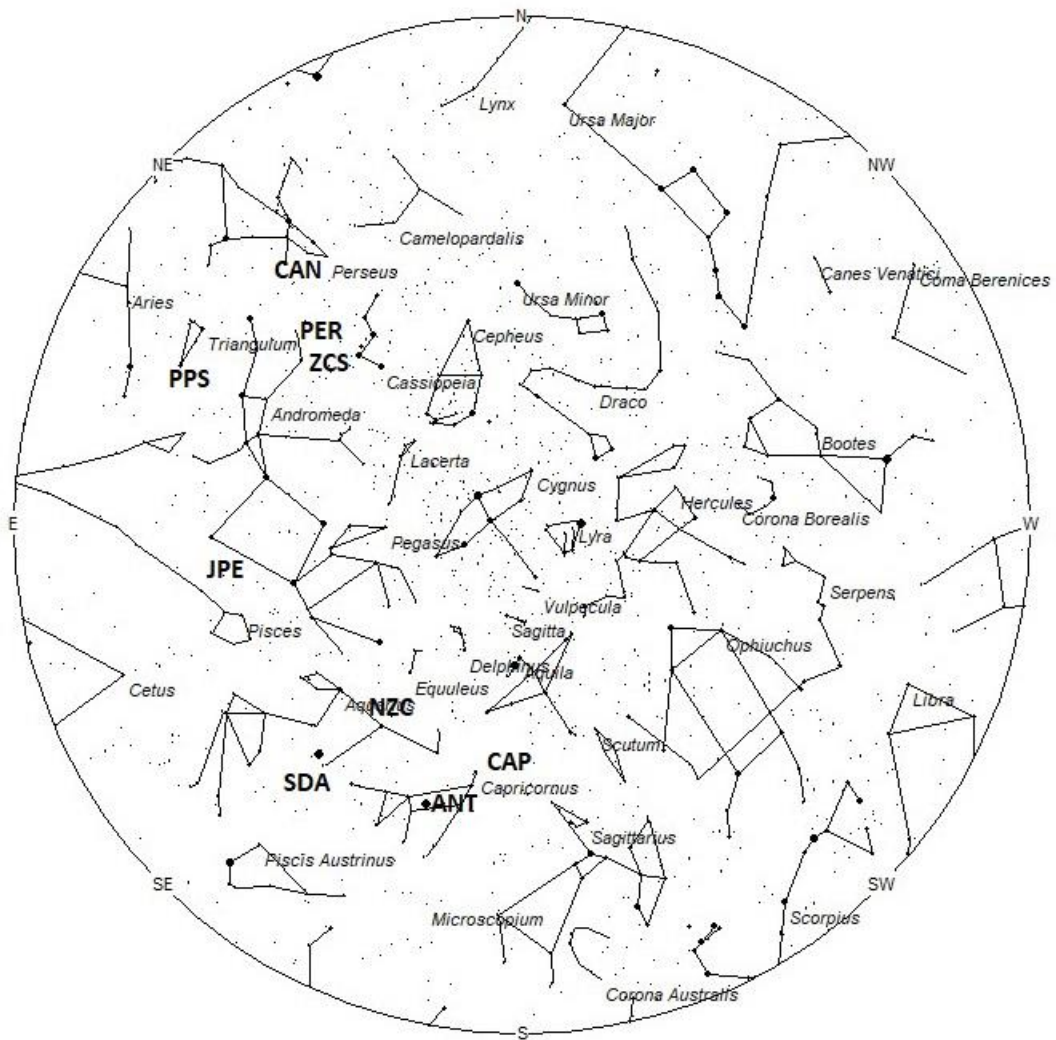
During this period, the moon reaches its first quarter phase on Saturday July 17th. At this time the moon lies near 90 degrees east of the sun and sets near midnight local daylight saving time (LDST). As the week progresses the waxing gibbous moon enters the morning sky and will begin to interfere with morning meteor observing. By the end of the week the nearly full moon will be in the sky nearly all night long making meteor observing difficult at best. The estimated total hourly meteor rates for evening observers this week is 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 17 as seen from tropical southern locations (25S). Evening rates are reduced by moonlight during this period. The actual rates 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 17/18. 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. 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. It must be remembered that meteor activity is rarely seen at the radiant position. Rather they

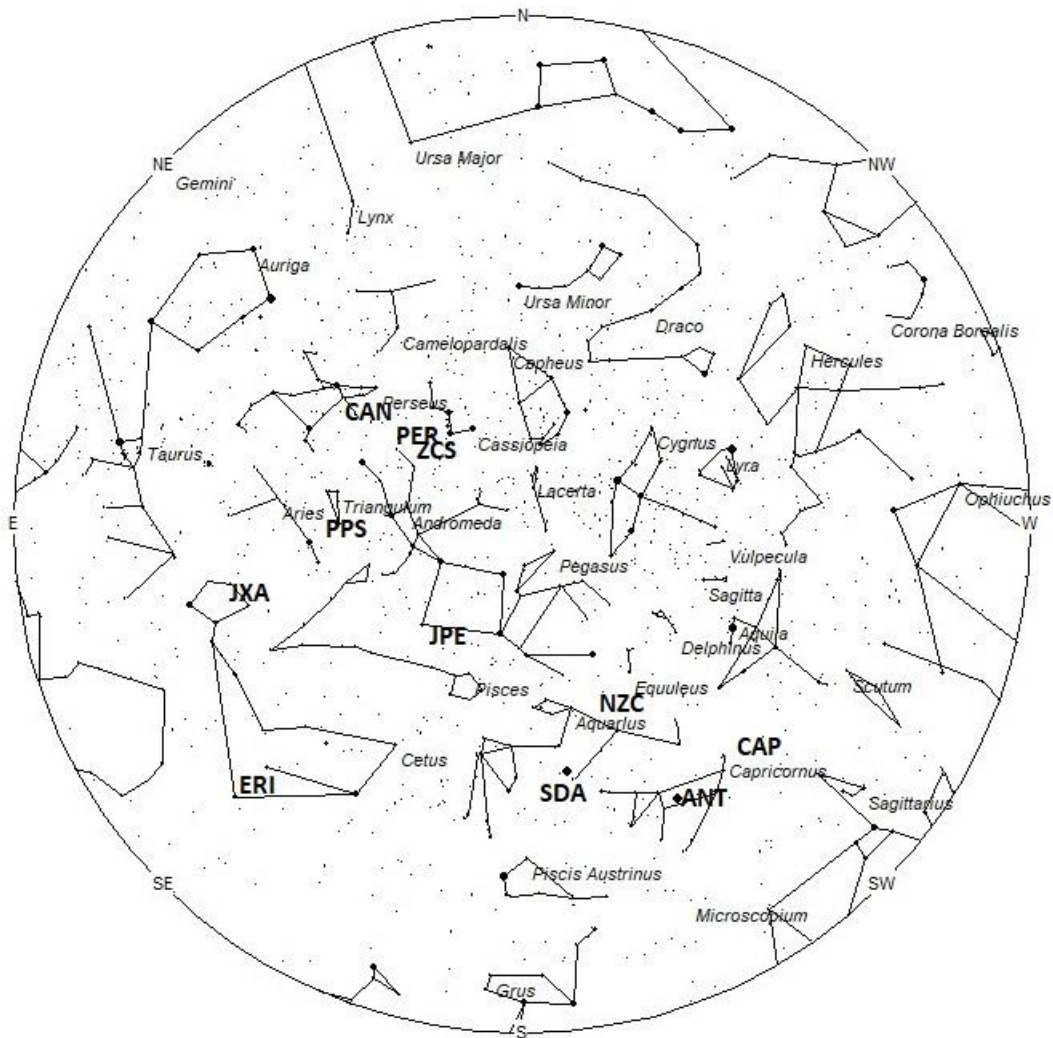
shoot outwards from the radiant, so it is best to center your field of view so that the radiant lies at the edge and not the center. Viewing there will allow you to easily trace the path of each meteor back to the radiant (if it is a shower member) or in another direction if it is sporadic. Meteor activity 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 for 10pm Local Daylight Saving Time



**Radiant Positions for 1am Local Daylight Saving Time**



## Radiant Positions for 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 20:00 (300) -12. This position lies on the border of Sagittarius and Aquila, 3 degrees northwest of the naked eye double star known as (alpha Capricornii). Current rates are expected to be near 1 per hour as seen from the Northern Hemisphere and 2 per hour as seen from south of the equator. These meteors are best seen near 0200 LDST, when the radiant lies highest in the sky. With an entry velocity of 24 km/sec., the average meteor from this source would be of slow velocity.

The center of the large **Anthelion (ANT)** radiant is currently located at 20:32 (308) -19. This position lies in western Capricornus, 5 degrees southeast of the 3rd magnitude star known as Dabih (beta Capricornii Aa). Due to the large size of this radiant, Anthelion activity may also appear from northwestern Aquarius as well as Capricornus. This radiant is best placed near 0200 LDST, when it lies on the meridian and is located highest in the sky. Rates at this time should be near 2 per hour as seen from the Northern Hemisphere and 3 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 21:27 (322) -02. This area of the sky is located in western Aquarius, 4 degrees north 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 sky. Hourly rates at this time should be less than 1 no matter your location. With an entry velocity of 37 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 **Southern delta Aquariids (SDA)** are now active from a radiant located at 22:08 (332) -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 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 10<sup>th</sup>. The radiant is currently located at 23:36 (354) +13. This area of the sky is located in southern Pegasus, 7 degrees southeast of the 2nd magnitude star known as Markab (alpha Pegasi). This radiant is best placed near 0500 LDST, when it lies on the meridian and is located highest in the 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 00:45 (011) +52. This position lies in a southern Cassiopeia, 4 degrees south of the 2<sup>nd</sup> magnitude star known as Schedar (alpha Cassiopeiae). 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 a dark sky. With an entry velocity of 58 km/sec., the average zeta Cassiopeiid meteor would be of swift speed.

The **Perseids (PER)** are active from a radiant located at 01:09 (017) +51. This position is not in Perseus, rather it lies in southern Cassiopeia, 7 degrees southeast of the 2<sup>nd</sup> magnitude star known as Schedar (alpha Cassiopeiae). This area of the sky is best placed for viewing during the last dark hour before dawn when it lies highest in the sky. Maximum is not until August 12<sup>th</sup> so current rates are expected to be near 1 as seen from the Northern Hemisphere and less than 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.

The **eta Eridanids (ERI)** are active from a radiant near 01:42 (026) -20. This position lies in southern Cetus, 4 degrees south of the 4<sup>th</sup> magnitude star known as tau Ceti. This source is active until September 10<sup>th</sup>, with maximum activity occurring on August 6<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 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 2-22, with maximum activity occurring on July 10<sup>th</sup>. Current rates are expected to be less than 1 no matter your location. The current position of the radiant lies near 01:50 (027) +29. This position lies in western Triangulum, 1 degree southwest of the 3<sup>rd</sup> magnitude star known as Mothallah (alpha Trianguli). This area of the sky lies highest in a dark sky during the last hour prior to dawn. With a entry velocity of 67km/sec., these meteors are swift.

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 02:32 (038) +10, which places it on the Aries/Cetus border, 2 degrees northeast 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 a dark 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 02:40 (040) +50, which places it on the Andromeda/Perseus border, 1 degree northwest of the 4<sup>th</sup> 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 a dark 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.

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 1 per hour. As seen from the tropical southern latitudes (25S), morning rates would be near 10 per hour as seen from rural observing sites and 1 per hour during the evening hours. Locations between these two extremes would see activity between the listed figures. Evening rates are reduced due to moonlight.

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	20:00 (300) -12	24	02:00	1 - 2	II
Anthelion (ANT)	-	20:32 (308) -19	30	02:00	2 - 3	II
Northern June Aquilids (NZA)	Jul 15	21:27 (322) -02	37	03:00	<1 - <1	IV
Southern delta Aquariids (SDA)	Jul 30	22:08 (332) -18	42	04:00	<1 - 1	I
July Pegasids (JPE)	Jul 10	23:36 (354) +13	64	05:00	1 - 1	II
zeta Cassiopeiids (ZCS)	Jul 16	00:45 (011) +52	58	06:00	<1 - <1	IV
Perseids (PER)	Aug 12	01:09 (017) +51	59	07:00	1 - <1	I
eta Eridanids (ERI)	Aug 06	01:42 (026) -20	64	08:00	<1 - <1	IV
phi Piscids B (PPS)	Jul 10	01:50 (027) +29	67	08:00	<1 - <1	IV
July chi Arietids (JXA)	Jul 07	02:32 (038) +10	69	09:00	<1 - <1	IV
c- Andromedids (CAN)	Jul 12	02:40 (040) +50	57	09:00	<1 - <1	IV

