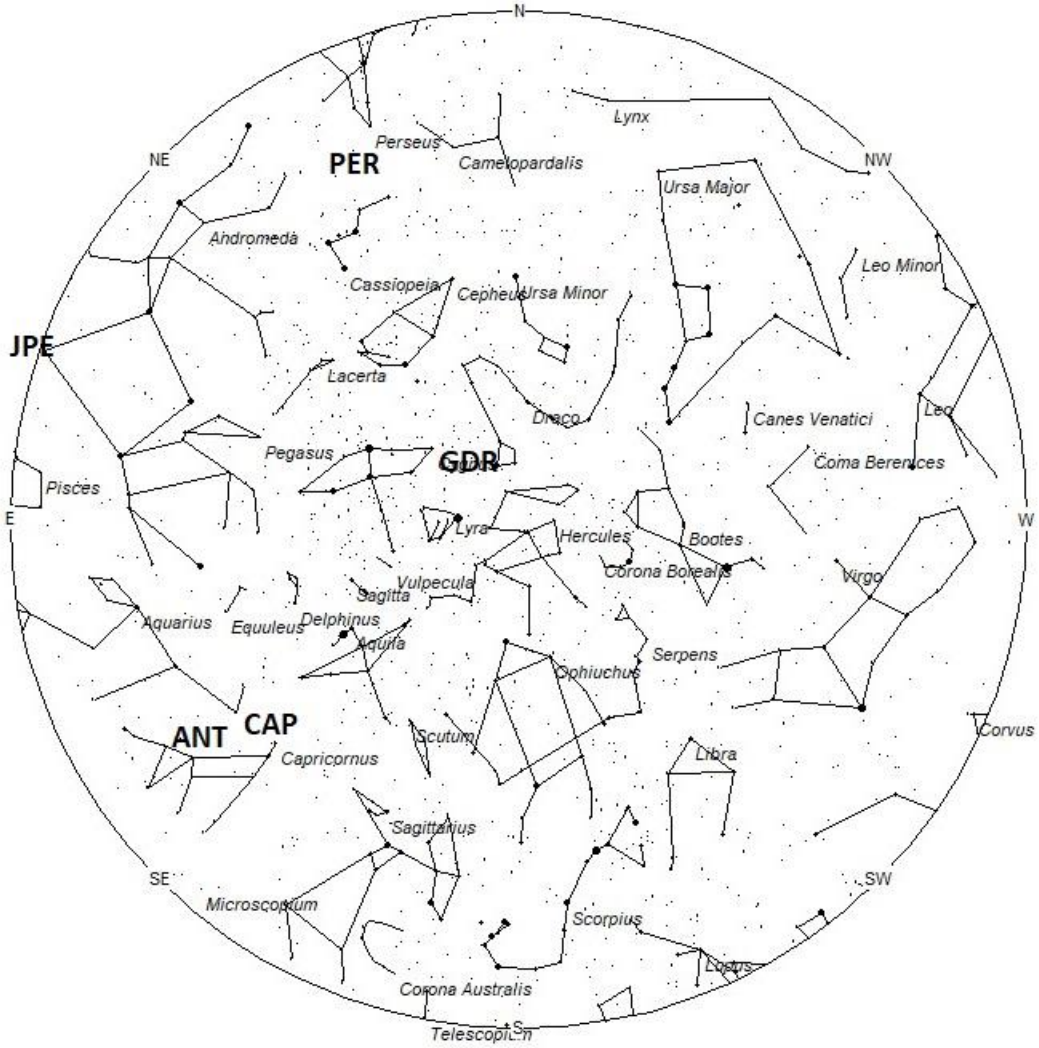
Meteor Activity Outlook for July 27- August 2, 2024

Jean-Marc Lecleire captured this multi-bursting fireball on February 4, 2024, at 23:21 CST (22:21 UT) from Moydans, France . Notice the Big Dipper in the slit of open sky in the observatory. ©Jean-Marc Lecleire/Observatoire des Baronnies Provençales,

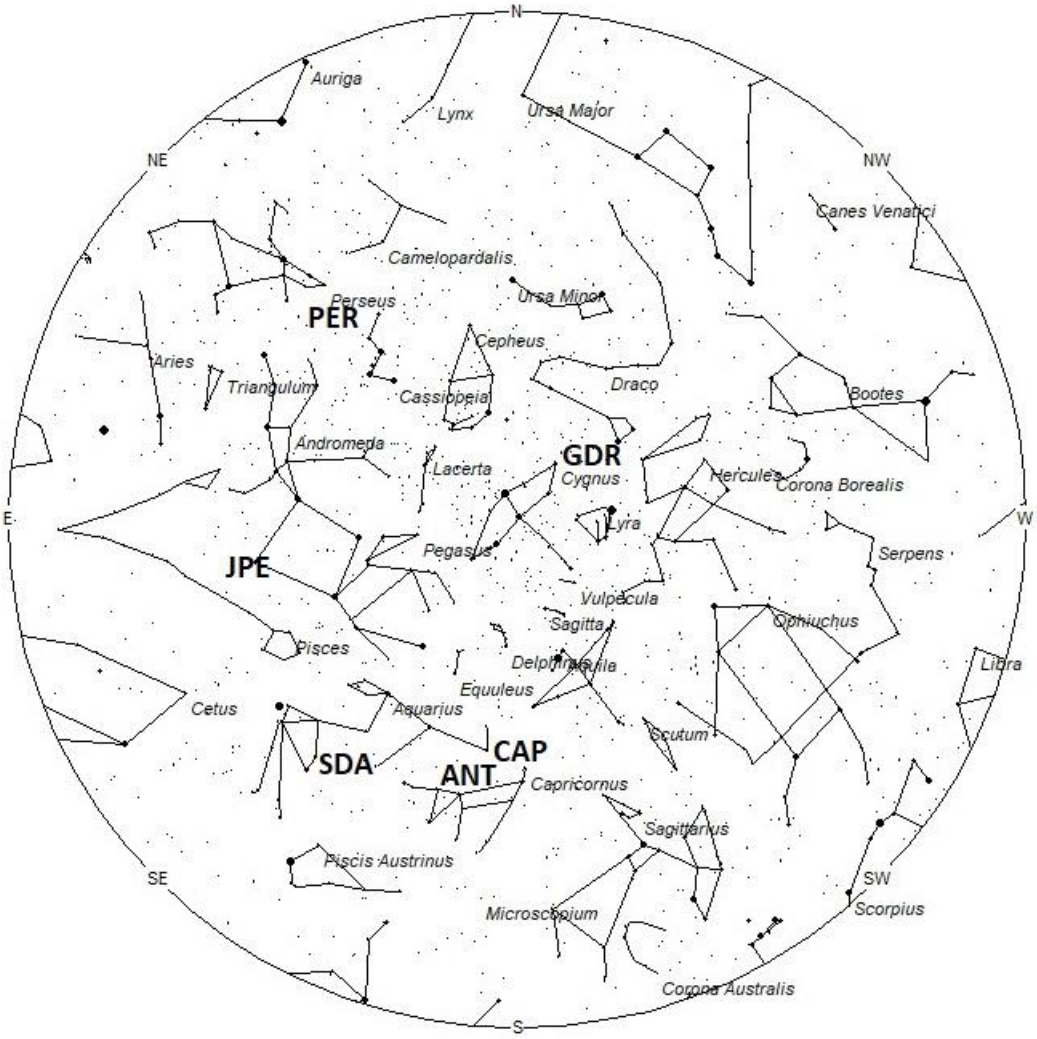
During this period, the moon reaches its last quarter phase on Sunday July 28th. At that time the moon will lie 90 degrees west of the sun and will rise near midnight local daylight-saving time (LDST) on July 28. As the week progresses the waning crescent moon will rise later during the morning hours, creating a larger window 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. Morning 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 27/28. 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

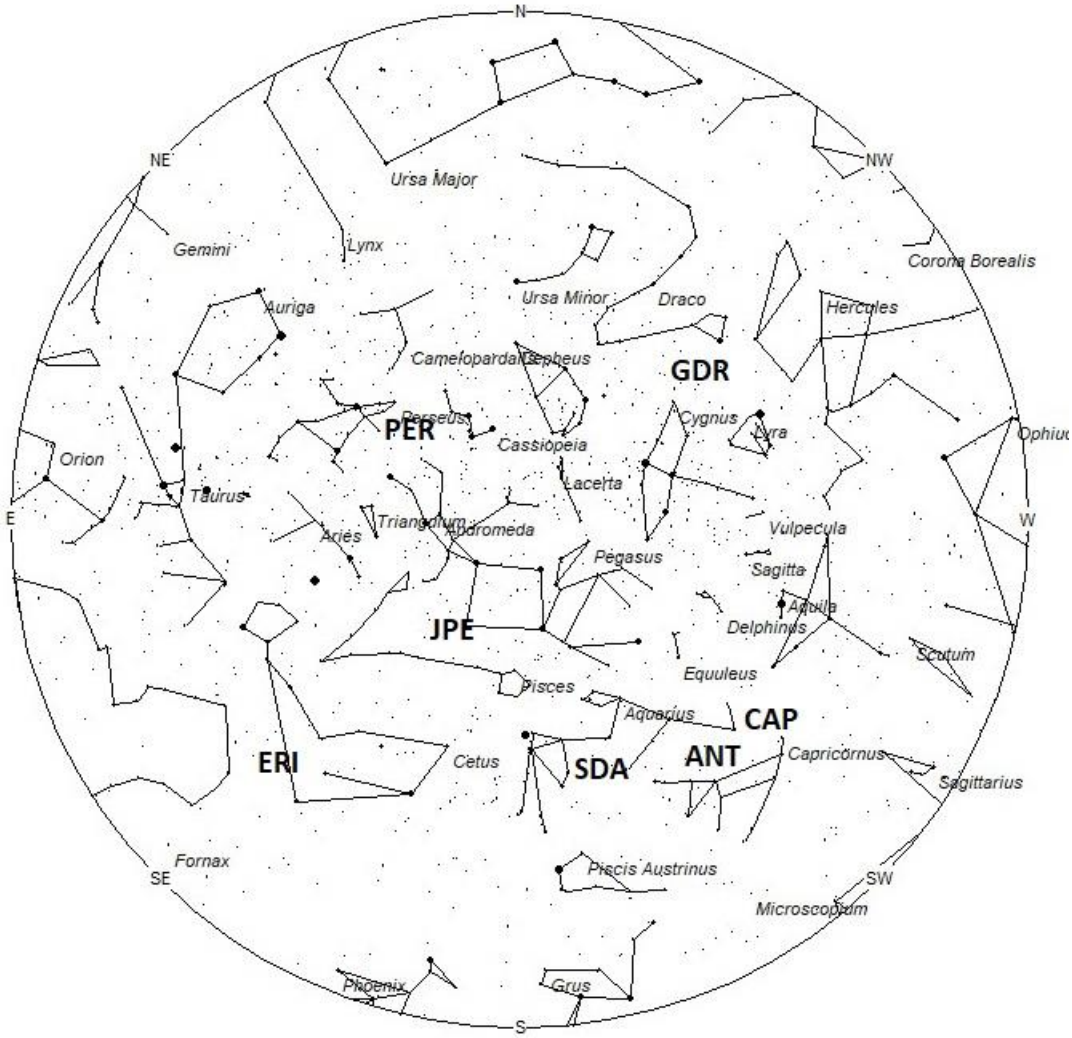
program is also useful in showing the sky at any time of night on any date of the year. Activity from each radiant is best seen when it is positioned highest in the sky, either due north or south along the meridian, depending on your latitude. Radiants that rise after midnight will not reach their highest 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 18:39 (280) +51, which places it in southeastern Draco, 7 degrees east of the 2nd magnitude star known as Eltanin (gamma Draconis). The radiant also lies 13 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 around midnight LDST to best view these meteors. With an entry velocity of 27 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. 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 31st. The radiant is currently located at 20:21 (305) -10. This position lies in northwestern Capricornus, 2 degrees northeast of the naked eye double star known as Algedi (Alpha^2 Capricornii). Current rates are expected to be near 2 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 22 km/sec., the average meteor from this source would be of medium-slow velocity. In 2023, there were several early fireballs from this source so we encourage observers to monitor this shower for continued fireball activity.

The large **Anthelion (ANT)** radiant is currently centered at 21:08 (317) -16. This position lies in northern Capricornus, 2 degrees north of the 4th magnitude star known as 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 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 **Southern delta Aquariids (SDA)** are active from a radiant located at 22:37 (339) -17. This area of the sky is located in central Aquarius, 4 degrees west of the 3rd magnitude star known as Skat (delta Aquarii). 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 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 4th through August 8th with maximum activity occurring on July 10th. The radiant is currently located at 00:10 (003) +16. This area of the sky is located in southeastern Pegasus, near the spot occupied by the 3rd magnitude star known as Algenib (gamma Pegasi). This radiant is best placed during the last hour prior to dawn, when it lies highest in a dark sky. Rates are expected to be less than 1 per hour this week no matter your

location. 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 01:56 (029) +54. This position lies in northwestern Perseus, 2 degrees northeast of the 4th magnitude star known as phi Persei. 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. Maximum activity is not until August 12th 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 02:16 (034) -16. This position lies in southeastern Cetus, 6 degrees west of the 4th magnitude star known as pi Ceti. This source is active until September 10th, with maximum activity occurring on August 7th. 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.

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 8 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 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 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	
July gamma Draconids (GDR)	Jul 28	18:47 (282) +50	29	00:00	<1 - <1	II
alpha Capricornids (CAP)	Jul 31	20:06 (302) -11	24	02:00	1 - 1	II
Anthelions (ANT)	-	20:44 (311) -17	30	02:00	<1 - 1	II
Southern delta Aquariids (SDA)	Jul 30	22:16 (334) -17	42	04:00	<1 - <1	I
July Pegasids (JPE)	Jul 10	23:47 (357) +14	65	06:00	<1 - <1	II
Perseids (PER)	Aug 12	01:23 (021) +52	59	07:00	1 - <1	I
eta Eridanids (ERI)	Aug 06	01:52 (028) -21	64	08:00	<1 - <1	II

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.