

Meteor Activity Outlook for July 29-August 4, 2023



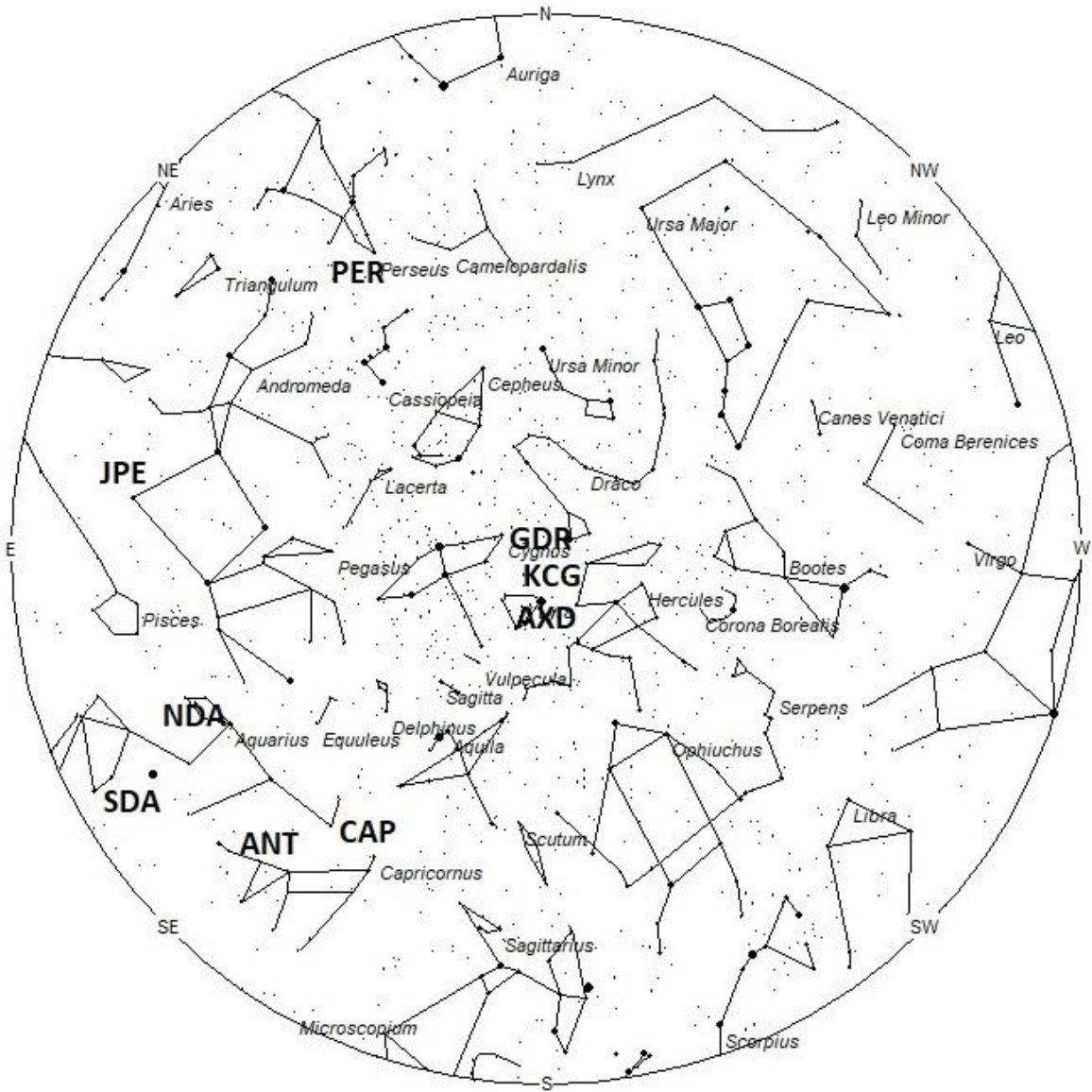
Following his capture of a bright Taurid on November 5, Eliot Herman captured another exceedingly bright Taurid fireball on November 9, 2022, at 02:17 MST (9:17 UT) from Tucson, Arizona, USA. The secondary frames display the resulting persistent train of this fireball as it fades. ©Eliot Herman

Meteor activity kicks into high gear in August as seen from the northern hemisphere. The main reason for all this activity is the Perseid shower that peak on August 13th. This shower is active most of the month and remains above the level of the sporadic background for a week centered on August 13th. The sporadic activity is also near maximum as seen from the northern hemisphere and is now more than double the rates from just three months ago. As seen from the southern hemisphere, meteor rates are still decent but falling rapidly. The sporadic rates continue their downward slide plus the Perseid radiant does not rise high into

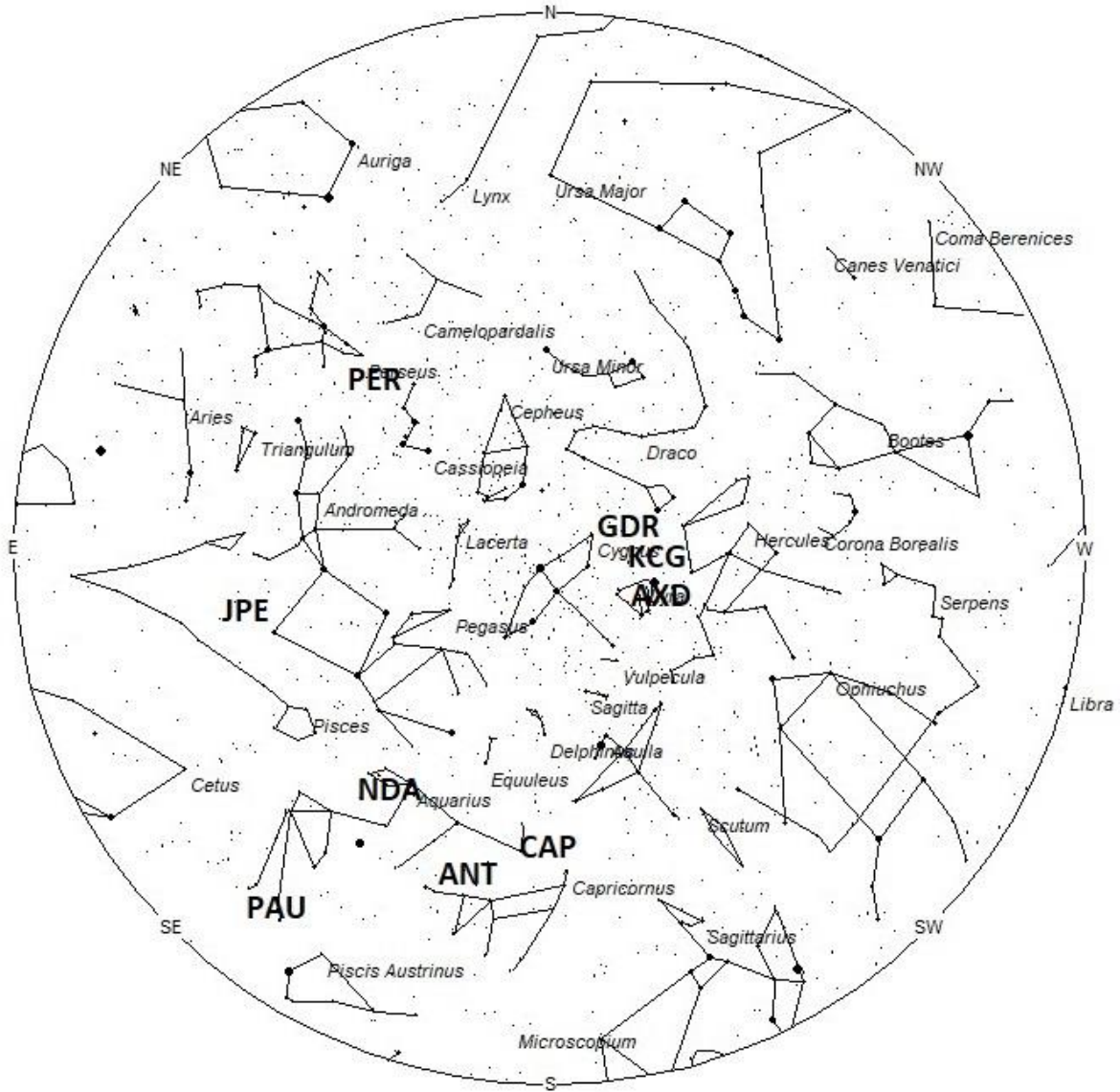
the sky as seen in the southern hemisphere. Therefore, rates for the Perseids are greatly reduced when compared to those seen from the northern hemisphere.

During this period, the moon reaches its full phase on Tuesday August 1st. During this entire period the moon will lie above the horizon most of the night making it difficult to observe meteor activity. 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 18 as seen from mid-northern latitudes (45N) and 16 as seen from tropical southern locations (25S). Rates are reduced due to interfering moonlight. 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.

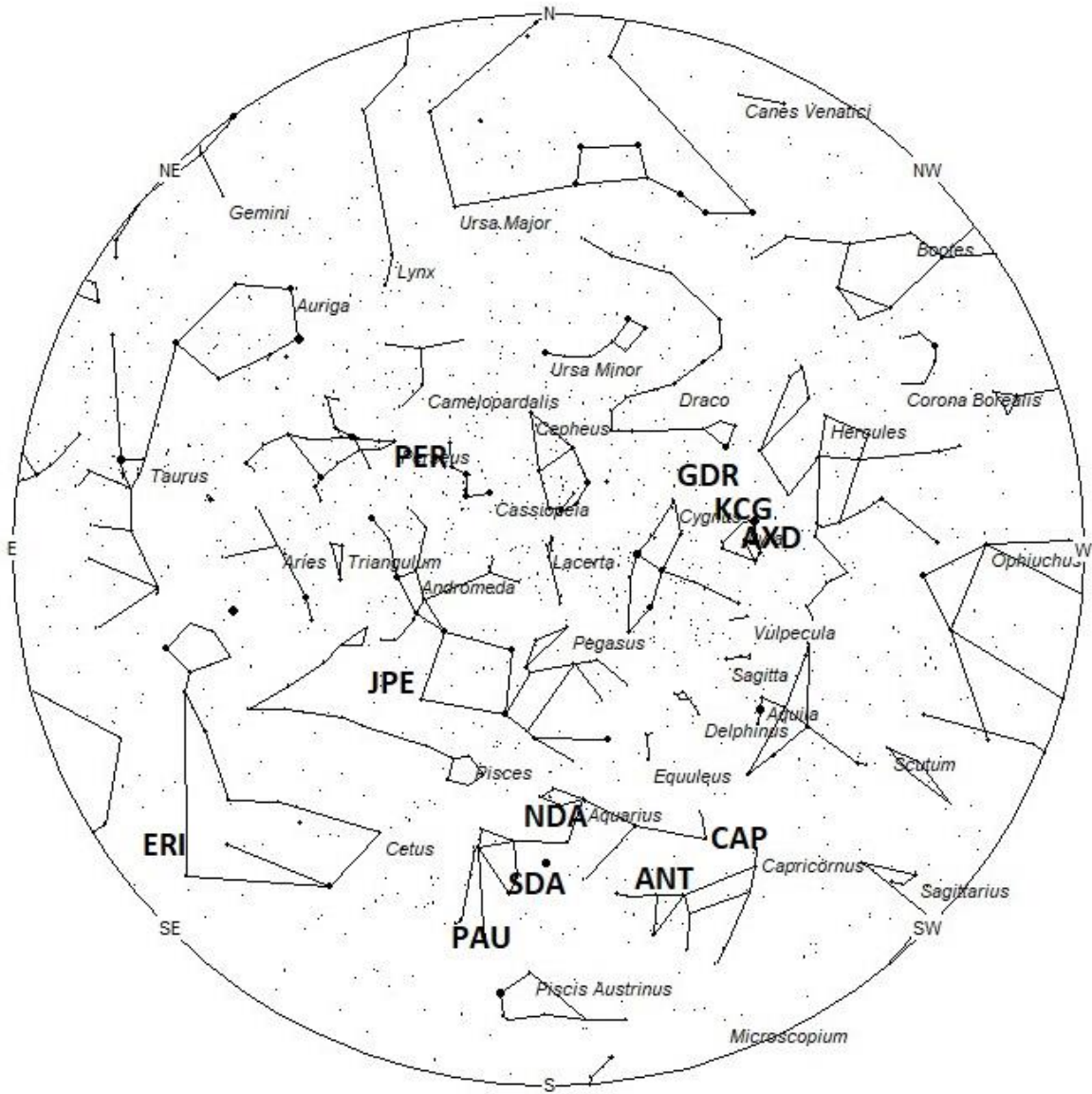
The radiant (the area of the sky where meteors appear to shoot from) positions and rates listed below are exact for Saturday night/Sunday morning July 29/30. These positions do not change greatly day to day so the listed coordinates may be used during this entire period. Most star atlases (available 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. Radianths that rise after midnight will not reach their highest point in the sky until daylight. For these radianths, 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 radianths 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 11:00pm Local Daylight-Saving Time



Radiant positions at 1:00am Local Daylight-Saving Time



Radiant positions at 3:00am Local Daylight-Saving Time

These sources of meteoric activity are expected to be active this week.

The **August xi Draconids (AXD)** was discovered by Masahiro Koseki in his study of SonotaCo video observations 2007–2018. These meteors were long considered part of the kappa Cygnids but Koseki states that they are clearly distinct*. This stream is active from August 4–28 with maximum activity occurring on the 15th. The radiant is currently located at 18:24 (276) +36, which places it in western Lyra, 3 degrees south of the zero-magnitude star known as Vega (alpha Lyrae). To best see these meteors, face low toward the north near 2300 Local Daylight Saving Time (LDST), when it lies on the meridian and is located highest in the sky. With an entry velocity of 18 km/sec., the average August Draconid meteor would be of slow velocity. Rates this week are expected to be less than 1 no matter your location. Due to the high northern declination these meteors are difficult to observe from the southern hemisphere.

*The activity of meteor showers recorded by SonotaCo video observations 2007–2018, Masahiro Koseki, 2021, <https://www.meteornews.net/2021/02/09/february-2021-special-issue-of-emeeteornews-online/> Page 147

The **kappa Cygnids (KCG)** are active from August 1–27, with maximum occurring on the 14th. The radiant is currently located at 18:29 (277) +41. This area of the sky is located in northern Lyra, 3 degrees northwest of the zero magnitude star known as Vega (alpha Lyrae). To best see these meteors face low toward the north near 2300 LDST when it lies on the meridian and is located highest in the sky. With a high northern declination, these meteors are difficult to view from the southern hemisphere. Expected hourly rates this week are less than 1 no matter your location. With an entry velocity of 20 km/sec., the average meteor from this source would be of slow velocity.

The **July gamma Draconids (GDR)** were first noticed by Japanese observers of SonotaCo 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 as soon as it becomes dark to best view these meteors. With an entry velocity of 26 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 2016. 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 20:26 (306) -09. This position lies in northwestern Capricornus, 3 degrees northeast of the naked eye double star known as Algedi (Alpha² Capricornii). Current rates are expected to be near 3 per hour no matter your location. These meteors are best seen near 01:00 LDST, when the radiant lies highest in the northern sky. With an entry velocity of 22 km/sec., the average meteor from this source would be of medium-slow velocity. There have been

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 21:16 (319) -15. This position lies in northern Capricornus, 2 degrees north of the 4th magnitude star known as iota 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 northern 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 delta Aquariids (NDA)** are a conglomeration of at least two weak radiants that peak 10 days apart. These meteors were first mentioned by Luigi G. Jacchia in his book *The Moon, Meteorites and Comets*. The NDA's are active from August 2-17, with the first peak occurring on the 12th. The radiant currently is located near 22:26 (337) -03. This area of the sky is located in northern Aquarius, 4 degrees southwest of the 4th magnitude star known as zeta Aquarii. To best see these meteors look high in the northern sky 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 40 km/sec., the average meteor from this source would be of medium velocity.

The **Southern delta Aquariids (SDA)** are active from a radiant located at 22:42 (341) -16. This area of the sky is located in central Aquarius, 3 degrees west of the 3rd magnitude star known as Skat (delta Aquarii). This position is also 2 degrees south of the bright planet Saturn. This radiant is best placed near 0300 LDST, when it lies on the meridian and is located highest in the northern sky. Hourly rates at this time should be near 3 as seen from the northern hemisphere and near 5 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.

The **Piscids Austrinids (PAU)** are an obscure shower, not well seen from the northern hemisphere. Recent studies by the IMO Video Network shows little activity. Other studies have indicated that this shower is active later than previously thought. We will go along with that idea until more information is available. It is now thought that this radiant is active from August 1st through the 10th, with maximum activity occurring on the 8th. Using these parameters, the current position of the radiant would be 23:11 (348) -22. This area of the sky is located in southeastern Aquarius, just west of the spot occupied by the faint star known as 88 Aquarii. This position is also 8 degrees northeast of the bright star known as Fomalhaut (alpha Piscis Austrini). To best see these meteors look high in the sky near 04:00 LDST, when it lies highest in the sky. Current hourly rates should be less than 1 no matter your location. With an entry velocity of 43km/sec., most activity from this radiant would be of medium velocities.

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 00:17 (004) +17. This area of the sky is located in central Pisces, 2 degrees northeast of the 3rd magnitude star known as Algenib (gamma 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 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 02:07 (038) +55. This position lies in northwestern Perseus, 8 degrees west of the 3rd magnitude star known as gamma 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 13th so current rates are expected to be near 5 as seen from the northern hemisphere and 2 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 02:23 (039) -15. This position lies in southeastern Cetus, 4 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.

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 1 per hour. As seen from the tropical southern latitudes (25S), morning rates would be near 4 per hour as seen from rural observing sites and 1 per hour during the evening hours. Rates are reduced due to moonlight during this period.

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	
August xi Draconids (AXD)	Aug 15	18:24 (276) +36	18	23:00	<1 - <1	IV
kappa Cygnids (KCG)	Aug 14	18:29 (277) +41	22	23:00	<1 - <1	IV
July gamma Draconids (GDR)	Jul 28	18:39 (280) +51	26	23:00	<1 - <1	II
alpha Capricornids (CAP)	Jul 31	20:26 (306) - 09	22	01:00	3 - 3	II
Anthelion (ANT)	-	21:16 (319) - 15	30	02:00	1 - 2	II
Northern delta Aquariids (NDA)	Aug 12	22:26 (337) - 03	40	03:00	<1 - <1	IV
Southern delta Aquariids (SDA)	Jul 31	22:42 (341) - 16	40	03:00	3 - 5	I
Piscids Austrinids (PAU)	Aug 08	23:11 (348) - 22	43	04:00	<1 - <1	IV
July Pegasids (JPE)	Jul 11	00:17 (004) +17	63	05:00	<1 - <1	II
Perseids (PER)	Aug 13	02:07 (038) +55	59	07:00	5 - 2	I
eta Eridanids (ERI)	Aug 07	02:23 (039) - 15	64	07:00	<1 - <1	II

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.