The Astonomy & Nightscape Photographer's Handbook

2026

SE QLD

NE NSW

Edition

Joseph Cali

Above: *The great Aurora of May 11, now called the" Gannon event," was a spectacular bright aurora observed all over the world and all the way up to tropical latitudes. Eastern Australia was covered in thick cloud. Joe Cali travelled to Hay in central south NSW to get a whole night of clear skies. The solar maximum continues into 2025 and possibly 2026 so stay tuned for more auroral displays.* ***Below:*** *Silo at Weethalie, NSW with Milky Way. Pentax K5, ISO 3200, 20s, Pentax 12mmED f4.* ***Front cover:*** *The comet C/2023 A3 (Tsuchinshan-ATLAS) put on quite a show in late September and October 2024. The front cover image is a tracked and stacked image with a Pentax K1 DSLR ISO 800 17 exposures of 30s with a Rokinon 135mm ED f2 lens.*

Shoot Planning Data for Astrophotography and Astronomical Nightscapes in the SE QLD Region 2026

[153°E, 27.5°S]

Compiled & Edited by Joe Cali

Above: *"The Zodiacal Light," single image captured at Cooper Creek Camp on the Birdsville Track. Pentax K1 DSLR with Samyang 14mm f2.8 lens. ISO 1600, 50s. Camera uses its own image stabiliser to track the stars.*

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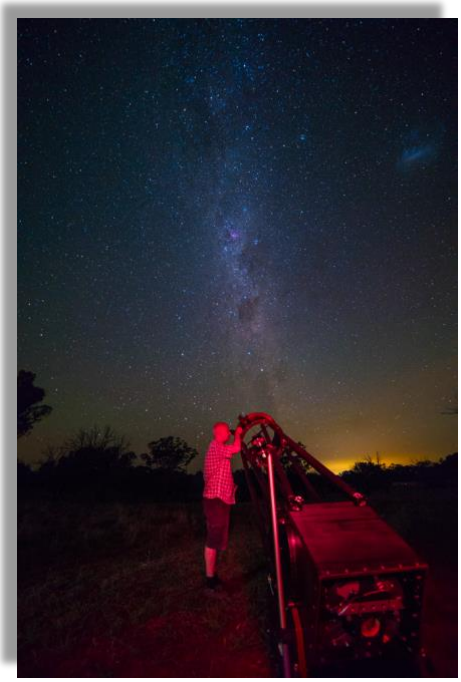
Introduction

Why this handbook?

Many smartphone apps can give you rise and set and other information for a specific day, usually the current day, I find it annoying to scroll forward to future dates. I farm online resources to produce an annual almanac of rise/set and other useful planning information that I use for forward planning of my nightscape and astronomical observing activities in the local region. I teach this approach in my nightscape photography themed workshops and events, use it for planning workshops and for deep sky observing weekends I host for friends a few times per year. I have produced a collection of such information each year for many years but only shared with a few close friends. It's genesis lies in small bespoke handbooks I used to produce for eclipse chases with my late friend, Bengt Alfredsson of Sweden. Rise and set tables switch from standard to daylight savings time on the appropriate dates. Times are calculated for Brisbane.

My sincere thanks to Glenn Hughes of Sydney for proofreading the draft.

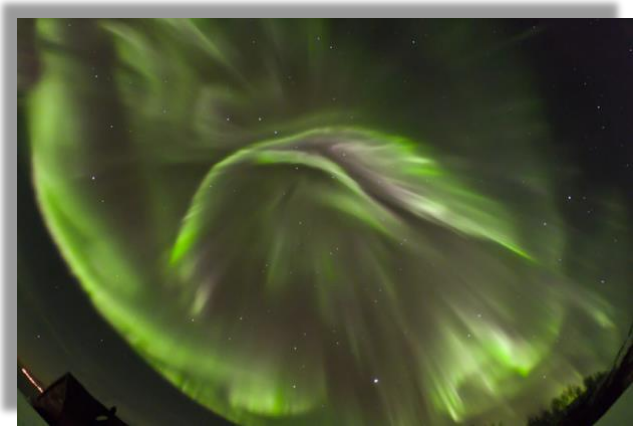


About me

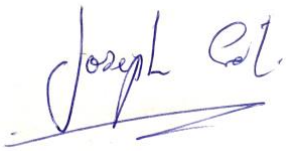
I have been an avid observer of all things astronomical and a keen photographer since the 1970's. I built my first telescope when I was 15, and my last scope ….well, I guess I haven't built or even planned it yet.

I really enjoy the meditative solitude of spending a whole night alone under the stars watching the Earth revolving. However, I equally love sharing it with close friends or introducing new people to the joys of the night sky. I have observed 15 total solar eclipses, many of them with my late friend, Bengt Alfredsson of Sweden seen in the photo above viewing through my 18 inch telescope on his last visit to Australia in 2018 a year before his death.

***Photos. Above left**, Bengt Alfredsson observing Omega Centauri through my 18" reflector.*



***Left:** A sky filling aurora lit the entire sky, and snow-covered ground beneath us on Kvaløya, Norway just one week before the 2015 total solar eclipse on Svalbard.*



Joseph Cali

Public Holidays Qld 2026

Holiday	2026
New Year's Day[1]	Thursday 1 January
Australia Day[2]	Monday 26 January
Good Friday	Friday 3 April
The day after Good Friday	Saturday 4 April
Easter Sunday[3]	Sunday 5 April
Easter Monday	Monday 6 April
Anzac Day[4]	Saturday 25 April
Labour Day[5]	Monday 4 May
Royal Show-BNE area[6]	Wednesday 12 August
King's Birthday[5]	Monday 5 October
Christmas Eve[7] (24 December) 6pm to midnight	Thursday 24 December
Christmas Day[1]	Friday 25 December
Boxing Day[1]	Saturday 26 December and Monday 28 December

2026 Moon Perigee and Apogee Distances (UT)
(micromoons and super moons)

Perigee				Apogee			
Jan 1	21:45	360347 km	F−1d12h	Jan 13	20:49	405436 km	N−4d23h
Jan 29	21:54	365877 km	F−3d 0h	Feb 10	16:54	404576 km	N−6d19h
Feb 24	23:20	370131 km	F−6d12h	Mar 10	13:44	404384 km	F+7d 2h
Mar 22	11:41	366856 km	N+3d10h	Apr 7	8:33	404973 km	F+5d 6h
Apr 19	6:58	361630 km	N+1d19h	May 4	22:32	405841 km	F+3d 5h
May 17	13:49	358073 km	N+ 17h	Jun 1	4:34	406368 km +	F+ 19h
Jun 14	23:19	357195 km	N− 3h	Jun 28	7:12	406266 km +	F−1d16h
Jul 13	7:51	359110 km	N−1d 1h	Jul 25	16:46	405548 km	F−3d21h
Aug 10	11:20	363287 km	N−2d 6h	Aug 22	8:22	404642 km	F−5d19h
Sep 6	20:27	368254 km	N−4d 7h	Sep 19	3:02	404216 km	F−7d13h
Oct 1	20:42	369336 km	F+5d 3h	Oct 16	22:57	404638 km	N+6d 7h
Oct 28	18:02	364410 km	F+2d13h	Nov 13	17:51	405618 km	N+4d10h
Nov 25	20:59	359346 km	F+1d 6h	Dec 11	6:47	406420 km −−	N+2d 5h
Dec 24	8:31	356649 km ++	F+ 7h				

Full Supermoons:Jan 1, Nov 25, Dec 24 Full Micromoons:Jun 1, Jun 28

Moon Phases 2026 (UT)

New	Full
2025 Dec 20 1:44	2026 Jan 3 10:04
2026 Jan 18 19:53	2026 Feb 1 22:11
2026 Feb 17 12:03	2026 Mar 3 11:39
2026 Mar 19 1:26	2026 Apr 2 2:13
2026 Apr 17 11:54	2026 May 1 17:25
2026 May 16 20:03	2026 May 31 8:47
2026 Jun 15 2:56	2026 Jun 29 23:58
2026 Jul 14 9:45	2026 Jul 29 14:37
2026 Aug 12 17:38	2026 Aug 28 4:20
2026 Sep 11 3:27	2026 Sep 26 16:50
2026 Oct 10 15:50	2026 Oct 26 4:13
2026 Nov 9 7:03	2026 Nov 24 14:55
2026 Dec 9 0:53	2026 Dec 24 1:30
2027 Jan 7 20:25	

SOURCE: FOURMILAB Lunar apogee and perigee calculator
https://www.fourmilab.ch/earthview/pacalc.html

Moon Phases 2026

Moon Calendar 2026 with all the **moon phases** of the year. Check here all the moon phases of every month of 2026 in *Australia*.

Source: https://www.calendarr.com/australia/lunar-calendar-2026/

You can also download your own print resolution Moon phase chart from BBC Sky at Night: Print at A3-A2 for best readability
https://www.skyatnightmagazine.com/advice/moon-phases-moonrise-times

2026 Sky Event Almanac

Australian Eastern Standard Time

January - June

Date	AEST (h:m)	Even
Jan 02	07:43	Moon at Perigee: 360348 km
03	20:03	FULL MOON
04	03	Earth at Perihelion: 0.98330 AU
04	08	Quadrantid Meteor Shower
04	08:01	Jupiter 3.7°S of Moon
04	13:28	Pollux 3.0°N of Moon
06	21	Mercury at Aphelion
07	02	Venus at Superior Conjunction
07	02:20	Regulus 0.5°S of Moon
07	21:22	Moon at Descending Node
09	20	Mars in Conjunction with Sun
10	18	Jupiter at Opposition
11	01:48	LAST QUARTER MOON
11	09:50	Spica 1.6°N of Moon
14	06:48	Moon at Apogee: 405437 km
15	05:28	Antares 0.6°N of Moon
19	05:52	NEW MOON
22	02	Mercury at Superior Conjunction
22	10:03	Moon at Ascending Node
23	06	Venus at Aphelion
23	22:31	Saturn 4.3°S of Moon
26	14:47	FIRST QUARTER MOON
28	07:07	Pleiades 1.1°S of Moon
30	07:53	Moon at Perigee: 365878 km
31	12:31	Jupiter 3.8°S of Moon
31	23:45	Pollux 3.0°N of Moon
Feb 02	08:09	FULL MOON
03	12:48	Regulus 0.4°S of Moon
04	05:18	Moon at Descending Node
07	18:26	Spica 1.8°N of Moon
09	22:43	LAST QUARTER MOON
11	02:52	Moon at Apogee: 404577 km
11	13:19	Antares 0.7°N of Moon
17	22:01	NEW MOON
17	22:12	Annular Solar Eclipse; mag=0.963
18	16:19	Moon at Ascending Node
19	09:03	Mercury 0.1°N of Moon: Occn.
19	21	Mercury at Perihelion
20	04	Mercury at Greatest Elong: 18.1°E
20	09:54	Saturn 4.6°S of Moon
24	12:43	Pleiades 1.2°S of Moon
24	22:28	FIRST QUARTER MOON
25	09:18	Moon at Perigee: 370132 km
27	16:26	Jupiter 4.0°S of Moon
28	07:34	Pollux 3.0°N of Moon
Mar 02	22:00	Regulus 0.4°S of Moon
03	14:35	Moon at Descending Node
03	21:34	Total Lunar Eclipse; mag=1.151
03	21:38	FULL MOON
07	03:24	Spica 1.8°N of Moon
07	21	Mercury at Inferior Conjunction
10	21:32	Antares 0.7°N of Moon
10	23:43	Moon at Apogee: 404385 km
11	19:39	LAST QUARTER MOON
16	05	Mercury 3.4°N of Mars
18	00:07	Mercury 2.0°N of Moon
18	01:22	Moon at Ascending Node
18	07:51	Mars 1.5°S of Moon
19	11:23	NEW MOON
20	22:39	Venus 4.6°S of Moon
21	00:46	Vernal Equinox
22	20	Neptune in Conjunction with Sun
22	21:40	Moon at Perigee: 366858 km
23	18:32	Pleiades 1.1°S of Moon
25	18	Saturn in Conjunction with Sun
26	05:18	FIRST QUARTER MOON
26	17	Mars at Perihelion: 1.38126 AU
26	22:13	Jupiter 3.9°S of Moon
27	13:18	Pollux 3.0°N of Moon
30	05:00	Regulus 0.4°S of Moon
30	21:34	Moon at Descending Node
Apr 02	12:12	FULL MOON
03	11:32	Spica 1.8°N of Moon
04	09	Mercury at Greatest Elong: 27.8°W
07	05:21	Antares 0.6°N of Moon
07	18:32	Moon at Apogee: 404974 km
10	14:52	LAST QUARTER MOON
14	09:43	Moon at Ascending Node
16	10:45	Mars 3.7°S of Moon
17	21:52	NEW MOON
19	16:57	Moon at Perigee: 361631 km
19	18:49	Venus 4.8°S of Moon
20	02:28	Pleiades 1.0°S of Moon

July - December

Date	AEST (h:m)	Even
Jul 01	20	Mercury at Aphelion
04	17:51	Moon at Ascending Node
07	04	Earth at Aphelion: 1.01664 AU
08	05:29	LAST QUARTER MOON
10	00:36	Venus 0.9°N of Regulus
11	08:54	Pleiades 1.1°S of Moon
13	11	Mercury at Inferior Conjunction
13	17:50	Moon at Perigee: 359111 km
14	19:43	NEW MOON
17	10:07	Regulus 0.5°N of Moon
17	10:27	Moon at Descending Node
18	02:31	Venus 2.0°N of Moon
21	13:21	Spica 2.4°N of Moon
21	21:06	FIRST QUARTER MOON
25	07:00	Antares 0.6°N of Moon
26	02:45	Moon at Apogee: 405549 km
28	20	Delta-Aquarid Meteor Shower
29	22	Jupiter in Conjunction with Sun
30	00:36	FULL MOON
31	21:54	Moon at Ascending Node
Aug 02	18	Mercury at Greatest Elong: 19.5°W
06	12:21	LAST QUARTER MOON
07	16:23	Pleiades 1.2°S of Moon
09	15:31	Mars 4.4°S of Moon
10	21:18	Moon at Perigee: 363288 km
11	08:38	Pollux 3.6°N of Moon
11	22:48	Mercury 2.1°S of Moon
13	03:37	NEW MOON
13	03:46	Total Solar Eclipse; mag=1.039
13	12	Perseid Meteor Shower
13	19:56	Moon at Descending Node
14	19	Mercury at Perihelion
15	16	Venus at Greatest Elong: 45.9°E
16	18:47	Venus 2.1°N of Moon
17	21:49	Spica 2.4°N of Moon
20	12:46	FIRST QUARTER MOON
21	14:18	Antares 0.6°N of Moon
22	18:20	Moon at Apogee: 404644 km
28	03	Mercury at Superior Conjunction
28	04:47	Moon at Ascending Node
28	14:13	Partial Lunar Eclipse; mag=0.930
28	14:18	FULL MOON
Sep 01	23:24	Venus 1.2°S of Spica
03	22:03	Pleiades 1.2°S of Moon
04	17:51	LAST QUARTER MOON
07	04:24	Mars 3.0°S of Moon
07	06:26	Moon at Perigee: 368255 km
07	16:32	Pollux 3.6°N of Moon
09	04:13	Jupiter 0.8°S of Moon: Occn.
10	05:17	Moon at Descending Node
10	05:36	Regulus 0.5°N of Moon
11	13:27	NEW MOON
14	06:53	Spica 2.4°N of Moon
14	21:10	Venus 0.5°S of Moon: Occn.
17	22:18	Antares 0.6°N of Moon
19	06:44	FIRST QUARTER MOON
19	13:00	Moon at Apogee: 404217 km
23	10:06	Autumnal Equinox
24	12:40	Moon at Ascending Node
26	10	Neptune at Opposition
26	11:49	Mercury 0.8°N of Spica
27	02:49	FULL MOON
Oct 01	03:39	Pleiades 1.1°S of Moon
02	06:41	Moon at Perigee: 369338 km
03	23:25	LAST QUARTER MOON
04	22	Saturn at Opposition
04	22:27	Pollux 3.8°N of Moon
05	15:30	Mars 1.2°S of Moon: Occn.
06	20:18	Jupiter 0.2°S of Moon: Occn.
07	11:19	Moon at Descending Node
07	12:57	Regulus 0.6°N of Moon
11	01:50	NEW MOON
12	12:30	Venus 3.1°S of Moon
12	20	Mercury at Greatest Elong: 25.2°E
13	06:08	Mercury 2.1°N of Moon
15	06:25	Antares 0.4°N of Moon
17	08:56	Moon at Apogee: 404639 km
19	02:13	FIRST QUARTER MOON
21	18:53	Moon at Ascending Node
22	04	Orionid Meteor Shower
24	13	Venus at Inferior Conjunction
26	14:12	FULL MOON
28	11:11	Pleiades 1.0°S of Moon

2026 Sky Event Almanac

Australian Eastern Standard Time

January - June

	20	05	Mars 1.2°N of Saturn
	20	20	Mercury 0.5°S of Saturn
	21	08	Mercury 1.7°S of Mars
	23	05	Lyrid Meteor Shower
	23	08:06	Jupiter 3.6°S of Moon
	23	18:59	Pollux 3.2°N of Moon
	24	12:32	FIRST QUARTER MOON
	24	14:17	Venus 3.4°S of Pleiades
	26	10:37	Regulus 0.2°S of Moon
	27	00:36	Moon at Descending Node
	30	18:17	Spica 1.8°N of Moon
May	02	03:23	FULL MOON
	04	12:20	Antares 0.5°N of Moon
	05	08:30	Moon at Apogee: 405843 km
	05	18	Eta-Aquarid Meteor Shower
	10	07:10	LAST QUARTER MOON
	11	14:36	Moon at Ascending Node
	15	00	Mercury at Superior Conjunction
	15	14	Venus at Perihelion
	17	06:01	NEW MOON
	17	23:48	Moon at Perigee: 358074 km
	18	20	Mercury at Perihelion
	19	11:50	Venus 2.9°S of Moon
	20	22:39	Jupiter 3.1°S of Moon
	21	02:30	Pollux 3.4°N of Moon
	23	02	Uranus in Conjunction with Sun
	23	16:41	Regulus 0.0°N of Moon
	23	21:11	FIRST QUARTER MOON
	24	01:26	Moon at Descending Node
	28	00:09	Spica 1.9°N of Moon
	31	18:32	Antares 0.4°N of Moon
	31	18:45	FULL MOON
Jun	01	14:32	Moon at Apogee: 406369 km
	07	16:19	Moon at Ascending Node
	08	02:17	Venus 4.6°S of Pollux
	08	20:00	LAST QUARTER MOON
	10	06	Venus 1.6°N of Jupiter
	13	23:15	Pleiades 1.0°S of Moon
	15	09:18	Moon at Perigee: 357196 km
	15	12:54	NEW MOON
	16	06	Mercury at Greatest Elong: 24.5°E
	17	05:32	Mercury 2.6°S of Moon
	17	12:08	Pollux 3.6°N of Moon
	17	16:54	Jupiter 2.5°S of Moon
	18	06:21	Venus 0.3°S of Moon: Occn.
	20	00:31	Regulus 0.3°N of Moon
	20	03:57	Moon at Descending Node
	21	18:25	Summer Solstice
	22	07:55	FIRST QUARTER MOON
	24	06:11	Spica 2.2°N of Moon
	25	22	Mercury 3.8°S of Jupiter
	28	00:32	Antares 0.5°N of Moon
	28	17:11	Moon at Apogee: 406267 km
	29	04:32	Mars 4.3°S of Pleiades
	30	09:57	FULL MOON

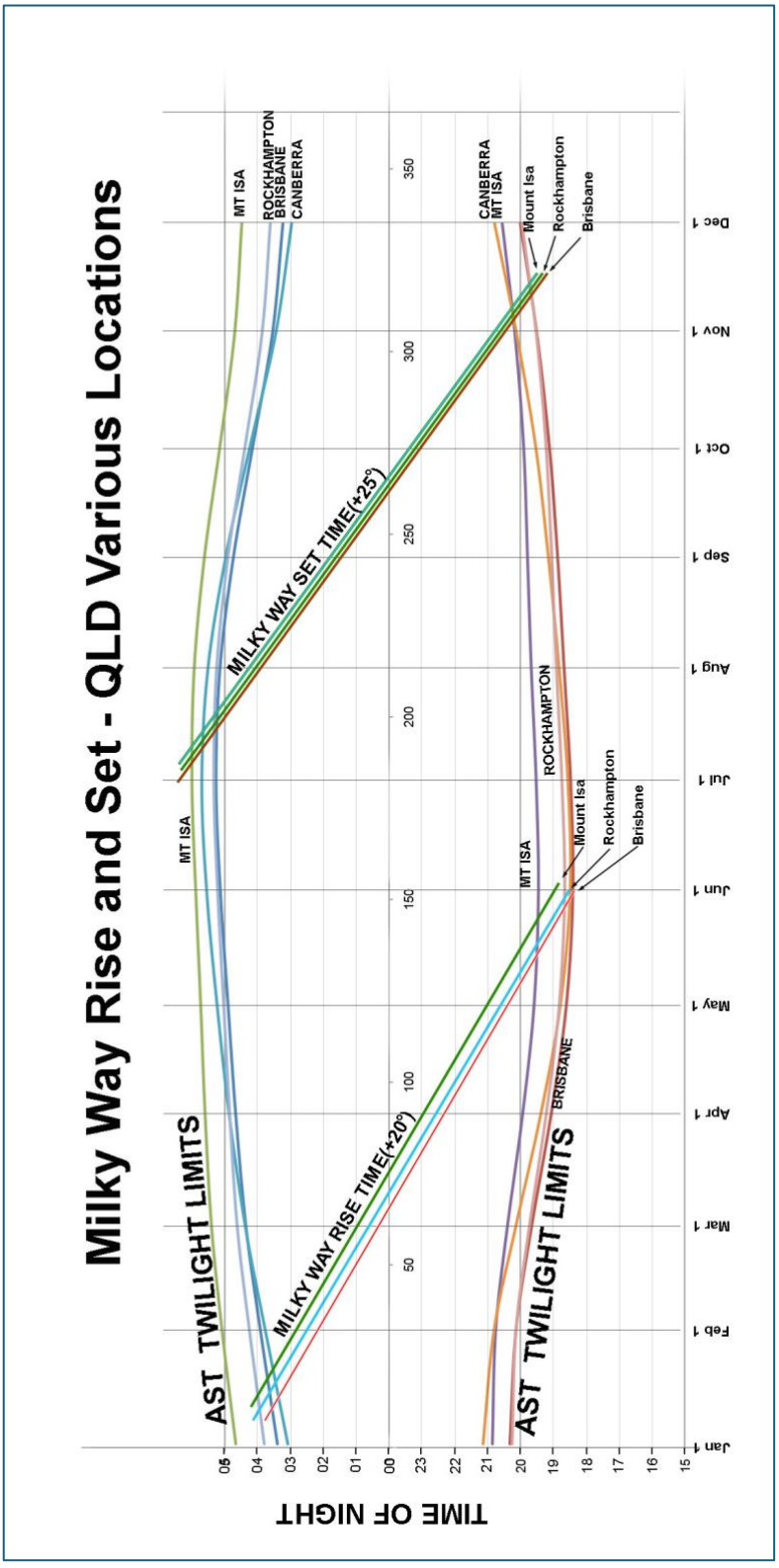
July - December

	29	04:01	Moon at Perigee: 364411 km
Nov	01	04:00	Pollux 4.0°N of Moon
	02	06:28	LAST QUARTER MOON
	03	00:23	Mars 1.1°N of Moon: Occn.
	03	09:11	Jupiter 0.5°N of Moon: Occn.
	03	13:02	Moon at Descending Node
	03	18:40	Regulus 0.8°N of Moon
	05	00	Mercury at Inferior Conjunction
	06	05	S Taurid Meteor Shower
	07	21:31	Venus 1.1°N of Moon: Occn.
	07	22:40	Spica 2.4°N of Moon
	09	17:02	NEW MOON
	10	19	Mercury at Perihelion
	10	23:49	Venus 0.1°S of Spica
	11	13:58	Antares 0.3°N of Moon
	13	04	N Taurid Meteor Shower
	14	03:50	Moon at Apogee: 405619 km
	16	14	Mars 1.2°N of Jupiter
	17	21:48	FIRST QUARTER MOON
	17	21:49	Moon at Ascending Node
	18	10	Leonid Meteor Shower
	21	09	Mercury at Greatest Elong: 19.6°W
	24	21:18	Pleiades 0.9°S of Moon
	25	00:53	FULL MOON
	25	17:47	Mars 1.6°N of Regulus
	26	06:58	Moon at Perigee: 359348 km
	26	09	Uranus at Opposition
	28	11:27	Pollux 4.2°N of Moon
	30	13:34	Moon at Descending Node
	30	19:18	Jupiter 1.2°N of Moon: Occn.
Dec	01	00:35	Regulus 1.1°N of Moon
	01	05:32	Mars 3.3°N of Moon
	01	16:09	LAST QUARTER MOON
	05	04:36	Spica 2.5°N of Moon
	09	10:52	NEW MOON
	11	16:46	Moon at Apogee: 406421 km
	13	01:35	Jupiter 1.3°N of Regulus
	14	23:04	Moon at Ascending Node
	14	23	Geminid Meteor Shower
	17	15:43	FIRST QUARTER MOON
	22	06:50	Winter Solstice
	22	08:37	Pleiades 1.0°S of Moon
	23	08	Ursid Meteor Shower
	24	11:28	FULL MOON
	24	18	Mercury at Aphelion
	24	18:30	Moon at Perigee: 356650 km
	25	21:41	Pollux 4.4°N of Moon
	26	07	Venus at Perihelion
	27	17:55	Moon at Descending Node
	28	03:32	Jupiter 1.5°N of Moon
	28	08:44	Regulus 1.4°N of Moon
	31	04:59	LAST QUARTER MOON

Terms Used in Sky Event Almanac

Perihelion - instant when a planet is closest to the Sun
Aphelion - instant when a planet is furthest from the Sun
Perigee - instant when the Moon is closest to Earth
Apogee - instant when the Moon is furthest from Earth
Inferior Conjunction - instant when a planet (Mercury or Venus) passes between Earth and the Sun
Superior Conjunction - instant when a planet (Mercury or Venus) passes on the opposite side of the Sun from **Earth**
Greatest Elongation - the maximum angular separation between the Sun and the planet (Mercury or Venus) as seen from Earth
- during eastern elongation (E), the planet appears as an evening star;
- during western elongation (W), the planet appears as a morning star
Opposition - instant when a planet appears opposite the Sun as seen from Earth
Conjunction - instant when a planet appears closest the Sun as seen from Earth
Occultation - the Moon occults or eclipses a star or planet
Ascending Node - point where the Moon crosses from the southern to northern portion of its orbit
Descending Node - point where the Moon crosses from the northern to the southern portion of its orbit
Aldebaran - bright star in the constellation Taurus
Pollux - bright star in the constellation Gemini
Regulus - bright star in the constellation Leo
Spica - bright star in the constellation Virgo
Antares - bright star in the constellation Scorpius
Pleiades - bright star cluster in the constellation Taurus

Source: Fred Espenak / https://astropixels.com/almanac/almanac21/almanac2026aest.html



Milky Way Rise and Set

This diagram plots the times when the Milky Way rises and sets. I have adopted a definition of rise and set that the galactic centre must be 20°-25° above the horizon which is usually a good altitude at which to photograph it because it is such a big object.

The sloped lines cover times when the galactic centre is at those 20°-25° above the east west horizon positions during astronomical darkness. The twilight curves are plotted.

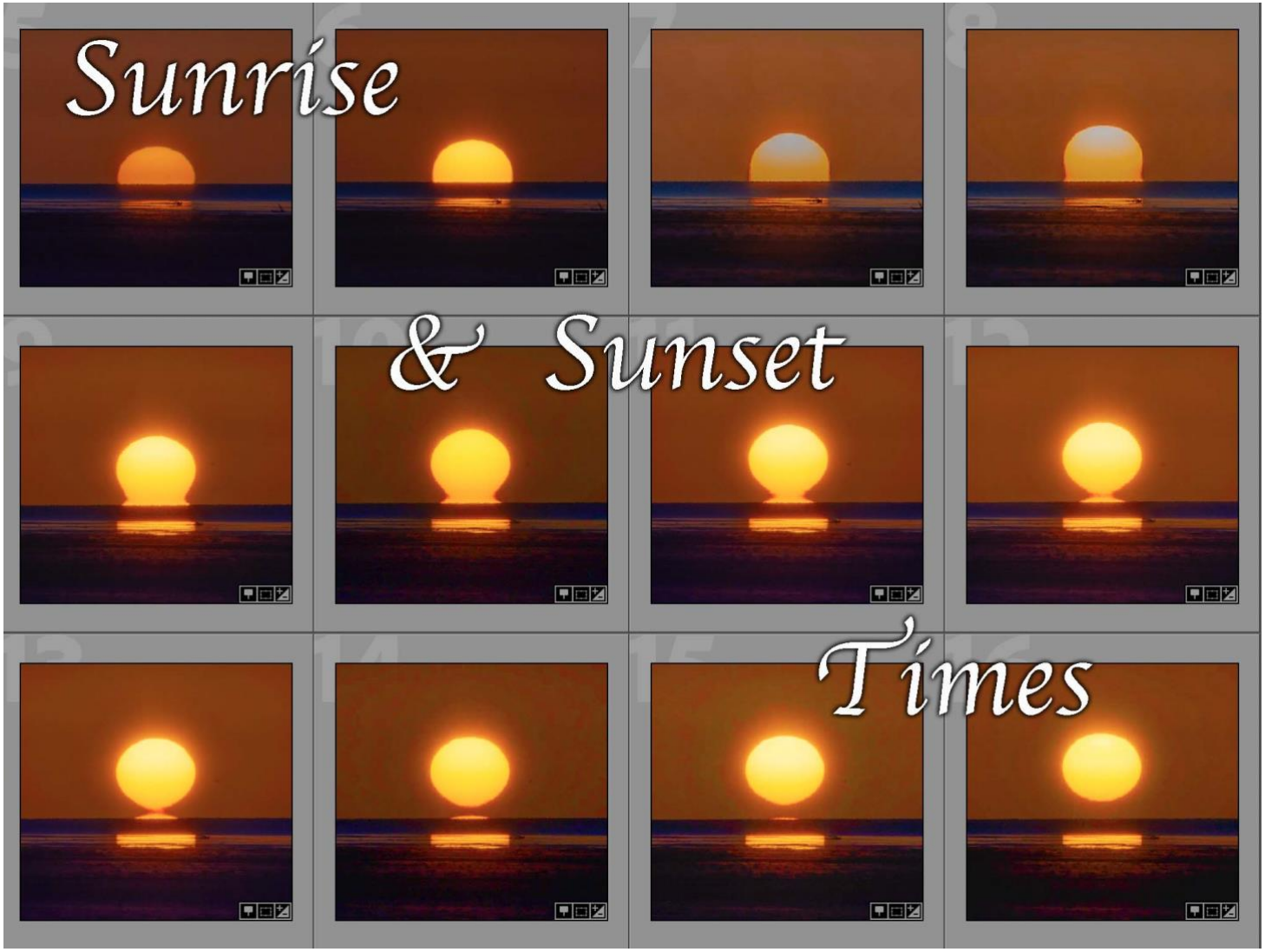


Photo: Sunrise at Kati Thanda Lake Eyre – Joe Cali

Times Of Sunrise And Sunset

Criteria

Latitude	Longitude	Date
27° 28' S	153° 1' E	2026 AEST

Results

Times Of Sunrise And Sunset												
	Jan		Feb		Mar		Apr		May		Jun	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	04:56	18:47	05:21	18:42	05:41	18:20	05:58	17:46	06:13	17:17	06:30	17:01
2	04:57	18:47	05:21	18:42	05:41	18:19	05:58	17:45	06:14	17:16	06:31	17:01
3	04:58	18:47	05:22	18:41	05:42	18:18	05:59	17:44	06:14	17:15	06:31	17:01
4	04:58	18:47	05:23	18:41	05:42	18:17	05:59	17:43	06:15	17:15	06:32	17:01
5	04:59	18:47	05:24	18:40	05:43	18:16	06:00	17:42	06:16	17:14	06:32	17:01
6	05:00	18:48	05:25	18:39	05:44	18:15	06:00	17:41	06:16	17:13	06:33	17:01
7	05:00	18:48	05:25	18:39	05:44	18:14	06:01	17:40	06:17	17:12	06:33	17:01
8	05:01	18:48	05:26	18:38	05:45	18:13	06:01	17:39	06:17	17:12	06:33	17:01
9	05:02	18:48	05:27	18:37	05:45	18:12	06:02	17:38	06:18	17:11	06:34	17:01
10	05:03	18:48	05:28	18:37	05:46	18:11	06:02	17:37	06:18	17:10	06:34	17:01
11	05:04	18:48	05:28	18:36	05:46	18:10	06:03	17:36	06:19	17:10	06:35	17:01
12	05:04	18:48	05:29	18:35	05:47	18:09	06:03	17:35	06:20	17:09	06:35	17:01
13	05:05	18:48	05:30	18:34	05:48	18:07	06:04	17:34	06:20	17:09	06:35	17:01
14	05:06	18:48	05:31	18:34	05:48	18:06	06:04	17:33	06:21	17:08	06:36	17:01
15	05:07	18:48	05:31	18:33	05:49	18:05	06:05	17:32	06:21	17:08	06:36	17:01
16	05:08	18:48	05:32	18:32	05:49	18:04	06:05	17:31	06:22	17:07	06:36	17:01
17	05:08	18:47	05:33	18:31	05:50	18:03	06:06	17:30	06:22	17:06	06:37	17:01
18	05:09	18:47	05:33	18:30	05:50	18:02	06:06	17:29	06:23	17:06	06:37	17:01
19	05:10	18:47	05:34	18:30	05:51	18:01	06:07	17:28	06:23	17:06	06:37	17:01
20	05:11	18:47	05:35	18:29	05:51	18:00	06:07	17:27	06:24	17:05	06:37	17:02
21	05:12	18:47	05:35	18:28	05:52	17:59	06:08	17:26	06:25	17:05	06:38	17:02
22	05:12	18:46	05:36	18:27	05:52	17:57	06:08	17:25	06:25	17:04	06:38	17:02
23	05:13	18:46	05:37	18:26	05:53	17:56	06:09	17:24	06:26	17:04	06:38	17:02
24	05:14	18:46	05:37	18:25	05:53	17:55	06:10	17:23	06:26	17:03	06:38	17:03
25	05:15	18:45	05:38	18:24	05:54	17:54	06:10	17:22	06:27	17:03	06:38	17:03
26	05:16	18:45	05:39	18:23	05:54	17:53	06:11	17:21	06:27	17:03	06:38	17:03
27	05:17	18:45	05:39	18:22	05:55	17:52	06:11	17:20	06:28	17:03	06:39	17:03
28	05:17	18:44	05:40	18:21	05:56	17:51	06:12	17:19	06:28	17:02	06:39	17:04
29	05:18	18:44			05:56	17:50	06:12	17:19	06:29	17:02	06:39	17:04
30	05:19	18:43			05:57	17:49	06:13	17:18	06:29	17:02	06:39	17:04
31	05:20	18:43			05:57	17:47			06:30	17:02		

Times Of Sunrise And Sunset												
	Jul		Aug		Sep		Oct		Nov		Dec	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	06:39	17:05	06:29	17:19	06:02	17:35	05:27	17:48	04:57	18:06	04:45	18:29
2	06:39	17:05	06:29	17:20	06:01	17:35	05:26	17:49	04:56	18:07	04:45	18:30
3	06:39	17:05	06:28	17:20	06:00	17:35	05:25	17:49	04:56	18:08	04:45	18:30
4	06:39	17:06	06:27	17:21	05:58	17:36	05:24	17:50	04:55	18:08	04:45	18:31
5	06:39	17:06	06:27	17:21	05:57	17:36	05:23	17:50	04:54	18:09	04:45	18:32
6	06:39	17:07	06:26	17:22	05:56	17:37	05:22	17:51	04:54	18:10	04:45	18:33
7	06:39	17:07	06:25	17:22	05:55	17:37	05:21	17:51	04:53	18:10	04:45	18:33
8	06:39	17:08	06:24	17:23	05:54	17:38	05:20	17:52	04:52	18:11	04:45	18:34
9	06:38	17:08	06:24	17:23	05:53	17:38	05:19	17:52	04:52	18:12	04:45	18:35
10	06:38	17:08	06:23	17:24	05:52	17:39	05:18	17:53	04:51	18:13	04:46	18:36
11	06:38	17:09	06:22	17:25	05:51	17:39	05:16	17:53	04:51	18:13	04:46	18:36
12	06:38	17:09	06:21	17:25	05:49	17:39	05:15	17:54	04:50	18:14	04:46	18:37
13	06:38	17:10	06:20	17:26	05:48	17:40	05:14	17:54	04:50	18:15	04:46	18:38
14	06:37	17:10	06:19	17:26	05:47	17:40	05:13	17:55	04:49	18:16	04:47	18:38
15	06:37	17:11	06:19	17:26	05:46	17:41	05:12	17:55	04:49	18:17	04:47	18:39
16	06:37	17:11	06:18	17:27	05:45	17:41	05:11	17:56	04:48	18:17	04:47	18:39
17	06:37	17:12	06:17	17:27	05:44	17:42	05:10	17:57	04:48	18:18	04:48	18:40
18	06:36	17:12	06:16	17:28	05:43	17:42	05:09	17:57	04:47	18:19	04:48	18:41
19	06:36	17:13	06:15	17:28	05:41	17:43	05:08	17:58	04:47	18:20	04:49	18:41
20	06:36	17:13	06:14	17:29	05:40	17:43	05:07	17:58	04:47	18:20	04:49	18:42
21	06:35	17:14	06:13	17:29	05:39	17:43	05:06	17:59	04:46	18:21	04:50	18:42
22	06:35	17:14	06:12	17:30	05:38	17:44	05:05	18:00	04:46	18:22	04:50	18:43
23	06:34	17:15	06:11	17:30	05:37	17:44	05:05	18:00	04:46	18:23	04:51	18:43
24	06:34	17:15	06:10	17:31	05:36	17:45	05:04	18:01	04:46	18:24	04:51	18:44
25	06:33	17:16	06:09	17:31	05:34	17:45	05:03	18:02	04:45	18:24	04:52	18:44
26	06:33	17:16	06:08	17:32	05:33	17:46	05:02	18:02	04:45	18:25	04:52	18:44
27	06:32	17:17	06:07	17:32	05:32	17:46	05:01	18:03	04:45	18:26	04:53	18:45
28	06:32	17:17	06:06	17:33	05:31	17:47	05:00	18:03	04:45	18:27	04:53	18:45
29	06:31	17:18	06:05	17:33	05:30	17:47	04:59	18:04	04:45	18:27	04:54	18:46
30	06:31	17:18	06:04	17:34	05:29	17:48	04:59	18:05	04:45	18:28	04:55	18:46
31	06:30	17:19	06:03	17:34			04:58	18:06			04:55	18:46

Times of Astronomical Twilight

Photo: Dawn Twilight Kati Thanda Lake Eyre. © Joe Cali

Times Of Astronomical Twilight

Criteria

Latitude	Longitude	Date
27° 28' S	153° 1' E	2026 AEST

Results

Times Of Astronomical Twilight												
	Jan		Feb		Mar		Apr		May		Jun	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	03:24	20:19	03:55	20:08	04:21	19:40	04:40	19:04	04:54	18:36	05:08	18:24
2	03:25	20:19	03:56	20:07	04:22	19:39	04:41	19:03	04:55	18:36	05:08	18:24
3	03:26	20:19	03:57	20:06	04:22	19:38	04:41	19:02	04:55	18:35	05:09	18:24
4	03:27	20:19	03:58	20:06	04:23	19:36	04:42	19:01	04:55	18:34	05:09	18:24
5	03:27	20:19	03:59	20:05	04:24	19:35	04:42	18:59	04:56	18:34	05:09	18:24
6	03:28	20:19	04:00	20:04	04:24	19:34	04:43	18:58	04:56	18:33	05:10	18:24
7	03:29	20:19	04:01	20:03	04:25	19:33	04:43	18:57	04:57	18:32	05:10	18:24
8	03:30	20:19	04:02	20:02	04:26	19:32	04:44	18:56	04:57	18:32	05:10	18:24
9	03:31	20:19	04:03	20:01	04:27	19:31	04:44	18:55	04:58	18:31	05:11	18:24
10	03:32	20:19	04:04	20:00	04:27	19:29	04:44	18:54	04:58	18:31	05:11	18:24
11	03:33	20:18	04:05	19:59	04:28	19:28	04:45	18:53	04:59	18:30	05:11	18:24
12	03:34	20:18	04:06	19:58	04:29	19:27	04:45	18:52	04:59	18:30	05:12	18:24
13	03:35	20:18	04:07	19:57	04:29	19:26	04:46	18:51	05:00	18:29	05:12	18:24
14	03:36	20:18	04:08	19:56	04:30	19:25	04:46	18:50	05:00	18:29	05:12	18:24
15	03:37	20:17	04:09	19:55	04:31	19:23	04:47	18:49	05:00	18:28	05:13	18:24
16	03:38	20:17	04:10	19:54	04:31	19:22	04:47	18:48	05:01	18:28	05:13	18:24
17	03:39	20:17	04:11	19:53	04:32	19:21	04:48	18:48	05:01	18:28	05:13	18:24
18	03:40	20:16	04:12	19:52	04:32	19:20	04:48	18:47	05:02	18:27	05:14	18:25
19	03:41	20:16	04:12	19:51	04:33	19:19	04:49	18:46	05:02	18:27	05:14	18:25
20	03:42	20:16	04:13	19:50	04:34	19:18	04:49	18:45	05:03	18:26	05:14	18:25
21	03:43	20:15	04:14	19:49	04:34	19:16	04:50	18:44	05:03	18:26	05:14	18:25
22	03:44	20:15	04:15	19:48	04:35	19:15	04:50	18:43	05:04	18:26	05:14	18:25
23	03:45	20:14	04:16	19:47	04:35	19:14	04:50	18:42	05:04	18:26	05:15	18:26
24	03:46	20:13	04:17	19:46	04:36	19:13	04:51	18:41	05:04	18:25	05:15	18:26
25	03:47	20:13	04:18	19:45	04:36	19:12	04:51	18:41	05:05	18:25	05:15	18:26
26	03:49	20:12	04:18	19:43	04:37	19:11	04:52	18:40	05:05	18:25	05:15	18:26
27	03:50	20:12	04:19	19:42	04:37	19:09	04:52	18:39	05:06	18:25	05:15	18:27
28	03:51	20:11	04:20	19:41	04:38	19:08	04:53	18:38	05:06	18:24	05:15	18:27
29	03:52	20:10			04:39	19:07	04:53	18:38	05:07	18:24	05:16	18:27
30	03:53	20:10			04:39	19:06	04:54	18:37	05:07	18:24	05:16	18:28
31	03:54	20:09			04:40	19:05			05:07	18:24		

Times Of Astronomical Twilight												
	Jul		Aug		Sep		Oct		Nov		Dec	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	05:16	18:28	05:09	18:40	04:44	18:52	04:09	19:06	03:33	19:30	03:14	19:59
2	05:16	18:28	05:08	18:40	04:43	18:53	04:08	19:07	03:33	19:31	03:14	20:00
3	05:16	18:29	05:08	18:41	04:42	18:53	04:07	19:08	03:32	19:32	03:14	20:01
4	05:16	18:29	05:07	18:41	04:41	18:53	04:05	19:08	03:31	19:33	03:14	20:02
5	05:16	18:29	05:07	18:41	04:40	18:54	04:04	19:09	03:30	19:34	03:14	20:03
6	05:16	18:30	05:06	18:42	04:39	18:54	04:03	19:10	03:29	19:34	03:14	20:04
7	05:16	18:30	05:05	18:42	04:38	18:55	04:02	19:10	03:28	19:35	03:14	20:05
8	05:16	18:30	05:05	18:43	04:36	18:55	04:01	19:11	03:27	19:36	03:14	20:06
9	05:16	18:31	05:04	18:43	04:35	18:56	03:59	19:11	03:26	19:37	03:14	20:07
10	05:16	18:31	05:03	18:43	04:34	18:56	03:58	19:12	03:25	19:38	03:14	20:07
11	05:16	18:31	05:03	18:44	04:33	18:56	03:57	19:13	03:25	19:39	03:14	20:08
12	05:15	18:32	05:02	18:44	04:32	18:57	03:56	19:13	03:24	19:40	03:14	20:09
13	05:15	18:32	05:01	18:45	04:31	18:57	03:55	19:14	03:23	19:41	03:14	20:10
14	05:15	18:33	05:00	18:45	04:30	18:58	03:53	19:15	03:22	19:42	03:14	20:10
15	05:15	18:33	05:00	18:45	04:28	18:58	03:52	19:16	03:22	19:43	03:15	20:11
16	05:15	18:33	04:59	18:46	04:27	18:59	03:51	19:16	03:21	19:44	03:15	20:12
17	05:15	18:34	04:58	18:46	04:26	18:59	03:50	19:17	03:20	19:45	03:15	20:12
18	05:14	18:34	04:57	18:47	04:25	19:00	03:49	19:18	03:20	19:46	03:16	20:13
19	05:14	18:35	04:56	18:47	04:24	19:00	03:47	19:19	03:19	19:48	03:16	20:14
20	05:14	18:35	04:56	18:47	04:23	19:01	03:46	19:19	03:19	19:49	03:17	20:14
21	05:13	18:35	04:55	18:48	04:21	19:01	03:45	19:20	03:18	19:50	03:17	20:15
22	05:13	18:36	04:54	18:48	04:20	19:02	03:44	19:21	03:18	19:51	03:17	20:15
23	05:13	18:36	04:53	18:49	04:19	19:02	03:43	19:22	03:17	19:52	03:18	20:16
24	05:12	18:37	04:52	18:49	04:18	19:03	03:42	19:23	03:17	19:53	03:19	20:16
25	05:12	18:37	04:51	18:49	04:16	19:03	03:41	19:24	03:16	19:54	03:19	20:17
26	05:12	18:37	04:50	18:50	04:15	19:04	03:40	19:24	03:16	19:55	03:20	20:17
27	05:11	18:38	04:49	18:50	04:14	19:04	03:39	19:25	03:15	19:56	03:20	20:17
28	05:11	18:38	04:48	18:51	04:13	19:05	03:38	19:26	03:15	19:57	03:21	20:18
29	05:10	18:39	04:47	18:51	04:12	19:05	03:37	19:27	03:15	19:58	03:22	20:18
30	05:10	18:39	04:46	18:51	04:10	19:06	03:35	19:28	03:15	19:58	03:22	20:18
31	05:09	18:39	04:45	18:52			03:34	19:29			03:23	20:18


Rise and Set of the Moon

Times Of Moonrise And Moonset

Criteria

Latitude	Longitude	Date
27° 28' S	153° 1' E	2026 AEST

Results

Times Of Moonrise And Moonset												
	Jan		Feb		Mar		Apr		May		Jun	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	16:41	02:03	18:23	04:05	16:59	02:57	17:09	04:52	16:42	05:32	17:25	07:10
2	17:51	03:01	19:04	05:14	17:36	04:03	17:39	05:48	17:17	06:28	18:17	08:03
3	18:54	04:07	19:39	06:20	18:09	05:06	18:09	06:44	17:56	07:25	19:12	08:51
4	19:48	05:18	20:11	07:22	18:39	06:05	18:42	07:40	18:41	08:21	20:09	09:35
5	20:33	06:29	20:41	08:20	19:09	07:03	19:19	08:37	19:30	09:16	21:06	10:13
6	21:11	07:37	21:10	09:17	19:39	07:59	19:59	09:34	20:23	10:07	22:02	10:48
7	21:44	08:40	21:40	10:12	20:10	08:55	20:45	10:30	21:18	10:54	22:59	11:20
8	22:14	09:39	22:12	11:07	20:44	09:51	21:35	11:23	22:15	11:36	23:55	11:51
9	22:43	10:35	22:47	12:03	21:22	10:48	22:30	12:13	23:13	12:14		12:20
10	23:12	11:29	23:27	12:59	22:04	11:44	23:27	12:59		12:48	00:53	12:52
11	23:42	12:23		13:55	22:52	12:39		13:40	00:10	13:20	01:54	13:26
12		13:18	00:12	14:50	23:45	13:32	00:26	14:17	01:08	13:51	03:00	14:06
13	00:14	14:13	01:02	15:41		14:21	01:24	14:51	02:07	14:23	04:09	14:53
14	00:51	15:09	01:57	16:29	00:41	15:05	02:24	15:23	03:08	14:56	05:22	15:48
15	01:32	16:05	02:55	17:12	01:40	15:45	03:24	15:55	04:13	15:34	06:35	16:53
16	02:19	16:59	03:55	17:50	02:40	16:21	04:25	16:28	05:22	16:17	07:42	18:04
17	03:12	17:49	04:56	18:25	03:40	16:55	05:29	17:03	06:35	17:09	08:40	19:17
18	04:08	18:34	05:56	18:57	04:41	17:27	06:36	17:43	07:49	18:09	09:28	20:27
19	05:07	19:15	06:55	19:29	05:42	17:59	07:47	18:30	08:58	19:16	10:09	21:32
20	06:07	19:52	07:56	20:00	06:44	18:32	09:00	19:24	10:00	20:27	10:44	22:33
21	07:07	20:25	08:57	20:34	07:48	19:09	10:10	20:26	10:52	21:36	11:16	23:31
22	08:05	20:56	10:01	21:11	08:56	19:50	11:14	21:33	11:35	22:42	11:45	
23	09:04	21:27	11:07	21:53	10:05	20:38	12:10	22:41	12:12	23:44	12:15	00:27
24	10:03	21:58	12:15	22:42	11:15	21:34	12:57	23:47	12:44		12:45	01:22
25	11:04	22:32	13:23	23:39	12:22	22:36	13:37		13:14	00:42	13:18	02:17
26	12:07	23:10	14:28		13:22	23:42	14:11	00:50	13:43	01:37	13:55	03:13
27	13:14	23:55	15:26	00:42	14:13		14:42	01:49	14:13	02:32	14:36	04:09
28	14:24		16:16	01:50	14:57	00:49	15:11	02:46	14:44	03:27	15:22	05:05
29	15:33	00:47			15:35	01:53	15:40	03:41	15:18	04:22	16:13	05:58
30	16:37	01:48			16:09	02:56	16:10	04:36	15:55	05:18	17:07	06:48
31	17:34	02:55			16:40	03:55			16:38	06:15		

Times Of Moonrise And Moonset												
	Jul		Aug		Sep		Oct		Nov		Dec	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	18:04	07:33	19:45	07:56	21:34	08:02	22:46	08:09		10:16		11:21
2	19:01	08:14	20:41	08:25	22:39	08:39	23:51	09:05	00:25	11:22	00:14	12:21
3	19:57	08:49	21:38	08:55	23:47	09:22		10:08	01:05	12:26	00:45	13:18
4	20:53	09:22	22:38	09:26		10:12	00:50	11:15	01:40	13:27	01:15	14:15
5	21:49	09:53	23:41	10:00	00:54	11:10	01:41	12:23	02:12	14:25	01:47	15:12
6	22:45	10:22		10:39	01:57	12:15	02:25	13:29	02:42	15:23	02:20	16:09
7	23:44	10:52	00:47	11:24	02:55	13:24	03:04	14:33	03:13	16:20	02:57	17:06
8		11:24	01:55	12:17	03:45	14:33	03:38	15:33	03:45	17:17	03:38	18:03
9	00:45	12:00	03:04	13:20	04:27	15:40	04:10	16:33	04:19	18:16	04:23	18:57
10	01:51	12:42	04:07	14:29	05:05	16:44	04:41	17:31	04:58	19:13	05:13	19:48
11	03:00	13:32	05:03	15:40	05:39	17:46	05:12	18:29	05:40	20:10	06:07	20:33
12	04:11	14:31	05:52	16:51	06:11	18:45	05:46	19:28	06:28	21:03	07:02	21:14
13	05:20	15:39	06:33	17:58	06:42	19:44	06:21	20:26	07:19	21:52	07:58	21:50
14	06:23	16:51	07:09	19:01	07:14	20:42	07:01	21:24	08:13	22:36	08:53	22:22
15	07:16	18:04	07:42	20:02	07:48	21:41	07:46	22:19	09:09	23:15	09:47	22:52
16	08:01	19:13	08:13	21:01	08:25	22:39	08:34	23:11	10:05	23:50	10:41	23:21
17	08:40	20:18	08:44	21:58	09:07	23:35	09:27	23:58	11:00		11:36	23:51
18	09:14	21:19	09:17	22:56	09:52		10:22		11:55	00:22	12:32	
19	09:45	22:17	09:51	23:53	10:43	00:29	11:19	00:41	12:51	00:52	13:31	00:22
20	10:15	23:14	10:30		11:37	01:19	12:15	01:18	13:48	01:22	14:34	00:56
21	10:46		11:12	00:50	12:33	02:05	13:12	01:53	14:47	01:53	15:42	01:35
22	11:18	00:10	12:00	01:46	13:31	02:46	14:08	02:24	15:50	02:26	16:54	02:22
23	11:54	01:06	12:52	02:38	14:28	03:22	15:06	02:55	16:58	03:04	18:04	03:19
24	12:33	02:03	13:47	03:26	15:25	03:56	16:05	03:26	18:09	03:48	19:10	04:24
25	13:17	02:59	14:45	04:10	16:23	04:27	17:07	03:58	19:21	04:40	20:07	05:37
26	14:07	03:53	15:42	04:49	17:21	04:58	18:13	04:33	20:29	05:42	20:56	06:50
27	15:00	04:44	16:40	05:24	18:21	05:29	19:22	05:14	21:29	06:50	21:37	08:01
28	15:57	05:31	17:37	05:57	19:24	06:02	20:33	06:01	22:20	08:02	22:13	09:09
29	16:54	06:13	18:34	06:28	20:30	06:38	21:41	06:56	23:04	09:12	22:46	10:11
30	17:52	06:50	19:32	06:58	21:38	07:20	22:44	07:59	23:41	10:19	23:17	11:11
31	18:48	07:24	20:32	07:29			23:39	09:07			23:48	12:09

Eclipses of 2026

Total lunar eclipse on March 3rd, 2026.

Only one eclipse is visible from SE Qld in 2026. A total lunar eclipse commences soon after moonrise on Wednesday March 3rd, 2026. Moonrise occurs at 18:09 AEST and the penumbral eclipse begins at 18:44 AEST almost 1 hr before astronomical twilight (19:38 AEST).

Lunar Eclipse Contacts

Eclipse Event	Contact	Time (AEST)
Moonrise/Sunset	-	18:09
Sunset		18:18
Penumbral Begins	P1	18:43:57.6
Civil Twilight		18:42
Nautical Twilight		19:09
Astronomical Twilight		19:38
Partial Begins	U1	19:49:36.6
Total Begins	U2	21:03:54.4
Greatest Eclipse	Greatest	21:33:40.0
Total Ends	U3	22:02:52.6
Partial Ends	U4	23:17:25.9
Penumbral Ends	P4	00:23:18.6

Contact times courtesy the late Fred Espenak/ https://EclipseWise.com

Solar Eclipses 2026

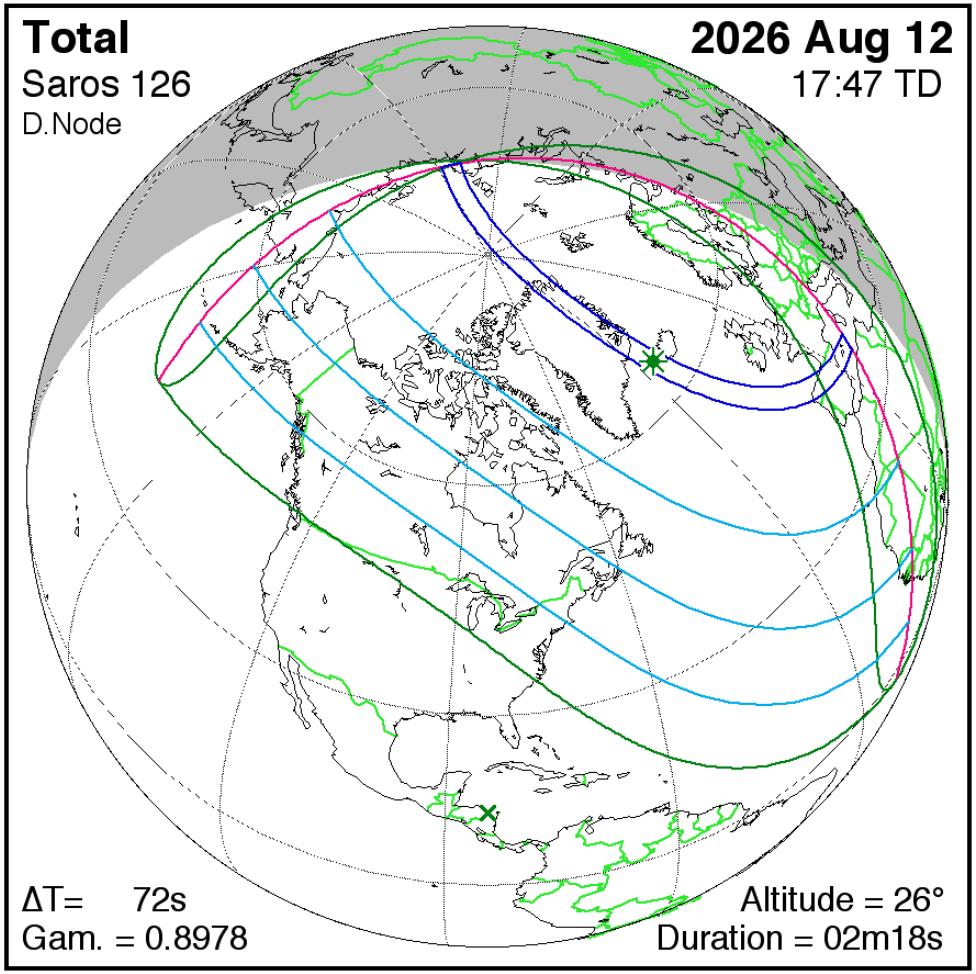
Two solar eclipses occur in 2026. An annular eclipse is visible from Antarctica on February 17th. The path of annularity will be difficult and expensive to access. Very small obscuration partial eclipses are visible from South Africa, Patagonia, and Tierra Del Fuego.

A total solar eclipse is visible on August 12th from Greenland, Iceland, and northern Spain. Weather around the Arctic Circle is mostly 80-90% cloudy. Weather prospects in Central Northern Spain are much better.

Eclipse circumstances and maps
http://www.EclipseWise.com/eclipse.html

Weather prospects
https://eclipsophile.com/tse2026/

www.EclipseWise.com/eclipse.html



Thousand Year Canon of Solar Eclipses

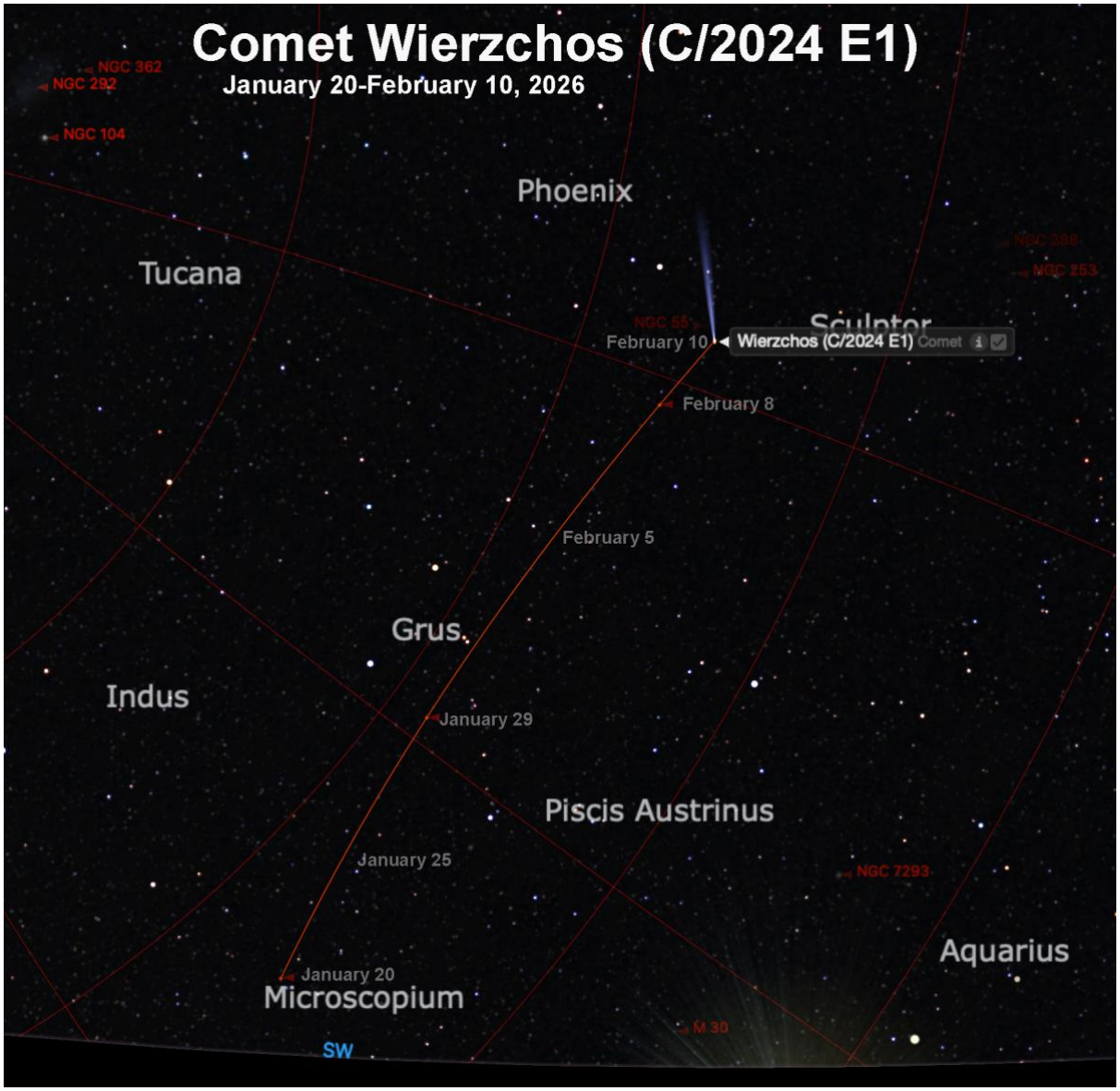
Upcoming Comets 2026

No bright naked eye comets have been discovered or are predicted at time of writing (October 2025). Two moderately bright binocular comets, one with marginal naked eye visibility are predicted at time of writing.

C/2024 E1 (Wierzchos)

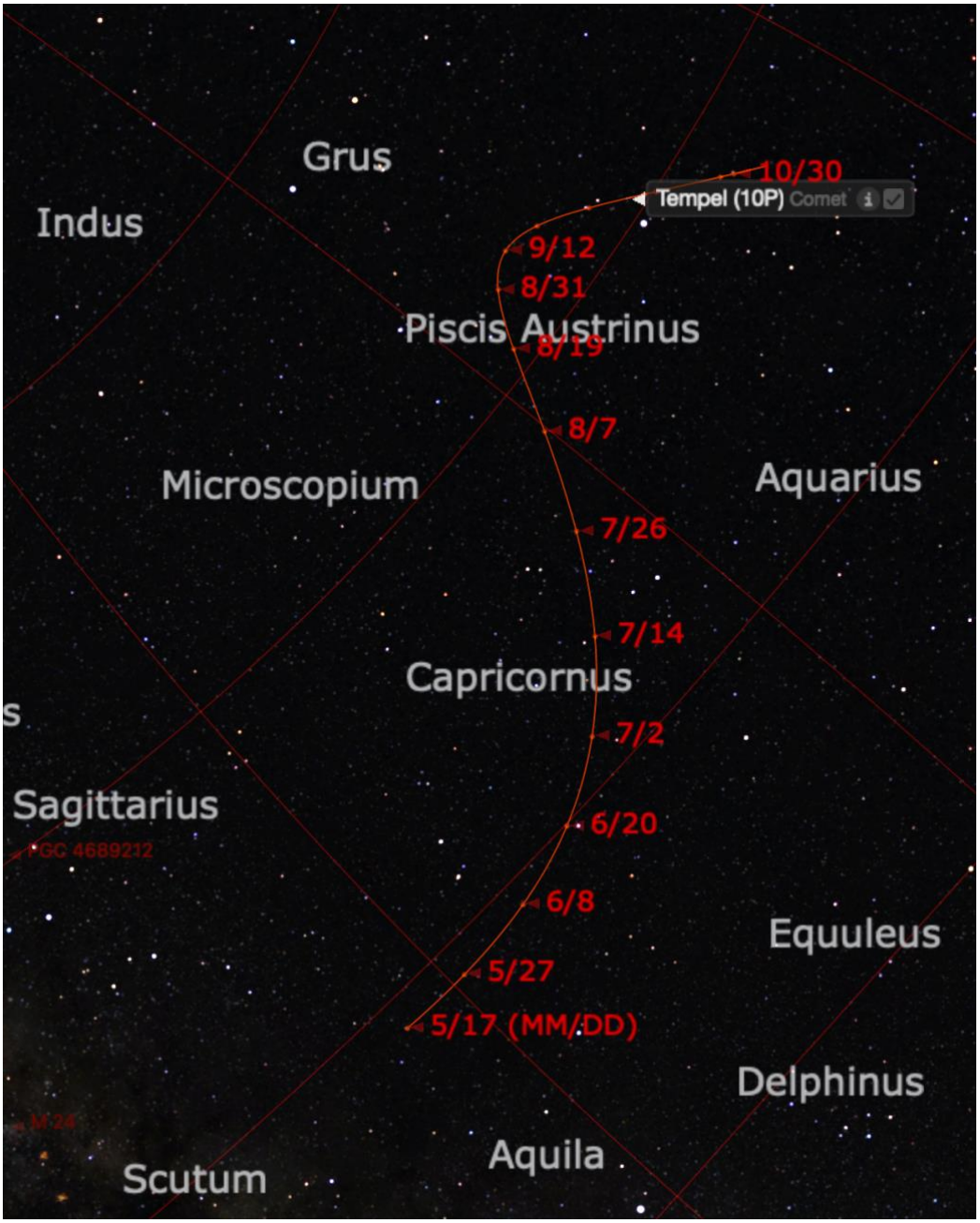
Discovery Date March 3, 2024
Magnitude 5.5 (Mid Jan-Feb, 2026)
Discoverer Kacper W. Wierzchos (Mt. Lemmon Survey)

This comet is predicted to rise to magnitude 5.5 from mid-January to mid-February, 2026 peaking in early February. On Feb 5th, the comet's coma will be within 1^{o} of the Grus Quartet. The comet will be visible in our southeastern sky near the star α Indi. Mag 5.5 spread across a comet is not naked eye but can provide a good binocular view.



10P/Tempel 2

Periodic Comet 10P/Tempel 2 will reach perihelion on August 2 and a maximum magnitude of about 7. It is also visible in the area around Piscis Austrinus. Best observed around August 10 without Moon interference in the constellation of Piscis Austrinus approximately midway between Fomalhaut and M30. It will be visible above magnitude 10 over an extended period from May to October meandering across a long path from Aquila to Sculptor.


Grus
Indus
10/30
Tempel (10P) Comet
9/12
8/31
Piscis Austrinus
8/19
8/7
Microscopium
Aquarius
7/26
7/14
Capricornus
7/2
Sagittarius
6/20
NGC 4689?12
6/8
Equuleus
5/27
5/17 (MM/DD)
Delphinus
M 24
Aquila
Scutum

Meteor Shower Calendar

The meteor showers listed below are the easiest to observe and provide the most activity from eastern Australia. Particular attention should be noted to the time and moonlight conditions. **Most showers are best seen after midnight when the part of the night sky you are observing is heading towards the oncoming meteors. Early evening, the night sky is trailing the Earth's motion.** Most are not even visible until after midnight. Showers that peak with the moon's phase greater than one half illuminated (first quarter to last quarter) will be affected by moonlight and difficult to observe. While the date and time of night-time each shower is best seen remains much the same year after year, the moonlight conditions change considerably from one year to the next.

Lyrids LYR

Active from April 16th to April 25th. Peak night Apr 21-22.

1. Medium strength shower in the north hemisphere as the radiant is essentially overhead with decent rates for three nights around the maximum. Fireballs possible. From Australia, the radiant is low in the sky, just 20^{o} altitude & due north at 4:20am in NSW, 27^{o} in SEQ. Activity from this shower can be seen from the southern hemisphere, but at a much lower rate, 3-5 per hr. Even though these are called the Lyrids, the radiant is in Hercules not far from Vega.

Radiant: RA:18:04 **DEC:** +34° - **ZHR**: 18 - Velocity: 48km/sec - Parent Object: C/1861 G1 (Thatcher)

Eta Aquariids

Active from April 19th to May 26th. Peak night May 6-7

Great shower when viewed from northern Australia where they can produce rates of 40-60 per hour in exceptional years. I saw a display like this from Karjini National Park in 2013 just before dawn on a couple of mornings. Activity is near peak for a week centred on May 6-7. Some decent albeit lower-level activity can usually be seen from anywhere in Australia.

Radiant: RA:22:32 **DEC:** -1° - **ZHR**: 55 - Velocity: fast 66.9km/sec - Parent Object: 1P/Halley

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Southern Delta Aquariids [SDA]

Active from July 21st to August 23rd. Peak night Jul 29-30

The Delta Aquariids, like the Eta Aquarids are best observed from northern Australia, but still worth it from NSW. Visible as soon as it is dark and all night so viewer friendly. These meteors also produce numbers for a week centred July 29-30. These are usually faint meteors , mostly mag 3 or 4 but some at 1 or 2 that lack both persistent trains and fireballs.

Radiant: RA: 22:40 **DEC:** -16.4° - **ZHR**: 16 - Velocity: medium - 42km/sec - Parent Object: 96P/Machholz

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Alpha Capricornids [CAP]

Active from July 11th to August 10th. Peak night Jul 26-27

The Alpha Capricornids are not very active with peak rates of five shower members per hour. The shower can produce bright fireballs and are seen as well from eastern Australian latitudes as anywhere else. Anywhere in Oz or NSW. Catch them while going for the SDA

Radiant: RA: 20:28 **DEC:** -10.2° - **ZHR**: 5 - Velocity: slow - 24km/sec - Parent Object: 169P/NEAT

Perseids [PER]

Active from July 13th to August 26th. Peak night Aug 11-12

The Perseids are the most popular meteor shower internationally as they peak on warm August nights as seen from the northern hemisphere. The Perseids are active from July 13 to August 26. They reach a strong maximum on August 12 or 13, depending on the year. Normal rates seen from dark-sky locations in the northern hemisphere range from 50-75 shower members per hour at maximum. They are well worth a look if you are in the northern hemisphere or even far north Australia but from Brisbane, the radiant barely rises and never rises from SE NSW and so we don't see much of a show though some meteors are always visible from dark skies.

Radiant: RA: 03:12 **DEC:** +57.6° - **ZHR**: 100(nth hemisphere) - Velocity: swift - 60km/sec - Parent Object: 109P/Swift-Tuttle

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Orionids [ORI]

Active from Oct 2nd to Nov 7th. Peak night Oct 21-22

The Orionids are a medium strength shower that sometimes reaches high strength activity. In a normal year the Orionids produce 20-25 shower members at maximum in the northern hemisphere. In exceptional years, such as 2006-2009, the peak rates were on par with the Perseids (50-75 per hour). No accurate prediction model exists. Southern hemisphere rates are a bit lower.

Radiant: RA: 06:20 **DEC:** +15.5° - **ZHR:** 25 - Velocity: swift - 67km/sec - Parent Object: 1P/Halley

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Southern Taurids [STA]

Active from September 23rd to November 19th. Peak night Oct 28-29

The Southern Taurids are a long-lasting shower with several minor peaks in October and November. The shower is active for two months but rarely produces more than five shower members per hour, even at maximum activity. The Taurids (both branches) are most notable

for colourful fireballs and are often responsible for an increased number of fireball reports from September through November. The shower is active for nearly two months so organise pre-dawn observing activities anytime from new Moons until a few days before full Moons. Peak night on Nov 5th.
Radiant: RA: 03:12 **DEC:** +12.8° - **ZHR**: 5 - Velocity: slow - 27km/sec - Parent Object: 2P/Encke

Northern Taurids [NTA]

Active from October 19th to December 10th. Peak night Nov 12-13.
This shower is much like the Southern Taurids, just active a bit later in the year. When the two showers are active simultaneously in late October and early November, there is sometimes a notable increase in the fireball activity. You might see 2 or 3 per hour - bright orange and slow. There seems to be a seven-year periodicity with these fireballs. 2008 was the last remarkable year so 2029 is a possible peak year. The shower is active for nearly two months so organise pre-dawn observing activities anytime from new Moons until a few days before full Moons.
Radiant: RA: 03:52 **DEC:** +22.7° - **ZHR**: 5 - Velocity: medium - 30km/sec - Parent Object: 2P/Encke

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Leonids [LEO]

Active from November 5th to November 30th. Peak is Nov 18 after 1:00 AM. The Leonids are best known for producing great meteor storms in the years of 1833, 1866, 1966, 1999 and 2001.

In the late 1990's, Asher and McNaught modelled the orbits of clusters of material reduced from observations of earlier outbursts. They published predictions of high activity, predicting both time and geographic location for high activity showers during the 1999-2001 peak.

- https://www.theguardian.com/science/2000/nov/16/technology
- https://articles.adsabs.harvard.edu//full/2000JIMO...28..138A/0000138.000.html

This was a seminal paper and ground-breaking prediction technique. I drove to western Queensland (near Quilpie) in November 2001 using these predictions and was privileged to see a great display of bright Leonid fireballs perhaps 60 per hour. These outbursts of meteor activity are best seen when the parent object, comet 55P/Tempel-Tuttle, is closest to the Sun.

Unfortunately, it appears that the Earth will not encounter any dense clouds of debris again until 2099. Therefore, when the comet returns in 2031 and 2064(the 33 year cycle years), there will be no extreme ZHR meteor storms, but perhaps several good displays of Leonid activity when rates are in excess of 100 per hour. The best we can hope for now until the year 2030 is peaks of around 15 shower members per hour and perhaps an occasional weak

outburst when the Earth passes near a debris trail. The Leonids are often bright meteors with a high percentage of persistent trains.

Radiant: RA: 10:08 **DEC:** +21.6° - **ZHR**: 15 - Velocity: 70km/sec
Parent Object: 55P/Tempel-Tuttle

Geminids [GEM]
Active from December 4th to December 16th. Peak time is the mornings of Dec 13-14-15 after midnight.

The Geminids are usually the strongest meteor shower of the year for northern and southern hemisphere observers. The Geminids are often bright and intensely coloured pale green. Due to their medium velocity, persistent trains of vapour can sometimes be seen. These meteors are also seen in the southern hemisphere, but at a reduced rate
Radiant: RA: 07:28 **DEC:** +32.2° - **ZHR**: 120 - Velocity: medium - 35km/sec - Parent Object: 3200 Phaethon (asteroid)