
Comet Prospects for 2025

There are few comets that offer much prospect for the visual observer in 2025. The best on offer is 24P/Schaumasse, which reaches perihelion in early 2026.

This draft version was created on 2022 October 20 to 2022 S3.

These predictions focus on comets that are likely to be within range of visual observers, though comets often do not behave as expected and can spring surprises. Members are encouraged to make visual magnitude estimates, particularly of periodic comets, as long term monitoring over many returns helps understand their evolution. Please submit your magnitude estimates in ICQ format. Guidance on visual observation and how to submit estimates is given in the BAA Observing Guide to Comets. Drawings are also useful, as the human eye can sometimes discern features that initially elude electronic devices.

Theories on the structure of comets suggest that any comet could fragment at any time, so it is worth keeping an eye on some of the fainter comets, which are often ignored. They would make useful targets for those making electronic observations, especially those with time on instruments such as the Faulkes telescopes. Such observers are encouraged to report electronic visual equivalent magnitude estimates via COBS. When possible use a waveband approximating to Visual or V magnitudes. These estimates can be used to extend the visual light curves, and hence derive more accurate absolute magnitudes. Such observations of periodic comets are particularly valuable as observations over many returns allow investigation into the evolution of comets.

In addition to the information in the BAA Handbook and on the Section web pages, ephemerides for new and currently observable comets are on the JPL, CBAT and Seiichi Yoshida's web pages. The BAA Observing Guide to Comets is available on the Section web page.

24P/Schaumasse does not reach perihelion until early January 2026, however it is currently the brightest comet on offer in 2025. It has been observed over six returns by the Section and the analysis suggests that the comet shows no secular trend in brightness. On this basis it should be around 8th – 9th magnitude, so visible in large binoculars, though it will be best seen in the morning sky. The comet passes close to the Beehive Cluster (M44) on November 11, though the nearby Moon is likely to spoil any imaging opportunities. Twelve days later it passes NGC 2903, which may be a little brighter than the comet. At the end of the year it forms an approximately equilateral triangle with M60 and M87.

29P/Schwassmann-Wachmann is an annual comet that has outbursts, which over the last few decades seem to have become more frequent, though this could just reflect more intense coverage. Richard Miles has developed a theory that suggests that these outbursts are in fact periodic, and arise from at least four independent active areas on the slowly rotating nucleus. The activity of the active areas evolves with time. The comet is an ideal target for electronic observations and it should be observed at every opportunity, ideally using the methodology established by Richard. The comet begins the year in Leo and is at opposition in February. It becomes poorly placed between May and October as it passes through solar conjunction and ends the year in Leo.

The other periodic and parabolic comets that are at perihelion during 2025 are unlikely to become brighter than 11th magnitude or are poorly placed. Ephemerides for these can be found on the CBAT or other WWW pages. Several D/ comets have predictions for a return, though searches at favourable returns in the intervening period have failed to reveal the comets and the orbits will have been perturbed by Jupiter. There is however always a chance that they will be rediscovered accidentally by one of the Sky Survey patrols.

Note that returns of D/ comets are awaiting preparation in Nakano Notes.

Looking ahead to 2026, the year starts well with 24P/Schaumasse near perihelion and three other periodic comets are likely to be visible in larger binoculars during the year. Some orbits for comets due to return in the future are yet to be published by the MPC.

With more and more discoveries and recoveries of periodic comets being made, the number of expected returns increases every year. A full list of returning comets is given as a supplement, but first only those comets expected to be brighter than 14th magnitude during the year are listed.

Comets brighter than magnitude 14 in 2025

Comet	T	q	P	N	H ₁	K ₁	Elong at peak	Peak mag
At perihelion in 2024								
33P/Daniel	Nov 11.0	2.24	8.29	?	7.3	10.0	156	11.5
333P/LINEAR	Nov 29.3	1.11	8.67	?	10.7	20.0	75	12.4
2022 E2 (ATLAS)	Sep 13.5	3.67			5.0	10.0	132	13.4
At perihelion in 2025								
21P/Giacobini-Zinner	Mar 25.4	1.01	6.52	?	9.4	15.4	4	11.0
47P/Ashbrook-Jackson	Oct 28.0	2.81	8.35	?	7.6	10.0	174	13.4
48P/Johnson	Mar 2.6	2.01	6.55	?	8.5	10.0	22	13.9
49P/Arend-Rigaux	Apr 10.6	1.43	6.75	?	9.6	10.0	46	12.6
65P/Gunn	Jun 16.4	2.93	7.68	?	7.8	9.3	172	13.6
217P/LINEAR	May 24.9	1.23	7.83	?	9.9	10.7	29	12.4
289P/Blanpain	Apr 14.3	0.95	5.31	?	10.5	10.0	27	11.5
414P/STEREO	Sep 26.3	0.52	4.67	?	13.3	10.0	27	10.9
At perihelion in 2026								
24P/Schaumasse	Jan 8.3	1.18	8.18	?	7.8	17.8	94	8.0
78P/Gehrels	Jun 25.1	2.00	7.21	?	4.6	17.1	43	13.6
88P/Howell	Mar 18.7	1.36	5.48	?	5.4	18.3	25	11.0

The date of perihelion (T), perihelion distance (q), period (P), the number of previously observed returns (N), the magnitude parameters H₁ and K₁, the brightest magnitude (which must be regarded as uncertain) and the approximate elongation at which this occurs are given for each comet. In most cases the comet will be brightest at around the time of perihelion.

Note: $m_1 = H_1 + 5.0 * \log(d) + K_1 * \log(r)$

The full table of comets due to reach perihelion in 2025 has not yet been prepared.

References and sources

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Minor Planet Electronic Circulars

Nakano Notes at <http://www.oaa.gr.jp/~oaacs/nk.htm> (Accessed 2022 October)

Jonathan Shanklin