
Comet Prospects for 2029

The best periodic comets of the year are likely to be 19P/Borrelly as it fades from binocular visibility at the start of the year, and 46P/Wirtanen, though observing the latter will require large binoculars or a telescope. 2026 C1 (Tsuchinshan) will be fading, but may be the brightest comet of the year.

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 or visual equivalent 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, ideally through the COBS portal. 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 total magnitude estimates there is considerable benefit in making photometric measurements using a standard aperture of 9 arc-seconds. Such observations often show small transient events in the near-nucleus environment much more clearly than do total magnitude estimates.

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.

19P/Borrelly could still be a binocular object at the start of the year, though is likely to show a large and diffuse coma. The comet passed 0.42 au from the Earth in early December 2028 and it is still only 0.5 au away at the beginning of 2029. It is conveniently placed for observation in the early evening sky. It will pass a few degrees from open cluster M34 around January 20 and a similar distance from another cluster NGC 1545 around a month later.

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 spends the most of the year making a loop through Libra, Scorpius and Lupus, then ends the year in Ophiuchus. It is in opposition in late May and conjunction in early December. With its southern declination it is poorly placed for observation from the UK.

46P/Wirtanen should come into view in large telescopes in August, but is a morning object throughout the apparition. It is brightest in late October when it is closest to both the Sun and Earth, but only reaches 9th magnitude at best. [Perhaps add some more when MPC adds the elements.]

116P/Wild is brightest at 11th magnitude in April, when closest to the Earth rather than when at perihelion in January. It is best seen from the Southern Hemisphere.

118P/Shoemaker-Levy is well placed in the January evening sky when it is likely to be 11th magnitude. It fades because the distance from Earth increases fairly rapidly after perihelion.

181P/Shoemaker-Levy is at perihelion in late August, when it may reach 11th magnitude. It is a morning object when brightest.

2026 C1 (Tsuchinshan) was at perihelion in 2028 November, but could still be a binocular object at the start of 2029, when it is well placed in the UK evening sky. It steadily fades and the elongation reduces. It may be 9th magnitude when it draws too close to the Sun in mid February.

The other periodic and parabolic comets that are at perihelion during 2029 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.

Looking ahead to 2030, there are currently no comets predicted to be brighter than 10th magnitude. 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 here only those comets expected to be brighter than 14th magnitude during the year are listed.

Comets brighter than magnitude 14 in 2029

Comet	T	q	P	N	H ₁	K ₁	Elong at peak	Peak mag
At perihelion in 2028								
19P/Borrelly	Dec 12.3	1.31	6.86	16	7.1	11.7	122	7.2
106P/Schuster	Dec 12.4	1.54	7.32	6	10.0	15.0	95	13.1
xxxP/Siding Spring (2026 M4)	Oct 9.7	1.22	21.73	2	11.5	6.0	117	12.9
2026 C1 (Tsuchinshan)	Nov 7.0	1.15			4.2	10.0	50	7.4
At perihelion in 2029								
4P/Faye	Mar 8.9	1.62	7.50	23	8.0	15.0	36	13.0
44P/Reinmuth	May 21.5	2.11	7.08	12	8.9	10.0	141	13.5
46P/Wirtanen	Oct 28.5	1.06	5.45	14	9.5	16.8	73	9.4
116P/Wild	Jan 17.7	2.19	6.51	6	5.6	13.4	154	11.1
118P/Shoemaker-Levy	Jan 11.4	1.83	6.13	6	7.1	14.1	156	10.6
132P/Helin-Roman-Alu	Jul 19.7	1.70	7.70	5	10.1	10.0	75	13.8
181P/Shoemaker-Levy	Aug 30.1	1.17	7.64	4	10.5	10.0	83	10.4
246P/NEAT	Oct 28.6	3.48	9.08	3	2.5	15.0	166	12.8
At perihelion in 2030								
119P/Parker-Hartley	Jan 20.0	2.34	7.45	5	9.0	8.0	164	12.8
134P/Kowal-Vavrova	Jan 5.5	2.60	15.82	3	7.1	10.0	46	13.8

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

References and sources

BAA Observing Guide to Comets, 6th edition (2020) at <https://britastro.org/wp-content/uploads/2017/05/Comet-Observing-Guide-2020-November-rev-6.pdf> (Accessed 2022 October)

Belyaev, N. A., Kresak, L., Pittich, E. M. and Pushkarev, A. N., *Catalogue of short Period Comets*, Bratislava (1986).

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Marsden, B. G. and Williams, G. V. *Catalogue of Cometary Orbits*, 17th edition, IAU MPC/CBAT, (2008).

Minor Planet Electronic Circulars

Nakano Notes at <http://www.oaa.gr.jp/~oaacs/nk.htm> (Accessed 2023 December)

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List of all comets predicted to reach perihelion in 2029.

This table will not be created until the end of 2028.

[illegible]

The date of perihelion (T), perihelion distance (q), period (P), the number of previously observed returns (N), the magnitude parameters H_1 and K_1 and the brightest magnitude (which must be regarded as uncertain) and the elongation at which it occurs are given for each comet. The magnitudes, orbits, and in particular the time of perihelion of the D/ comets are uncertain. The SOHO comets are only likely to be observed by satellite and some of the linkages are uncertain so that for a few alternative linkages give a different perihelion date.

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