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. It was updated 2023 July to add D/ comets and those to 2023 M4. It was last updated 2024 January to 2023 X2.

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.

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 here 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	11	7.3	10.0	156	11.5
333P/LINEAR	Nov 29.3	1.11	8.67	2	10.7	20.0	75	12.4
2022 E2 (ATLAS)	Sep 13.5	3.67		0	5.0	10.0	132	13.4
2023 A3 (Tsuchinshan-ATLAS)	Sep 28.2	0.39		0	6.5	8.0	32	11.1
2023 C2 (ATLAS)	Nov 16.8	2.37		0	7.0	10.0	22	13.4
At perihelion in 2025								
21P/Giacobini-Zinner	Mar 25.4	1.01	6.52	16	9.4	15.4	4	11.0
47P/Ashbrook-Jackson	Oct 28.0	2.81	8.35	10	7.6	10.0	174	13.4
48P/Johnson	Mar 2.6	2.01	6.55	11	8.5	10.0	22	13.9
49P/Arend-Rigaux	Apr 10.6	1.43	6.75	11	9.6	10.0	46	12.6
65P/Gunn	Jun 16.4	2.93	7.68	9	7.8	9.3	172	13.6
217P/LINEAR	May 24.9	1.23	7.83	3	9.9	10.7	29	12.4
289P/Blanpain	Apr 14.3	0.95	5.31	5	10.5	10.0	27	11.5
414P/STEREO	Sep 26.3	0.52	4.67	2	13.3	10.0	27	10.9
				1			165	
At perihelion in 2026								
24P/Schaumasse	Jan 8.3	1.18	8.18	12	7.8	17.8	94	8.0
78P/Gehrels	Jun 25.1	2.00	7.21	7	4.6	17.1	43	13.6
88P/Howell	Mar 18.7	1.36	5.48	8	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 H_1 and K_1, 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: $m_1 = H_1 + 5.0 * \log(d) + K_1 * \log(r)$

List of all comets predicted to reach perihelion in 2025

Comet name	T	Q	P	No	H_1	K_1	Elong	Peak mag
3D/Biela	May 25.8	0.82	6.65	6	8.0	15.0	21	7.9?
18D/Perrine-Mrkos	Jan 1.7	1.64	7.83	5	11.5	20.0	79	16.7
21P/Giacobini-Zinner	Mar 25.4	1.01	6.52	16	9.4	15.4	4	11.0
25D/Neujmin	May 11.6	1.45	5.78	2	10.5	10.0	81	12.7?
40P/Vaisala	Nov 12.0	1.82	10.99	8	8.9	15.0	39	14.8
43P/Wolf-Harrington	Aug 4.5	2.44	9.02	12	6.7	16.5	108	15.4
47P/Ashbrook-Jackson	Oct 28.0	2.81	8.35	10	7.6	10.0	174	13.4
48P/Johnson	Mar 2.6	2.01	6.55	11	8.5	10.0	22	13.9
49P/Arend-Rigaux	Apr 10.6	1.43	6.75	11	9.6	10.0	46	12.6
60P/Tsuchinshan	Jul 20.6	1.65	6.63	9	6.5	31.8	5	15.5
65P/Gunn	Jun 16.4	2.93	7.68	9	7.8	9.3	172	13.6

105P/Singer Brewster	Jan 22.8	2.05	6.47	6	12.5	15.0	120	18.9
136P/Mueller	Jan 3.3	2.96	8.56	4	11.0	10.0	152	18.2
164P/Christensen	May 27.4	1.68	6.98	4	11.0	10.0	9	15.4
171P/Spahr	Sep 25.0	1.77	6.70	4	10.2	15.0	95	15.1
172P/Yeung	Nov 2.4	3.36	8.68	4	13.0	10.0	170	20.3
195P/Hill	Jul 28.4	4.47	16.58	2	8.5	10.0	147	17.9
198P/ODAS	Oct 9.7	2.00	6.82	4	9.0	10.0	157	12.4
210P/Christensen	Nov 22.7	0.53	5.62	4	13.5	10.0	10	9.1
217P/LINEAR	May 24.9	1.23	7.83	3	9.9	10.7	29	12.4
229P/Gibbs	Mar 5.8	2.44	7.77	3	13.0	10.0	60	19.2
235P/LINEAR	Dec 22.7	1.98	6.40	3	12.0	10.0	59	16.8
236P/LINEAR	Feb 3.8	1.83	7.19	3	14.0	10.0	46	18.6
240P/NEAT	Dec 20.0	2.12	7.59	3	12.0	10.0	165	15.6
242P/Spahr	Jan 1.8	3.96	12.84	2	8.0	10.0	120	16.6
248P/Gibbs	Sep 15.4	2.16	14.67	2	14.0	10.0	145	18.3
249P/LINEAR	Feb 1.7	0.50	4.60	4	18.5	10.0	3	16.3
250P/Larson	May 16.7	2.27	7.34	4	14.5	10.0	139	19.5
261P/Larson	Dec 27.4	2.01	6.52	3	14.0	10.0	144	18.1
289P/Blanpain	Apr 14.3	0.95	5.31	5	10.5	10.0	27	11.5
294P/LINEAR	Aug 11.2	1.27	5.70	3	15.5	10.0	28	18.1
302P/Lemmon-PANSTARRS	Mar 9.4	3.29	8.82	2	12.5	10.0	165	19.7
306P/LINEAR	Aug 1.6	1.27	5.52	4	19.0	10.0	95	19.3
313P/Gibbs	Dec 2.8	2.42	5.62	4	15.0	10.0	163	19.8
317P/WISE	Oct 31.7	1.27	5.10	4	17.5	10.0	19	20.2
323P/SOHO	Mar 14.5	0.04	4.15	6	20.0	10.0	3	7.3
331P/Gibbs	Dec 25.5	2.88	5.20	4	12.0	10.0	178	18.0
340P/Boattini	Aug 29.2	3.06	8.75	4	13.0	10.0	178	19.4
341P/Gibbs	Apr 22.7	2.51	8.87	2	12.5	10.0	150	18.2
351P/Wiegert-PANSTARRS	Mar 26.3	3.13	9.35	3	12.5	10.0	169	19.2
366P/Spacewatch	Jan 30.9	2.28	6.55	3	13.8	15.0	151	20.3
367P/Catalina	Jan 11.6	2.53	6.58	2	17.5	5.0	164	20.8
414P/STEREO	Sep 26.3	0.52	4.67	2	13.3	10.0	27	10.9
441P/PANSTARRS	Sep 9.5	3.33	8.40	2	13.5	10.0	179	20.5
456P/PanSTARRS	Apr 15.0	2.80	5.64	2	13.0	10.0	161	18.9
469P/PANSTARRS	Dec 8.4	3.01	9.05	2	15.5	10.0	158	22.5
D/1886 K1 (Brooks)	Jun 18.0	1.89	6.70	1	8.0	15.0	164	12.0?
D/1895 Q1 (Swift)	Sep 4.8	1.39	7.18	1	11.4	10.0	162	10.9?
P/1999 RO$_{28}$ (LONEOS)	Oct 30.3	1.12	6.34	1	18.0	5.0	91	16.8
D/1999 XN$_{120}$ (Catalina)	Dec 21.2	3.30	8.58	1	13.5	5.0	178	17.9
P/2000 R2 (LINEAR)	Dec 2.3	1.63	6.46	1	18.0	10.0	74	21.4
P/2002 R5 (SOHO)	Jul 18.7	0.04	5.63	1	15.0	10.0	3	3.2?
P/2002 S5 (SOHO)	Oct 26.3	0.05	5.77	2			2	
P/2002 S5 (SOHO)	Nov 9.8	0.05	5.78	2			2	
P/2002 S7 (SOHO)	Nov 4.9	0.05	5.78	2			3	
P/2003 QX$_{29}$ (NEAT)	Aug 6.9	4.23	22.67	1	8.5	10.0	171	17.3
D/2005 J1 (McNaught)	Jul 11.1	1.54	6.76	1	16.5	10.0	108	18.2
P/2005 R5 (SOHO)	Jul 19.3	0.04	5.63	2			1	87.4
P/2005 T5 (Broughton)	Jun 14.5	3.26	19.62	1	11.0	10.0	156	18.2
P/2010 A3 (Hill)	Mar 11.6	1.62	15.03	1	14.0	10.0	99	16.8
P/2010 H2 (Vales)	Mar 10.0	3.08	7.51	1	6.0	10.0	165	12.5
P/2011 UA$_{134}$ (Spacewatch-PANSTARRS)	Feb 16.9	2.08	13.29	1	17.5	10.0	106	21.8

	T	q	P	N	H1	K1	elong	mag
P/2012 O1 (McNaught)	Nov 1.6	1.44	6.67	1	17.5	10.0	76	19.8
P/2015 R2 (PANSTARRS)	Jan 14.8	2.46	9.57	1	14.5	10.0	133	21.0
P/2015 TO$_{19}$ (Lemmon-PANSTARRS)	Nov 23.6	2.91	9.70	1	14.0	10.0	170	20.1
P/2015 X6 (PANSTARRS)	May 11.1	2.27	4.57	1	16.0	10.0	91	21.3
P/2016 A2 (Christensen)	Oct 25.1	3.46	10.40	1	11.5	10.0	162	18.9
P/2016 G1 (PANSTARRS)	May 16.1	2.04	4.15	1	14.0	10.0	159	17.6
P/2017 B4 (PANSTARRS)	Dec 2.4	2.82	9.13	1	14.5	10.0	127	20.6
P/2018 L1 (PANSTARRS)	Nov 5.7	1.90	7.00	1	15.0	10.0	116	19.4
P/2018 L5 (Leonard)	Apr 3.9	2.31	6.91	1	14.5	10.0	150	19.6
P/2019 A8 (PANSTARRS)	Feb 4.4	2.02	6.10	1	16.0	10.0	170	19.2
P/2019 S3 (PANSTARRS)	Dec 19.0	1.81	6.31	1	16.0	15.0	114	20.9
P/2019 Y3 (Catalina)	Mar 4.1	0.93	5.24	1	18.5	10.0	71	15.8
P/2022 B2 (PANSTARRS)	Sep 7.8	3.33	8.41	0	13.5	10.0	180	20.5
C/2022 N2 (PANSTARRS)	Jul 13.4	3.76		0	6.0	10.0	155	14.3
C/2022 QE$_{78}$ (ATLAS)	Sep 9.9	5.48		0	5.0	10.0	143	15.8
C/2022 R6 (PANSTARRS)	Aug 26.2	6.57		0	5.0	10.0	134	17.1
C/2023 F3 (ATLAS)	Feb 2.9	5.19		0	6.0	10.0	138	16.4
C/2023 H5 (Lemmon)	Jun 30.1	4.31		0	7.0	10.0	127	16.3
P/2023 S1	Feb 23.3	2.62	7.58	0	11.5	10.0	177	16.8
C/2023 T3 (Fuls)	Jan 28.7	3.45		0	8.5	10.0	152	16.0
C/2023 V1 (Lemmon)	Jul 13.2	5.09		0	8.5	10.0	93	19.0
C/2023 X2 (Lemmon)	Dec 26.2	5.10		0	7.0	10.0	109	17.4

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

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