Comet Prospects for 2020

Unless some bright long period comets are discovered it promises to be yet another disappointing year for comet enthusiasts. If 289P/Blanpain outbursts it will still be visible at the start of the year. Otherwise it is another poor year for periodic comets, with only 88P/Howell reaching as bright as 9th magnitude and then being a southern hemisphere object. Long period comet 2017 T2 (PanSTARRS) may put on a good display during the first half of the year.

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This draft version was completed on 2017 October 26. Updated to 2017 T2 on 2017 October 26. Minor update to peak brightness of 2017 T2 on 2019 January 3.

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.

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. It is in solar conjunction in March and at opposition in October. The comet has moved into the northern celestial sphere, and should be adequately placed for observation from the UK in the second half of the year.

Ellen Howell discovered **88P/Howell** in 1981 with the 0.46-m Palomar Schmidt. It passed 0.6 au from Jupiter in 1978, which reduced the perihelion distance, but the biggest change to its orbit occurred in 1585 when an encounter reduced q from 4.7 to

2.4 au. The comet was well observed in 2009 and 2015, and the magnitude observations are best fitted by a linear form of light curve. The parameters of this fit seem to be changing with time and observations at this return will help to ascertain the cause. For UK observers the comet is a convenient evening object until it is lost in the summer twilight of mid June. It is better placed for Southern Hemisphere observers, and they should be able to follow it until the end of the year. It passes close to NGC 4753 around May 5 and could be a similar magnitude. On September 5 it passes close to globular cluster NGC 5897. Between October 4 and 11 it passes three more globulars, first M19 then NGC 6293 and NGC 6355.

289P/Blanpain makes a relatively prolonged close approach to the Earth at the end of 2019, closing to 0.089 au on 2020 January 10. Unless it outbursts again it may only reach 18th magnitude.

2017 T2 (PanSTARRS) was the 159th comet discovered by PanSTARRS, and it was found some 30 months before perihelion. It could already be 8th magnitude as the year opens and is well placed for observation from the UK for most of the apparition. It passes through the Perseus double cluster over January 26 to 31 and close to M81 & M82 around May 24, when it is near its brightest. It is close to M106 around June 25 and several other galaxies in Canes Venatici over the following week. It will sink into the summer twilight of late August, by which time it is likely to be a telescopic object.

2019 N1 (ATLAS) may be a faint telescopic object during the northern summer, but its orbit takes it rapidly south and it will be lost to UK observers from early August. Southern hemisphere observers may recover it in December, when it could be 11th magnitude.

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The other periodic and parabolic comets that are at perihelion during 2020 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 2021, 7P/Pons-Winnecke and 15P/Finlay might reach 9th magnitude, though in both cases the comet is a morning object. It is possible that 67P/Churyumov-Gerasimenko could reach 7th magnitude during its closest observed perihelion passage, when it also comes relatively close to the Earth. It will be best seen from the morning sky, but is relatively well placed in the latter part of the year.

Comets reaching perihelion in 2020

Comet	T	q	P	N	H_1	K_1	Peak mag
D/Helfenzreider (1766 G1)	May 4.7	0.40	4.49	1			
D/Barnard (1884 O1)	Aug 8.6	1.32	5.41	1			
D/Brooks (1886 K1)	Oct 9.1	1.36	5.71	1			
D/Denning (1894 F1)	Jun 5.3	1.36	8.14	1			
P/SOHO (1996 X5)	Jan 16.9	0.05	5.77	2			
P/SOHO (2002 S4)	Aug 6.1	0.05	5.95	2			

P/SOHO (2002 S7)	Jan 24.8	0.05	5.78	2			
P/LINEAR (2004 WR_9)	Apr 1.6	1.95	15.25	1	14.5	10.0	19
P/Christensen (2005 T2)	Apr 8.4	2.24	7.55	1	14.5	10.0	20
P/Siding Spring (2006 R1)	Jan 4.9	1.66	13.37	1	16.0	10.0	20
P/Gibbs (2006 W1)	Mar 9.1	1.70	13.93	1	12.0	10.0	16
P/Gilmore (2007 Q2)	Nov 27.0	1.86	13.45	1	16.0	10.0	20
P/Gibbs (2007 R2)	Sep 16.2	1.64	6.75	1	17.0	10.0	18
P/Catalina (2007 VQ_1)	Sep 18.0	2.70	12.64	1	12.0	10.0	18
P/Boattini (2009 Q4)	Dec 26.9	1.31	5.53	1	15.5	10.0	15
P/Catalina (2009 WX_5)	Nov 16.4	0.80	5.40	1	19.0	5.0	19
P/WISE (2010 B2)	Dec 4.6	1.62	5.48	1	17.0	10.0	20
P/PanSTARRS (2011 U1)	Aug 19.4	2.37	8.18	1	9.0	10.0	15
P/Lemmon (2012 SB_6)	Jun 19.5	2.28	7.48	1	14.0	10.0	19
P/Lemmon (2013 TLB)	Dec 24.2	1.12	6.86	1	17.5	10.0	16
P/PanSTARRS (2013 W1)	Sep 10.3	1.42	6.52	1	17.5	10.0	21
P/PanSTARRS (2015 X6)	Oct 17.2	2.28	4.57	1	16.0	10.0	20
PanSTARRS (2017 K5)	Mar 25.7	7.70			7.0	10.0	20
PanSTARRS (2017 T2)	May 6.0	1.62			0.0	14.0	5
P/SOHO (2003 T12)	May 6.9	0.60	4.16	4			
11P/Tempel-Swift-LINEAR	Nov 26.2	1.39	5.95	6	15.0	10.0	15
36P/Whipple	May 31.6	3.02	8.39	12	8.5	15.0	18
58P/Jackson-Neujmin	May 25.1	1.38	8.25	5	11.0	15.0	15
85D/Boethin	Jul 29.5	1.13	11.30	2			
87P/Bus	May 9.2	2.10	6.37	6	10.0	15.0	15
88P/Howell	Sep 26.6	1.35	5.47	8	6.0	15.0	9
91P/Russell	Nov 9.4	2.60	7.67	5	7.5	15.0	16
101P/Chernykh	Jan 13.1	2.35	13.96	3	7.6	10.0	13
112P/Urata-Niijima	Feb 8.0	1.45	6.62	5	14.0	15.0	17
114P/Wiseman-Skiff	Jan 14.1	1.58	6.68	5	11.5	15.0	14
115P/Maury	Jul 29.8	2.06	8.84	4	11.5	15.0	16
124P/Mrkos	Apr 26.9	1.65	6.04	5	13.1	15.0	16
141P/Machholz	Dec 15.4	0.81	5.34	4	12.8	10.0	11
156P/Russell-LINEAR	Nov 17.9	1.33	6.44	5	13.0	15.0	13
162P/Siding Spring	Dec 7.8	1.29	5.43	5	15.0	10.0	16
178P/Hug-Bell	Jul 16.6	1.88	6.92	3	13.5	10.0	18
184P/Lovas	Oct 26.2	1.70	7.39	3	14.0	10.0	16
203P/Korlevic	Mar 5.0	3.20	10.10	2	14.5	5.0	19
210P/Christensen	Apr 7.9	0.53	5.63	3	13.5	10.0	11
218P/LINEAR	Oct 3.8	1.17	5.44	3	14.0	10.0	16
220P/McNaught	Dec 10.6	1.55	5.50	3	15.0	10.0	18
228P/LINEAR	Mar 10.7	3.44	8.53	2	14.5	5.0	19
233P/La Sagra	Oct 1.7	1.78	5.28	2	15.0	10.0	19
249P/LINEAR	Jun 29.5	0.50	4.59	3	18.5	10.0	14
254P/McNaught	Sep 29.7	3.14	9.91	3	11.0	10.0	18
257P/Catalina	Sep 10.7	2.14	7.30	2	11.5	10.0	15
258P/PANSTARRS	Jun 19.6	3.48	9.24	2	13.0	10.0	21
266P/Christensen	Apr 19.4	2.34	6.65	2	12.0	10.0	17
277P/LINEAR	Dec 30.2	1.90	7.56	2	14.0	10.0	17
278P/McNaught	Sep 12.1	2.09	7.10	2	14.0	10.0	18
293P/Spacewatch	Dec 19.3	2.12	6.96	2	14.5	10.0	18
296P/Garradd	Sep 17.9	1.82	6.54	3	14.0	10.0	18
298P/Christensen	Sep 6.4	2.20	6.81	2	15.0	10.0	21
304P/Ory	Aug 12.5	1.26	5.59	3	16.5	10.0	18
306P/LINEAR	Jan 22.9	1.27	5.51	2	19.0	10.0	22
311P/PANSTARRS	Oct 7.4	1.94	3.24	3	17.0	10.0	20
312P/NEAT	Sep 25.0	1.98	6.45	2	14.5	10.0	17
313P/Gibbs	Apr 15.2	2.42	5.62	2	15.0	10.0	20
317P/WISE	Sep 26.2	1.27	5.11	2	19.0	10.0	21

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321P/SOHO	Jan 17.3	0.05	3.77	6			
331P/Gibbs	Sep 29.6	2.88	5.21	3	12.0	10.0	18
377P/Scotti	Jul 11.3	5.02	17.39	1	8.5	10.0	19
378P/McNaught	Oct 20.9	3.38	16.12	1	9.0	5.0	14
A/[ATLAS] (2019 C1)	May 4.8	6.58			3.0	10.0	15
ATLAS (2019 K1)	Feb 13.4	2.00			10.0	10.0	15
Smith (2019 K7)	Jun 16.9	4.47			6.0	10.0	15
ATLAS (2019 N1)	Dec 2.1	1.70			6.5	10.0	11

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) 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. 156P may be brighter than expected, as the perihelion distance will be significantly reduced following a Jupiter encounter in 2018.

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

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P/Scotti (2003 L1)	Jul 11.7	5.02	17.39	1	8.5	10.0	19

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P/McNaught (2005 Y2)	Oct 20.8	3.38	16.12	1	9.0	5.0	14