

ALPO COMET NEWS FOR OCTOBER 2020

A Publication of the Comets Section of the Association of Lunar and Planetary Observers

By Carl Hergenrother – 2020-October-7

The monthly ALPO Comet News PDF can be found on the ALPO Comets Section website (<http://www.alpo-astronomy.org/cometblog/>). A shorter version of this report is posted on a dedicated Cloudy Nights forum (<https://www.cloudynights.com/topic/733309-alpo-comet-news-for-october-2020/>). All are encouraged to join the discussion over at Cloudy Nights. The ALPO Comet Section welcomes all comet related observations, whether textual descriptions, images, drawings, magnitude estimates, or spectra. You do not have to be a member of ALPO to submit material, though membership is encouraged. To learn more about the ALPO, please visit us @ <http://www.alpo-astronomy.org>.

Two comets are expected to be good targets for small aperture observers: fading 88P/Howell (8th to 9th magnitude) and brightening C/2020 M3 (ATLAS) (9th to 8th magnitude). C/2020 P1 (NEOWISE), not to be confused with this year's brightest comet C/2020 F3 (NEOWISE), could brighten above 10th magnitude but will only be visible to southern hemisphere observers at low elevations during the first week of the month. Assuming it survives perihelion, which may be unlikely as the comet is intrinsically faint and dynamically new, C/2020 P1 could be visible to northern observers as a faint visual object during the last week of the month. Among fainter comets to watch (10-12th mag) are departing comets C/2020 F3 (NEOWISE) and C/2020 Q1 (Borisov) and inbound comet C/2020 S3 (Erasmus).

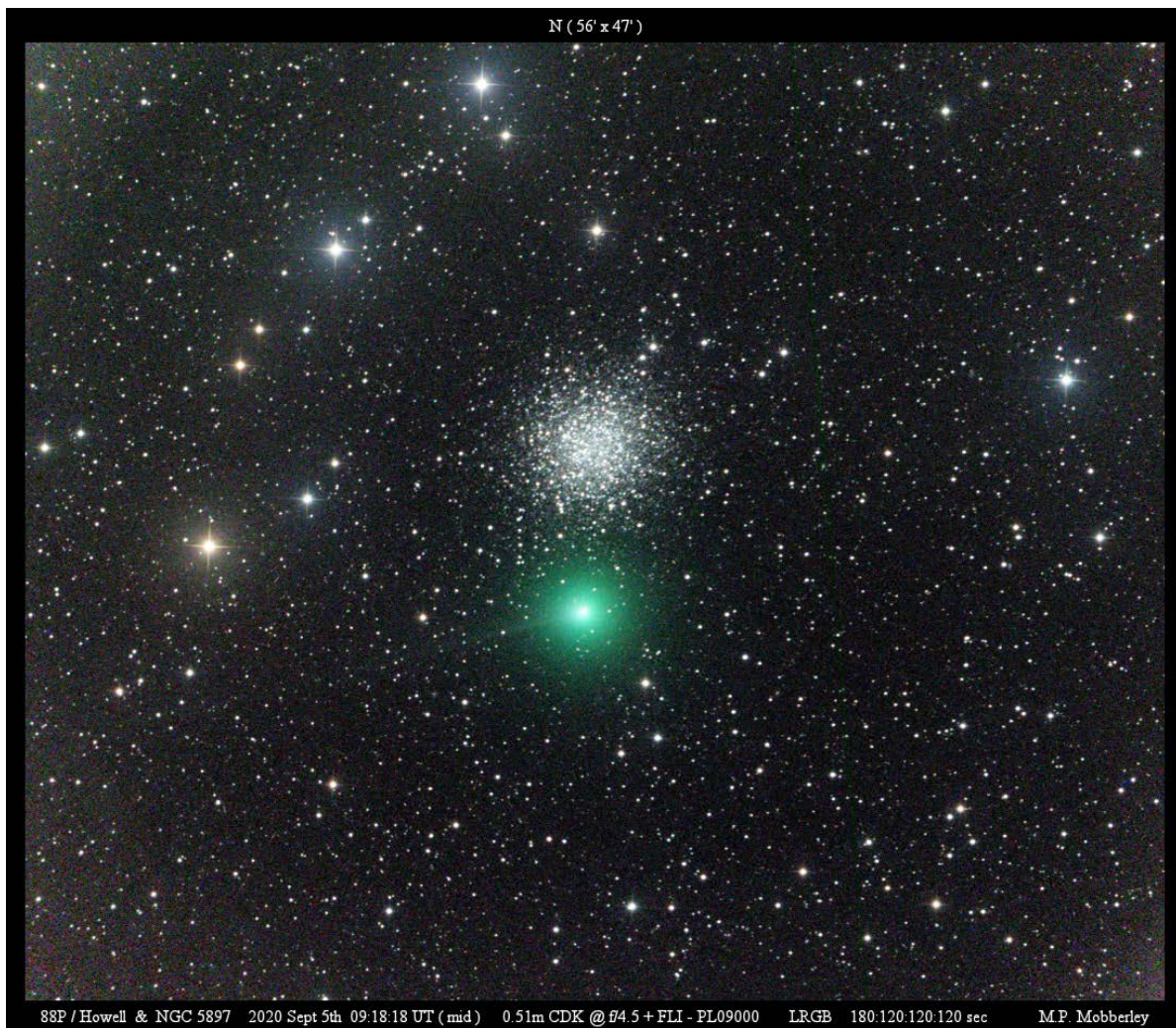
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Bright Comets (magnitude < 10.0)

88P/Howell – Jupiter-family comet 88P/Howell is now outbound after perihelion on September 28 at 1.35 au. Since its 1981 discovery, its perihelion distance has dropped from 1.62 au to 1.35 au. Perihelion will stay within a few 0.01 au of 1.35 au until a close approach to Jupiter in 2061 resulting in a perihelion increase to 1.55 au.

In September the comet was consistently observed around magnitude 9.0. Five visual magnitude estimates were submitted to the ALPO by Chris Wyatt and J. Gonzalez. On the 7th, Wyatt reported a brightness of 8.9 and coma diameter of 4.5' while Gonzalez reported magnitude 8.7 and a 8' coma. Wyatt also observed 88P on the next night at 8.9 and 4.5' coma, and on the 22nd/23rd at magnitude 9.1 and 9.3 with a coma between 6.2' and 6.5'. The image below shows 88P and globular star cluster NGC 5897 as captured by Martin Mobberley on September 5.



As has been the case over the past few months, 88P is an evening object. It is rather low in the southwestern sky for northern observers, but much better placed for southern hemisphere observers. 88P is moving against the rich star fields of Scorpius (Oct 1-2), Ophiuchus (2-15), and Sagittarius (15-31). 88P should slowly fade from around magnitude 9.0 to 10.0 in October.

88P/Howell

T = 2020-Sep-28 $q = 1.35$ au

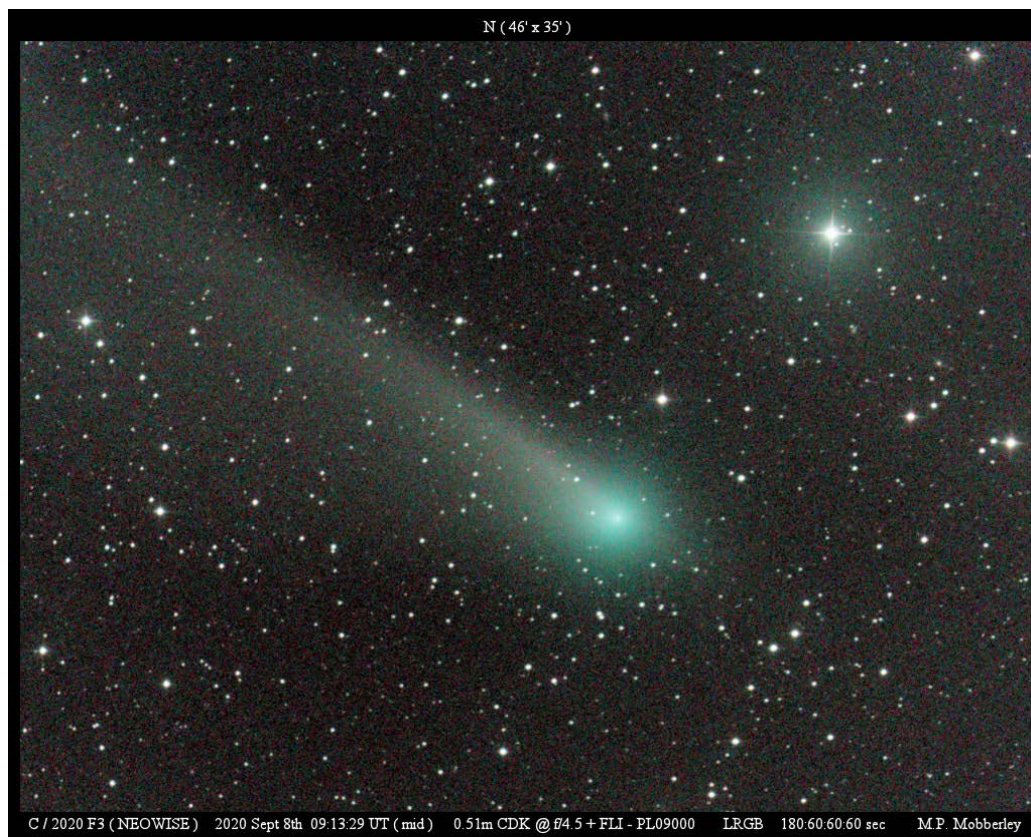
Jupiter-family comet

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020 10 01	9.1	16 46	-26 00	1.354	1.415	65	Sco	12	45
2020 10 06	9.1	17 05	-26 34	1.357	1.433	65	Oph	12	44
2020 10 11	9.2	17 25	-26 59	1.362	1.453	64	Oph	13	43
2020 10 16	9.3	17 45	-27 14	1.370	1.475	63	Sgr	13	42
2020 10 21	9.5	18 05	-27 19	1.380	1.500	63	Sgr	14	41
2020 10 26	9.6	18 24	-27 13	1.392	1.527	62	Sgr	15	39
2020 10 31	9.8	18 44	-26 58	1.405	1.558	62	Sgr	16	38
2020 11 05	10.0	19 04	-26 32	1.421	1.591	61	Sgr	16	36

Comet Magnitude Parameters --- $H = 4.2$, $2.5n = 31.4$

C/2020 F3 (NEOWISE) – This October we’ll be saying goodbye to *C/2020 F3* for a few months. The comet is already a very low object from the northern hemisphere at the start of the month and will be too low to be observed by mid-month. Southern hemisphere observers will be able to follow NEOWISE through the end of the month. Not helping matters, is the comet’s steady fading from around magnitude 11.0 to 12.5 this month.

C/2020 F3 will once again become visible in January 2021 for observers both hemispheres. At that time the comet may still be as bright as 14th magnitude if it follows its post-perihelion fading trend. It is also possible it could be much fainter. Either way, it will be more of an imaging rather than visual target. Time will tell. Departing NEOWISE as imaged by Martin Mobberley on Sep. 8.



C/2020 F3 (NEOWISE)

T = 2020-Jul-03 $q = 0.29$ au Max El
Dynamically old long period comet (deg)

Date	Mag	R.A.	Decl.	r	d	Elong	Const	40N	40S
2020 10 01	11.1	15 04	-12 19	1.945	2.612	39	Lib	6	18
2020 10 06	11.3	15 09	-13 19	2.025	2.746	36	Lib	4	14
2020 10 11	11.6	15 15	-14 14	2.103	2.874	32	Lib	2	11
2020 10 16	11.8	15 20	-15 05	2.180	2.996	29	Lib	1	8
2020 10 21	12.1	15 25	-15 52	2.256	3.113	25	Lib	0	4
2020 10 26	12.3	15 30	-16 36	2.330	3.223	21	Lib	0	1
2020 10 31	12.5	15 35	-17 17	2.404	3.327	18	Lib	0	0
2020 11 05	12.6	15 40	-17 55	2.477	3.425	14	Lib	0	0

Comet Magnitude Parameters --- $H = 6.3$, $2.5n = 9.3$

C/2020 M3 (ATLAS) – The previous two comets, 88P and *C/2020 F3*, are outbound and fading. Most of the remaining comets we’ll focus on in this report are inbound. Of the inbound comets, only *C/2020 M3 (ATLAS)* is guaranteed to be within reach of small telescopes. The others are either poorly placed or uncertain brightness forecasts.

C/2020 M3 is a Halley-type comet with an orbital period of 139 years. It was a faint 19th magnitude object when discovered on June 27, but rapidly brightened and was observed at 9-11th magnitude last month. Its current brightness is in question as most observers place it around magnitude 10-11 while a few contributors to the ALPO and COBS placed it between 9 and 10. A large low surface brightness coma may explain the uncertainty in brightness since the observed size of the low surface brightness comets can be very sensitive to sky conditions, equipment, observer experience, and observing techniques.

This month *C/2020 M3* is extremely well placed for observation from the southern hemisphere with the comet nearly overhead in the morning sky in Eridanus (Oct 1-16) and Lepus (16-31). *M3* starts the month a little low for northern observers but it becomes progressively better placed with time. Assuming the comet starts the month around magnitude 9.5, it could be around magnitude 8.5 at the end of the month. The end of the month will also see the comet at perihelion (October 25 @ 1.27 au). *M3* will continue to brighten slowly in November as it passes within 0.36 au of Earth on November 15.

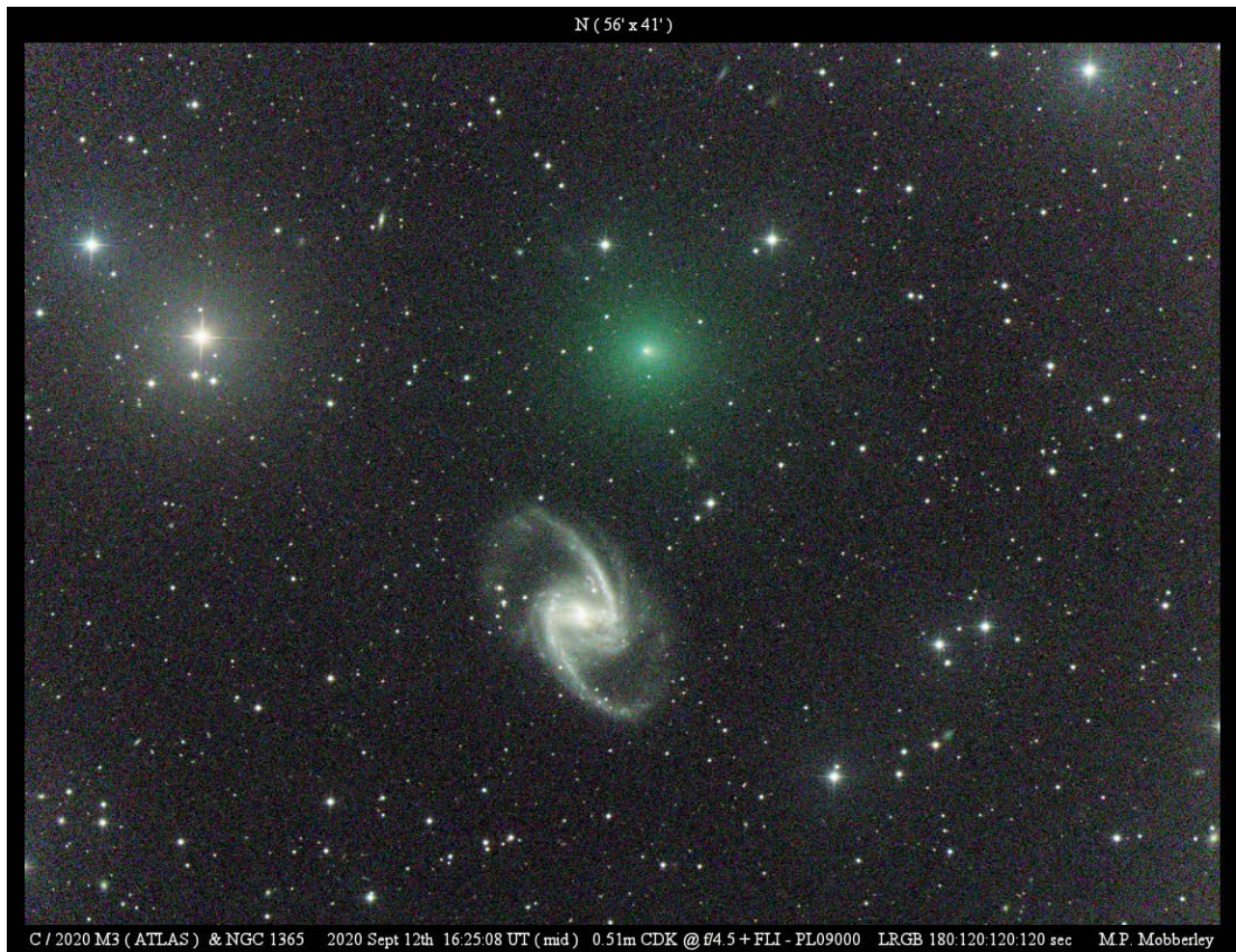
C/2020 M3 (ATLAS)

T = 2020-Oct-25 $q = 1.27$ au Max El
Halley-type comet – 139-year period (deg)

Date	Mag	R.A.	Decl.	r	d	Elong	Const	40N	40S
2020 10 01	9.5	04 21	-32 15	1.320	0.539	114	Eri	18	82
2020 10 06	9.3	04 33	-30 24	1.301	0.508	115	Eri	20	80
2020 10 11	9.1	04 44	-28 04	1.287	0.479	116	Eri	22	78
2020 10 16	8.9	04 53	-25 13	1.276	0.451	118	Eri	25	75
2020 10 21	8.8	05 02	-21 46	1.270	0.426	121	Lep	29	71
2020 10 26	8.7	05 09	-17 38	1.268	0.404	124	Lep	33	67
2020 10 31	8.6	05 16	-12 49	1.271	0.385	129	Lep	38	62
2020 11 05	8.5	05 20	-07 19	1.278	0.370	134	Ori	43	57

Comet Magnitude Parameters --- $H = 9.8$, $2.5n = 10.0$

88P/Howell isn't the only comet to photobomb a nice deep sky object. Martin Mobberley caught C/2020 M3 near the beautiful barred spiral NGC 1365.



C/2020 P1 (NEOWISE) – Not to be confused with this summer's spectacular *C/2020 F3 (NEOWISE)*, *C/2020 P1* is NEOWISE's second small perihelion long-period comet 2020 discovery. Magnitude estimates reported to COBS placed the comet around 10th magnitude at the end of September. That is quite faint for a comet that is less than 1 au from the Sun and Earth. Combined with it being dynamically new, the survival of this comet is in question.

The comet has yet to be observable from the northern hemisphere. Even southern hemisphere observers will lose sight of the comet by the second week of the month as it moves close to the Sun. If it survives, it could peak at 5th magnitude around mid-month. That brightness assumes about 2 magnitudes of forward scattering due to a high angle. Even with the enhanced brightness, it will only be visible (if at all) to Sun watching spacecraft until after its October 20 perihelion at 0.34 au. By the last week of October, it could be visible to northern observers if it is still with us. To be honest, the post perihelion brightness shown below is very uncertain.

C/2020 P1 (NEOWISE)

T = 2020-Oct-20 $q = 0.34$ au

Long-Period comet – dynamically new

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020 10 01	10.0	12 31	-41 54	0.627	0.752	38	Cen	0	11
2020 10 06	8.9	12 32	-34 42	0.525	0.697	29	Cen	0	5
2020 10 11	7.3	12 33	-24 37	0.432	0.661	19	Crv	0	0
2020 10 16	5.5	12 39	-12 04	0.364	0.672	11	Crv	0	0
2020 10 21	6.9	12 52	-00 35	0.343	0.752	16	Vir	0	0
2020 10 26	8.6	13 11	+06 15	0.382	0.885	22	Vir	4	0
2020 10 31	9.6	13 31	+09 05	0.461	1.030	26	Vir	7	0
2020 11 05	10.5	13 49	+09 52	0.558	1.166	28	Boo	8	0

Comet Magnitude Parameters --- H = 12.2, 2.5n = 8.0

Fainter Comets of Interest (fainter than magnitude 10.0)

C/2020 Q1 (Borisov) – Last month we quickly mentioned the discovery of C/2020 Q1, the 10th comet discovered by Gennady Borisov. When first seen on August 17 at 16-17th magnitude, it was only predicted to reach 14th magnitude. The comet brightened faster than expected as it passed through its August 15 perihelion at 1.32 au and close approach to Earth on September 25 at 0.73 au. Now that we know it is a dynamically old comet with an orbital period of 407 years, maybe this shouldn't have been a surprise. Exactly how bright the comet got is still a bit in question as magnitude measurements submitted to the ALPO and COBS are all over the place (between 10th and 15th magnitude). Estimates of the size of the coma also cover a wide range (<1' to 9') suggesting, yet again, a large low surface brightness coma.

J. J. Gonzalez has trended towards the bright end of the estimates and submitted the following to the ALPO: Aug. 25.14 UT, mag = 11.6, coma diam = 2.5', DC=2; Sep 07.92 UT, mag = 10.8, coma diam = 2.5', DC=3; Sep 09.94 UT, mag = 10.1, coma diam = 7', DC = 2/.

This month, C/2020 Q1 should rapidly fade as it moves away from the Sun and Earth. It also continues to move through the Milky Way constellations of Auriga (Oct 1-7), Perseus (7-10), Camelopardalis (10-17), Cassiopeia (17-23), and Cepheus (23-31). The comet starts the month in the northern circumpolar sky but should move far enough south by mid-month to be seen from the southern hemisphere.

C/2020 Q1 (Borisov)

T = 2020-Aug-15 $q = 1.32$ au

Long-Period comet – dynamically old

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020 10 01	11.1	21 42	+60 02	1.489	0.758	114	Aur	70	0
2020 10 06	11.4	20 49	+50 40	1.524	0.824	112	Aur	79	0
2020 10 11	11.8	20 21	+42 06	1.561	0.921	108	Cam	88	7
2020 10 16	12.1	20 06	+35 04	1.600	1.039	103	Cam	84	12
2020 10 21	12.5	19 56	+29 29	1.641	1.171	98	Cas	77	15
2020 10 26	12.9	19 51	+25 04	1.684	1.311	92	Cep	71	16
2020 10 31	13.2	19 48	+21 34	1.728	1.456	87	Cep	65	15
2020 11 05	13.5	19 46	+18 45	1.774	1.604	82	Cyg	61	13

Comet Magnitude Parameters --- H = 10.0, 2.5n = 8.0

C/2020 S3 (ERASMUS) – Don't be fooled by the name of this comet as *C/2020 S3* is yet another ATLAS discovery. Nicolas Erasmus of the South African Astronomical Observatory discovered *C/2020 S3* on September 17 with the ATLAS (Asteroid Terrestrial-Impact Last Alert System) 0.5-m f/2 Schmidt at Mauna Loa, Hawaii. ATLAS reported it as bright as 17th magnitude at discovery. On September 28, Pete Carson reported a CCD magnitude of 14.6 to the COBS site.

The magnitude prediction below is a guess as we really don't know how quickly *C/Erasmus* will brighten. Also, its orbit is still too uncertain to know if it is dynamically old or new. Perihelion is 3 months from now on 2020 December 12 at 0.39 au. This means we still have time to watch the comet develop. October will see the comet observable from both hemispheres in the morning sky in Hydra (Oct 1-23) and Sextans (23-31). Assuming Carson's magnitude is correct, and the comet brightens at a conservative $2.5n = 8.0$ rate, *C/2020 S3* could brighten from magnitude ~14.4 to ~12.2 this month. That rate of brightening would only result in a 9th magnitude object at perihelion which is quite faint for such a small perihelion distance.

C/2020 S3 (Erasmus)
 T = 2020-Dec-12 $q = 0.39$ au Max El
 Long-Period comet – dynamically TBD (deg)

Date	Mag	R.A.	Decl.	r	d	Elong	Const	40N	40S
2020 10 01	14.4	08 18	+05 50	1.615	1.795	63	Hya	35	22
2020 10 06	14.1	08 34	+04 17	1.531	1.679	63	Hya	35	23
2020 10 11	13.8	08 51	+02 30	1.446	1.567	64	Hya	35	23
2020 10 16	13.4	09 10	+00 28	1.360	1.461	63	Hya	35	23
2020 10 21	13.0	09 31	-01 49	1.272	1.362	63	Hya	33	22
2020 10 26	12.6	09 55	-04 25	1.183	1.272	61	Sext	31	22
2020 10 31	12.2	10 22	-07 19	1.091	1.193	59	Sext	29	21
2020 11 05	11.8	10 52	-10 26	0.999	1.128	55	Sext	25	19

Comet Magnitude Parameters --- $H = 11.5$, $2.5n = 8.0$

New Discoveries, Recoveries and Other Comets in the News

P/2020 S5 (PANSTARRS) – The Pan-STARRS1 1.8-m reflector at Haleakala, Hawaii discovered this 20th magnitude comet on September 21. *P/2020 S5* arrived at perihelion on August 8, 2020 at 2.68 au. It has an 8.15-year orbital period.

2020 SJ5 – This apparently asteroidal object was also found by Pan-STARRS1 on September 19 at 21st magnitude. Pre-discovery observations back to August 28 were identified. *2020 SJ5* comes to perihelion on 2021 January 1 at 2.62 au. It is a Halley-family object with a period of 77 years. Unless it experiences some significant activity, it is unlikely to get any brighter than 20th magnitude.

C/2020 S4 (PANSTARRS) – The Pan-STARRS1 telescope was also used to find this 21st magnitude comet on September 16. The comet is still years away from a 2023 February 9 perihelion at 3.36 au when it may have brightened to 14th magnitude.

C/2020 S3 (Erasmus) – See above.

C/2020 S2 (PANSTARRS) – C/2020 S2 was found on September 16 at 20th magnitude. The comet is unlikely to get brighter than 19th magnitude around the time of perihelion on 2020 December 21 at 1.76 au. The comet has an orbital period of 32.4 years.

P/2020 S1 (PANSTARRS) – Like the previous 3 comets, P/2020 S1 is yet another Pan-STARRS1 discovery. The comet is a faint short period comet with a perihelion on 2021 January 17 at 2.95 au. It was 21st magnitude at discovery and unlikely to get brighter than 20th magnitude.

C/2020 R7 (ATLAS) – The ATLAS (Asteroid Terrestrial-Impact Last Alert System) 0.5 f/2 Schmidt at Mauna Loa was used to find this 18th magnitude comet on September 15. C/2020 R7 is still two years from its 2022 September 14 perihelion at 2.93 au. Around that time, it may brighten to 13th magnitude.

C/2020 R6 (Rankin) – David Rankin is an observer with the Catalina Sky Survey. He used the Mount Lemmon 1.5-m to find this 20th magnitude comet on September 15. The comet is already a year past its 2019 September 12 perihelion at 2.95 au. The comet is likely already past its peak brightness.

P/2020 R5 (PANSTARRS) – The Pan-STARRS2 1.8-m at Haleakala found this 20th magnitude on September 14. As the P/ denotes, P/2020 R5 is a short period comet. Perihelion occurred back on 2020 May 28 at 3.41 au. With a 11.1-year period, its next perihelion will be on 2031 July 22. Like the previous comet, P/2020 R5 has already peaked in brightness.

C/2020 R4 (ATLAS) – Put this one on the list of comets to watch in 2021. C/2020 R4 was discovered on September 12 with the ATLAS Mauna Loa 0.5-m f/2. While currently a faint 18th magnitude object, the comet should brighten as it approaches a perihelion of 1.03 au on 2021 March 1. It also passes within 0.46 au of Earth in late April 2021. Assuming a conservative $2.5n=8.0$ brightening index only brings R4 to around 12th magnitude. Since it will be well placed to observe when at its brightest, we'll have to watch and see if it brightens at a faster rate than predicted.

P/2020 R3 = P/2006 H1 (McNaught) – P/McNaught was discovered by Robert McNaught as part of the Siding Spring Survey (which was a part of the Catalina Sky Survey) in April 2006. The comet peaked at 17th magnitude during that return. E. Schwab used a 0.8-m f/3 Schmidt at Calar Alto, Spain (in a project with D. Koschny, M. Micheli, and R. Jehn) to recover P/McNaught on September 11 and 12 at 20th magnitude. Recovery didn't take place till many months after its 2019 December 7 perihelion at 2.42 au. The comet was located deep in the Milky Way of Scorpius and Sagittarius near perihelion so perhaps its southern declination and the dense Milky Way prevented recovery at that time. McNaught will next be at perihelion in October 2033.

C/2020 R2 (PANSTARRS) – 20th magnitude C/2020 R2 was first noticed in images by the Pan-STARRS2 telescope on September 12. Pre-discovery observations were also found by Pan-STARRS in August and earlier in September. A high-q object, C/2020 R2 won't reach perihelion until 2022 February 24 at 4.67 au when it is only expected to reach 18th magnitude.

P/2020 R1 = P/2013 PA104 (PANSTARRS) – Not often does a new discovery quickly result in a multi-apparition object. P/2020 R1 (PANSTARRS) was identified as a new 19th magnitude object in images taken on 2020 September 9 with the Pan-STARRS1 telescope. Robert Weryk of the Pan-STARRS team was able to find observations taken on 11 nights in 2013 through 2016 as well as additional nights in 2020. The past observations were inadvertently designated with the asteroidal designation 2013 PA104 hence the double designation. The comet is not expected to get brighter than 18th magnitude with a perihelion on 2021 February 10 at 2.10 au. With a ~6.7-year period, it will next be at perihelion in November 2027.

P/2020 O4 = P/2013 O2 (PANSTARRS) – The Mount Lemmon 1.5-m recovered this 19-20th magnitude comet during the course of the Mount Lemmon Survey on July 30 and August 13. Perihelion arrives on 2021 May 22 at 2.10 au. With a 7.4-year period, it will next arrive at perihelion in October 2028. At its discovery apparition in 2013, it reached 17th magnitude but appeared to quickly fade after perihelion.

C/2019 Q1 (Lemmon) – This object was originally designated A/2019 Q1 due to being an apparently asteroidal object on a cometary orbit. The Mount Lemmon Survey discovered it on 2019 August 28 at magnitude 20.6. Even though observations going back to November 2019 reported cometary activity, the object was only designated as a comet on 2020 September 9. Perihelion occurs on 2020 July 19 at 5.00 au. The comet is currently near its peak brightness of 18th magnitude.

As always, the Comet Section is happy to receive all comet observations, whether textual descriptions, images, drawings, magnitude estimates, or spectra. Please send your observations via email to < carl.hergenrother @ alpo-astronomy.org >.

Thank you to everyone who contributed to the ALPO Comets Section!

Stay safe and enjoy the sky!

- Carl Hergenrother (ALPO Comets Section Coordinator)

Recent Magnitude Measurements Contributed to the ALPO Comet Section

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA		TAIL		ICQ CODE	Observer Name
							Dia	DC	LENG	PA		
2020Q1	2020 09 09.94	S 10.1	TK	20.3T	10	77	7	2/			ICQ XX GON05	J. J. Gonzalez
2020Q1	2020 09 07.92	S 10.8	TK	20.3T	10	133	2.5	3			ICQ XX GON05	J. J. Gonzalez
2020P1	2020 09 23.38	xM 10.3	AQ	25.0L	5	74	3	3/			ICQ XX WYA	Christopher Wyatt
2020P1	2020 09 22.39	xS 10.7	AQ	25.0L	5	74	2.5	3			ICQ XX WYA	Christopher Wyatt
2020M3	2020 09 28.15	&I 10.0:	TK	25.0C	10	190	6	1/&	0.1	270	ICQ XX DECaa	Michel Deconinck
2020M3	2020 09 22.63	xM 9.4	TK	25.0L	5	40	7.5	3/			ICQ XX WYA	Christopher Wyatt
2020M3	2020 09 08.50	xS 10.3	TK	25.0L	5	40	6.8	2			ICQ XX WYA	Christopher Wyatt
2020F3	2020 09 22.40	xS 10.6	AQ	25.0L	5	74	3	3			ICQ XX WYA	Christopher Wyatt
2020F3	2020 09 08.41	xM 9.0	TK	25.0L	5	40	7	4	36.0m	59	ICQ XX WYA	Christopher Wyatt
2020F3	2020 09 07.86	S 8.9:	TK	20.3T	10	77	6	2/			ICQ XX GON05	J. J. Gonzalez Juan
2020F3	2020 09 07.39	xM 8.7	TK	25.0L	5	40	8.4	4	32.0m	63	ICQ XX WYA	Christopher Wyatt
2020F3	2020 09 05.13	S 8.7	TK	12.5B		30	2	2			ICQ xx HER02	Carl Hergenrother
2019U6	2020 09 09.87	S 10.3:	TK	20.3T	10	77	6	2			ICQ XX GON05	J. J. Gonzalez
2019U6	2020 09 08.40	xS 12.6	AQ	25.0L	5	74	1.8	2			ICQ XX WYA	Christopher Wyatt
2019U6	2020 09 07.89	S 10.2	TK	20.3T	10	77	5	2			ICQ XX GON05	J. J. Gonzalez
2019U6	2020 09 07.36	xS 12.5	AQ	25.0L	5	74	1.2	2/			ICQ XX WYA	Christopher Wyatt
2017T2	2020 09 09.84	S 10.2	TK	20.3T	10	77	6	1/			ICQ XX GON05	J. J. Gonzalez
2017T2	2020 09 07.37	xS 12.0:	AQ	25.0L	5	74	1.3	3			ICQ XX WYA	Christopher Wyatt
88	2020 09 23.40	xM 9.3	TK	25.0L	5	40	6.2	4			ICQ XX WYA	Christopher Wyatt
88	2020 09 22.41	xM 9.1	TK	25.0L	5	40	6.5	4			ICQ XX WYA	Christopher Wyatt
88	2020 09 08.42	xM 8.9	TK	25.0L	5	40	4.5	5			ICQ XX WYA	Christopher Wyatt
88	2020 09 07.85	S 8.7	TK	20.3T	10	77	8	2/			ICQ XX GON05	J. J. Gonzalez Juan
88	2020 09 07.39	xM 8.9	TK	25.0L	5	40	4.5	5/			ICQ XX WYA	Christopher Wyatt
29	2020 09 09.93	S 11.0:	TK	20.3T	10	100	5	2			ICQ XX GON05	J. J. Gonzalez

Images Contributed to the ALPO Comet Section from the Previous Month
88P/Howell



N (47' x 36')



88P / Howell 2020 Sept 7th 09:52:25 UT (mid) 0.51m CDK @ f4.5 + FLI PL09000 LRGB 180:60:60:60 sec M.P. Moberley

C/2020 M3 (ATLAS)

