



ALPO COMET NEWS FOR AUGUST 2020

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

By Carl Hergenrother – 2020-August-5

The monthly ALPO Comet News PDF can be found on the ALPO Comet 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/721655-alpo-comet-news-for-august-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>.

C/2020 F3 (NEOWISE) was the celestial highlight of July and likely the best comet of 2020. NEOWISE is now rapidly fading but still a visually and photographically impressive object well placed for observation in the evening sky. August will see it fade from around 6th to 9th magnitude. By the end of August, short-period comet 88P/Howell will challenge NEOWISE's place as the "brightest comet in the sky". 2P/Encke, C/2017 T2 (PANSTARRS), and C/2019 U6 (Lemmon) start the month around 9-10th magnitude but fade throughout the month.

All lightcurves in this report were produced with Seiichi Yoshida's "Comets for Windows" program and include magnitude estimates by Michel Deconinck (ICQ code DECaa), J. J. Gonzalez (GON05), Carl Hergenrother (HER02), Gabriel Jaimes (JAIAa), John D. Sabia (SAB), Willian Souza (SOU01), Roger Venable, and Christopher Wyatt (WYA).

Almost 200 images and sketches of NEOWISE were submitted to the ALPO in July. Rather than include them all in this report, you can visit the Comet Section Image Gallery to see all of the NEOWISE images at <http://www.alpo-astronomy.org/gallery3/index.php/Comet-Images-and-Observations>.

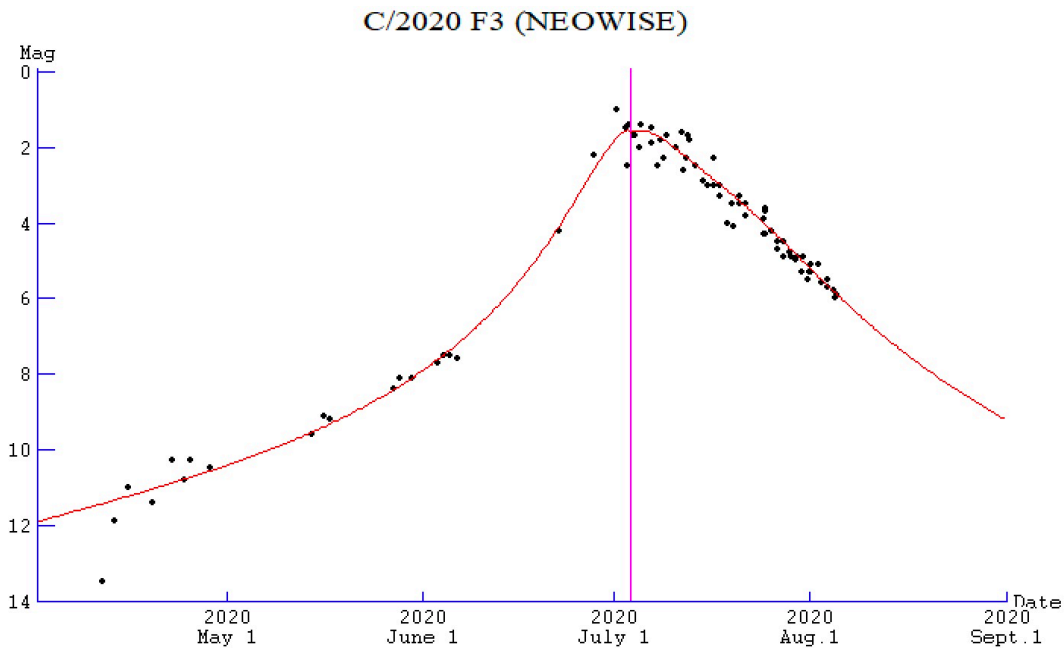
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Bright Comets (magnitude < 10.0)

C/2020 F3 (NEOWISE) – After throwing us a few head fakes, 2020 finally delivered a really good comet as *C/2020 F3 (NEOWISE)* developed into the breakout hit of July. After peaking around magnitude 1.5 in the days around its July 3rd perihelion at 0.29 au, the comet proceeded to put on a good show for both visual and imaging observers. Around the time of its July 23rd closest approach to Earth (0.69 au), dust and ion tails as long as ~10 and ~30 degrees were being imaged.

Now in full retreat from the Sun and Earth, NEOWISE is rapidly fading. Visual observations have placed the comet between magnitude 5.5 and 6.0 during the first few days of August. This month the comet is an evening object moving through Coma Berenices (Aug 1-9), Virgo (9-12), Boötes (12-15), and back into Virgo (15-31). The comet should fade to around magnitude 7 by the August 13, magnitude 8 by the 21st, and magnitude 9 by month's end. NEOWISE will pass close to the globular cluster M53 late on August 5 UT.



C/2020 F3 (NEOWISE)

T = 2020-Jul-03 $q = 0.29$ au

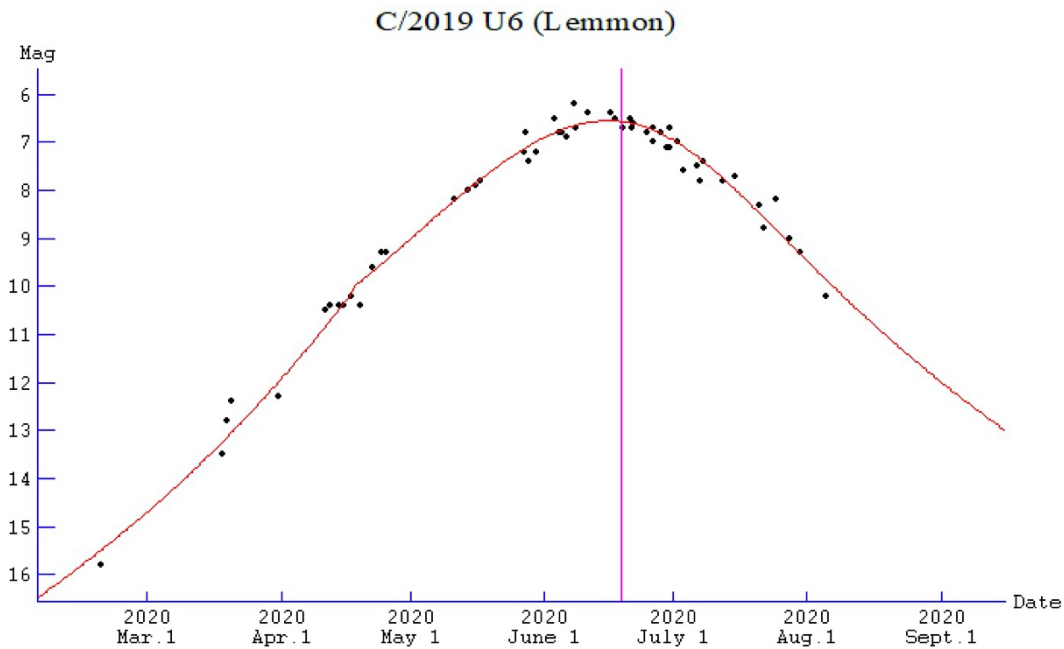
Dynamically old long period comet

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020-08-01	5.2	12 32	+27 34	0.827	0.794	52	Com	27	13
2020-08-06	6.0	13 08	+19 00	0.933	0.913	57	Com	27	21
2020-08-11	6.8	13 32	+12 20	1.035	1.054	60	Vir	25	27
2020-08-16	7.4	13 49	+07 11	1.135	1.206	60	Vir	23	30
2020-08-21	8.1	14 02	+03 11	1.232	1.364	60	Vir	21	32
2020-08-26	8.6	14 13	-00 02	1.326	1.524	58	Vir	19	33
2020-08-31	9.1	14 22	-02 39	1.418	1.684	57	Vir	17	32
2020-09-05	9.6	14 31	-04 50	1.507	1.843	54	Vir	15	31

Comet Magnitude Parameters --- H = 6.5, 2.5n = 9.8

C/2019 U6 (Lemmon) – *C/2019 U6 (Lemmon)* was discovered by Rich Kowalski (University of Arizona) on October 31 with the Mount Lemmon Survey’s 1.5-m reflector. At discovery, Lemmon showed no evidence of cometary activity. Since then, it rapidly brightened to a peak around magnitude 6.5 near the time of its mid-June perihelion at 0.91 au. Since then the comet has faded more rapidly than expected. In fact, its lightcurve is best fit if its peak activity is offset ~12 days prior to perihelion. Perhaps the comet has one or a few active areas that were at peak illumination or heating just before perihelion causing a seasonal effect. The most recent observations placed Lemmon at magnitude 9.0 on July 27.92 (Willian Souza), 9.3 on July 30.35 (Chris Wyatt), and 10.2: on August 5.35 UT (Chris Wyatt).

This month Lemmon is visible from both hemispheres in the evening sky as it moves through Coma Berenices (Aug 1-3) and Boötes (3-31). Starting the month around magnitude 9.5-10.0 it may fade to magnitude 12 by the end of the month.



C/2019 U6 (Lemmon)

T = 2020-Jun-18 q = 0.91 au

Dynamically old long period comet

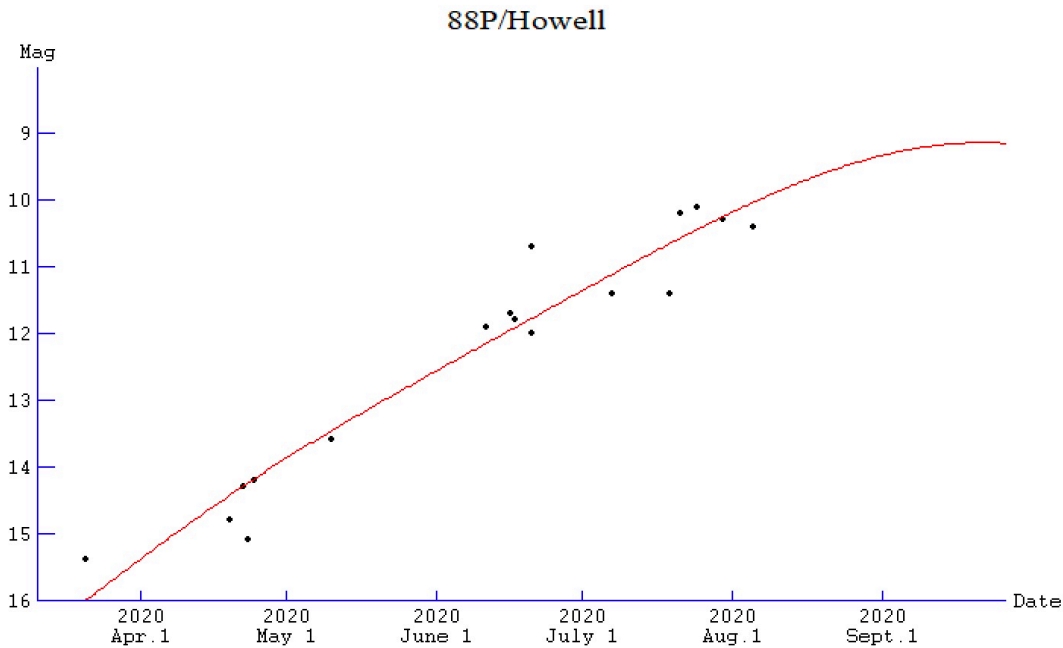
Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020-08-01	9.5	13 26	+17 15	1.187	1.145	66	Com	31	27
2020-08-06	9.9	13 46	+18 44	1.241	1.225	66	Boo	34	26
2020-08-11	10.3	14 05	+19 53	1.298	1.307	66	Boo	36	24
2020-08-16	10.8	14 22	+20 47	1.357	1.391	66	Boo	38	23
2020-08-21	11.2	14 38	+21 28	1.417	1.475	66	Boo	39	21
2020-08-26	11.5	14 53	+21 58	1.479	1.560	66	Boo	40	20
2020-08-31	11.9	15 08	+22 20	1.541	1.646	65	Boo	41	18
2020-09-05	12.3	15 21	+22 36	1.603	1.731	65	Ser	42	17

Comet Magnitude Parameters --- H = 7.3, 2.5n = 15.5, Offset = -12 days

88P/Howell – Short-period comet 88P/Howell is making its 9th observed return. 88P was discovered in August 1981 and has been observed at every return since then. The comet’s perihelion distance has gradually fallen from 1.62 au in 1981 to its current 1.35 au. The lower perihelion distance has resulted in Howell often peaking at brighter than 10th magnitude. 88P comes to perihelion next month on September 28 and should peak around 8-9th magnitude.

The most recent estimates place P/Howell around magnitude 10 (10.4 on August 5.37 UT – Chris Wyatt, 10.3 on July 30.37 UT – Chris Wyatt, and 10.1 on July 24.91 UT – J. J. Gonzalez). This month, 88P moves through Virgo (Aug 1-16) and Libra (16-31) as it brightens from 10th to 9th magnitude. It is possible it could be the brightest comet in the sky by the end of August.

88P/Howell was the target of the proposed Comet Rendezvous, Sample Acquisition, Investigation, and Return (CORSAIR) mission. In 2017, CORSAIR was proposed to the NASA New Frontiers program but was ultimately not selected. The Dragonfly mission to Titan was the eventual winner of the 2017 New Frontiers call for proposals.



88P/Howell

T = 2020-Sep-28 q = 1.35 au

Max El

Jupiter-family comet

(deg)

Date	Mag	R.A.	Decl.	r	d	Elong	Const	40N	40S
2020-08-01	10.2	13 45	-12 14	1.488	1.281	79	Vir	15	56
2020-08-06	10.0	13 56	-13 29	1.467	1.291	77	Vir	14	55
2020-08-11	9.9	14 07	-14 45	1.447	1.301	76	Vir	13	54
2020-08-16	9.7	14 20	-16 02	1.429	1.311	74	Vir	12	53
2020-08-21	9.6	14 33	-17 19	1.412	1.320	73	Lib	12	53
2020-08-26	9.4	14 46	-18 36	1.398	1.329	71	Lib	11	52
2020-08-31	9.3	15 01	-19 51	1.385	1.338	70	Lib	11	51
2020-09-05	9.3	15 16	-21 03	1.374	1.348	69	Lib	11	50

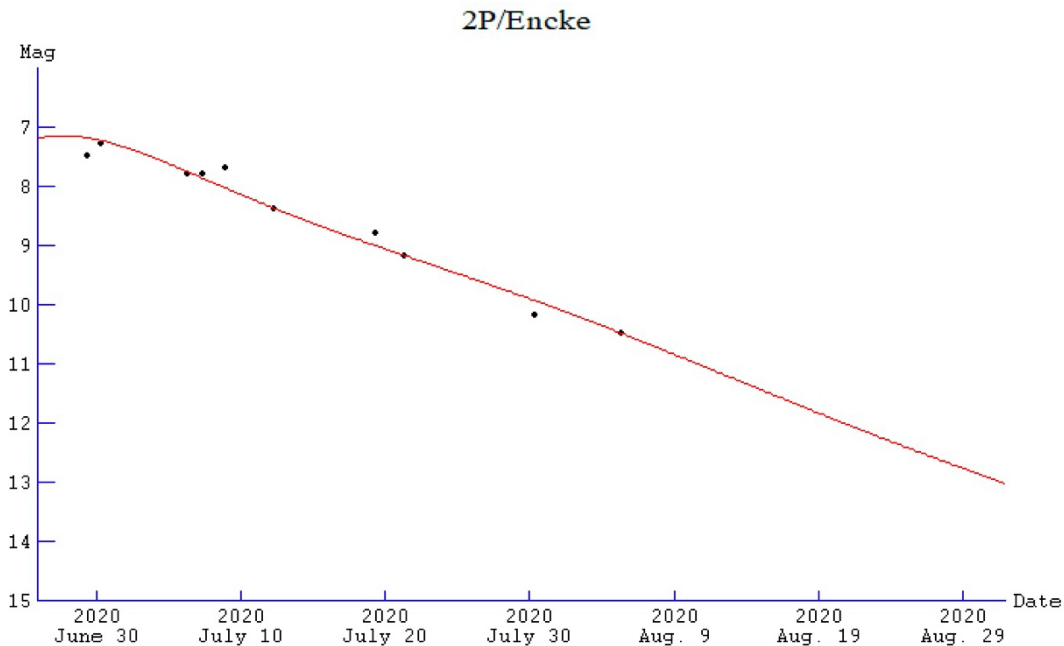
Comet Magnitude Parameters --- H = 3.7, 2.5n = 34.1

Fainter Comets of Interest (fainter than magnitude 10.0)

2P/Encke – Comet Encke has the shortest known orbital period of any comet (not counting asteroidal objects that appear cometary due to impacts or rotational splitting) at 3.3 years. 2020 marks Encke's 65th observed return since 1786. Perihelion occurred on June 26 at 0.34 au. Northern summer/southern winter returns of Encke result in very poor placement pre-perihelion and then good placement after perihelion but only for southern hemisphere observers.

Willian Souza estimated Encke at magnitude 9.0 on July 27.92 while Chris Wyatt placed it fainter at magnitude 10.5 on August 5.36 UT. Encke should continue to rapidly fade past 13th magnitude by mid-month. August sees the comet moving through the evening constellations of Corvus (Aug 1-6), Hydra (6-19), Centaurus (19-21), and Lupus (21-31).

The lightcurve below finds Encke fading at a slower rate ($2.5n = 10.1$) than predicted by Seichi Yoshida based on past apparitions ($2.5n = 15.7$). If the later rate is correct, the comet will be fainter than in the prediction below.



2P/Encke

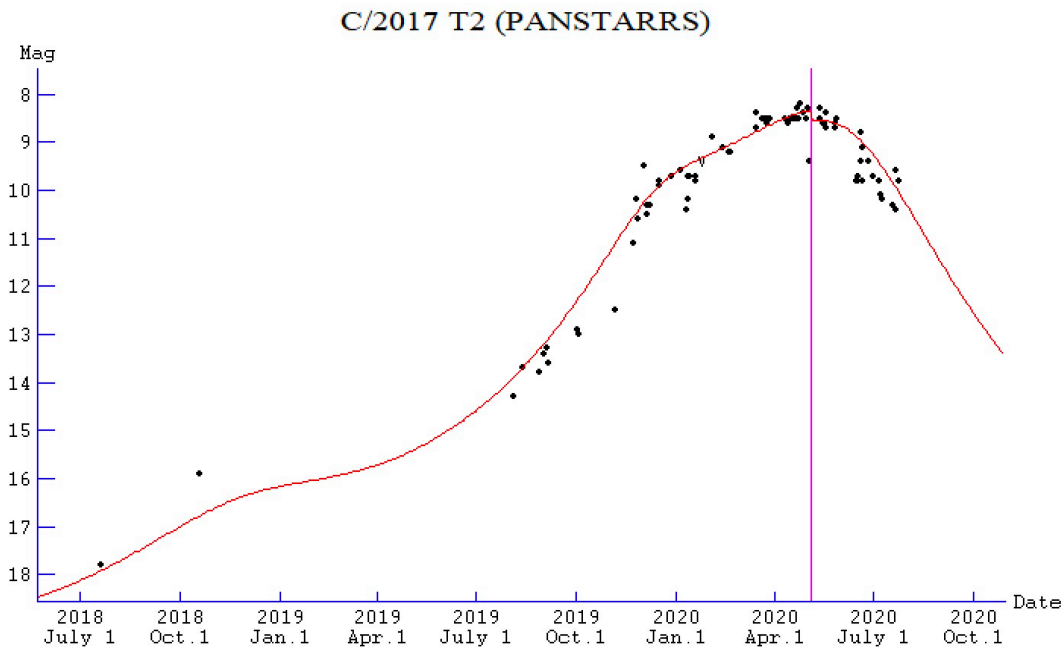
T = 2020-Jun-26 q = 0.34 au

Jupiter-family comet

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020-08-01	10.5	12 07	-17 14	0.896	0.624	60	Cor	0	44
2020-08-06	11.2	12 54	-22 22	0.981	0.645	68	Cor	0	51
2020-08-11	11.9	13 39	-26 13	1.063	0.687	74	Hyd	0	57
2020-08-16	12.6	14 20	-28 50	1.142	0.747	79	Hyd	3	62
2020-08-21	13.2	14 57	-30 27	1.219	0.821	82	Cen	5	65
2020-08-26	13.8	15 29	-31 20	1.294	0.904	84	Lup	7	67
2020-08-31	14.4	15 56	-31 44	1.366	0.996	85	Lup	9	68
2020-09-05	15.0	16 20	-31 50	1.435	1.093	86	Lup	10	68

Comet Magnitude Parameters - H = 11.6, 2.5n = 10.1

C/2017 T2 (PANSTARRS) – For the past 8 months, *C/2017 T2 (PANSTARRS)* has been brighter than 10th magnitude as it leisurely traversed the northern evening sky. Now 3 months past its early May perihelion at 1.62 au, PANSTARRS will likely fade back below 10th magnitude. Between July 19 and 24, visual observations by J. J. Gonzalez and Chris Wyatt placed PANSTARRS between magnitude 9.6 and 10.4. This month PANSTARRS’ path somewhat parallels NEOWISE’s though PANSTARRS will be moving more slowly. It moves to the southeast through the evening constellations of Coma Berenices (Aug 1-6), Boötes (6-23), and Virgo (23-31).



C/2017 T2 (PANSTARRS)

T = 2020-May-04 q = 1.62 au

Long-Period comet - dynamically new

Date	Mag	R.A.	Decl.	r	d	Elong	Const	Max El	
								40N	40S
2020-08-01	10.3	13 27	+19 34	1.993	2.175	66	Com	33	25
2020-08-06	10.5	13 35	+16 34	2.031	2.254	64	Com	30	26
2020-08-11	10.7	13 42	+13 44	2.070	2.336	62	Boo	28	27
2020-08-16	10.9	13 50	+11 04	2.110	2.422	60	Boo	26	27
2020-08-21	11.1	13 57	+08 32	2.151	2.509	57	Boo	23	27
2020-08-26	11.3	14 04	+06 10	2.193	2.599	55	Vir	21	26
2020-08-31	11.5	14 11	+03 55	2.236	2.689	53	Vir	19	25
2020-09-05	11.6	14 18	+01 49	2.279	2.780	50	Vir	17	24

Comet Magnitude Parameters --- H = 4.6, 2.5n = 13.5

New Discoveries, Recoveries and Other Comets in the News

P/2020 O3 (PANSTARRS) – This 20th magnitude comet was found on July 28 by the Pan-STARRS1 1.8-m reflector on Haleakala. P/2020 O3 is a short-period comet with a 10.1-year period and perihelion back on 2020 December 22 at 4.18 au. The comet has likely peaked in brightness.

C/2020 O2 (Amaral) – Leonardo S. Amaral of Rio de Janeiro, Brazil discovered this 18th magnitude comet with a 0.3-m f/4 reflector at the Observatório Campo dos Amarais (OCA). This is the first comet discovery by the OCA which has also discovered 3 near-Earth asteroids. C/2020 O2 is about 1 year out from a perihelion at 4.90 au on 2021 August 23. Currently located at a southern declination of -51 degrees, the comet is slowly moving north and will be observable from both hemispheres when it is at its brightest (16th magnitude) in mid-2021.

P/2020 O1 (Lemmon-PANSTARRS) – This object is an “Active Asteroid” or “Main Belt Comet”. It was reported as a 19th magnitude comet discovery from images taken on July 20 UT with the Pan-STARRS1 telescope. One night earlier, the object was reported as an asteroid by the Mount Lemmon Survey using the Mount Lemmon 1.5-m. The object has a very asteroidal orbit with semi-major axis of 2.65 au, eccentricity of 0.12, and inclination of 5.2 degrees. Perihelion was on 2020 May 3 at 2.33 au. The mechanism responsible for its recent activity (i.e. impact, rotational disruption, ice sublimation) is still TBD.

C/2020 N2 (ATLAS) – The "Asteroid Terrestrial-Impact Last Alert System" or ATLAS program discovered C/2020 N2 on 2020 July 13 at 18th magnitude with their 0.5-m f/2 Schmidt reflector at Mauna Loa. With perihelion coming this month (August 23) at 1.80 au, C/2020 N2 is unlikely to get much brighter than 17th magnitude.

C/2020 N1 (PANSTARRS) – The Pan-STARRS1 telescope on Haleakala, Hawaii found this 21st magnitude object on July 3. Perihelion occurs on 2021 March 12 at 1.32 au. Unfortunately, this comet will never get closer than 1.2 au to Earth. If it brightens at a $2.5^n = 8$ rate, it will brighten to 14th magnitude. If it brightens at $2.5^n = 10$, it would reach 13th magnitude. This is one to keep an eye on if it brightens at a more rapid rate.

C/2020 M5 (ATLAS) – ATLAS found C/2020 M5 on June 30 at 19th magnitude. Numerous pre-discovery observations by Pan-STARRS were found back to August 2019 when the comet was at 23rd magnitude. Perihelion is still over a year out on 2021 August 19 at 3.00 au when the comet should be at 15th magnitude.

A/2020 M4 – This apparently asteroidal object was found by Pan-STARRS on June 17 at 22nd magnitude. It comes to perihelion on 2020 November 23 at 5.95 au and is unlikely to get brighter.

2020 MK4 – Yet another apparently asteroidal Pan-STARRS discovery, 2020 MK4 was found on June 16 at 22nd magnitude. Perihelion was back on 2020 April 11 at 2.54 au. It is has also likely peaked in brightness. Its current orbit has an orbital period of ~400 years.

2020 ML1 – 2020 ML1 is on a nearly circular Centaur-type orbit just outside the orbit of Jupiter. With a very small eccentricity of 0.017, its orbit only ranges from a perihelion of 6.03 au to an

aphelion of 6.25 au. Like the previous two objects, ML1 was also a Pan-STARRS find. It was first seen on June 16 at 21st-22nd magnitude.

C/2019 Y5 (PANSTARRS) – This object was discovered by Pan-STARRS on 2019 December 28 at 21st magnitude. Pre-discovery observations were found by Pan-STARRS back to 2019 September 11. Even though the object was reported as cometary by Pan-STARRS with a 1.9' coma and 6" long tail, it was announced as an asteroidal object with the designation A/2019 Y5. Since then numerous other observers have confirmed its cometary nature resulting in a re-designation as C/2019 Y5 (PANSTARRS). It is a dynamically old long-period comet with perihelion back on 2019 August 18 at 4.91 au. The comet is now slowly fading.

C/2019 O3 (Palomar) – Here's another object that was classified as an asteroid at discovery. This time cometary activity was not noticed at discovery. This object was originally designated as A/2019 O3 when after discovery with the 1.2-m Oschin schmidt on Mount Palomar on 2019 July 26 at 19th magnitude. Numerous recent reports of its cometary nature were reported on CBET 4817 leading to its re-designation as C/2019 O3 (Palomar). The comet is currently 18th magnitude but is not expected to get much brighter as it approaches a distant perihelion on 2021 March 7 at 8.82 au.

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 Comet Section!

Stay safe and enjoy the sky!

- Carl Hergenrother (ALPO Comet 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	
	(NEOWISE)					T	Dia	DC	LENG	PA				
C/2020 F3	2020 08 05.35	xM	5.9	TK	7.0B	15	9.0	5/	1.0	088	ICQ	XX WYA	Christopher Wyatt	
2020F3	2020 08 05.14	M	6.0	TK	5.0B	10	8	5 &	1.0	70	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 08 04.91	S	5.8	TK	7.0B	15	5	5			ICQ	XX SOU01	Willian Souza	
2020F3	2020 08 03.92	S	5.5	TK	7.0B	15	5	5			ICQ	XX SOU01	Willian Souza	
2020F3	2020 08 02.35	xM	5.1	TK	7.0B	15	6.5	5/	30.0m	84	ICQ	XX WYA	Christopher Wyatt	
2020F3	2020 08 01.35	xM	5.1	TK	7.0B	15	6.5	5/	39.0m	80	ICQ	XX WYA	Christopher Wyatt	
2020F3	2020 08 01.16	M	5.3	TK	5.0B	10	8	6 &2		80	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 31.15	M	4.9	TK	5.0B	10	7	6 &2		90	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 30.88	I	5.3:TK		5.0R	7		6			ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 30.34	xM	5.2	TK	7.0B	15	8	5/	45.0m	80	ICQ	XX WYA	Christopher Wyatt	
2020F3	2020 07 30.16	M	4.9	TK	5.0B	10	7	6 &2		80	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 29.80	xB	5.0	AA	4.0B	6	2 & 4		& 5.0	75	ICQ	xx JAIaa	Gabriel Jaimes	
2020F3	2020 07 29.35	wM	5.0	TK	7.0B	15	6.4	5	50.0m	74	ICQ	XX WYA	Christopher Wyatt	
2020F3	2020 07 28.90	M	4.8	TK	5.0B	10	5	7			ICQ	XX SOU01	Willian Souza	
2020F3	2020 07 29.23	wM	4.9	TK	5.0B	10	7	6 &1		60	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 27.90	M	4.5	TK	5.0B	10	4	7			ICQ	XX SOU01	Willian Souza	
2020F3	2020 07 27.84	xB	4.9	AA	4.0B	6	2 & 4		& 6.0	75	ICQ	xx JAIaa	Gabriel Jaimes	
2020F3	2020 07 26.86	xB	4.7	AA	4.0A	6	2 & 8		& 7.0m	75	ICQ	xx JAIaa	Gabriel Jaimes	
2020F3	2020 07 25.91	M	3.7	TK	5.0B	10	5	D6 <	5	40	ICQ	XX SAB	John D Sabia	
2020F3	2020 07 24.96	M	4.3	TK	5.0B	10	6	8/	9	60	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 24.87	I	4.3:TK		0.0E	1		6	7.0	50	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 24.85	B	4.3	TK	12.6B	5	25	3.8	6 >	1.0	75	ICQ	XX DECaa	Michel Deconinck
2020F3	2020 07 21.89	I	3.8	TK	12.6B	5	90	4.15	7/		ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 21.88	I	3.8	TK	5.0B	10	3.5	7/	2.0	50	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 21.87	B	3.8	TK	0.0E			7/	&10.0	50	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 20.91	I	3.5	TK	0.0E			8/	12	30	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 19.90	I	3.5:TK		5.0B	10	& 2	7/	9.0	40	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 17.88	I	3.3	TK	0.0E			7/	& 9.0	20	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 16.91	aI	2.3:TK		0.0E			8/	17	0	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 16.88	I	3.0:TK		1.0B	10	&10	7/	& 6.0	20	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 16.87	I	3.0:TK		0.0E			7/	&15.0	20	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 15.90	I	3.0:TK		0.0E	1	& 2	7	>10.0	15	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 15.89	I	2.9:TK		12.6B	5	90	3	8		ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 15.86	B	2.9:TK		12.6B	5	25	10	7/	4.5	20	ICQ	XX DECaa	Michel Deconinck
2020F3	2020 07 13.13	I	1.8:TK		0.0E			8/	12	340	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 12.48	aI	2.3:TK		0.0E		1 & 1	8	&1	350	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 12.48	aI	2.5:TK		5.0B	10	& 1	7	&2	350	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 12.11	I	2.6:TK		0.0E			7/	6.0	320	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 12.11	I	2.6:TK		7.0B	10	& 1.5	7/	& 8.0	320	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 09.47	wI	1.7:TK		0.0E	1	& 1	8	&1.5	320	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 09.47	wB	1.8:TK		5.0B	10	& 1	7	&2	320	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 08.48	wI	1.8:TK		0.0E	1	& 1	8	&1	300	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 08.48	wB	1.8:TK		5.0B	10	& 1	7	&2	300	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 08.15	\$I	2.5:TK		5.0B	10	1	8	2.5	310	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 07.89	I	5.3:TK		25.0C10	190	3.1	5			ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 07.10	I	1.9:TK		0.0E			7/	2.5	315	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 07.10	I	1.9:TK		7.0B	10		7	2.5	310	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 07.10	I	1.9:TK		5.0B	10		7	2.5	310	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 05.12	&I	2.0:TK		12.6B	5	40	& 1.2	7/	& 16.0m310	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 05.11	&I	2.0:TK		12.6B	5	25	& 1.2	7/	& 26.0m310	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 04.13	&I	1.7:TK		5.0B	10	& 5	7	& 20.0m300	300	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 04.12	&I	1.7:TK		12.6B	5	40	7	& 15.0m300	300	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 04.12	&I	1.7:TK		12.6B	5	25	7	& 17.0m300	300	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 03.49	sS	1.4:TK		5.0B	10	& 1	7	0.3	300	ICQ	xx HER02	Carl Hergenrother	
2020F3	2020 07 03.16	\$I	2.5:TK		20.3T10	77	0.3	8	0.1	290	ICQ	XX GON05	J. J. Gonzalez Suarez	
2020F3	2020 07 03.13	I	1.5:TK		5.0B	10		8		300	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 03.12	I	1.5:TK		12.6B	5	40	& 5	D7 &	15.0m300	ICQ	XX DECaa	Michel Deconinck	
2020F3	2020 07 01.49	wS	1.0:TK		12.5B	30	& 1	7			ICQ	xx HER02	Carl Hergenrother	
C/2019 U6	(Lemmon)													
2019U6	2020 08 05.35	xS	10.2:TK		25.0L	5	40	3.7	3		ICQ	XX WYA	Christopher Wyatt	
2019U6	2020 07 30.35	xS	9.3	TK	25.0L	5	40	5.4	3/		ICQ	XX WYA	Christopher Wyatt	
2019U6	2020 07 24.94	S	8.2	TK	20.3T10	77	10	3/			ICQ	XX GON05	J. J. Gonzalez Suarez	
2019U6	2020 07 20.95	S	8.3	TK	20.3T10	77	7	3/			ICQ	XX GON05	J. J. Gonzalez Suarez	
2019U6	2020 07 19.36	xM	8.5	TK	7.0B	15	9.0	5			ICQ	XX WYA	Christopher Wyatt	
2019U6	2020 07 13.87	B	8.3	TK	15.2R	8	30	1.5	4		ICQ	XX DECaa	Michel Deconinck	
2019U6	2020 07 13.86	B	8.3	TK	12.6B	5	40	1	3		ICQ	XX DECaa	Michel Deconinck	
2019U6	2020 07 12.35	xM	7.8	TK	7.0B	15	9.0	5			ICQ	XX WYA	Christopher Wyatt	
2019U6	2020 07 07.36	xM	7.8	TK	7.0B	15	9.0	5			ICQ	XX WYA	Christopher Wyatt	
2019U6	2020 07 07.91	S	7.4	TK	20.3T10	77	6	4			ICQ	XX GON05	J. J. Gonzalez Suarez	

2019U6	2020 07 06.36	xM	7.5	TK	7.0B	15	7.2	5/	ICQ XX WYA	Christopher Wyatt
2019U6	2020 07 03.37	xM	7.6	TK	7.0B	15	9.0	4/	ICQ XX WYA	Christopher Wyatt
C/2017 T2 (PANSTARRS)										
2017T2	2020 07 24.95	S	9.8	TK	20.3T10	77	6	3/	ICQ XX GON05	J. J. Gonzalez Suarez
2017T2	2020 07 21.36	xM	10.4	TK	25.0L 5	40	5	3/	ICQ XX WYA	Christopher Wyatt
2017T2	2020 07 20.96	S	9.6	TK	20.3T10	77	6	4	ICQ XX GON05	J. J. Gonzalez Suarez
2017T2	2020 07 19.37	xM	10.3	TK	25.0L 5	40	2.8	4/	ICQ XX WYA	Christopher Wyatt
2017T2	2020 07 08.92	B	10.2	TK	25.0C10	100	1	3	ICQ XX DECa	Michel Deconinck
2017T2	2020 07 07.35	xM	10.1	TK	25.0L 5	40	4.8	4	ICQ XX WYA	Christopher Wyatt
2017T2	2020 07 06.35	xM	9.8	AQ	25.0L 5	40	3.6	3	ICQ XX WYA	Christopher Wyatt
249P/LINEAR										
249	2020 07 03.46	S[	8.3	TK	12.5B	30	&	1	ICQ xx HER02	Carl Hergenrother
88P/Howell										
88	2020 08 05.37	xM	10.4	TK	25.0L 5	40	3.8	4	ICQ XX WYA	Christopher Wyatt
88	2020 07 30.37	xS	10.3	TK	25.0L 5	40	4	2/	ICQ XX WYA	Christopher Wyatt
88	2020 07 24.91	S	10.1	TK	20.3T10	100	3.5	2/	ICQ XX GON05	J. J. Gonzalez Suarez
88	2020 07 21.35	xM	10.2	AQ	25.0L 5	40	4.6	4	ICQ XX WYA	Christopher Wyatt
88	2020 07 19.38	xM	11.4	AQ	25.0L 5	40	2.9	3/	ICQ XX WYA	Christopher Wyatt
88	2020 07 07.35	xS	11.4	AQ	25.0L 5	40	4.3	2	ICQ XX WYA	Christopher Wyatt
29P/Schwassmann-Wachmann										
29	2020 07 19.77	xI[	14.6	AQ	25.0L 5	125			ICQ XX WYA	Christopher Wyatt
29	2020 07 02.77	xI[	14.0	AQ	25.0L 5	125			ICQ XX WYA	Christopher Wyatt
2P/Enccke										
2	2020 08 05.36	xS	10.5	TK	25.0L 5	40	6.5	2/	ICQ XX WYA	Christopher Wyatt
2	2020 07 30.36	xS	10.2	TK	25.0L 5	40	4.6	2/	ICQ XX WYA	Christopher Wyatt
2	2020 07 21.34	xM	9.2	TK	7.0B	15	4.3	4	ICQ XX WYA	Christopher Wyatt
2	2020 07 19.35	xM	8.8	TK	7.0B	15	5.5	4	ICQ XX WYA	Christopher Wyatt
2	2020 07 12.34	&M	8.4	TK	7.0B	15	3.5	6	ICQ XX WYA	Christopher Wyatt
2	2020 07 08.89	M	7.7	TK	7.0B	15	1	7	ICQ XX SOU01	Willian Souza
2	2020 07 07.35	&M	7.8	TK	7.0B	15	3.4	6	ICQ XX WYA	Christopher Wyatt
2	2020 07 07.34	&M	7.8	TK	25.0L 5	40	2.1	5/	ICQ XX WYA	Christopher Wyatt
2	2020 07 06.34	xM	7.8	AQ	25.0L 5	40	1.3	6	ICQ XX WYA	Christopher Wyatt