

ALPO COMET NEWS FOR APRIL 2021

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Association of Lunar and Planetary Observers

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Twenty-five years ago, C/1996 B2 (Hyakutake) ended a 20-year long drought of great comets. Passing 0.102 au from Earth in March, Hyakutake peaked at 1st magnitude with a tail measured by some to be over 100 degrees long. The photo above was taken by John D. Sabia on 1996 April 19 with a Nikon F2 camera, 50mm f/1.8 lens, and Fuji 800 Super G film.

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/764427-alpo-comet-news-for-april-2021/>). All are encouraged to join the discussion over at Cloudy Nights. The ALPO Comet Section welcomes all comet related articles, observations, images, drawings, magnitude estimates, or spectra. One does 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>.

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Summary

As announced in the Spring 2021 issue of the Journal of the ALPO, Michel Deconinck has graciously accepted to serve as Acting Assistant Coordinator of the ALPO Comets Section. Michel is an avid observers and master sketcher of not just comets but many astronomical phenomena. Two of his sketches are included in the PDF version of this month's Report. Please join me in welcoming Michel to the ALPO team!

Two comets, C/2020 R4 (ATLAS) and C/2021 D1 (SWAN) reached 9th magnitude in March. While SWAN should now be fainter than magnitude 10.0 and fading, C/2020 R4 (ATLAS) will continue to brighten to about magnitude 8.5 as it passes 0.46 au from Earth on April 23. A number of fainter comets are also visible for large aperture visual observers including 7P/Pons-Winnecke which is brightening to a 11th magnitude maximum in June/July. This marks 7P's 25th observed return and is part of a run of low numbered periodic comets returning in 2021.

Bright Comets (magnitude < 10.0)

C/2020 R4 (ATLAS) – While writing the March ALPO Comet News there was still some question as to how bright *C/2020 R4 (ATLAS)* was going to get. Luckily, the comet has not disappointed. Three visual observers (Chris Wyatt, Michel Deconinck, and J. J. Gonzalez) reported their observations to the ALPO last month. There is some scatter between their estimates, but all suggest a comet that was no fainter than magnitude 10.3 (on March 23) and perhaps as bright as 8.3 (March 22).



Figure 1 - C/2020 R4 as imaged by Gregg Ruppel on 2021 March 28.



Comet C/2020 R4 (ATLAS)

2021/03/23 - 3h55 UTC

Bino Vixen 126mm f5 - 16mm (40x)

F.O.S.: 30'

Aquarellia Mobile Observatory (plateau Valensole 575m)

Figure 2 - Michel Deconinck spotted C/2020 R4 (ATLAS) on March 23 in 30x126 binoculars as an elongated object.

Perihelion occurred back on March 1 at 1.03 au. While most comets become less active after perihelion, any intrinsic fading will be offset by a rapidly decreasing geocentric (Earth-comet) distance. As April begins, R4 should be around magnitude 9 as it is located 1.14 au from the Sun and 0.92 au from Earth. A maximum brightness close to 8.5 occurs around the time of close approach to Earth on April 23 at 0.46 au. The comet is mainly a morning to opposition object observable from both hemispheres as it moves through Aquila (Apr 1-12), Ophiuchus (12-13), Hercules (13-22), Corona Borealis (22-26), Boötes (26-30), and Canes Venatici (30).

C/2020 R4 (ATLAS)

T = 2021-Mar-01 $q = 1.03$ au

Long-period comet - ~957-year orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2021-Apr-01	19 49	-01 19	1.144	0.918	73M	Aql	9.3	32	39
2021-Apr-06	19 28	+02 30	1.183	0.777	82M	Aql	9.1	40	42
2021-Apr-11	18 58	+07 53	1.225	0.645	93M	Aql	8.8	51	41
2021-Apr-16	18 11	+15 24	1.270	0.537	107M	Her	8.6	64	34
2021-Apr-21	16 59	+24 26	1.318	0.472	122M	Her	8.5	75	25
2021-Apr-26	15 24	+31 26	1.368	0.473	132M	CrB	8.6	82	18
2021-May-01	13 53	+33 14	1.421	0.540	130E	CVn	9.1	83	17
2021-May-06	12 48	+31 40	1.475	0.655	123E	CVn	9.7	81	19

Comet Magnitude Parameters --- H = 8.9, $2.5n = 10.0$

Fainter Comets of Interest (generally between magnitude 10.0 and 13.0)

7P/Pons-Winnecke - If you are keeping track of your comet observing life list, 2021 is a good year to cross off a bunch of low numbered comets. 4P, 6P, 7P, 8P, 10P, 15P, and 19P are all expected to become brighter than 12th magnitude this year. 7P/Pons-Winnecke should peak at around 11th magnitude which is about as bright as it gets nowadays.

7P was discovered on 1819 June 12 by Jean-Luis Pons from Marseilles, France. Pons discovered 37 comets and holds the record for discoveries by a visual observer. 7P was rediscovered 39 years, or 7 returns, later on 1858 March 9 by Friedrich August Theodor Winnecke of Bonn, Germany. It was one of Winnecke's 10 visual discoveries. The comet often reached ~6th magnitude throughout the 19th and early 20th century. Its best return was in 1927 when it brightened to magnitude 3.5 during an especially close approach to Earth (0.04 au). The last bright return (6th magnitude) was in 1939. Since then, the "best" returns have seen the comet no brighter than ~11th magnitude.

So why is 7P fainter now? Simple, its perihelion distance has increased from a minimum of 0.76 au in 1841 to a maximum of 1.26 in 1989. Pons-Winnecke experiences alternating periods of relatively close and distant approaches to Jupiter. A period of close approaches to Jupiter ended in 1812, right before Pons's initial discovery, leaving the comet with a close perihelion. Between 1870 and 1953, close approaches to Jupiter progressively increased the perihelion distance. Since then, perihelion has been 0.25 au beyond Earth's orbit. The larger perihelion means less solar heating, so less cometary activity, and no possibility of extremely close Earth approaches. Starting in 2025, a new series of Jupiter close approaches will begin resulting in a quick drop in perihelion from its current 1.23 au to 1.13 au in 2017 and 2023, 0.98 au in 2039 and 2045, and a new minimum between 0.83 and 0.87 au for the rest of the 21st century.

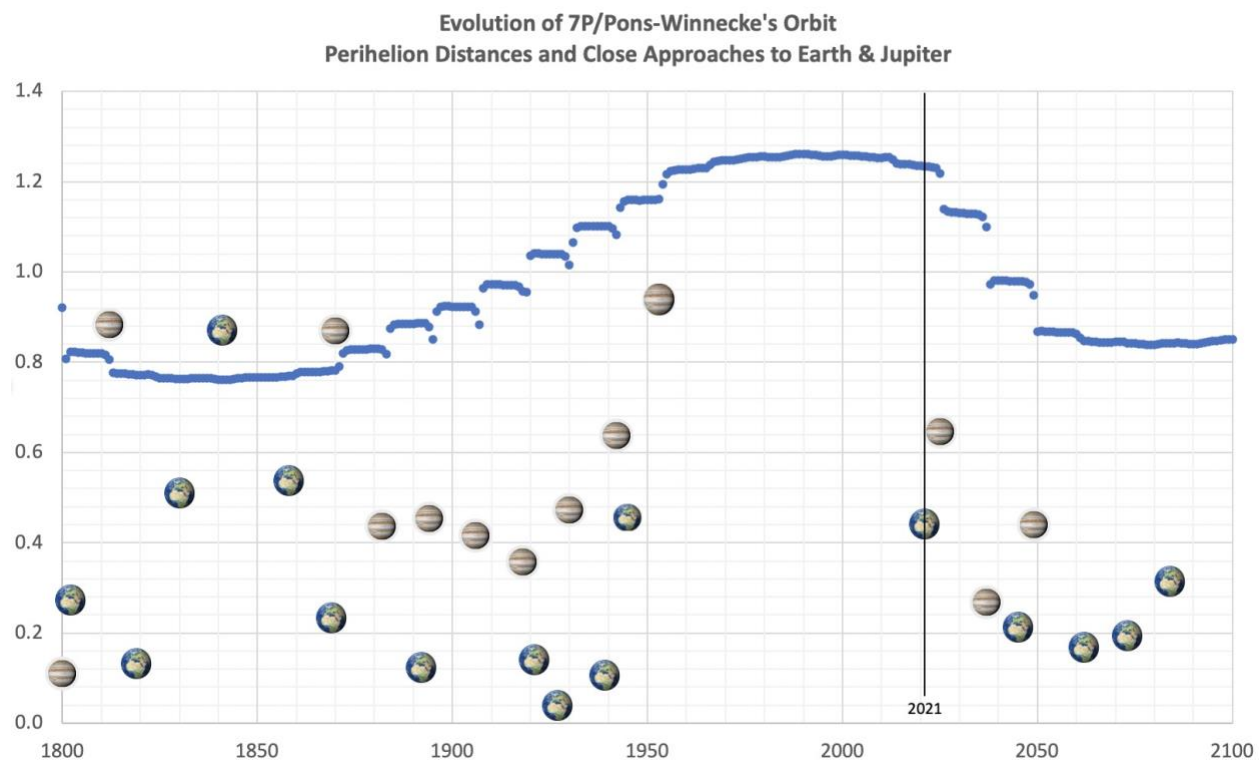


Figure 3 - Evolution of 7P/Pons-Winnecke's perihelion distance and close approaches to Earth and Jupiter (less than 1 au) between 1800 and 2100. The current year is denoted by a vertical thin black line. Data was retrieved from the [JPL Horizons](#) and [Comet Orbit Page](#).

Currently, the comet is inbound to a 2021 May 27 perihelion and close approach of 0.44 au to Earth on June 12. Pons-Winnecke should start the month around 14th magnitude and brighten to a bit better than 13th magnitude by the end of the month. Most observations submitted to the COBS site place the comet between 14th and 16th magnitude during the 2nd half of March. A

recent CCD observation by Thomas Lehmann found the comet at magnitude 12.7 with an 8' coma on March 21.14 UT. His most recent observation on March 28.15 found it to have faded to magnitude 13.5 with a 4.9' coma. These observations suggest an object brighter than the prediction below. Both hemispheres should have a nice view as the comet moves through the dense Milky Way star fields of Ophiuchus (Apr 1-17) and Aquila (17-30).

7P/Pons-Winnecke

								Max El	
T = 2021-May-27 q = 1.23 au								(deg)	
Jupiter-family comet - 6.31-yr orbital period									
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	17 51	+09 03	1.410	0.813	101M	Oph	14.3	56	41
2021-Apr-06	18 06	+08 40	1.382	0.768	101M	Oph	14.0	55	41
2021-Apr-11	18 22	+08 08	1.357	0.726	102M	Oph	13.8	54	42
2021-Apr-16	18 39	+07 26	1.333	0.685	102M	Oph	13.6	53	43
2021-Apr-21	18 56	+06 32	1.311	0.648	102M	Aql	13.3	51	44
2021-Apr-26	19 13	+05 24	1.292	0.613	103M	Aql	13.1	50	45
2021-May-01	19 31	+04 00	1.276	0.580	103M	Aql	12.8	47	46
2021-May-06	19 50	+02 18	1.261	0.551	104M	Aql	12.6	45	48

Comet Magnitude Parameters --- H = 11.7, 2.5n = 12.5, offset = +50 days

10P/Tempel - Jupiter-family comet 10P/Tempel is one of 12 visual comet discoveries to bear the name of Ernst Wilhelm Leberecht Tempel. He swept up 10P on 1873 July 3 while working at Brera Observatory in Milan. The current apparition marks its 24th observed return. It has been seen at every return since its poorly placed 1941 return.

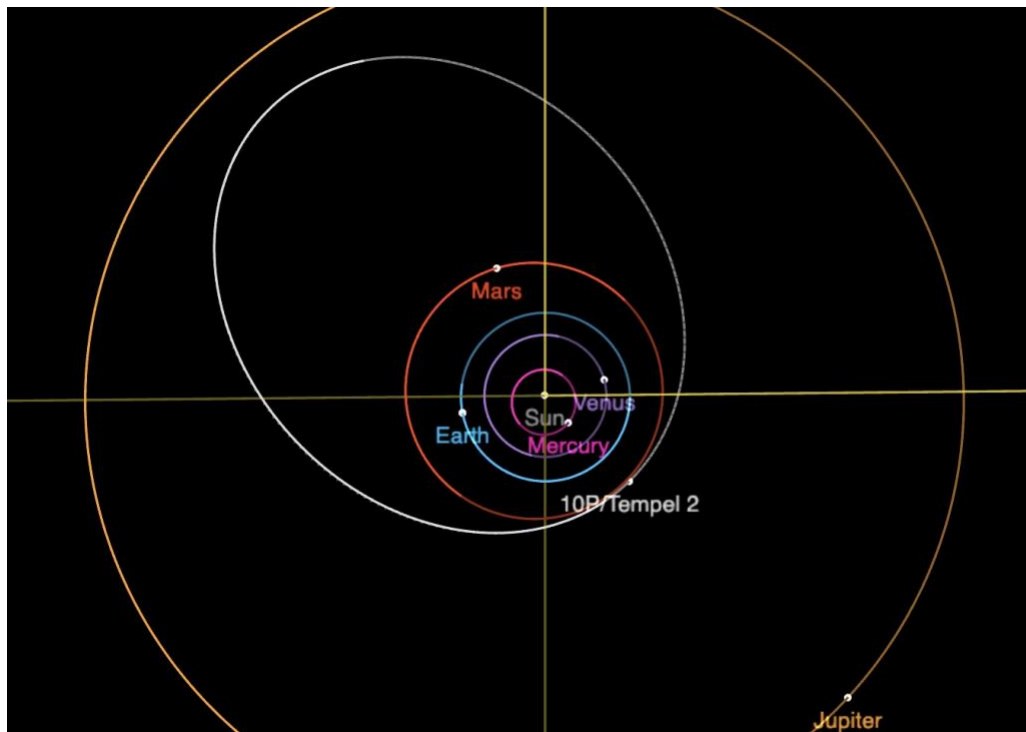


Figure 4 - Orbit of 10P/Tempel from the JPL Small Body Database Browser. Planetary positions are valid for 2021 April 1.

10P/Tempel is one of the more interesting Jupiter-family comets. Its nucleus is a large 11 km in diameter ($H \sim 13.6$). That combined with its relative inactivity to within 5-6 months before perihelion has allowed astronomers to directly study its nucleus even in modest sized professional telescopes (1-2 meters). Its rotation period of 8.948 hours (in 2010) has been

observed to slow down by ~0.004 hours between per apparition though recently this rate of change appears to have slowed. When observing conditions are favorable, the comet has displayed near-nucleus jet features as well as a nicely defined anti-tail or trail (see this [image by Francois Kugel](#) from 2010 August 10) showing both kinds of features).

The 2021 return is extremely poor for northern hemisphere observers, as in the comet will not be observable till June/July. Southern hemisphere observers have a better view though it stays within 31-36 degrees from the Sun this month in Aquarius (Apr 1-22) and Pisces (22-30). Australian visual observer Chris Wyatt was able to observe 10P twice in late March (on the 24th and 25th) at magnitude 10.6 with a 2' coma. With perihelion on March 24 at 1.41 au, Tempel should slowly fade as April progresses. We can all look forward to its next return which will be its best since 1967. On 2026 August 3, 10P will pass within 0.41 au of Earth when it should be closer to magnitude 7.5 in brightness.

10P/Tempel
T = 2021-Mar-24 q = 1.41 au Max El
Jupiter-family comet - 5.4-yr orbital period (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	22 50	-10 24	1.415	2.170	31M	Aqr	10.6	0	13
2021-Apr-06	23 06	-09 17	1.419	2.162	32M	Aqr	10.6	0	14
2021-Apr-11	23 22	-08 07	1.425	2.156	33M	Aqr	10.6	0	15
2021-Apr-16	23 37	-06 58	1.433	2.150	33M	Aqr	10.6	0	16
2021-Apr-21	23 53	-05 48	1.443	2.146	34M	Aqr	10.6	0	17
2021-Apr-26	00 08	-04 39	1.454	2.143	35M	Psc	10.7	0	18
2021-May-01	00 23	-03 30	1.467	2.141	37M	Psc	10.7	0	19
2021-May-06	00 37	-02 24	1.482	2.139	38M	Cet	10.7	0	20

Comet Magnitude Parameters --- H = 7.7, 2.5n = 8.1

C/2019 L3 (ATLAS) – *C/2019 L3* was discovered by the ATLAS survey back on 2019 June 10. At that time the comet was 18th magnitude and 8.5 au from the Sun. The comet is still between 4.4 and 4.2 au from the Sun in April and won't arrive at perihelion till January 2022 when it will be at a heliocentric (Sun-comet) distance of 3.57 au. The large distance means *C/2019 L3* could remain a visual object well into 2022 and possibly even 2023. Visual observers reported *L3* between magnitude 11.2 and 12.2 in late March. If the comet continues to brighten even at a conservative $2.5n = 8$ rate, it could be around magnitude 10.0 at the end of this year. This month sees the comet only visible from the northern hemisphere as its elongation drops in the northwestern evening sky [moving through Perseus (Apr 1-5), Andromeda (5-11), and Perseus again (11-30)].

C/2019 L3 (ATLAS)
T = 2022-Jan-09 q = 3.55 au Max El
Long-period comet - Dynamically new (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	02 20	+51 07	4.369	4.927	51E	Per	11.9	29	0
2021-Apr-06	02 29	+51 03	4.344	4.943	48E	And	11.9	26	0
2021-Apr-11	02 38	+50 58	4.319	4.956	45E	And	11.9	24	0
2021-Apr-16	02 47	+50 54	4.295	4.967	43E	Per	11.8	22	0
2021-Apr-21	02 57	+50 51	4.270	4.976	41E	Per	11.8	20	0
2021-Apr-26	03 06	+50 47	4.246	4.982	38E	Per	11.8	18	0
2021-May-01	03 16	+50 44	4.223	4.986	36E	Per	11.8	16	0
2021-May-06	03 26	+50 40	4.199	4.987	34E	Per	11.8	14	0

Comet Magnitude Parameters --- H = 3.3, 2.5n = 8.0

C/2020 J1 (SONEAR) – Like C/2019 L3, C/2020 J1 (SONEAR) is a large perihelion distance comet (or “large-q” comet, “q” being the symbol for perihelion). C/SONEAR was discovered on 2020 May 1 by the Southern Observatory for Near Earth Research survey with a Celestron 11” RASA located in Oliveira, Brazil. In addition to the RASA 11”, SONEAR also uses a 0.45-m f/2.9 astrograph. This is the 2nd comet to carry the SONEAR name, the other being C/2014 A4 (SONEAR). Other comets discovered by the survey but named after the individual discoverer were C/2014 E2 (Jacques), C/2015 F4 (Jacques), P/2015 Q2 (Pimental), C/2017 D2 (Barros), C/2017 K6 (Jacques), C/2018 E2 (Barros), and P/2020 G1 (Pimental). Of all the SONEAR discoveries, C/2014 E2 was the brightest and reached ~6th magnitude in mid-2014.

Chris Wyatt successfully observed C/2020 J1 on March 24 and 25 at magnitudes 13.4 and 13.5. He reported a moderately condensed object (DC = 5 to 6) with a small 0.4-0.5’ coma. This month will see the comet reach perihelion on the 18th at 3.36 au. A slow brightening should continue this month as the Earth-comet distance decreases from 2.9 to 2.5 au. The comet is visible from both hemispheres as it moves through Scorpius (Apr 1-30) Lupus (May 1-6) in the morning sky though its southern declination makes it a much easier object for southern observers.

C/2020 J1 (SONEAR)
T = 2021-Apr-18 q = 3.36 au Max El
Long-period comet - Dynamically new (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	17 16	-38 41	3.359	2.895	109M	Sco	13.2	11	89
2021-Apr-06	17 07	-38 16	3.357	2.800	115M	Sco	13.1	12	88
2021-Apr-11	16 57	-37 45	3.356	2.711	122M	Sco	13.1	12	88
2021-Apr-16	16 46	-37 05	3.355	2.628	129M	Sco	13.0	13	87
2021-Apr-21	16 34	-36 17	3.355	2.555	136M	Sco	12.9	14	86
2021-Apr-26	16 21	-35 18	3.356	2.491	143M	Sco	12.9	15	85
2021-May-01	16 08	-34 08	3.357	2.439	151M	Lup	12.8	16	84
2021-May-06	15 54	-32 47	3.359	2.401	158M	Lup	12.8	17	83

Comet Magnitude Parameters --- H = 6.7, 2.5n = 8.0

C/2020 T2 (Palomar) – Dmitry Duev of the California Institute of Technology found C/2020 T2 during the course of the Zwicky Transient Facility survey with the Palomar 1.2-m Schmidt telescope on 2020 October 7. Pre-discovery observations from Pan-STARRS and the Mount Lemmon Survey were found back to December of 2019.

C/2020 T2 is a long-period comet with an orbital period of ~5720 years and perihelion on 2021 July 11 at 2.05 au. The comet has brightened rapidly and is now within range of visual observers. Both J. J. Gonzalez and Chris Wyatt were able to observe Palomar last month. J. J. used a 20-cm telescope to measure the comet between magnitude 10.5 and 10.7 with a large 6-7’ diffuse (DC=2) coma. Chris came in fainter at magnitude 12.5 to 12.8. He also saw a smaller (1.5-1.8’), more condensed coma (DC=6) in his 40-cm telescope at 108 power. Visual and CCD submissions to the COBS site seem to split the difference which is what we used for the magnitude predictions below.

Palomar is nicely placed near opposition for northern observers as it moves through Canes Venatici (Apr 1-30). It is a more difficult observation for southern observers.

C/2020 T2 (Palomar)
T = 2021-Jul-11 $q = 2.05$ au Max El
Long-period comet - ~5720-year orbital period (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	14 03	+34 15	2.376	1.548	136M	CVn	11.5	84	16
2021-Apr-06	14 01	+34 24	2.348	1.517	136M	CVn	11.4	84	16
2021-Apr-11	13 58	+34 23	2.321	1.490	136M	CVn	11.3	84	16
2021-Apr-16	13 55	+34 11	2.294	1.467	135M	CVn	11.2	84	16
2021-Apr-21	13 52	+33 47	2.269	1.449	134E	CVn	11.2	84	16
2021-Apr-26	13 49	+33 11	2.245	1.434	133E	CVn	11.1	83	17
2021-May-01	13 45	+32 23	2.222	1.424	131E	CVn	11.0	82	18
2021-May-06	13 42	+31 22	2.200	1.417	129E	CVn	11.0	81	19

Comet Magnitude Parameters --- $H = 6.8$, $2.5n = 10.0$

C/2020 A1 (Leonard) – The 10th comet to bear Catalina Sky Survey astronomer Greg Leonard’s name was found on 2021 January 3 with the Mount Lemmon 1.5-m reflector. *C/2020 A1 (Leonard)* was around magnitude 19 and located at a distance of 5.1 au from the Sun at discovery. Pre-discovery observations from Mount Lemmon and PANSTARRS have been found back to April 2020 (when the comet was 7.5 au from the Sun). *C/Leonard* is a dynamically old long-period comets with an orbital period of ~70,000 years.



Figure 5 - Denis Buczynski imaged *C/2021 A1 (Leonard)* on 2021 March 12 with a C14 + f/6 focal reducer + ASI1600MM Pro camera. The image is a co-add of 10x120s exposures and shows a hint of developing tail to the south.

Comet Leonard has the potential to become a nice object at the end of 2021 as it nears perihelion on 2022 January 3 at 0.62 au. Prior to perihelion, the comet makes a close approach to Earth on December 12 at 0.233 au (34.9 million km or 21.7 million miles) and even closer approach to

Venus on 2021 December 18 at 0.028 au (4.2 million km or 2.6 million miles). From Earth, the phase angle will reach a maximum of 160 degrees on December 14. Such a large phase angle may result in a few magnitudes of enhanced brightness due to forward scattering by dust in the coma and tail. The downside is that the comet will be a difficult object to observe as it will be located at a low solar elongation of only 15 degrees at that time.

I was able to observe the comet a few times since discovery with the iTelescope T11 0.51-m and T24 0.61-m telescopes. The following photometry was conducted on unfiltered image data calibrated with V-band reference stars:

Jan. 17.47, V = 19.1,
 Feb. 07.39, V = 18.7,
 Feb. 22.46, V = 18.5,
 Mar. 07.34, V = 18.0,
 Mar. 19.43, V = 17.8.

As mentioned last month, CCD photometry submitted to the Minor Planet Center between April 2020 and March 2021 showed a rapidly brightening comet with a $2.5n$ rate of ~ 17 . A fit to only my iTelescopes data produces a slightly slower but healthy brightening rate of $2.5n \sim 14$. But a warning(!!!), Leonard is still located at 4 au from the Sun and comet brightening rates can be unpredictable and rarely stay elevated for long. With that caveat out of the way, what are Leonard's prospects looking like? Using a conservative $2.5n = 8$ rate and the March 19th datapoint results in a peak brightness of magnitude 5.8 in mid-December. A rate of $2.5n = 10$ produces a peak magnitude of 4.3. Forward scattering by dust at that time may add another 2-3 magnitudes of brightness. Still, it will be located only 15 degrees from the Sun when at its best so unless Leonard can rival C/2020 F3 (NEOWISE) in brightness (around magnitude 1.5), it could be a difficult object for most observers. Time will tell.

Leonard is now on the evening side of opposition and located at a high northern declination in Ursa Major. This month, it is still a faint object of around 17th magnitude as its distance from the Sun drops from 4.2 to 3.8 au. CCD imagers are strongly encouraged to watch Leonard's development over the coming months.

C/2021 A1 (Leonard)
 T = 2022-Jan-03 q = 0.61 au Max El
 Long-period comet - Dynamically old (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	12 49	+60 33	4.152	3.629	114E	UMa	17.6	70	0
2021-Apr-06	12 36	+61 08	4.096	3.610	112E	UMa	17.5	69	0
2021-Apr-11	12 23	+61 33	4.041	3.595	109E	UMa	17.4	69	0
2021-Apr-16	12 09	+61 47	3.985	3.586	106E	UMa	17.4	68	0
2021-Apr-21	11 56	+61 49	3.929	3.581	102E	UMa	17.3	68	0
2021-Apr-26	11 43	+61 41	3.872	3.580	99E	UMa	17.2	68	0
2021-May-01	11 31	+61 24	3.815	3.582	95E	UMa	17.2	69	0
2021-May-06	11 20	+60 58	3.758	3.586	91E	UMa	17.1	69	0

Comet Magnitude Parameters --- H = 8.6, $2.5n = 10.0$

C/2021 D1 (SWAN) – While morning comet C/2020 R4 (ATLAS) may be the brightest comet of March and April, the 2nd brightest comet of the month could be the evening object C/2021 D1 (SWAN). Unfortunately, 2nd brightest comet still means no brighter than magnitude 10.

The latest SWAN discovery was made in online SOHO data by Michael Mattiazzo of Swan Hill, Victoria, Australia. He first reported the comet on February 25 from SWAN images going back to February 19. After reporting the find on the comets-ml, a concerted effort by amateur imagers and visual observers was able to recover the comet. Check out former ALPO Comets Section Recorder Don Machholz's podcast, [Looking Up with Don #61](#) (SWAN discussion starting around minute 14), for a nice rundown of the story behind SWAN's discovery.

Comet SWAN is a dynamically old long-period comet with an orbital period of ~960 years and on 2021 February 27 at 0.90 au. Unfortunately, it is invisible for southern observers. Even for northerners, it is a horizon hugger as it moves through Triangulum (Apr 1-7), Perseus (7-28), and Auriga (28-30).

Michel Deconinck and J. J. Gonzalez both visually observed SWAN in March. J. J. observed it at magnitude 9.7 and 9.2 on the 12th and 15th, respectively. It was a diffuse object (DC=2-3) with a 5-8' coma. Michel found the comet to also be diffuse (DC = 3/) and a little fainter at ~10.0 on March 22. This month should see the comet fade from around magnitude 10 to 12 as it moves away from the Earth and Sun.



Comet C/2021 D1 (SWAN)

2021/03/22 - 19h25 UTC

Bino Vixen 126mm f5 - 16mm (40x)

F.O.S.: 30'

Aquarellia Mobile Observatory (plateau Valensole 575m)

Figure 6 - Michel Deconinck's visual impression of C/2021 D1 (SWAN) from March 22.

C/2021 D1 (SWAN)

T = 2021-Feb-27 q = 0.90 au

Max El

Long-period comet - ~960-year orbital period

(deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Apr-01	02 14	+30 51	1.059	1.720	34E	Tri	10.4	17	0
2021-Apr-06	02 43	+32 17	1.106	1.757	35E	Tri	10.7	18	0
2021-Apr-11	03 11	+33 19	1.157	1.802	36E	Per	10.9	19	0
2021-Apr-16	03 38	+33 56	1.210	1.855	36E	Per	11.2	19	0
2021-Apr-21	04 04	+34 13	1.266	1.915	37E	Per	11.4	19	0
2021-Apr-26	04 28	+34 11	1.324	1.981	36E	Per	11.7	19	0

2021-May-01	04	52	+33	54	1.383	2.053	36E	Aur	12.0	18	0
2021-May-06	05	13	+33	26	1.443	2.129	36E	Aur	12.2	17	0

Comet Magnitude Parameters --- H = 9.0, 2.5n = 10.0

New Discoveries, Recoveries and Other Comets in the News

Sad News – Roy Tucker passed away on March 5. Roy discovered two comets, 328P/1998 QP54 (LONEOS-Tucker) and C/2004 Tucker Q1, from his backyard observatory outside of Tucson, Arizona. Roy was also part of the team that discovered potential impactor (99942) Apophis with the University of Arizona 2.3-m Bok telescope on Kitt Peak.

P/2021 E1 = P/2009 Q1 (Hill) – Erwan Schwab reported his recovery of P/2009 Q1 (Hill) on images taken on 2021 March 11 with the 0.8-m f/3 Schmidt reflector at Calar Alto, Spain [CBET 4943]. Confirming images were obtained on March 14 with the 1.0-m f/4.4 reflector at the European Space Agency's Optical Ground Station at Tenerife by D. Koschny, M. Micheli, A. Knöfel and M. Busch. The comet appeared stellar in all images. P/Hill was discovered on 2009 August 27 by ALPO Solar Section Coordinator with the 0.7-m Catalina Schmidt. In 2009, the comet peaked at 17th magnitude. The current apparition sees perihelion on 2022 May 22 at 2.79 au. Peak brightness should be around 18th magnitude.

Back in 2009, Robert Matson found possible observations of this comet in images taken by the NEAT survey in 1996 and 1998. Syuichi Nakano was unable to definitively link the 1996 and 1998 observations with those taken at the 2009 and current return. The 1996 observations were of a bright comet around 15th magnitude while the 1998 observations were near the limit of detection (19th magnitude). Nakano was able to make a good linkage between the 1996, 2009 and 2022 observations suggesting that the 1998 observations were spurious [CBET 4943, NK 4399].

C/2021 D2 (ZTF) – The Zwicky Transient Facility which uses the 1.2-m Schmidt on Mount Palomar independently reported this comet as a stellar object on the nights of February 19 and March 9 [CBET 4948]. CCD imagers detected cometary activity in follow-up observations. C/2021 D2 is a long-period comet that is less than a year from its 2022 February 4 perihelion at 2.95 au. The comet was 19th magnitude at discovery and should brighten to ~16th magnitude near perihelion.

C/2021 C6 (Lemmon) – The Mount Lemmon Survey's 1.5-m reflector was used to detect this apparently asteroidal 20th magnitude object on February 7 [CBET 4946]. Pan-STARRS found pre-discovery observations going back to January 23. Perihelion occurs on 2021 November 13 at 3.27 au. A maximum brightness of ~18th magnitude may be reached in early 2022 when the comet will be at opposition.

C/2021 C5 (PANSTARRS) – C/2021 C5 discovered on February 12 with the Pan-STARRS1 1.8-m on Haleakala [CBET 4941]. Pre-discovery observations by Pan-STARRS have been found back to 2020 December 22. At discovery, the comet was 21st magnitude and located 7.1 au from the Sun. A dynamically old long-period comet, C5 is still almost 2 years away from a 2023 February 11 perihelion at 3.24 au when the comet will be around 16-17th magnitude.

C/2021 C4 (ATLAS) – Both C/2021 C4 and C5 were found on the same night and same mountain top. While C5 was found by the Pan-STARRS1 1.8-m, C4 was found by the ATLAS survey with

their 0.5-m f/2 Schmidt [CBET 4937]. Perihelion already occurred back on 2021 January 21 at 4.50 au. As a result, the comet is already near its peak brightness of 18th magnitude.

C/2020 F7 (Lemmon) – This object was discovered back on 2020 March 22 at 20th magnitude by the Mount Lemmon Survey's 1.5-m. Due to a lack of obvious cometary features, the object was designated A/2020 F7. By the Fall of 2020, observers started to report a small coma and tail [CBET 4949]. The comet has a ~22,000-year orbital period and comes to perihelion on 2021 November 14 at 5.33 au. The comet is currently around 17th magnitude and should brighten only a little more by perihelion.

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

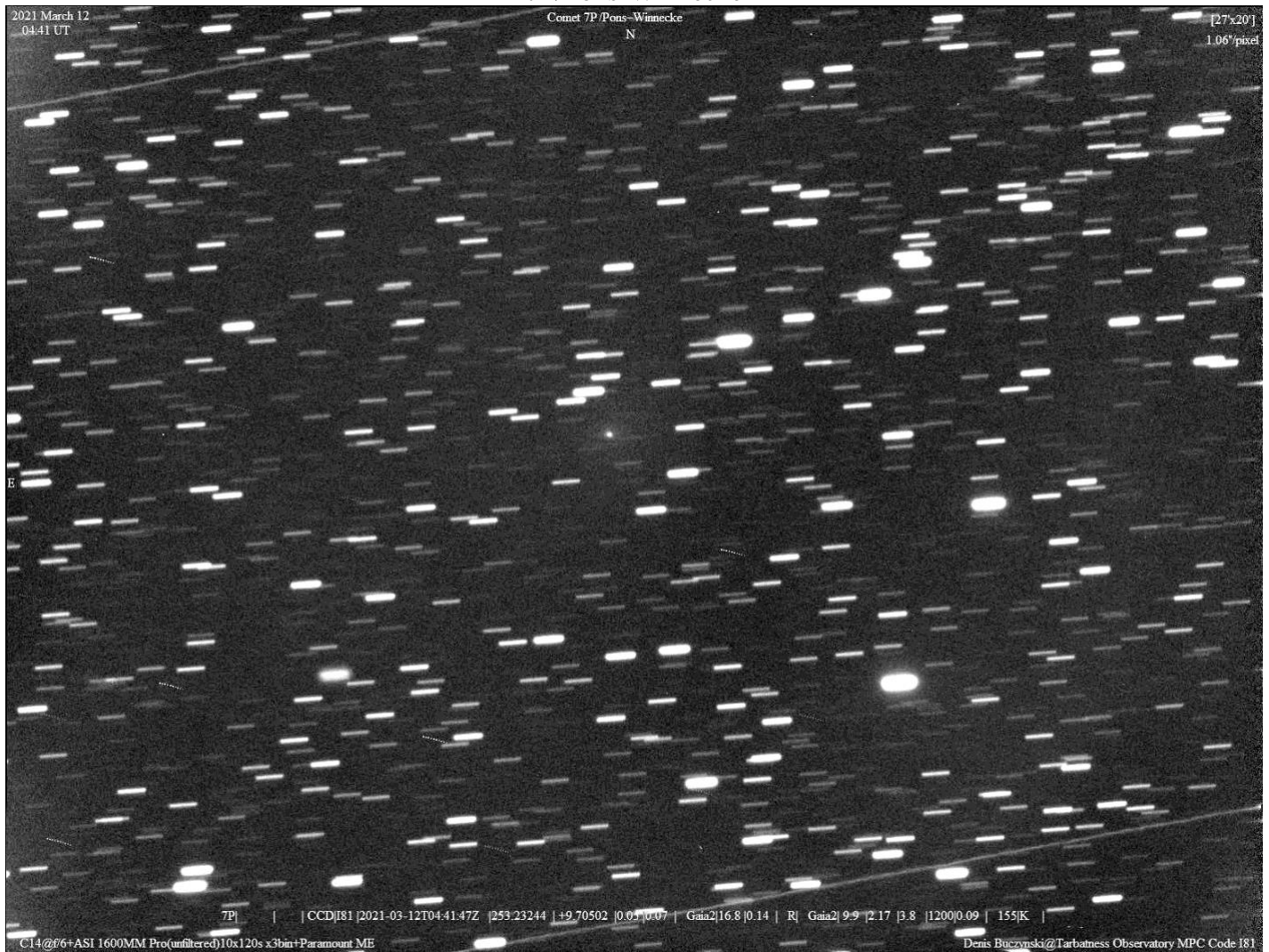
Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
C/2021 D1 (SWAN)										
2021D1	2021 03 22.81	&I	10.0	TK	12.6B	5 40	3/		ICQ XX DECa	Michel Deconinck
2021D1	2021 03 15.83	S	9.2	TK	20.3T10	77	8 2		ICQ XX GON05	J J Gonzalez Suarez
2021D1	2021 03 12.83	S	9.7	TK	20.3T10	77	5 3		ICQ XX GON05	J J Gonzalez Suarez
C/2021 A4 (NEOWISE)										
2021A4	2021 03 12.85	S	11.7	TK	20.3T10	133	1.5 3		ICQ XX GON05	J J Gonzalez Suarez
C/2021 A1 (Leonard)										
2021A1	2021 02 22.46	C	18.5	U4	61.0Y	7A440	0.3		ICQ xx HER02	Carl Hergenrother
C/2020 M3 (ATLAS)										
2020M3	2021 01 16.85	S	10.5	TK	20.3T10	77	4 2		ICQ XX GON05	J J Gonzalez Suarez
2020M3	2021 01 13.83	S	10.3	TK	20.3T10	77	5 2		ICQ XX GON05	J J Gonzalez Suarez
2020M3	2021 01 07.89	S	10.5	TK	20.3T10	100	5 2		ICQ XX GON05	J J Gonzalez Suarez
C/2020 T2 (Palomar)										
2020T2	2021 03 25.70	xM	12.8	AQ	40.0L	4 108	1.5 6		ICQ XX WYA	Christopher Wyatt
2020T2	2021 03 24.66	xM	12.5	AQ	40.0L	4 108	1.8 6		ICQ XX WYA	Christopher Wyatt
2020T2	2021 03 22.15	S	10.5	TK	20.3T10	77	7 2		ICQ XX GON05	J J Gonzalez Suarez
2020T2	2021 03 15.90	S	10.7	TK	20.3T10	100	6 2		ICQ XX GON05	J J Gonzalez Suarez
C/2020 R4 (ATLAS)										
2020R4	2021 03 25.75	xM	9.3	TK	40.0L	4 59	3.4 5		ICQ XX WYA	Christopher Wyatt
2020R4	2021 03 24.71	xM	9.5	TK	40.0L	4 59	3.5 5/		ICQ XX WYA	Christopher Wyatt
2020R4	2021 03 23.16	&I	10.3	TK	12.6B	5 40	& 2 2/		ICQ XX DECa	Michel Deconinck
2020R4	2021 03 22.20	S	8.3	TK	20.3T10	77	8 3		ICQ XX GON05	J J Gonzalez Suarez
2020R4	2021 03 13.21	S	8.4	TK	20.3T10	77	6 3		ICQ XX GON05	J J Gonzalez Suarez
C/2020 J1 (SONEAR)										
2020J1	2021 03 25.74	xM	13.4	AQ	40.0L	4 261	0.4 6		ICQ XX WYA	Christopher Wyatt
2020J1	2021 03 24.70	xM	13.3	AQ	40.0L	4 182	0.5 5		ICQ XX WYA	Christopher Wyatt
C/2019 N1 (ATLAS)										
2019N1	2021 03 25.76	xM	13.5	AQ	40.0L	4 108	1.0 3/		ICQ XX WYA	Christopher Wyatt
2019N1	2021 03 24.67	xM	14.3	AQ	40.0L	4 182	0.5 3/		ICQ XX WAY	Christopher Wyatt
C/2019 L3 (ATLAS)										
2019L3	2021 03 15.85	S	11.7	TK	20.3T10	133	1.5 5		ICQ XX GON05	J J Gonzalez Suarez
C/2019 F1 (ATLAS-Africano)										
2019F1	2021 03 25.72	xM	14.8	AQ	40.0L	4 261	0.3 5/		ICQ XX WYA	Christopher Wyatt
2019F1	2021 03 24.68	xM	14.8	AQ	40.0L	4 261	0.3 4/		ICQ XX WYA	Christopher Wyatt
C/2017 K2 (PANSTARRS)										
2017K2	2021 03 25.76	xM	14.0	AQ	40.0L	4 261	0.4 3/		ICQ XX WYA	Christopher Wyatt
2017K2	2021 03 24.74	xM	13.9	AQ	40.0L	4 182	0.6 3/		ICQ XX WYA	Christopher Wyatt

10P/Tempel

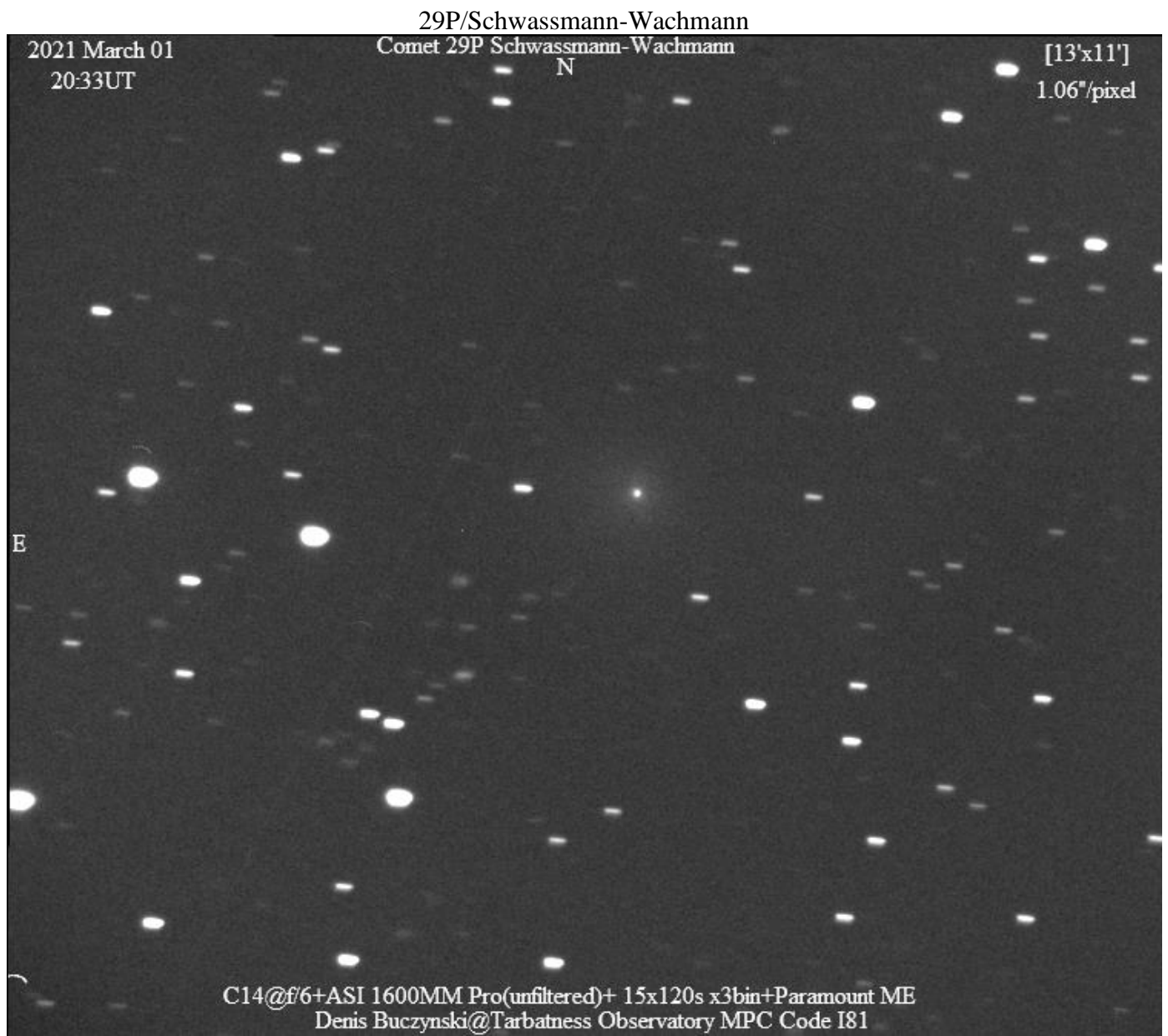
10 2021 03 25.77 xM 10.6 TK 40.0L 4 108 2.0 3/ ICQ XX WYA Christopher Wyatt
10 2021 03 24.77 xM 10.6 TK 40.0L 4 108 1.6 3/ ICQ XX WYA Christopher Wyatt

Recent Select Images Contributed to the ALPO Comet Section

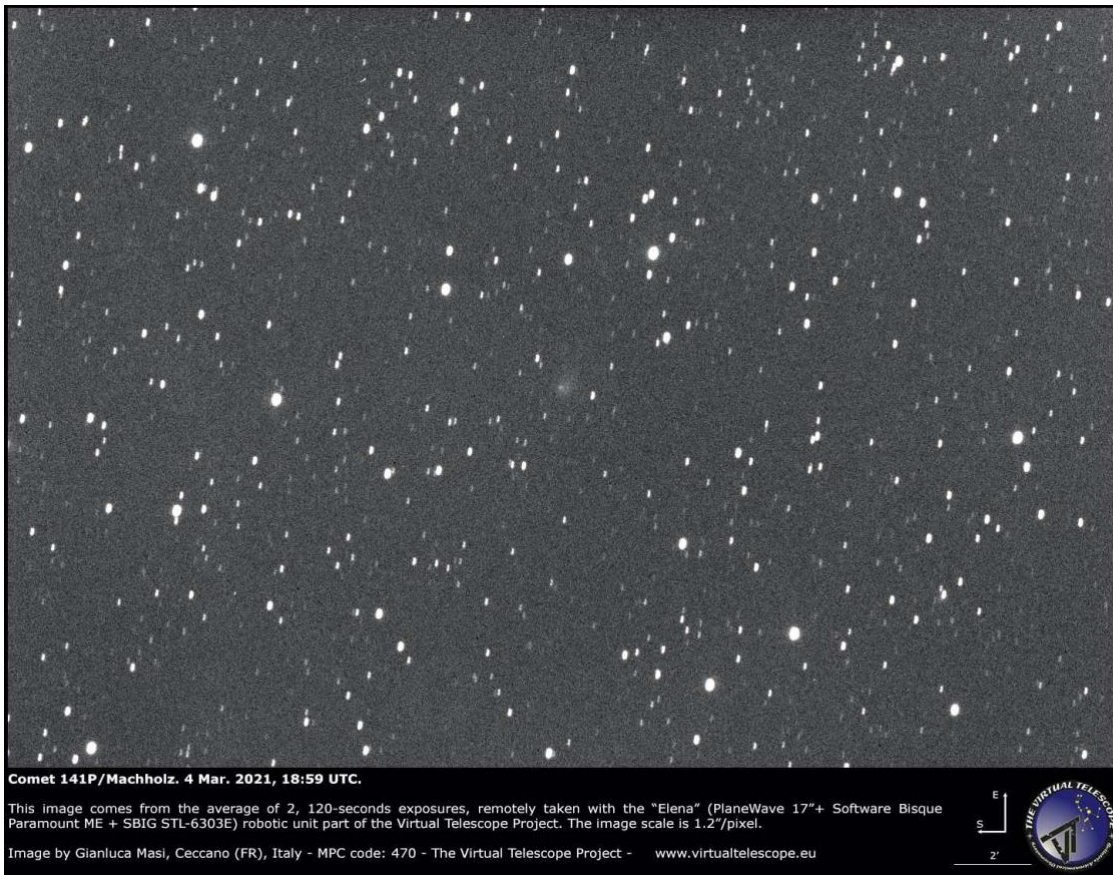
7P/Pons-Winnecke

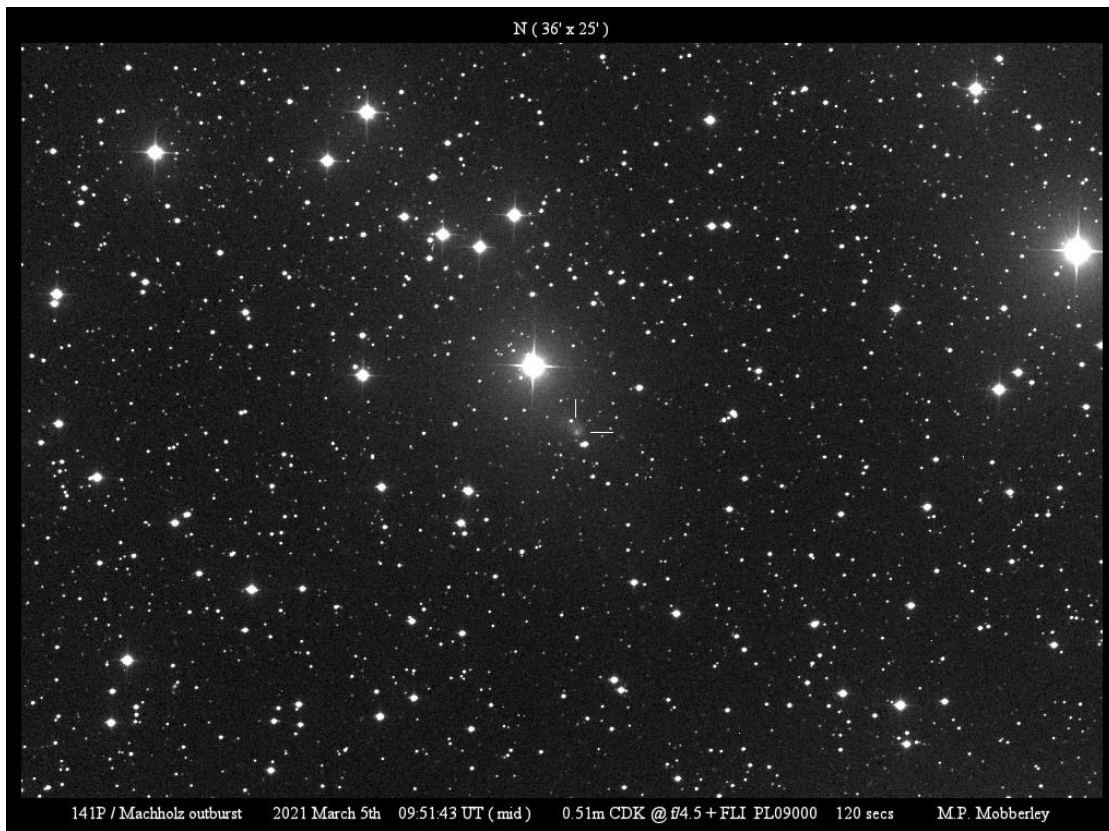


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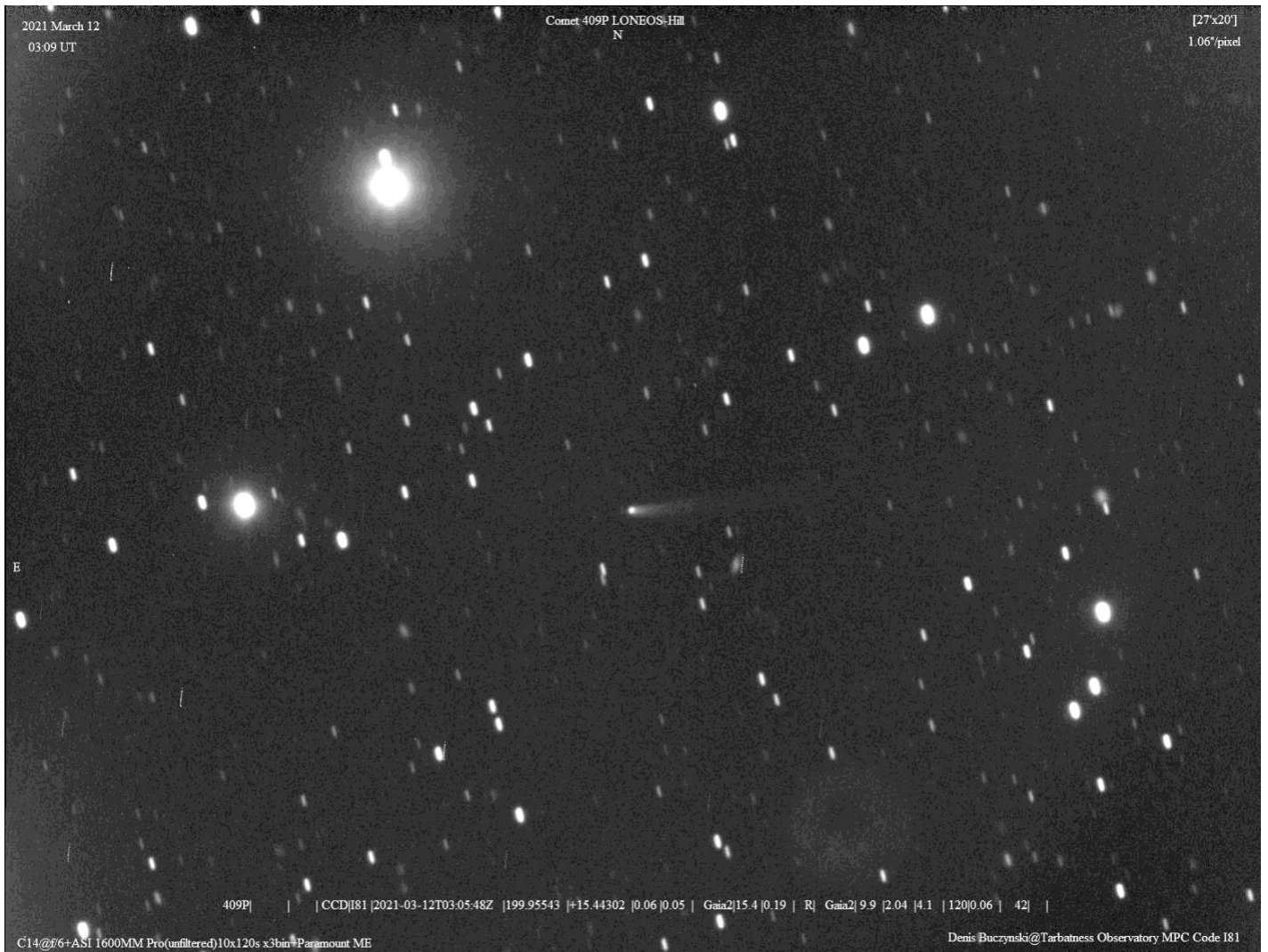


141P/Machholz

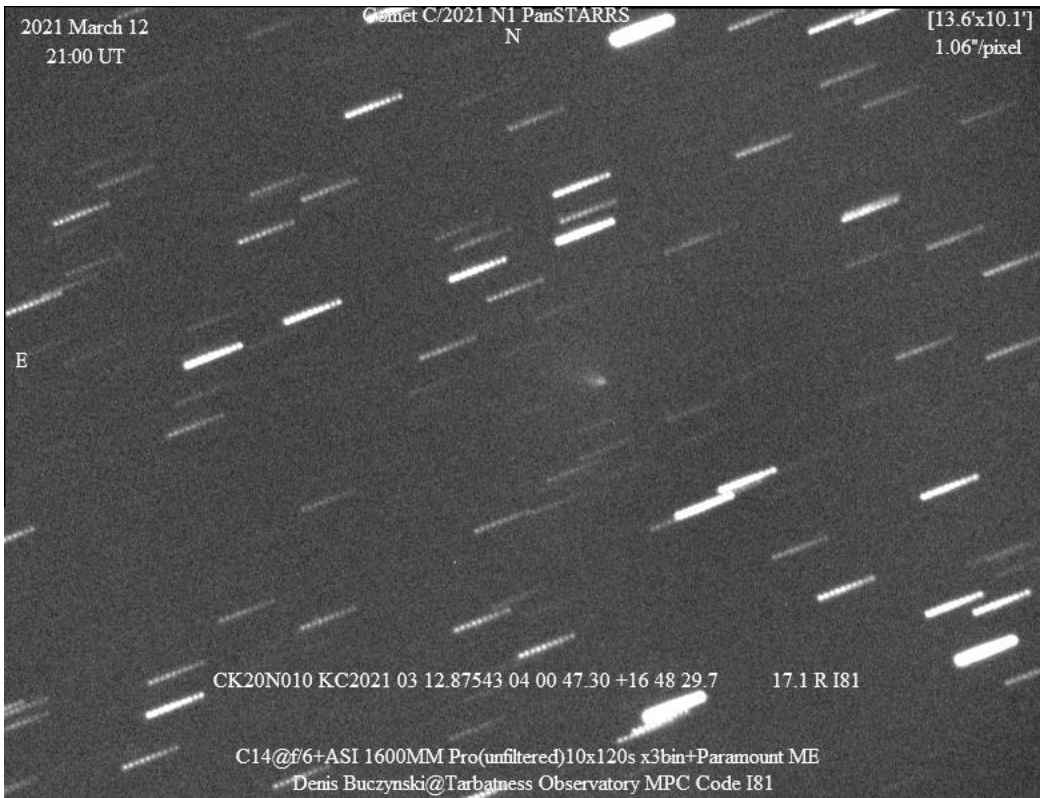




409P/LONEOS-Hill



C/2020 N1 (PANSTARRS)



C/2020 R4 (ATLAS)



C/2020 T2 (Palomar)

2021 March 12
02:15 UT

Comet C/2020 T2 Palomar
N

[27°x20']
1.06"/pixel

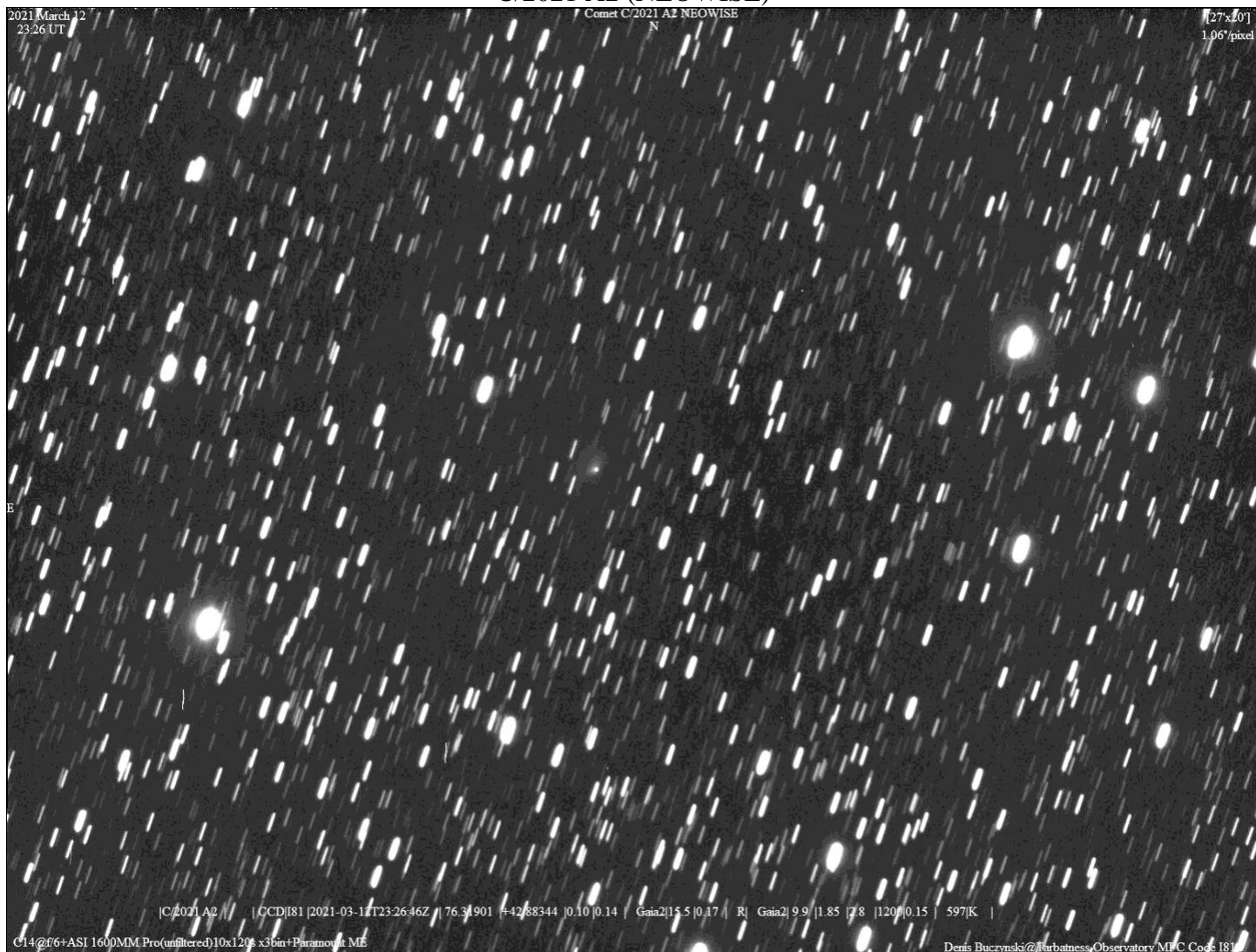
E

[C/2020 T2 | CCD|I81 |2021-03-12T02:12:03Z |211.86781 |+32.48642 |0.04|0.07 | Gaia2|14.4|0.12 | R| Gaia2| 9.9 |2.27 |3.2 | 120|0.07 | 34| |

C14@f/6+ASI 1600MM Pro(unfiltered)10x120s x3bin+Paramount ME

Denis Buczynski@Tarbatness Observatory MPC Code I81

C/2021 A2 (NEOWISE)



C/2021 D1 (SWAN)

2021 March 01

Comet SWAN21D

[13.8'x12.2']

19:26 UT

N

1.06"/pixel

E

SWAN21D	KC2021	03	01.80263	23	35	26.52	+14	16	32.8	13.2	R	I81
SWAN21D	KC2021	03	01.81490	23	35	29.91	+14	17	03.2	13.3	R	I81
SWAN21D	KC2021	03	01.82594	23	35	32.97	+14	17	29.5	13.2	R	I81

C14@f/6+ASI 1600MM Pro(unfiltered)+ 25x30s x3bin+Paramount ME

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