ALPO COMET NEWS FOR FEBRUARY 2021

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

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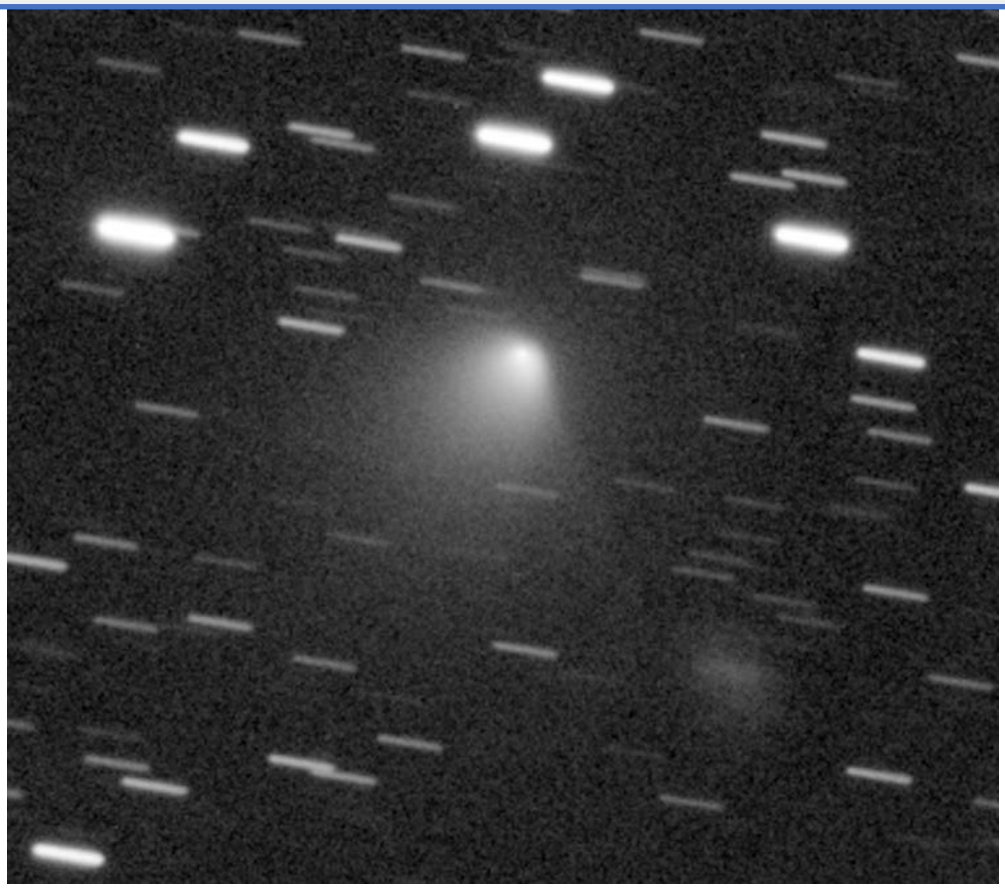

Jupiter-family comet 156P/Russell-LINEAR shows tail structure as seen in this co-added image taken on 2021 February 1 by Denis Buczynski with a Celestron C14 at f/6 and ASI1600MM camera. The additional "fuzzy" to the lower right of the comet is a background galaxy.

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/754292-alpo-comet-news-for-february-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.

In This Issue

Summary
For the second month in a row, no comets are expected to be brighter than 10th magnitude. Hopefully, this changes in March with C/2020 R4 (ATLAS). In the meantime, there are nearly a dozen comets between magnitude 10 and 13 that are good targets for CCD imagers and large aperture visual observers including 88P/Howell, 156P/Russell-LINEAR, 141P/Machholz, C/2019 N1 (ATLAS), C/2020 M3 (ATLAS), C/2021 A2 (NEOWISE), and P/2016 J3 = P/2021 A3 (STEREO).

Recently discovered C/2020 A1 (Leonard) may be a nice object in December. Currently a faint 18-19th magnitude object, CCD imagers are encouraged to monitor it as it brightens.

Bright Comets (magnitude < 10.0)

None.

Fainter Comets of Interest (generally fainter than magnitude 10.0)

29P/Schwassmann-Wachmann - 29P/Schwassmann-Wachmann was discovered photographically in 1927 by German astronomer team Arnold Schwassmann and Arno Arthur Wachmann. The duo discovered 4 comets together, three short-period comets (29P, 31P and 73P) and a long-period comet shared with Leslie Peltier (C/1930 D1).

For the past few months, 29P has stayed between magnitude 11-14 in the evening sky in Aries. If you image 29P, please consider contributing your observations to the British Astronomical Society's (BAA) 29P monitoring program coordinated by Richard Miles. You can find more information at the BAA's "Observing the outbursting comet 29P/Schwassmann-Wachmann" page (https://britastro.org/node/18562).

29P/Schwassmann-Wachmann
T = 2019-Mar-07 q = 5.77 au
Centaur comet - 14.8-yr orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	02 19	+23 52	5.854	5.796	88E	Ari	var	68	10
2021-Feb-06	02 21	+23 52	5.855	5.877	83E	Ari	var	64	9
2021-Feb-11	02 23	+23 53	5.857	5.958	79E	Ari	var	60	7
2021-Feb-16	02 26	+23 56	5.858	6.037	74E	Ari	var	56	6
2021-Feb-21	02 28	+24 00	5.859	6.114	70E	Ari	var	52	5
2021-Feb-26	02 31	+24 06	5.860	6.190	66E	Ari	var	48	3
2021-Mar-03	02 34	+24 12	5.861	6.263	61E	Ari	var	44	2

88P/Howell – This is likely the last month to observe 88P/Howell. Not only is the comet fading from around 11th to 12th magnitude this month, but its elongation drops from 39 to 27 degrees as its moves through Aquarius (1-9), Pisces (9-25), and Cetus (25-28) in the evening sky. The low elongation already makes 88P a difficult object for northern observers and unobservable for southern observers. Peak brightness was reached last September, October, and November at around magnitude 9.0. With a 5.74-year orbital period, 88P will return to perihelion in March 2026 though this will be a fainter apparition than the current one.

88P/Howell
T = 2020-Sep-26 q = 1.35 au   Max El
Jupiter-family comet — 5.47-year orbital period   (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Feb-01	23 32	-05 32	1.895	2.550	39E	Aqr	11.2	19	1
2021-Feb-06	23 43	-04 13	1.928	2.615	37E	Aqr	11.4	17	0
2021-Feb-11	23 54	-02 55	1.961	2.679	35E	Psc	11.5	16	0
2021-Feb-16	00 05	-01 39	1.994	2.743	33E	Psc	11.6	14	0
2021-Feb-21	00 16	-00 24	2.027	2.806	31E	Psc	11.7	12	0
2021-Feb-26	00 26	+00 48	2.061	2.868	29E	Cet	11.8	10	0
2021-Mar-03	00 36	+01 59	2.094	2.929	26E	Cet	11.9	8	0

Comet Magnitude Parameters --- H = 7.0, 2.5n = 8.0

156P/Russell-LINEAR – Yet another fading comet, 156P/Russell-LINEAR should drop from 11th to 13th magnitude in February. Back in November, it brightened to magnitude 9.5-10.0. That was quite the surprise for a comet that rarely showed any cometary activity across 5 pervious apparitions and prior to 2020 was never observed brighter than 17th magnitude. 2020 did mark the comet's closest approach to Earth and a decrease in perihelion from 1.58 to 1.33 au. While an outburst is possible, increased solar heating due to the smaller perihelion may have been enough to "activate" the comet. CCD imagers are encouraged to image 156P as recent images show evidence of interesting structure. This month, the comet is a far northern object in the evening constellations of Triangulum (Feb 1) and Perseus (1-28). Its next perihelion will be in late April 2027 though this will be a very poorly place apparition with the comet at an unobservable elongation near the Sun at perihelion. It won't come as close to the Earth as it did in 2020 (0.48 au) until 2073 (0.46 au).

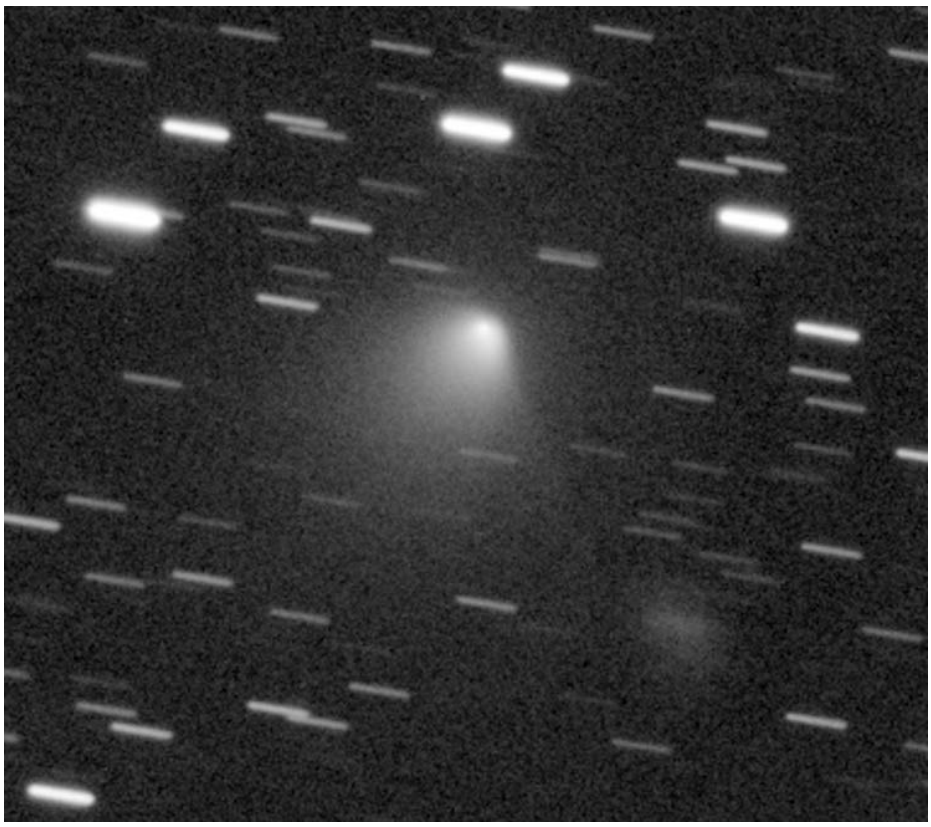

Figure 1 – Unfiltered co-added (15 x 60s) image of 156P/Russell-LINEAR by Denis Buczynski on 2021 February 1 with a C14+ ASI1600MM. Note the thin tail-like structure extending to the lower right (southwest).

156P/Russell-LINEAR
T = 2020-Nov-17 q = 1.33 au
Jupiter-family comet — 6.44-year orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	02 40	+36 31	1.583	1.129	96	Tri	11.7	79	2
2021-Feb-06	02 56	+37 31	1.613	1.189	95	Per	12.0	78	2
2021-Feb-11	03 11	+38 23	1.644	1.252	93	Per	12.2	76	2
2021-Feb-16	03 27	+39 06	1.675	1.318	92	Per	12.5	75	2
2021-Feb-21	03 43	+39 41	1.708	1.385	90	Per	12.8	73	2
2021-Feb-26	03 59	+40 09	1.741	1.454	88	Per	13.1	71	2
2021-Mar-03	04 14	+40 30	1.774	1.525	86	Per	13.4	70	2

Comet Magnitude Parameters --- H = 7.8, 2.5n = 24.0, offset = +33 days

141P/Machholz – Short-period comet 141P/Machholz was one of the brightest comets in January. That statement says more about the current lack of bright comets than 141P's performance. The most recent observation by Chris Wyatt with a 10" reflector at 40 power found placed the comet at magnitude 11.2 on February 2. Now past its mid-December perihelion at 0.81 au, it should fade to 13th magnitude this month as it hopscotches through the evening constellations of Cetus (Feb 1), Eridanus (2-7), Taurus (7-10), Eridanus (10-15), Taurus (15-22), and Orion (22-28).

Former ALPO Comet Section Coordinator Don Machholz discovered 141P/Machholz in August 1994. With a 5.34-year period, 141P is making its 5th observed perihelion passage. Quite the dynamic object, the comet has been observed with multiple components going back to its discovery apparition when at least 7 components were observed. Research by Zdenek Sekanina found that these 1994 components were shed from the primary during the previous return (over a period from 1987 to 1991). Other research suggests 141P (or its progenitor) may have been breaking up for some time as it is related to both the Alpha Capricornid meteor shower and comet 169P/NEAT (a weakly active comet on an orbit with a 4.2-year period).

Currently, three components are visible to imagers. The brightest at around 10-11th magnitude is component A and presumably the primary component that has been observed at nearly all returns back to 1994 (it was missed in 2010). Two fainter, 17th magnitude components have also been imaged this return. Seiichi Nakano has linked the "outer", or furthest from the primary, component to one seen at the 1994, 1999, 2005, and 2015 returns. In 1994, 1999, and 2005 it was designated as component D and in 2015 as component H though it has now been proven to be the same object. The other component, the "inner" or closest to the primary, had not been previously observed. According to Nakano, it most likely separated from the primary around the time of the 2015 perihelion though there is possibility it split from component D.

141P/Machholz
T = 2020-Dec-16 q = 0.81 au
Jupiter-family comet — 5.34-year orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	02 45	-03 11	1.101	0.562	86E	Cet	11.2	46	35
2021-Feb-06	03 19	-01 57	1.152	0.598	89E	Eri	11.5	47	38
2021-Feb-11	03 50	-00 46	1.203	0.643	92E	Eri	11.8	49	40
2021-Feb-16	04 17	+00 19	1.256	0.696	94E	Tau	12.2	50	41
2021-Feb-21	04 41	+01 18	1.309	0.756	96E	Tau	12.6	51	42
2021-Feb-26	05 03	+02 11	1.362	0.821	97E	Ori	12.9	51	42
2021-Mar-03	05 22	+02 58	1.415	0.892	97E	Ori	13.3	52	42

Comet Magnitude Parameters --- H = 12.0, 2.5n = 10.0

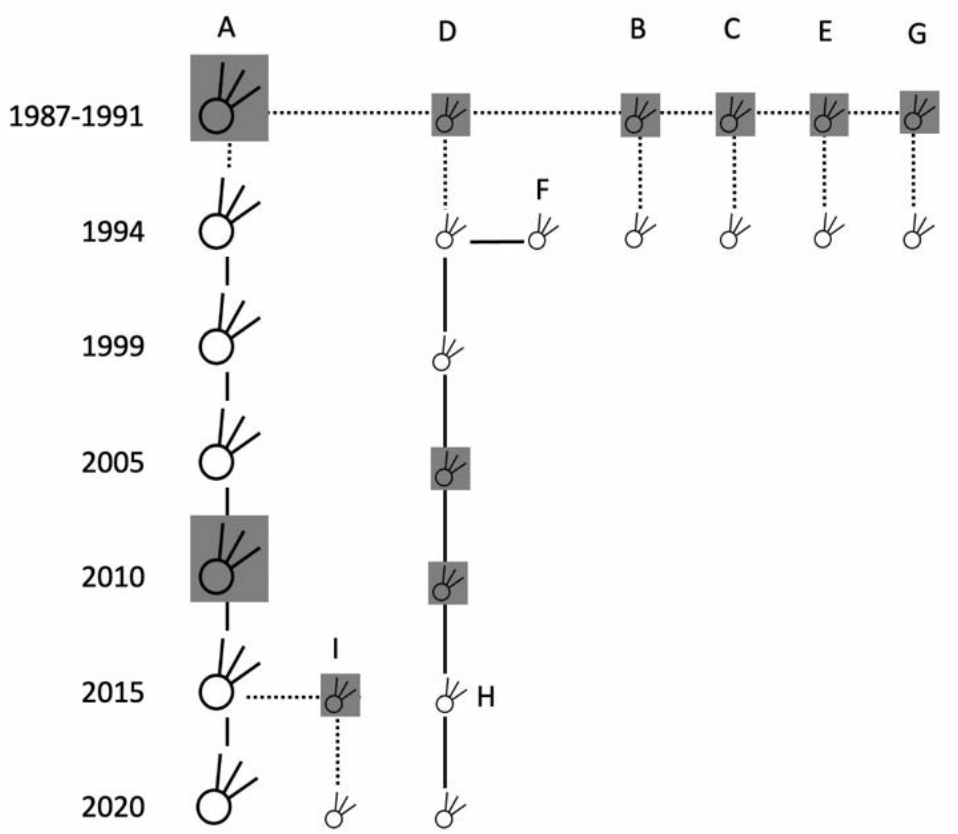

Figure 2 – An attempt at a schematic showing the splitting history of comet 141P/Machholz. Comet symbols denote the returns when a component should have existed. Comet symbols shaded in grey denote returns when a component was not observed.

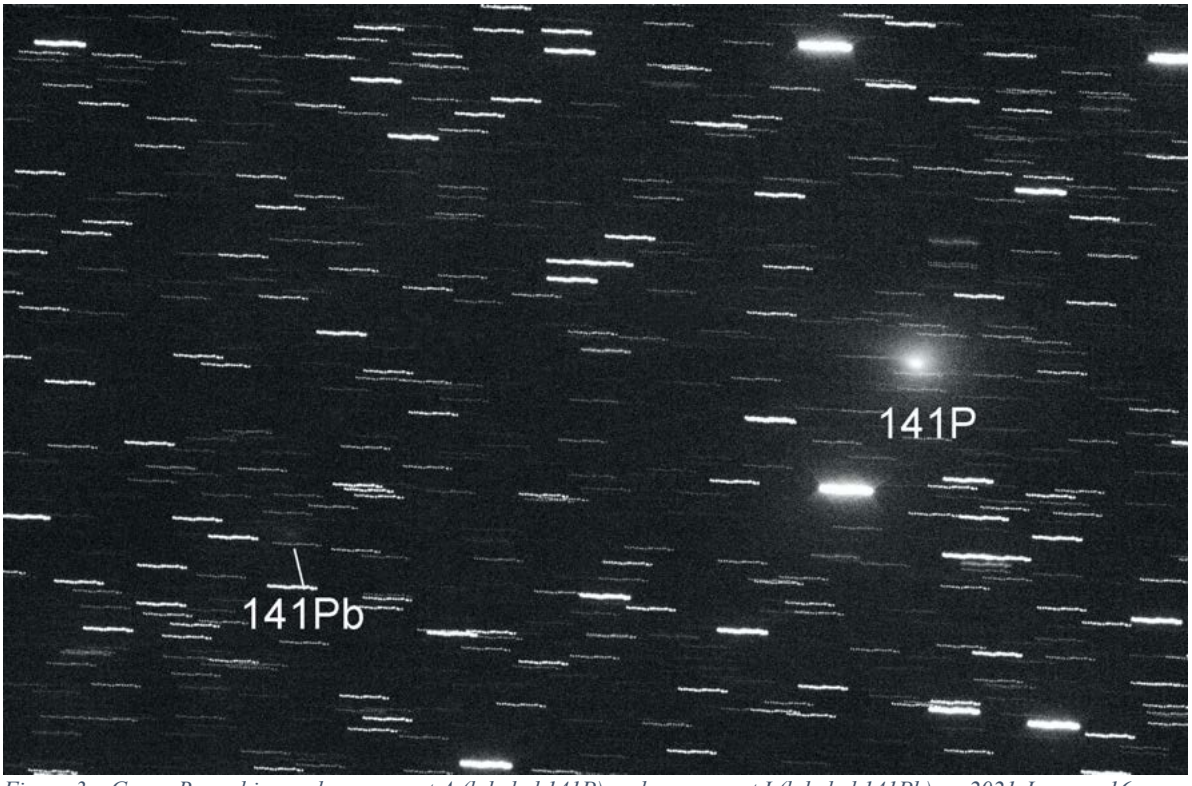

Figure 3 – Gregg Ruppel imaged component A (labeled 141P) and component I (labeled 141Pb) on 2021 January 16.

C/2019 N1 (ATLAS) – C/2019 N1 (ATLAS) is a dynamically new long-period comet discovered by on 2019 July 5 at 18th magnitude. As is characteristic for a dynamically new long-period comet, N1 has brightened very slowly since discovery (at a 2.5n rate ~ 7.5). Last month, Chris Wyatt placed C/2019 N1 at magnitude 13.2 on January 23 and 12.8 on the 25th. Other reports to the COBS site place the comet as bright as 11.9. This month, it is only visible from the southern hemisphere as it moves through Triangulum Australe (Feb 1-4), Apus (4-18), and Octans (18-28) and passes within a few degrees of the celestial south pole at the end of the month.

C/2019 N1 (ATLAS)
T = 2020-Dec-01 q = 1.70 au

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	15 11	-67 41	1.874	1.911	72	TrA	12.3	0	53
2021-Feb-06	15 20	-72 00	1.902	1.904	74	Aps	12.3	0	52
2021-Feb-11	15 32	-76 18	1.932	1.904	76	Aps	12.3	0	50
2021-Feb-16	15 49	-80 30	1.962	1.912	78	Aps	12.4	0	47
2021-Feb-21	16 23	-84 33	1.994	1.927	79	Oct	12.5	0	44
2021-Feb-26	18 52	-88 02	2.028	1.949	80	Oct	12.6	0	40
2021-Mar-03	01 25	-86 55	2.062	1.977	80	Oct	12.6	0	40

Long-period comet — Dynamically new
Comet Magnitude Parameters --- H = 8.8, 2.5n = 7.5

C/2020 M3 (ATLAS) – One of the highlights of the latter half of 2020, C/2020 M3 (ATLAS) peaked around magnitude 7.6 in November. The comet is now rapidly fading as it has been months since its October perihelion at 1.27 au and close approach to Earth in November at 0.36 au. At the start of February, C/2020 M3 is 1.9 au from the Sun and 1.1 au from Earth. Those numbers increase to 2.1 and 1.6 au, respectively, by month's end. Northern observers have this comet to themselves as it is located in Auriga and fades from around magnitude 11.8 to 13.6.

Figure 4 - A receding, fading C/2020 M3 (ATLAS) as imaged on 2021 January 1 by Denis Buczynski with his C14 at Tarbatness Observatory.

C/2020 M3 (ATLAS)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	05 33	+48 44	1.892	1.117	128E	Aur	11.8	81	1
2021-Feb-06	05 39	+48 41	1.941	1.201	124E	Aur	12.1	81	1
2021-Feb-11	05 46	+48 33	1.991	1.288	121E	Aur	12.4	81	1
2021-Feb-16	05 53	+48 20	2.042	1.378	118E	Aur	12.7	82	1
2021-Feb-21	06 01	+48 04	2.093	1.470	115E	Aur	13.0	82	2
2021-Feb-26	06 09	+47 46	2.144	1.565	112E	Aur	13.3	82	2
2021-Mar-03	06 17	+47 24	2.195	1.663	108E	Aur	13.6	83	2

T = 2020-Oct-25 q = 1.27 au
Halley-family comet – 139-year orbital period
Comet Magnitude Parameters --- H = 8.0, 2.5n = 13.5, Offset = +5 days

C/2020 R4 (ATLAS) – C/2020 R4 (ATLAS) has been out of sight since early January. As February starts, the comet is located within a degree or so of the Sun. Unfortunately, it appears to still be too faint to be seen in the coronagraph imagery from SOHO. Our next chance at seeing R4 will come near the end of the month when it will slowly climb into the morning sky. At the time it may around 10-11th magnitude. Even though perihelion occurs on March 1 at 1.03 au, the show is only beginning as the comet closes to within 0.46 au of Earth on April 23 when it could be as bright as 8-9th magnitude. Hopefully we'll know more in time for next month's ALPO Comet News.

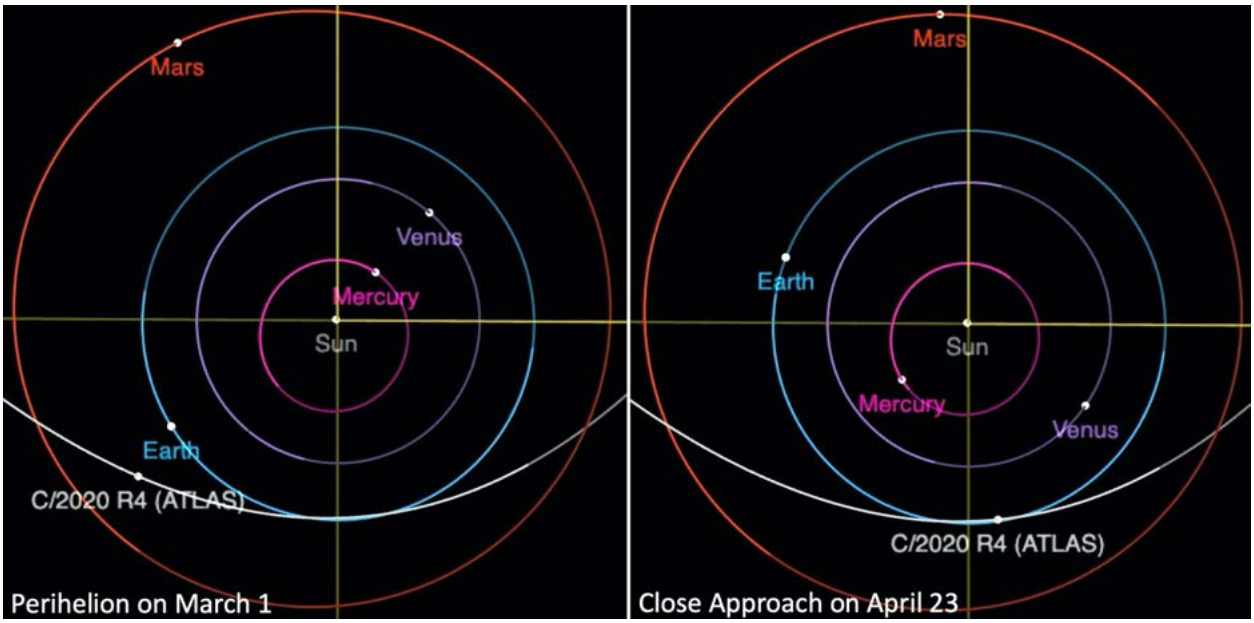

Figure 5 – Orbits of C/2020 R4 (ATLAS) and the inner planets for the date of R4's perihelion on 2021 March 1 and closest approach to Earth on April 23. Diagrams made with the JPL Small-Body Database Browser.

C/2020 R4 (ATLAS)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Feb-01	20 58	-15 34	1.137	2.121	1E	Cap	11.7	0	0
2021-Feb-06	20 55	-14 58	1.104	2.081	5M	Cap	11.5	0	0
2021-Feb-11	20 52	-14 21	1.077	2.029	11M	Aqr	11.4	0	0
2021-Feb-16	20 49	-13 40	1.055	1.962	16M	Aqr	11.2	0	0
2021-Feb-21	20 46	-12 57	1.039	1.883	22M	Aqr	11.0	0	0
2021-Feb-26	20 42	-12 09	1.031	1.792	28M	Aqr	10.9	2	5
2021-Mar-03	20 38	-11 16	1.029	1.688	34M	Aqr	10.8	5	10

T = 2021-Mar-01 q = 1.03 au
Long-period comet – ~940-year orbital period
Comet Magnitude Parameters --- H = 9.5, 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).

Though currently faint, C/2020 A1 is already making a buzz within the comet community as it should brighten considerably by the time it reaches perihelion almost a year from now on 2022 January 3 at 0.62 au. Adding to the buzz are a close approach to Earth on December 12 at 0.233 au (34.9 million km or 21.7 million miles), maximum phase angle as seen from Earth of 160.5 degrees on December 14, and close approach to Venus on 2021 December 18 at 0.028 au (4.2 million km or 2.6 million miles).

Of course, the question on everyone's mind is how bright will Comet Leonard get? Well, let's start with what we know. Orbit computations by the Minor Planet Center and Seiichi Nakano both find a dynamically old solution with an original semi-major axis of ~1700 au and orbital period of ~70,000 years. The comet's already long observational arc of 8 months and Nakano's error bars on the semi-major axis (+64,-69 au) suggest that the computed orbit should be close to the real values. Dynamically old long-period comets are less prone to disintegration though two recent 2020 disintegrators may have been dynamically old. C/2019 Y4 (ATLAS) definitely was and C/2020 P1 (NEOWISE) may have been.

CCD photometry provided by the major surveys suggest the comet brightened at a fast rate of 2.5n ~ 16 between April 2020 and now. It is unlikely the comet will continue to brighten at such a fast rate. Assuming a conservative rate of 2.5n = 7.5, Leonard would brighten to around magnitude 6 in mid-December. Around that time the comet will also be at a very high phase angle of ~160 degrees. High phase angles result in enhanced brightness due to forward scattering of light by dust. If the comet proves to be dust-rich, it could be an additional 3-4 magnitudes brighter in mid-December (so more like magnitude 2 to 3). As exciting as that sounds, the comet will be at an elongation of only 15 degrees at that time so a very difficult object to observe. Let's hope Leonard brightens at a faster rate and is a dust-rich object. In the meantime, imagers will be able to follow its development without interruption this year. Visual observers may be able to pick it up at 13-14th magnitude by September. We will undoubtably be talking more about C/2021 A1 as the year progresses.

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C/2021 A1 (Leonard)
T = 2022-Jan-03  q = 0.62 au                                        Max El
Long-period comet — Dynamically old                                  (deg)
    Date      R.A.   Decl.     r       d    Elong  Const  Mag    40N  40S
2021-Feb-01  14 06  +46 37   4.782   4.336   111    CVn  18.5     83    0
2021-Feb-06  14 04  +47 51   4.730   4.245   113    CVn  18.4     82    0
2021-Feb-11  14 02  +49 07   4.678   4.158   116    UMa  18.3     81    0
2021-Feb-16  13 59  +50 26   4.626   4.076   118    UMa  18.2     80    0
2021-Feb-21  13 55  +51 46   4.573   4.000   119    UMa  18.2     78    0
2021-Feb-26  13 51  +53 07   4.520   3.930   120    UMa  18.1     77    0
2021-Mar-03  13 45  +54 25   4.466   3.867   121    UMa  18.0     76    0
          Comet Magnitude Parameters --- H = 10.2, 2.5n = 7.5
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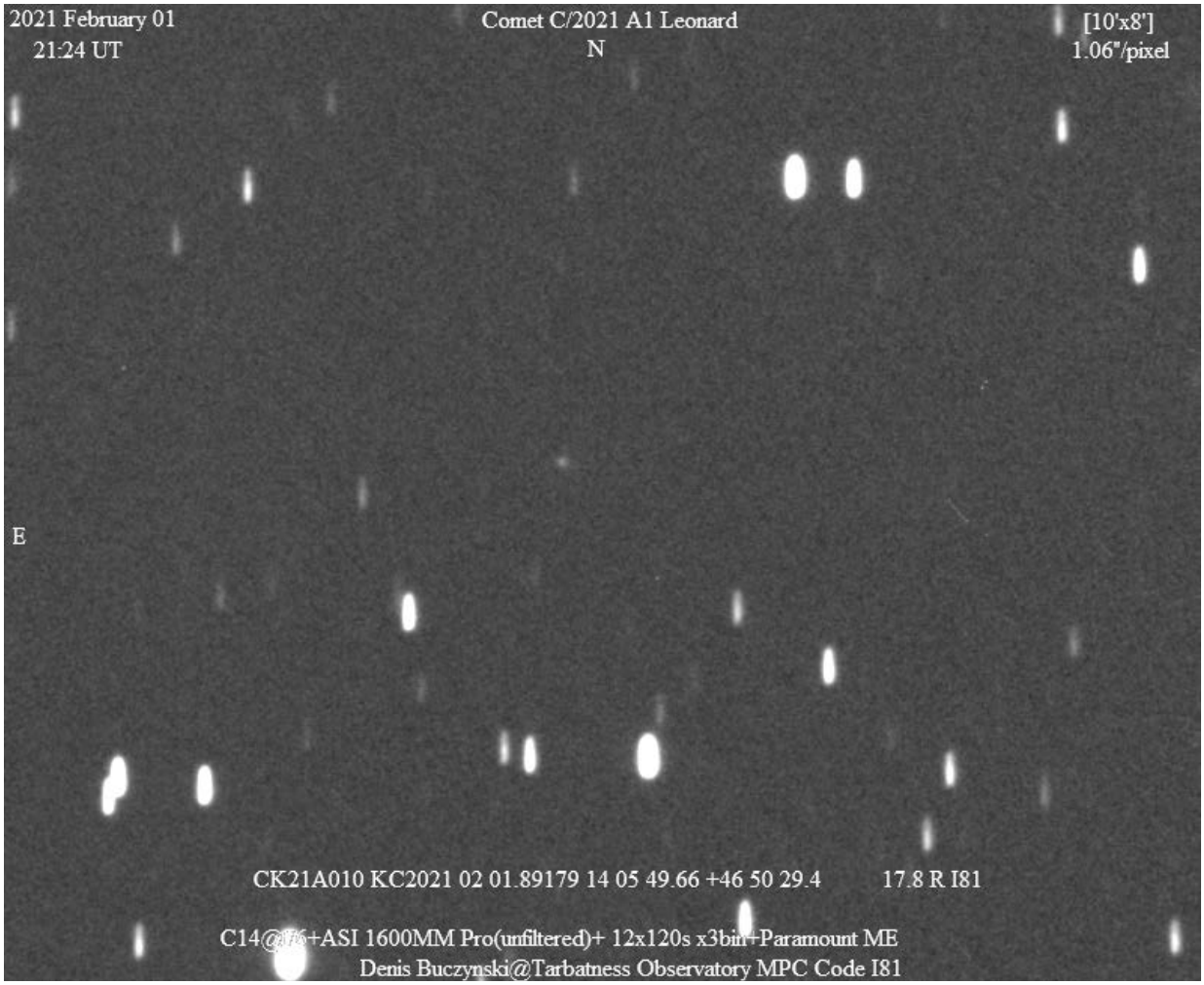

Figure 6 - While not much to look at right now, C/2021 A1 (Leonard) could be a nice object at the end of 2021. Image by Denis Buczynski with a C14 + ASI1600MM camera from 2021 February 1 (12x120s co-added exposure).

C/2020 A2 (NEOWISE) – Jana Chesley (Jet Propulsion Laboratory) reported the discovery of this comet in images taken on 2021 January 3 by the NEOWISE spacecraft in low-Earth orbit. Though estimated to have a visual magnitude of magnitude 15 by NEOWISE, ground-based visual observers were able to observe the comet. Chris Wyatt estimated it at magnitude 11.4 on January 13, 11.0 on January 23 and 25, and 10.3 on February 3. It is possible that C/2020 A2 (NEOWISE) could be the brightest comet of February at a paltry 10-11th magnitude.

Perihelion occurred on 2021 January 22 at 1.41 au. A close approach to Earth at 0.50 au happened on February 3. As a result, the comet will be near its peak brightness at the start of the month. If should fade over the coming weeks since it is now moving away from the Sun and Earth. Both hemispheres have a view of the comet in the morning sky as it moves through the winter Milky Way constellations of Puppis (Feb 1-3), Monoceros (3-11), Gemini, (11-12), Orion (12-16), Gemini (16-17), Taurus (17-21), and Auriga (21-28).

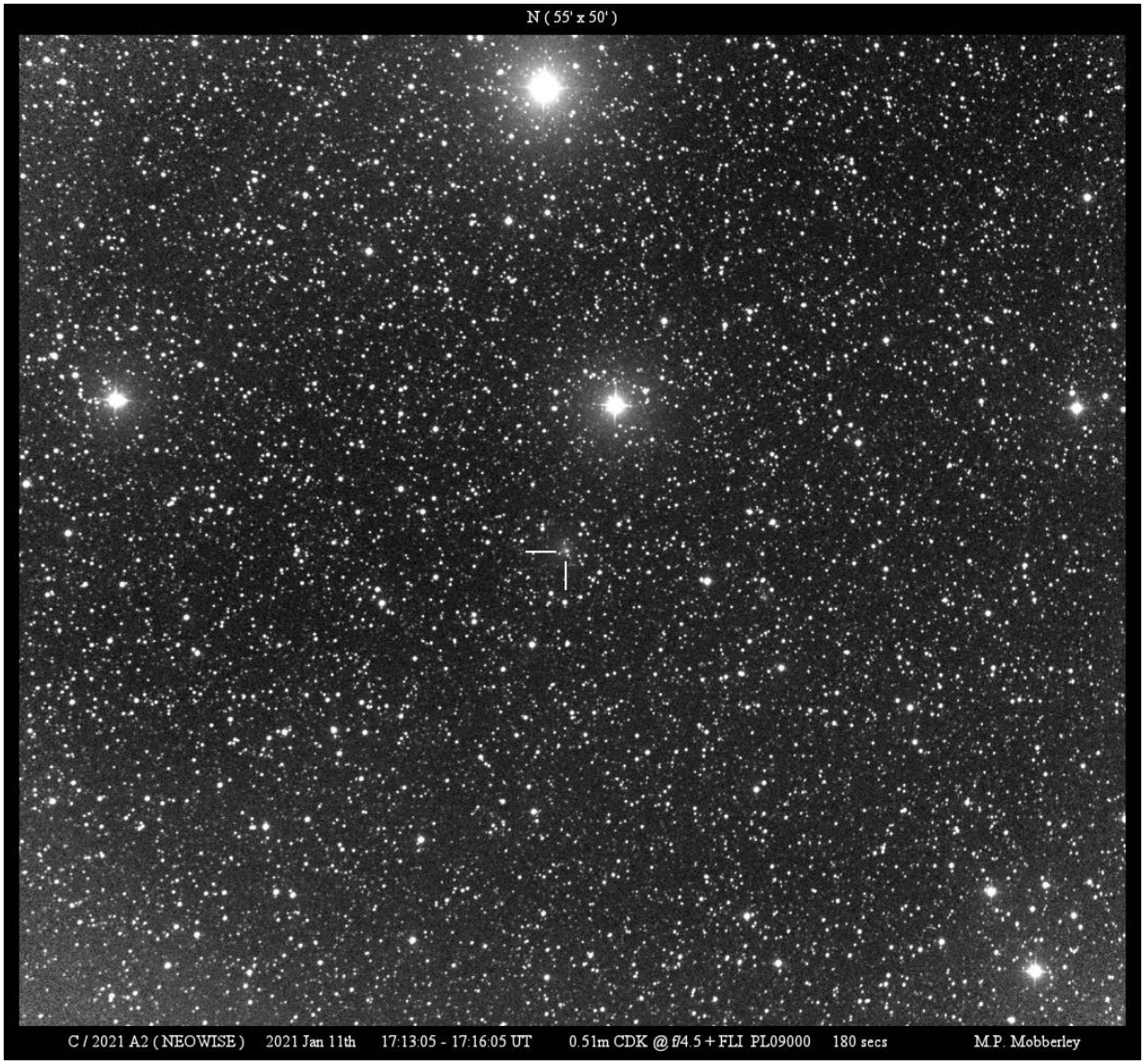

Figure 7 – C/2021 A2 (NEOWISE) as imaged by Martin Mobberley on 2021 January 11 with one of the iTelescopes 20" CDK telescopes + FLI PL09000 camera.

C/2021 A2 (NEOWISE)
T = 2021-Jan-22 q = 1.41 au Max El
Long-period comet (deg)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2021-Feb-01	07 44	-17 26	1.419	0.511	140E	Pup	10.7	33	67
2021-Feb-06	07 05	-03 03	1.428	0.514	142E	Mon	10.7	47	53
2021-Feb-11	06 32	+10 11	1.440	0.564	134E	Mon	10.9	61	39
2021-Feb-16	06 06	+20 33	1.456	0.650	124E	Ori	11.3	71	29
2021-Feb-21	05 45	+28 05	1.475	0.758	114E	Tau	11.6	78	21
2021-Feb-26	05 30	+33 30	1.497	0.880	106E	Aur	12.0	83	15
2021-Mar-03	05 19	+37 30	1.522	1.010	98E	Aur	12.4	81	9

Comet Magnitude Parameters --- H = 10.9, 2.5n = 8.0

P/2020 A3 = P/2016 J3 (STEREO) – Between May 11 and 13, 2016, a rapidly fading comet was detected by Scott Ferguson in images taken with the STEREO-A spacecraft. Over the course of those two days, the comet faded from 8th to 13th magnitude. The rapid change in brightness was likely caused by changes in the amount of forward scattering by dust due to large phase angles (see the write-up above on C/2020 A1). No other observations of P/2016 J3 were made in 2016.

On 2021 January 4, the Zwicky Transient Facility (ZTF) independently re-discovered P/STEREO in data taken with the 1.2-m Oschin Schmidt on Mount Palomar. Pre-recovery observations from 2020 December 19 by the Mount Lemmon 1.5-m were also found. The comet reported at 21st magnitude in the Mount Lemmon images and 18-19th magnitude in the ZTF images. Follow-up observations found a much brighter (or rapidly brightening) object. By mid-January, visual observers made estimates as bright as 10-11th magnitude.

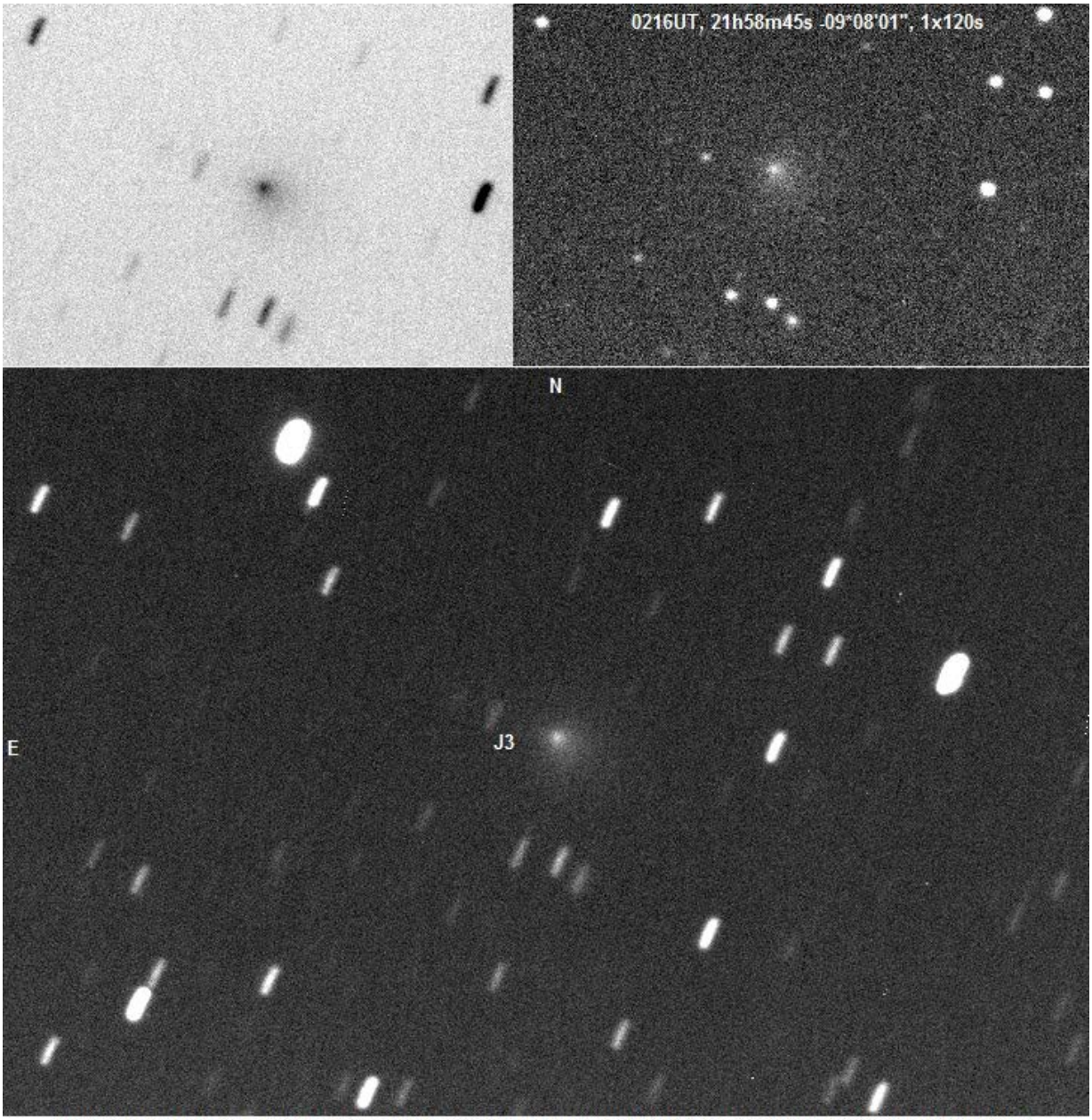

Figure 8 – P/2016 J3 (STEREO) as imaged by Mike Olason on 2021 January 13 with his C11 + STF8300M camera.

Perihelion occurred on 2021 January 25 at 0.53 au. The comet begins the month very close to the Sun. Over the next few weeks, observability should improve though the comet may also rapidly fade. To be honest, we have little information to base a brightness prediction on, so the values given in the ephemerides below are very speculative. Regardless, this is a southern hemisphere object only as it moves through Pisces Austrinus (Feb 1), Grus (1-4), Microscopium (4-8), Indus (8-14), and Telescopium (14-28) in the morning sky.

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P/2016 J3 = P/2021 A3 (STEREO)
T = 2021-Jan-25  q = 0.81 au                                          Max El
Jupiter-family comet — 5.53-year orbital period                        (deg)
    Date      R.A.   Decl.     r       d    Elong  Const  Mag   40N  40S
2021-Feb-01  21 42  -35 12   0.545   0.501    20E   PsA   9.9     0    3
2021-Feb-06  21 17  -42 15   0.581   0.504    26M   Mic  10.6     0    4
2021-Feb-11  20 49  -47 11   0.631   0.524    34M   Ind  11.6     0   15
2021-Feb-16  20 21  -50 06   0.690   0.552    42M   Tel  12.7     0   23
2021-Feb-21  19 58  -51 36   0.756   0.582    49M   Tel  13.8     0   31
2021-Feb-26  19 40  -52 17   0.825   0.610    56M   Tel  14.8     0   38
2021-Mar-03  19 24  -52 31   0.896   0.635    62M   Tel  15.8     0   44
          Comet Magnitude Parameters --- H = 18.0, 2.5n = 25.0
```

New Discoveries, Recoveries and Other Comets in the News

January proved to be a busy month for comet discovery and recovery announcements. Due to the large number of comets to introduce here, some write-ups may be a bit more succinct than usual.

C/2021 B2 (PANSTARRS) – The Pan-STARRS1 1.8-m telescope at Haleakala was used to find this 19th magnitude comet on January17. The comet is not likely to get any brighter as it moves away from the Earth even though perihelion doesn't arrive till 2021 May 4 at 2.52 au.

P/2021 B1 = P/2015 J3 (NEOWISE) – Erwin Schwab recovered this comet on January 17 at 20th magnitude with 0.8-m f/3 Schmidt reflector at Calar Alto, Spain. The original discovery was made by NEOWISE in May 2015 when the comet was near its peak brightness of 19th magnitude. For the current apparition, perihelion is on 2021 April 22 at 1.49 au and close approach to Earth on June 16 at 0.64 au. Peak brightness should be in June at 17th magnitude.

C/2021 A9 (PANSTARRS) – Pan-STARRS1 also found this 21st magnitude comet. At discovery on January12, it was located at 10.2 au from the Sun. Perihelion won't occur till 2023 December 2, but even then, the comet will be no closer than 7.77 au from the Sun.

P/2021 A8 = P/2013 A2 (Scotti) – Erwin Schwab also recovered this returning short-period comet with the 0.8-m f/3 Schmidt at Calar Alto, Spain. The comet was 19th magnitude when recovered on January 14. P/Scotti was originally discovered by Jim Scotti with the Spacewatch 0.9-m telescope on Kitt Peak in January of 2013. At its brightest in 2013, it only reached 18-19th magnitude. With an 8.0-year period, the comet reaches perihelion again on 2021 February 15 at 2.19 au. It will likely become no brighter than 19th magnitude.

C/2021 A7 (NEOWISE) – The NEOWISE spacecraft discovered C/2021 A7 on January 9. While NEOWISE reported it at 20th magnitude, ground-based observers found it to be between magnitude 16 and 17. The newest Comet NEOWISE may peak around magnitude 15 when it reaches its 2021 July 14 perihelion at 1.97 au.

C/2021 A6 (PANSTARRS) – Like C/2021 A9 (PANSTARRS), C/2021 A6 (PANSTARRS) is another large perihelion distance object. Discovered with the Pan-STARRS1 telescope on January 8 at 20th magnitude, A6 is unlikely to get much brighter with a perihelion on 2021 May 1 at 7.93 au.

P/2021 A5 (PANSTARRS) – On January 6th, the Pan-STARRS1 telescope found P/2021 A5 at 21st magnitude. With a semi-major axis of 3.05 au and low eccentricity of 0.14, this object appears to be a Main Belt Comet. Perihelion occurred on 2020 November 12 at 2.62 au.

C/2021 A4 (NEOWISE) – The NEOWISE spacecraft first imaged C/2021 A4 (NEOWISE) on January 3. Ground-based observers estimated a brightness around 18th magnitude. A conservative brightening rate of 2.5n = 8 suggests a peak brightness of 14-15th magnitude around the time of its 2021 March 19 perihelion at 1.15 au.

P/2021 A3 = P/2016 J3 (STEREO) – See write-up above.

C/2020 A2 (NEOWISE) – See write-up above.

C/2021 A1 (Leonard) – See write-up above.

P/2020 Y5 = P/2010 A5 (LINEAR) – Michael Rudenko of the Minor Planet Center identified this returning short-period comet in astrometry produced by the Pan-STARRS1 and Pan-STARRS2 telescopes on December 23 and January 9. Rudenko is currently working at the Minor Planet Center but his name may also be familiar to older comet watchers as the visual discoverer of three comets back in the 1980s: C/1984 V1 (Levy-Rudenko), C/1987 Q1 (Rudenko), and C/1989 Q1 (Okazaki-Levy-Rudenko).

P/2020 Y4 = P/2013 EW90 (Tenagra) – Michael Schwartz and Paulo R. Holvorcem found P/2013 EW90 with a 0.41-m f/3.75 astrograph at the Tenagra Observatories near Nogales, Arizona. On 2021 January 13, Erwin Schwaub used the 0.8-m f/3 Schmidt reflector at Calar Alto, Spain to recover P/Tenagra at 19th magnitude. Perihelion is predicted for 2021 February 15 at 3.31 au. As was the case in 2013, the comet is not expected to become brighter than 19th magnitude.

C/2020 Y3 (ATLAS) – The ATLAS 0.5-m f/2 astrograph on Mauna Loa found this 18th magnitude comet on 2020 December 28. Perihelion occurred on 2020 December 4 at 2.01 au. It should brighten to 17th magnitude this month.

C/2020 Y2 (ATLAS) – The Mauna Loa ATLAS astrograph also discovered this comet on the same night as C/2020 Y3 and at 18th magnitude. C/2020 Y2 is still almost a year and half from a perihelion on 2022 June 17 at 3.13 au when it may be as bright as 13th magnitude.

P/2020 Y1 = P/2010 B2 (WISE) – A University of Maryland team used the 4.3-m Lowell Observatory Discovery Telescope in northern Arizona to recover P/2010 B2 (WISE) on

December 19 at 20th magnitude. P/WISE is a short-period comet with an orbital period of 5.5-years. In 2010, the comet was discovered in January 2010 at 20th magnitude. The new observations conform a single night observation identified by Sam Deen in DECam images from June 2015 which may be the only observation from the 2015 return. The most recent perihelion was on 2020 December 5 at 1.62 au. The comet is already near its peak brightness of 20th magnitude.

C/2020 X4 (Leonard) – Greg Leonard of the Catalina Sky Survey used the Mount Lemmon 1.5-m reflector to find this 20th magnitude comet on December 14. The comet is likely as bright as it will get since it is passed perihelion on 2020 November 11 at 5.21 au. Its current orbit suggests an orbital period of ~312 years (give or take a few tens of years).

C/2020 W5 (Lemmon) – The Mount Lemmon 1.5-m was also used to discover C/2020 W5. It was at 21st magnitude when first imaged on 2020 November 20. Like the previous comet, C/2020 W5 is already a few months passed perihelion (T = 2020 November 30 at q = 3.36 au). The comet is unlikely to get any brighter than 21st magnitude.

P/2020 W4 = P/2014 E1 (Larson) – Yet another 0.8-m Calar Alto Schmidt recovery by Erwin Schwab. P/2014 E1 was discovered in March 2014 by Steve Larson of the Catalina Sky Survey. During the 2014 return it peaked at 15-16th magnitude. Schwab made the recovery on 2020 November 25 at 20th magnitude. Confirmation of the recovery was made on December 11 on images obtained by D. Abreu with a 1.0-m f/4.4 reflector on Tenerife. With a 7.2-year period, P/Larson will reach perihelion on 2021 July 20 at 2.14 au. Peak brightness this time should be around 16-17th magnitude.

P/2020 W3 = P/2007 B1 (Christensen) – And finally we arrive at the end of our list of new discoveries and recoveries announced in January with yet another Erwin Schwab recovery. P/2007 W1 was discovered by Eric Christensen of the Catalina Sky Survey in January 2007 with the 0.68-m Catalina Schmidt. With a 13.5-year period, P/Christensen is making its first return since discovery. Though it reached 18th magnitude in 2007, it will be a little fainter at 19th magnitude this return (T = 2021 January 24 at q = 2.44 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 Comets Section!

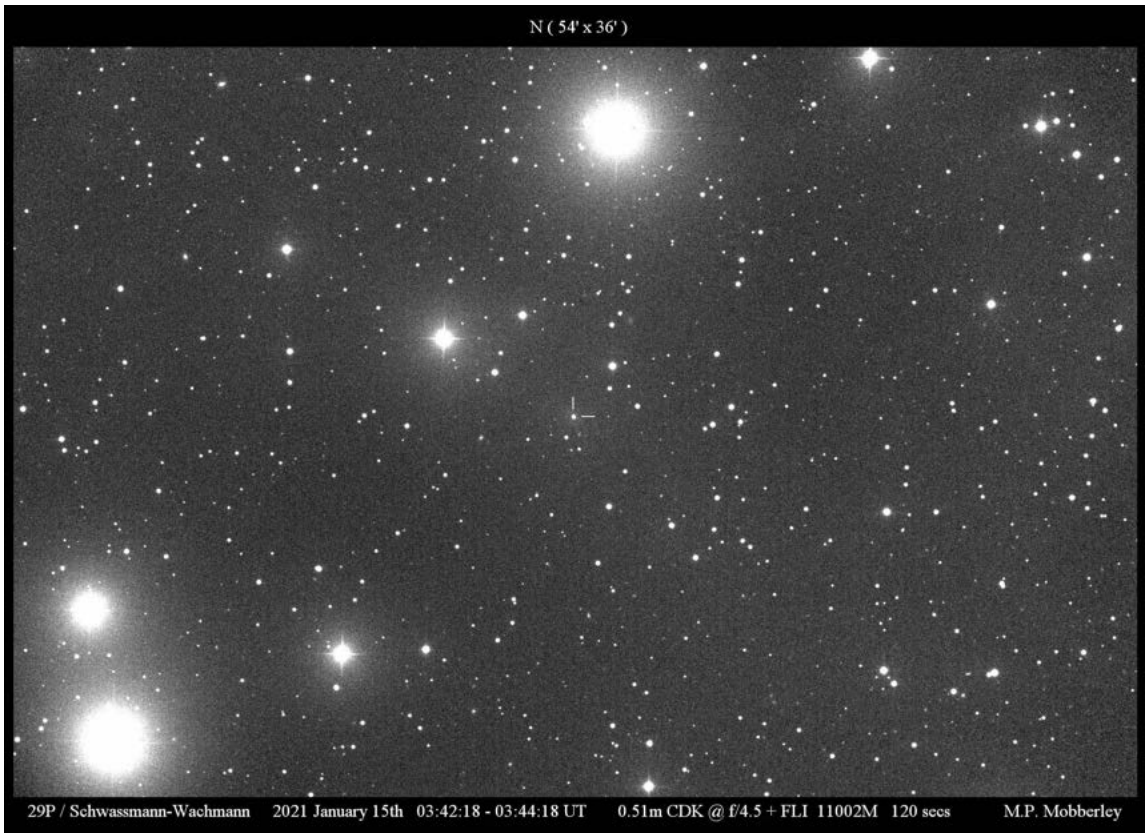
Stay safe and enjoy the sky!
- Carl Hergenrother (ALPO Comets Section Coordinator)

Recent Magnitude Measurements Contributed to the ALPO Comet Section

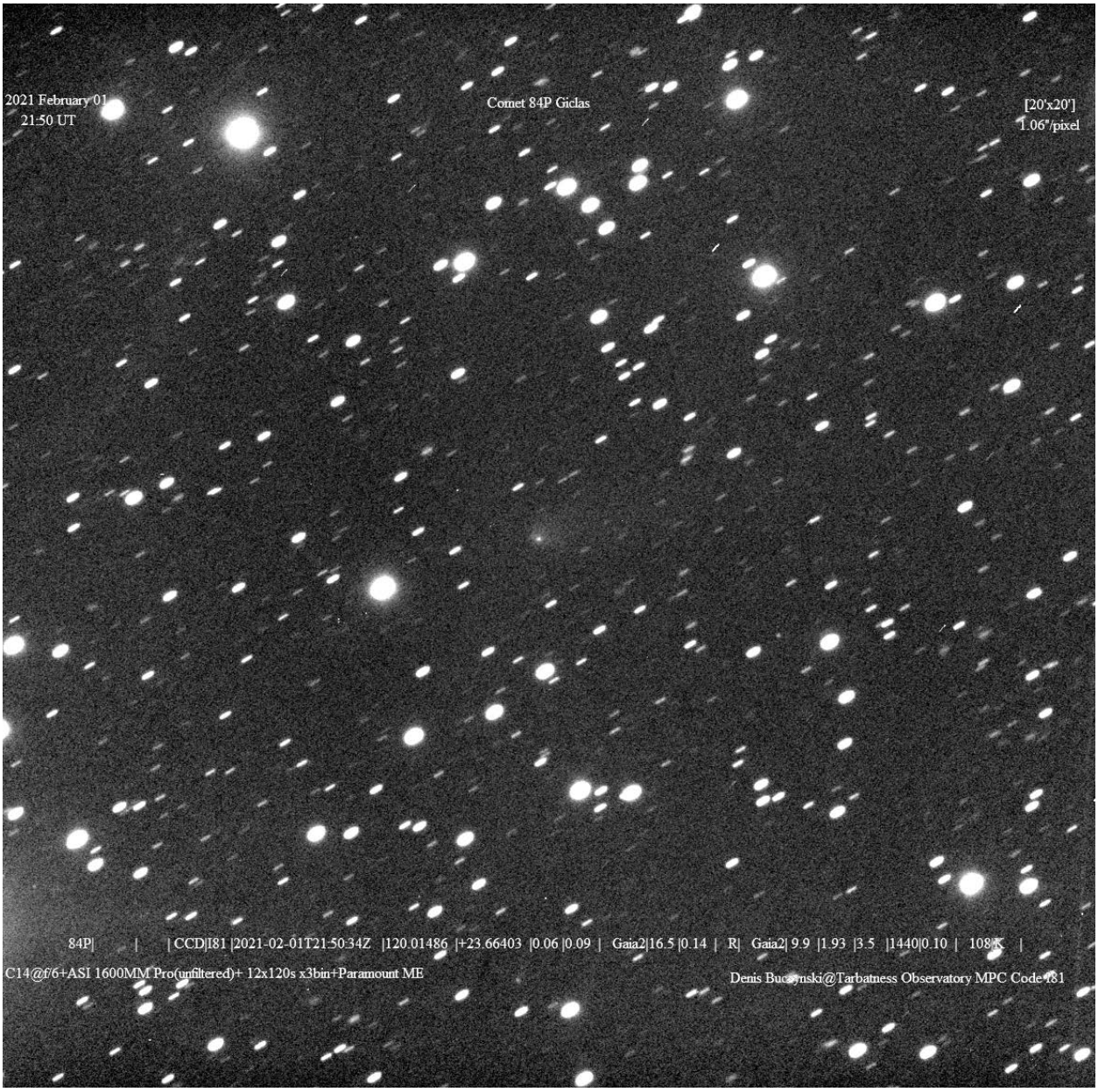
Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia	COMA DC	TAIL LENG	TAIL PA	ICQ CODE	Observer Name
P/2021 A3 (STEREO)												
P2016J3	2021 01 16.78	S 9.7	TK	20.3T	10	100	5	2/			ICQ XX GON05	J J Gonzalez Suarez
C/2021 A2 (NEOWISE)												
2021A2	2021 01 25.69	xM 11.0	AQ	40.0L	4	59	7	4			ICQ XX WYA	Christopher Wyatt
2021A2	2021 01 23.66	xM 11.0	AQ	40.0L	4	59	3.3	4			ICQ XX WYA	Christopher Wyatt
2021A2	2021 01 11.49	xS 13.0	AQ	25.0L	5	125	1.2	2/			ICQ XX WYA	Christopher Wyatt
C/2021 A1 (Leonard)												
2021A1	2021 01 17.47	C 19.1	U4	50.7Y	7A	200	0.3				ICQ xx HER02	Carl Hergenrother
C/2020 R4 (ATLAS)												
2020R4	2021 01 07.77	S 9.5	TK	20.3T	10	100	4	3			ICQ XX GON05	J J Gonzalez Suarez
C/2020 M3 (ATLAS)												
2020M3	2021 01 16.85	S 10.5	TK	20.3T	10	77	4	2			ICQ XX GON05	J J Gonzalez Suarez
2020M3	2021 01 13.83	S 10.3	TK	20.3T	10	77	5	2			ICQ XX GON05	J J Gonzalez Suarez
2020M3	2021 01 07.89	S 10.5	TK	20.3T	10	100	5	2			ICQ XX GON05	J J Gonzalez Suarez
C/2019 T4 (ATLAS)												
2019T4	2021 01 25.68	xM 14.2	AQ	40.0L	4	182	1	5/			ICQ XX WYA	Christopher Wyatt
2019T4	2021 01 23.64	xM 14.2	AQ	40.0L	4	182	0.9	6			ICQ XX WYA	Christopher Wyatt
C/2019 N1 (ATLAS)												
2019N1	2021 01 25.70	xM 12.8	AQ	40.0L	4	108	2	5/			ICQ XX WYA	Christopher Wyatt
2019N1	2021 01 23.67	xM 13.2	AQ	40.0L	4	108	0.9	5/			ICQ XX WYA	Christopher Wyatt
398P/Boattini												
398	2021 01 23.63	xM 12.5	AQ	40.0L	4	59	0.8	3/			ICQ XX WYA	Chris Wyatt
398	2021 01 16.82	S 11.2	TK	20.3T	10	100	4	2			ICQ XX GON05	J J Gonzalez Suarez
398	2021 01 13.80	S 10.8	TK	20.3T	10	133	4	2			ICQ XX GON05	J J Gonzalez Suarez
398	2021 01 13.48	xM 13.0	AQ	25.0L	5	125	0.6	5/			ICQ XX WYA	Chris Wyatt
398	2021 01 11.47	xM 12.9	AQ	25.0L	5	125	0.9	5/			ICQ XX WYA	Christopher Wyatt
398	2021 01 07.85	S 11.2	TK	20.3T	10	100	4	2			ICQ XX GON05	J J Gonzalez Suarez
398	2021 01 05.45	xM 12.5	AQ	25.0L	5	74	1.4	4/			ICQ XX WYA	Christopher Wyatt
156P/Russell-LINEAR												
156	2021 01 16.83	S 10.8	TK	20.3T	10	100	3	3			ICQ XX GON05	J J Gonzalez Suarez
156	2021 01 13.81	S 10.6	TK	20.3T	10	100	5	3			ICQ XX GON05	J J Gonzalez Suarez
156	2021 01 13.47	xM 12.0	AQ	25.0L	5	74	1.7	6			ICQ XX WYA	Chris Wyatt
156	2021 01 11.45	xM 12.0	AQ	25.0L	5	74	2.3	5			ICQ XX WYA	Christopher Wyatt
156	2021 01 07.84	S 10.8	TK	20.3T	10	77	4	3/			ICQ XX GON05	J J Gonzalez Suarez
156	2021 01 05.44	xM 11.8	AQ	25.0L	5	74	0.9	6			ICQ XX WYA	Christopher Wyatt
141P/Machholz												
141	2021 01 16.81	S 10.2	TK	20.3T	10	100	4	2/			ICQ XX GON05	J J Gonzalez Suarez
141	2021 01 13.79	S 9.8	TK	20.3T	10	77	6	2/			ICQ XX GON05	J J Gonzalez Suarez
141	2021 01 13.46	xS 10.6	AQ	25.0L	5	40	4.0	3			ICQ XX WYA	Chris Wyatt
141	2021 01 11.44	xM 10.3	TK	25.0L	5	40	4.2	3/			ICQ XX WYA	Christopher Wyatt
141	2021 01 07.80	S 10.1	TK	20.3T	10	77	6	2/			ICQ XX GON05	J J Gonzalez Suarez
141	2021 01 05.43	xM 10.5	TK	25.0L	5	40	5	6			ICQ XX WYA	Christopher Wyatt
141	2020 12 16.80	S 10.8	TK	20.3T	10	77	5	2/			ICQ XX GON05	J J Gonzalez Suarez
141	2020 12 08.78	S 11.7	AQ	20.3T	10	100	4	2/			ICQ XX GON05	J J Gonzalez Suarez
88P/Howell												
88	2021 01 16.80	S 10.0	TK	20.3T	10	77	5	2/			ICQ XX GON05	J J Gonzalez Suarez
88	2021 01 13.78	S 10.1	TK	20.3T	10	77	5	2/			ICQ XX GON05	J J Gonzalez Suarez
88	2021 01 13.45	xS 12.3	AQ	25.0L	5	125	1.3	3/			ICQ XX WYA	Chris Wyatt
88	2021 01 11.44	xS 11.9	AQ	25.0L	5	40	1.8	2/			ICQ XX WYA	Christopher Wyatt
88	2021 01 07.79	S 10.2	TK	20.3T	10	77	5	2			ICQ XX GON05	J J Gonzalez Suarez
29P/Schwassmann-Wachmann												
29	2021 01 13.82	S 10.8	TK	20.3T	10	77	6	1/			ICQ XX GON05	J J Gonzalez Suarez
29	2021 01 13.47	xI[14.4	AQ	25.0L	5	125					ICQ XX WYA	Chris Wyatt
29	2021 01 11.46	xI[14.3	AQ	25.0L	5	125					ICQ XX WYA	Christopher Wyatt
29	2021 01 07.82	S 11.0	TK	20.3T	10	77	6	1			ICQ XX GON05	J J Gonzalez Suarez
29	2021 01 05.44	xI[13.5	AQ	25.0L	5	125					ICQ XX WYA	Christopher Wyatt

Recent Select Images Contributed to the ALPO Comet Section

29P/Schwassmann-Wachmann



84P/Giclas


2021 February 01
21:50 UT
Comet 84P Giclas
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1.06"/pixel
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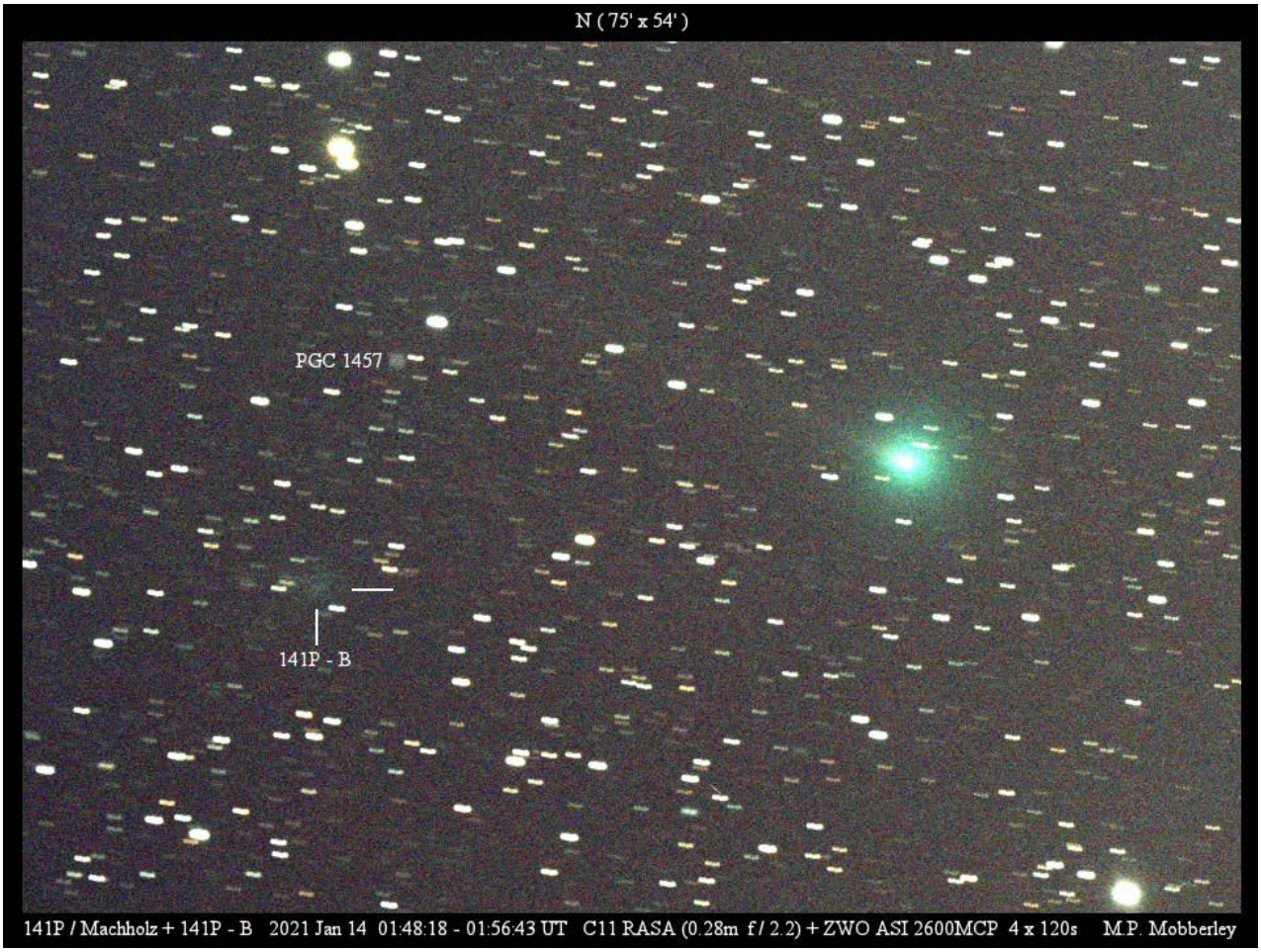
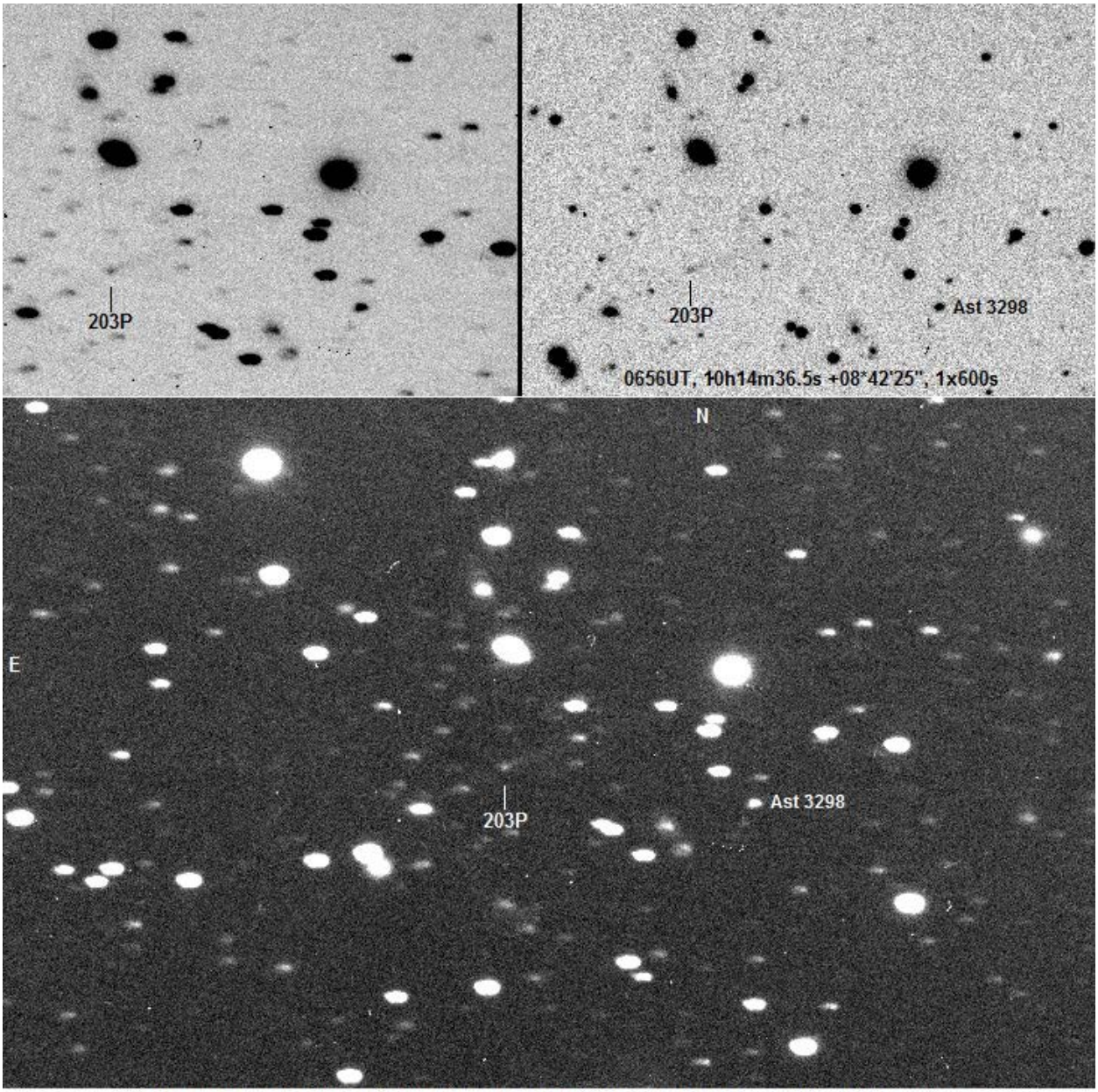
C14@f/6+ASI 1600MM Pro(unfiltered)+ 12x120s x3bin+Paramount ME
Denis Bucz̨yński@Tarbatness Observatory MPC Code I81

141P/Machholz

Image of the primary (comp A) of 141P/Machholz taken by Tenho Toumi on 2021 January 8.

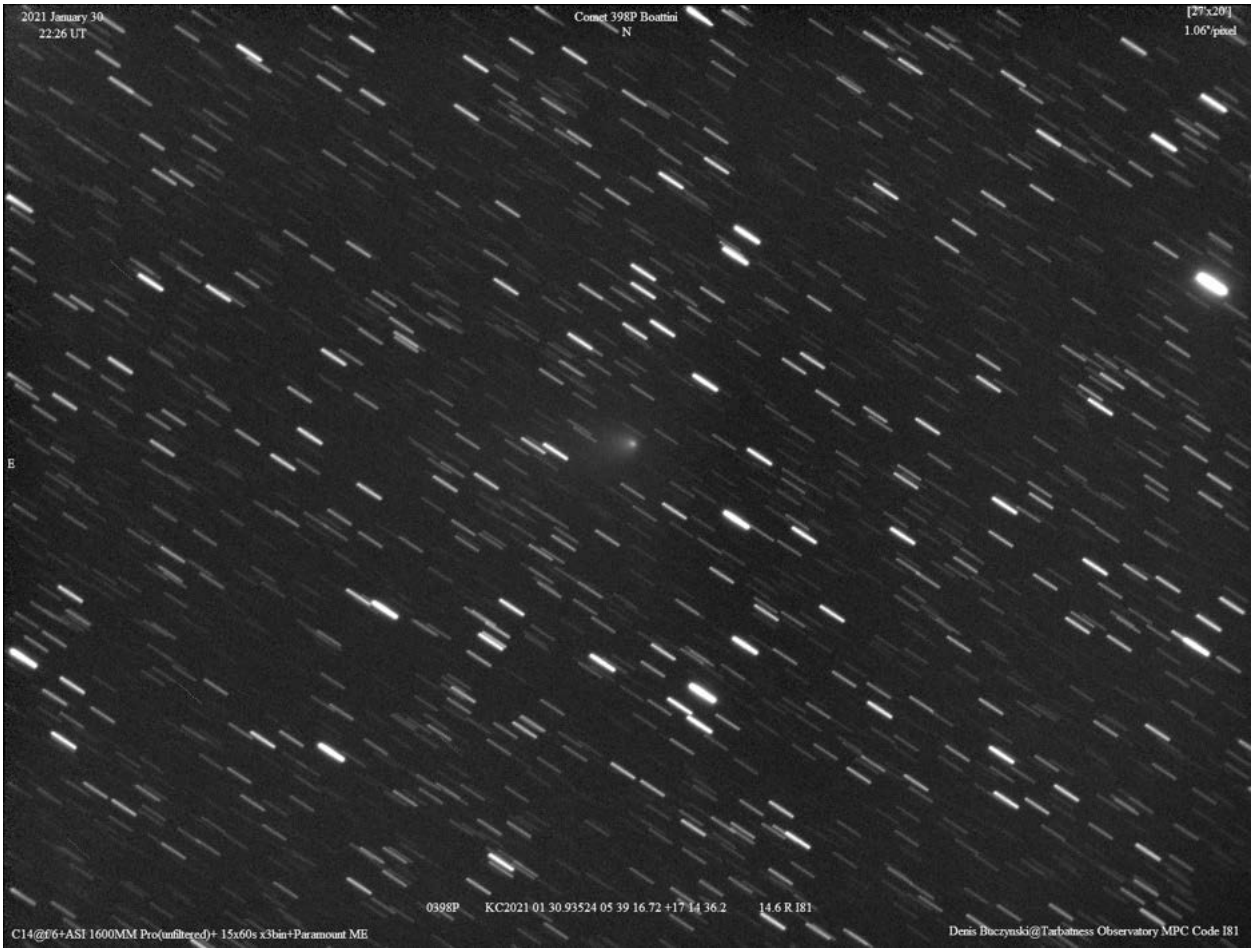


203P/Korlevic

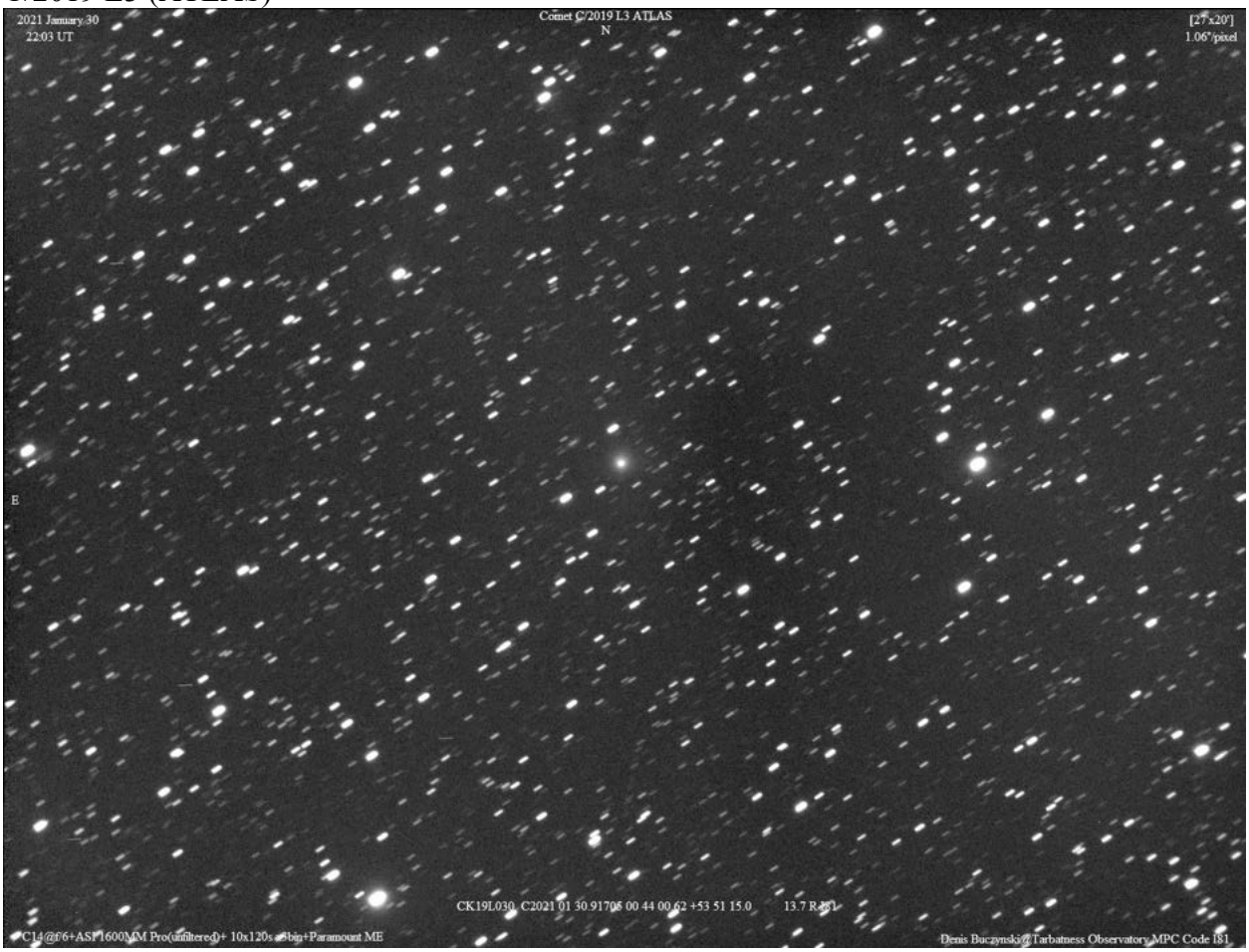


203P/Korlevic, m=19.3, tail 106" PA 291*, 2021/01/13 0646-0736UT, 5x600s, FOV 15.2'x9.7'
11" SCT f/6.4 STF-8300M 1.24"/pixel Mike Olason, Tucson Arizona

398P/Boattini

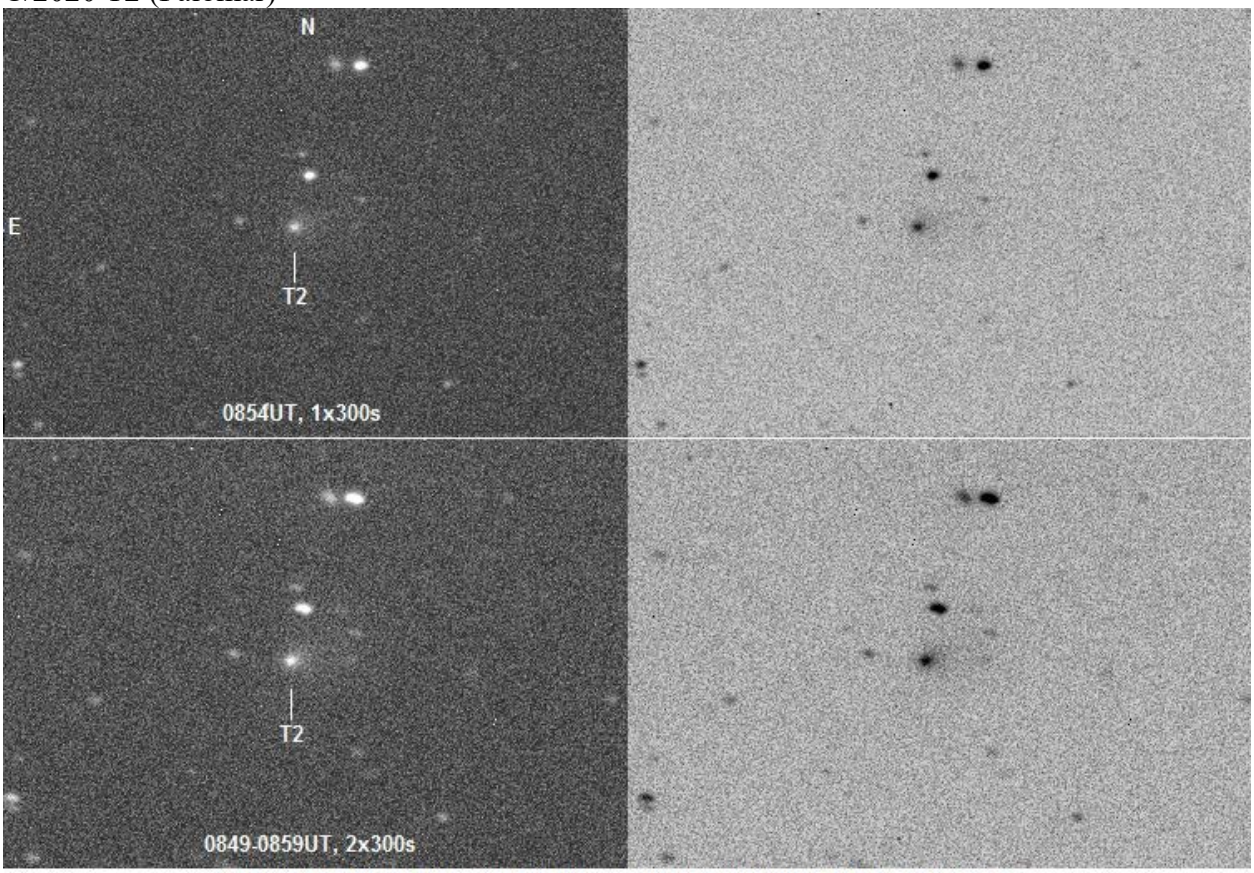


C/2019 L3 (ATLAS)



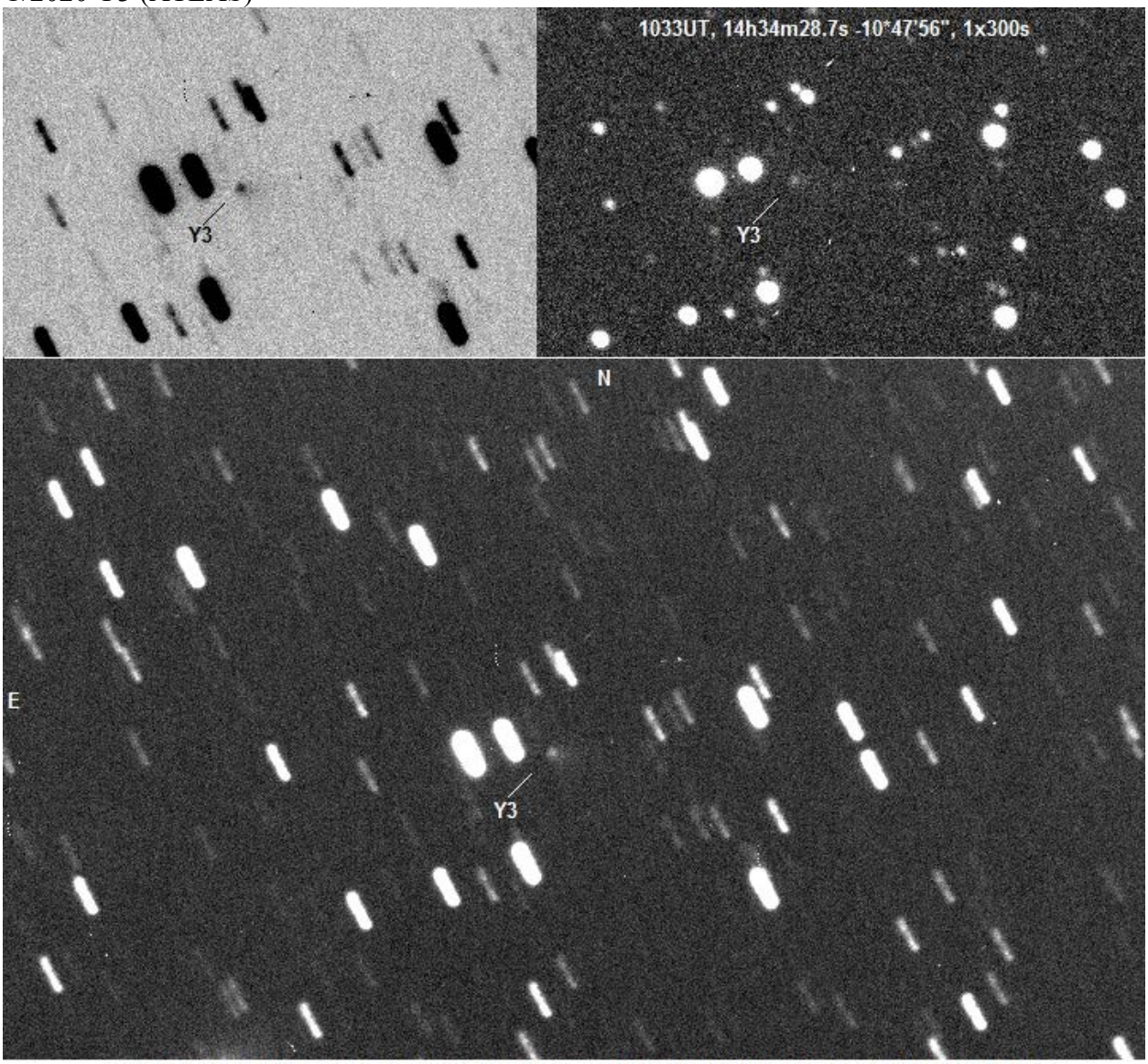
C/2020 M3 (ATLAS)

C/2020 T2 (Palomar)



C/2020 T2 (Palomar), m=16.4, tail/coma 30" PA 285*, 2021/01/10, FOV 7.8'x5.4'
11" SCT f/6.4 STF-8300M 1.24"/pixel Mike Olason, Tucson Arizona

C/2020 Y3 (ATLAS)



C/2020 Y3 (ATLAS), m=18.0, fan tail 21" PA 255*, 2021/01/18 1023-1048UT, 5x300s, FOV 14.9'x9.3'
11" SCT f/6.4 STF-8300M 1.24"/pixel Mike Olason, Tucson Arizona