ALPO COMET NEWS FOR MARCH 2021

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C/2021 A4 (NEOWISE) shares the stage with galaxy NGC 2403 in Camelopardalis. Martin Mobberley took this 120-sec luminance image on 2021 February 10 with a 0.43-m reflector and FLI PL6303E camera.

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/759374-alpo-comet-news-for-march-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

Not sure if we'll have any comets brighter than 10th magnitude this month though there are two contenders. C/2020 R4 (ATLAS) may break the magnitude 10 barrier at the end of March but this is uncertain as the comet has not been observed since early January (due to being too close to the Sun). Newly discovered C/2021 D1 (SWAN) is close to the magnitude 10 barrier but it appears likely that it is currently as bright as it will get at 10-11th magnitude. In the meantime, there are many other comets between magnitude 10 and 13 that are good targets for CCD imagers and large aperture visual observers. Though still around 18th magnitude, imagers are encouraged to monitor C/2020 A1 (Leonard) which may become a nice object in December.

Bright Comets (magnitude < 10.0)

C/2020 R4 (ATLAS) – Placing C/2020 R4 (ATLAS) in the brighter than 10th magnitude category may be a stretch for March. When we last saw the comet it was a 11-13th magnitude object in early January. Since then, it has been located too close to the Sun to observe. As March begins, ATLAS will be slowly pulling away from the brightness of dawn. Based on its brightness when last observed in January, the comet may start March around 11th magnitude and brighten to around magnitude 9.9 by the end of March. With no observations for the past month and a half, the predictions here could be off. The fact that no observations were made in late February does suggest it is fainter than predicted.

Perihelion occurs on March 1 at 1.03 au. But what could make this a nice 8-9th magnitude object over the next two months is its close approach to Earth on April 23 at 0.46 au. The comet will become progressively easier to observe in the morning as it moves through Aquarius (Mar 1-2), Capricornus (2-14), and Aquila (14-31).

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C/2020 R4 (ATLAS)
T = 2021-Mar-01  q = 1.03 au                                  Max El
Long-period comet – ~930-year orbital period                   (deg)
    Date      R.A.    Decl.     r       d     Elong  Const  Mag   40N  40S
2021-Mar-01  20 39  -11 38   1.029   1.731    31M    Aqr  10.8     4    8
2021-Mar-06  20 35  -10 40   1.031   1.621    37M    Cap  10.7     8   14
2021-Mar-11  20 30  -09 34   1.040   1.500    43M    Cap  10.5    11   19
2021-Mar-16  20 23  -08 14   1.055   1.370    49M    Aql  10.4    15   24
2021-Mar-21  20 15  -06 38   1.077   1.233    56M    Aql  10.3    20   29
2021-Mar-26  20 05  -04 36   1.105   1.091    63M    Aql  10.1    25   34
2021-Mar-31  19 52  -01 57   1.137   0.947    71M    Aql   9.9    31   39
2021-Apr-05  19 33  +01 37   1.175   0.804    80M    Aql   9.7    39   41
           Comet Magnitude Parameters --- H = 9.5, 2.5n = 10.0
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Fainter Comets of Interest (generally fainter than magnitude 10.0)

10P/Tempel - Jupiter-family comet 10P/Tempel (formally known as "Tempel 2") is one of 12 comets to bear the name of discoverer Ernst Wilhelm Leberecht Tempel. Though originally from Germany, Tempel made his discoveries while working in Marseilles, Milan, and Florence in France and Italy.

While working at Brera Observatory in Milan, Tempel visually swept up 10P on 1873 July 3. In 1873, 10P had a perihelion distance of 1.34 au. Perihelion has slowly increased since that time to its current value of 1.41 au. The current apparition marks its 24th observed return. It has been seen at every return since its poorly placed 1941 return.

10P/Tempel is one of the more interesting Jupiter-family comets. Its nucleus is a large 11 km in diameter (H ~ 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).

Unfortunately, this is not a good apparition to observe 10P. The comet comes to perihelion nearly on the other side of the Sun when it will be around magnitude 11 but at a solar elongation of only ~30 degrees. To make matters worse, the alignment of the ecliptic and comet's location in Capricornus (Mar 1-16) and Aquarius (16-31) means northern hemisphere observers will miss out on 10P in March when it is at its brightest. 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 will be closer to magnitude 7.5 in brightness.

Figure 1 - 10P/Tempel as imaged by Tenho Tuomi two apparitions ago on 2010 July 9. Image is a co-add of 13x60-sec exposures with a 0.3-m f/5 reflector.

10P/Tempel MPC114607
T = 2021-Mar-24 q = 1.41 au
Jupiter-family comet - 5.4-yr orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Mar-01	21 06	-16 23	1.434	2.256	26M	Cap	11.6	0	6
2021-Mar-06	21 23	-15 35	1.426	2.237	26M	Cap	11.4	0	7
2021-Mar-11	21 40	-14 43	1.419	2.221	27M	Cap	11.2	0	8
2021-Mar-16	21 57	-13 47	1.415	2.206	28M	Cap	11.1	0	10
2021-Mar-21	22 14	-12 47	1.413	2.193	29M	Aqr	11.0	0	11
2021-Mar-26	22 30	-11 43	1.413	2.181	30M	Aqr	11.1	0	12
2021-Mar-31	22 47	-10 38	1.414	2.172	31M	Aqr	11.1	0	13
2021-Apr-05	23 03	-09 30	1.418	2.164	31M	Aqr	11.1	0	13

Comet Magnitude Parameters --- H = -2.7, 2.5n = 80.0 (pre-T)
Comet Magnitude Parameters --- H = 8.2, 2.5n = 8.1 (post-T)

29P/Schwassmann-Wachmann - 29P/Schwassmann-Wachmann was discovered photographically in 1927 by German astronomer team Arnold Schwassmann and Arno Arthur Wachmann. 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 is slowly sinking into the evening sky at the end of dusk. It is already lost to southern observers due to its location north of the Sun in Aries.

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29P/Schwassmann-Wachmann
T = 2019-Mar-07   q = 5.77 au                                    Max El
Centaur comet - 14.8-yr orbital period                            (deg)
    Date        R.A.    Decl.      r        d     Elong  Const  Mag    40N  40S
2021-Mar-01   02 33   +24 10    5.861    6.234    63E    Ari   15.7    46    3
2021-Mar-06   02 36   +24 17    5.862    6.306    59E    Ari   15.7    41    1
2021-Mar-11   02 39   +24 25    5.863    6.374    55E    Ari   15.7    37    0
2021-Mar-16   02 42   +24 34    5.865    6.439    50E    Ari   15.7    33    0
2021-Mar-21   02 46   +24 44    5.866    6.501    46E    Ari   15.7    29    0
2021-Mar-26   02 50   +24 54    5.867    6.559    42E    Ari   15.8    25    0
2021-Mar-31   02 53   +25 05    5.868    6.612    38E    Ari   15.8    21    0
2021-Apr-05   02 57   +25 17    5.870    6.661    34E    Ari   15.8    17    0
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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 Octans (Mar 1-10), Hydrus (10-31) and passes within a few degrees of the celestial south pole at the end of the month.

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C/2019 N1 (ATLAS)
T = 2020-Dec-01   q = 1.70 au                                       Max El
Long-period comet – Dynamically new                                  (deg)
    Date        R.A.    Decl.      r        d     Elong  Const  Mag    40N  40S
2021-Mar-01   23 49   -88 04    2.048    1.965    80E    Oct   12.6     0   40
2021-Mar-06   02 19   -84 52    2.084    1.997    80E    Oct   12.7     0   42
2021-Mar-11   02 54   -81 26    2.120    2.035    81E    Hyi   12.8     0   43
2021-Mar-16   03 11   -78 09    2.157    2.077    80E    Hyi   12.9     0   45
2021-Mar-21   03 23   -75 04    2.195    2.124    80E    Hyi   13.0     0   45
2021-Mar-26   03 32   -72 13    2.234    2.173    80E    Hyi   13.1     0   46
2021-Mar-31   03 41   -69 35    2.274    2.226    79E    Hyi   13.2     0   46
2021-Apr-05   03 48   -67 09    2.314    2.281    79E    Ret   13.3     0   46
           Comet Magnitude Parameters --- H = 8.8, 2.5n = 7.5
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Figure 2 - C/2020 N1 (ATLAS) as imaged by Denis Buczynski on 2021 February 1 with a C14 + ASI 1600MM Pro camera.

C/2020 T2 (Palomar) – Dmitry Duev of the California Institute of Technology identified this 19th magnitude comet 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 as far back as 2019 December 11.

C/2020 T2 is a long-period comet with an orbital period of ~5800 years and is still months from its 2021 July 11 perihelion at 2.05 au. Observations submitted to the COBS site show C/2020 T2 rapidly brightening from around magnitude 17 in late December to 13 in late February. In fact, a fit to that data shows a 2.5n ~ 30 rate of brightening. The prediction below is for a more "normal" rate (2.5n = 10) as it is unlikely a 2.5n = 30 rate is sustainable through perihelion.

The comet is well placed for northern observers as it moves through Canes Venatici (Mar 1-11), Bootes (11-18), and back into Canes Venatici (18-31) near opposition. Southern observers can observe C/2020 T2 as well though it'll be a lowish object.

C/2020 T2 (Palomar)
T = 2021-Jul-11 q = 2.05 au
Long-period comet – ~5800-year orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	Max El (deg) 40S
2021-Mar-01	14 04	+31 03	2.572	1.836	128M	CVn	12.8	81	19
2021-Mar-06	14 06	+31 43	2.539	1.779	130M	CVn	12.7	82	18
2021-Mar-11	14 07	+32 21	2.506	1.726	132M	CVn	12.6	82	18
2021-Mar-16	14 07	+32 56	2.474	1.677	133M	Boo	12.5	83	17
2021-Mar-21	14 07	+33 27	2.442	1.632	135M	CVn	12.3	83	17
2021-Mar-26	14 06	+33 53	2.412	1.592	136M	CVn	12.2	84	16
2021-Mar-31	14 04	+34 12	2.382	1.555	136M	CVn	12.1	84	16
2021-Apr-05	14 02	+34 23	2.354	1.523	136M	CVn	12.0	84	16

Comet Magnitude Parameters --- H = 7.4, 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.

Perihelion arrives on 2022 January 3 at 0.62 au. As a result, Leonard has the potential to be a nice object at the end of 2021. 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 close 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 160.5 degrees on December 14. Such a large phase angle may result in enhanced brightness due to forward scattering by dust in the coma and tail. Without forward scattering, the comet's current rate of brightening (2.5n = 8) suggests a peak brightness around magnitude 6. If the comet proves to be dust-rich, forward scattering could add an additional 3-4 magnitudes in mid-December (so more like magnitude 2 to 3). Though as exciting as that sounds, the comet will be at a solar elongation of only 15 degrees at that time so a difficult object to observe.

Figure 3 - C/2021 A1 (Leonard) shows a hint of a tail in this 2021 February 15 co-added 10x120-s image by Denis Buczynski with a C14 and ASI 1600MM Pro camera.

I was able to observe the comet a few times with iTelescope 0.51-m and 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. 7.39, 18.7; and Feb. 22.46, 18.5. Although data submitted to the MPC going back to April 2020 produce a rapid brightening rate of 2.5n ~17, a fit to my data suggest its current rate of brightening has slowed to a more "normal" 2.5n ~ 8. That rate still predicts a peak brightness (without any forward scattering enhancement) of 6th magnitude.

In the meantime, imagers are encouraged to follow its development as the comet can be observed without interruption this year (at least from the northern hemisphere as it is currently located Ursa Major). Visual observers may have to wait till September to observe the comet when it will be around 13-14th magnitude. This month, Leonard will still be a faint object around 18th magnitude as its distance from the Sun drops from 3.9 to 3.6 au.

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

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Mar-01	13 47	+53 54	4.488	3.892	121M	UMa	18.3	76	0
2021-Mar-06	13 41	+55 12	4.434	3.832	121M	UMa	18.3	75	0
2021-Mar-11	13 33	+56 26	4.380	3.779	121M	UMa	18.2	74	0
2021-Mar-16	13 24	+57 36	4.326	3.733	120M	UMa	18.1	72	0
2021-Mar-21	13 14	+58 40	4.272	3.694	119M	UMa	18.1	71	0
2021-Mar-26	13 03	+59 37	4.218	3.661	117M	UMa	18.0	70	0
2021-Mar-31	12 51	+60 24	4.163	3.634	115M	UMa	17.9	70	0
2021-Apr-05	12 39	+61 02	4.107	3.613	112M	UMa	17.9	69	0

Comet Magnitude Parameters --- H = 10.2, 2.5n = 8.0

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 as it peaked a little shy of magnitude 10.0 in late January and early February. Chris Wyatt spotted A2 at magnitude 10.3 on February 2.

Perihelion occurred on 2021 January 22 at 1.41 au and a close approach to Earth of 0.50 au on February 3. As a result, the comet is now fading as it recedes from the Sun and Earth. Moving north through the winter Milky Way constellation of Auriga (Mar 1-31), C/2021 A2 will only be visible to northern observers by mid-month.

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

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Mar-01	05 23	+36 02	1.511	0.957	101E	Aur	12.2	83	11
2021-Mar-06	05 13	+39 24	1.538	1.090	95E	Aur	12.5	78	7
2021-Mar-11	05 07	+42 01	1.567	1.224	89E	Aur	12.9	72	3
2021-Mar-16	05 02	+44 08	1.599	1.358	84E	Aur	13.2	67	0
2021-Mar-21	04 59	+45 53	1.633	1.491	79E	Aur	13.5	62	0
2021-Mar-26	04 58	+47 24	1.669	1.621	74E	Aur	13.7	57	0
2021-Mar-31	04 58	+48 44	1.706	1.749	70E	Aur	14.0	53	0
2021-Apr-05	04 59	+49 56	1.746	1.873	67E	Aur	14.3	49	0

Comet Magnitude Parameters --- H = 10.5, 2.5n = 10.0

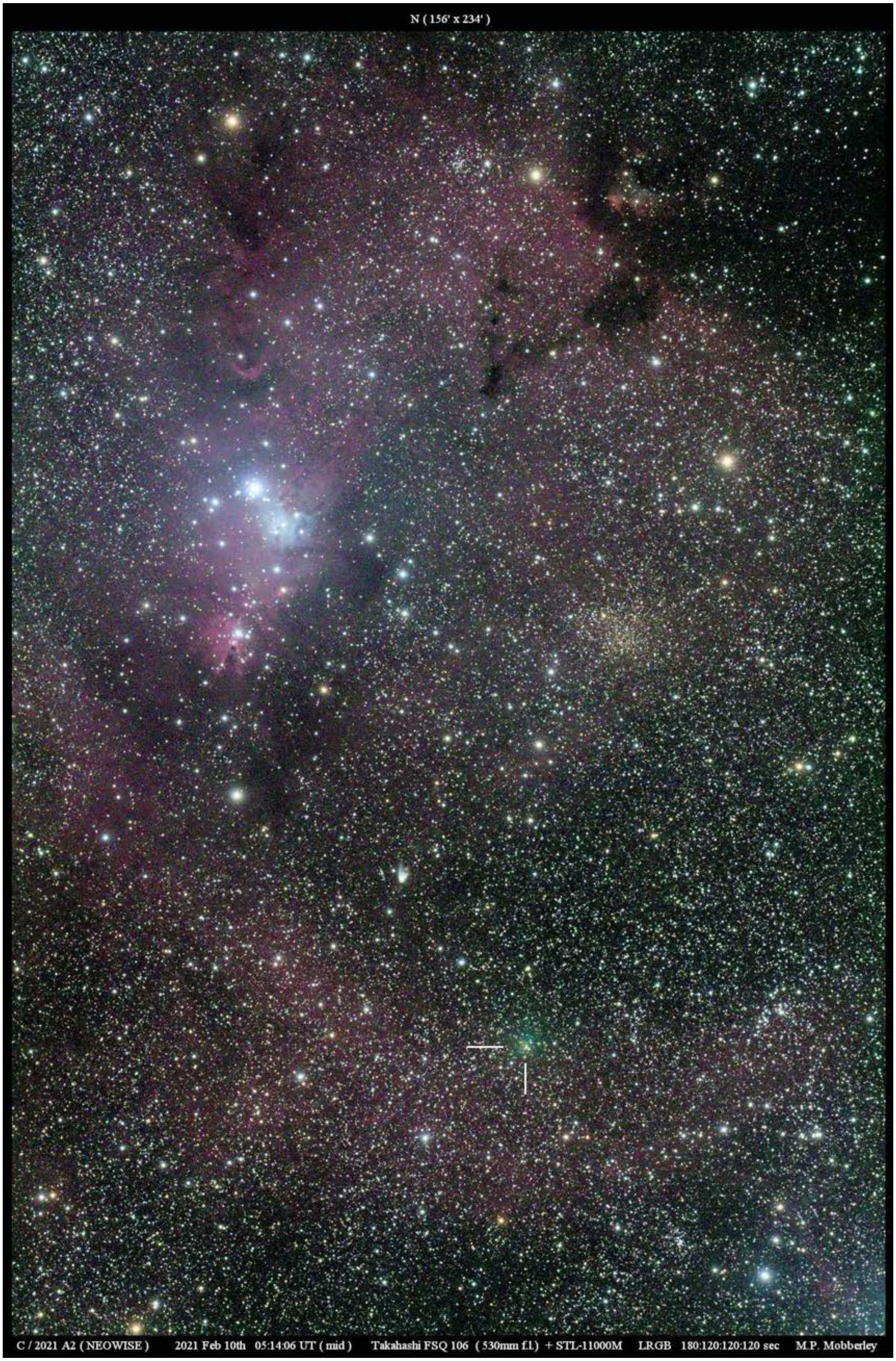


Figure 4 - Martin Mobberley caught C/2021 A4 (NEOWISE) traversing a beautiful region of Monoceros on 2021 February 10 with a Takahashi FSQ106 + STL-11000M.

C/2021 A4 (NEOWISE) – NEOWISE detected this object as a new fast moving asteroidal object in data taken on January 3. Follow-up ground-based observers found the comet to be around 18^{th} magnitude in the days following discovery. Around a month later in early February, imagers reported a significantly brighter C/2021 A4 at 13^{th} magnitude. It was around this time, on February 12, that the comet passed 0.43 au from Earth. Since then, the comet's geocentric distance has been increasing but any apparent fading has been offset by a rapid intrinsic brightening as the comet approaches a March 20 perihelion at 1.15 au. The comet should still be around 12-13^{th} magnitude as March begins though it may fade as the month progresses.

It is observable from both hemispheres as it moves through the evening constellations of Taurus (Mar 1-16) and Eridanus (16-31). Its orbital period is a relatively short ~300 years.

Figure 5 - C/2021 A4 (NEOWISE) also shows a hint of a tail in this 2021 February 17 co-added 5x120-s image by Denis Buczynski with a C14 and ASI 1600MM Pro camera.

C/2021 A4 (NEOWISE)
T = 2021-Mar-20 q = 1.15 au
Long-period comet – ~300-year orbital period

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Mar-01	04 32	+15 55	1.185	0.676	88E	Tau	12.8	60	26
2021-Mar-06	04 24	+09 08	1.167	0.796	80E	Tau	13.0	50	29
2021-Mar-11	04 19	+04 11	1.155	0.921	74E	Tau	13.1	42	31
2021-Mar-16	04 16	+00 27	1.148	1.047	68E	Tau	13.3	34	32
2021-Mar-21	04 14	-02 29	1.146	1.170	63E	Eri	13.5	28	32
2021-Mar-26	04 13	-04 53	1.150	1.289	58E	Eri	13.8	21	31
2021-Mar-31	04 12	-06 54	1.160	1.402	54E	Eri	14.1	15	31
2021-Apr-05	04 12	-08 37	1.174	1.508	51E	Eri	14.4	10	30

Comet Magnitude Parameters --- H = 11.2, 2.5n = 33.6

C/2021 D1 (SWAN) – The latest comet discovery was found in data taken with the Solar Wind Anisotropies (SWAN) instrument on the Solar and Heliospheric Observatory (SOHO) spacecraft. Although the discovery involved spacecraft data, it was pretty much a 100% amateur effort. Michael Mattiazzo of Swan Hill, Victoria, Australia first reported the comet on February 25 in SWAN images going back to February 19. After reporting the find on the comets-ml, a number of ground-based observers started hunting for the possible comet. While there was some doubt of its reality, which was even shared by Mattiazzo, Michael Jaeger was able to image the comet on February 28 at around magnitude 10.8.

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.

The Minor Planet Center published an orbit with a Halley-like orbital period of ~77 years, while Seiichi Nakano and the Central Bureau of Astronomical Telegrams published an e=1 assumed orbit. We'll know more about whether it is a Halley-type or long-period comet as more observations are made. What we do know is that perihelion was back on 2021 February 27 at 0.90 au. The comet is currently on the other side of the Sun from Earth, so this isn't a very good apparition, and the comet is unlikely to become any brighter.

This month, it is observable low in the western evening sky in Pegasus (Mar 1-9), Pisces (9-12), Andromeda (12-17), Pisces (17-25), and Triangulum (25-31) from the northern hemisphere.

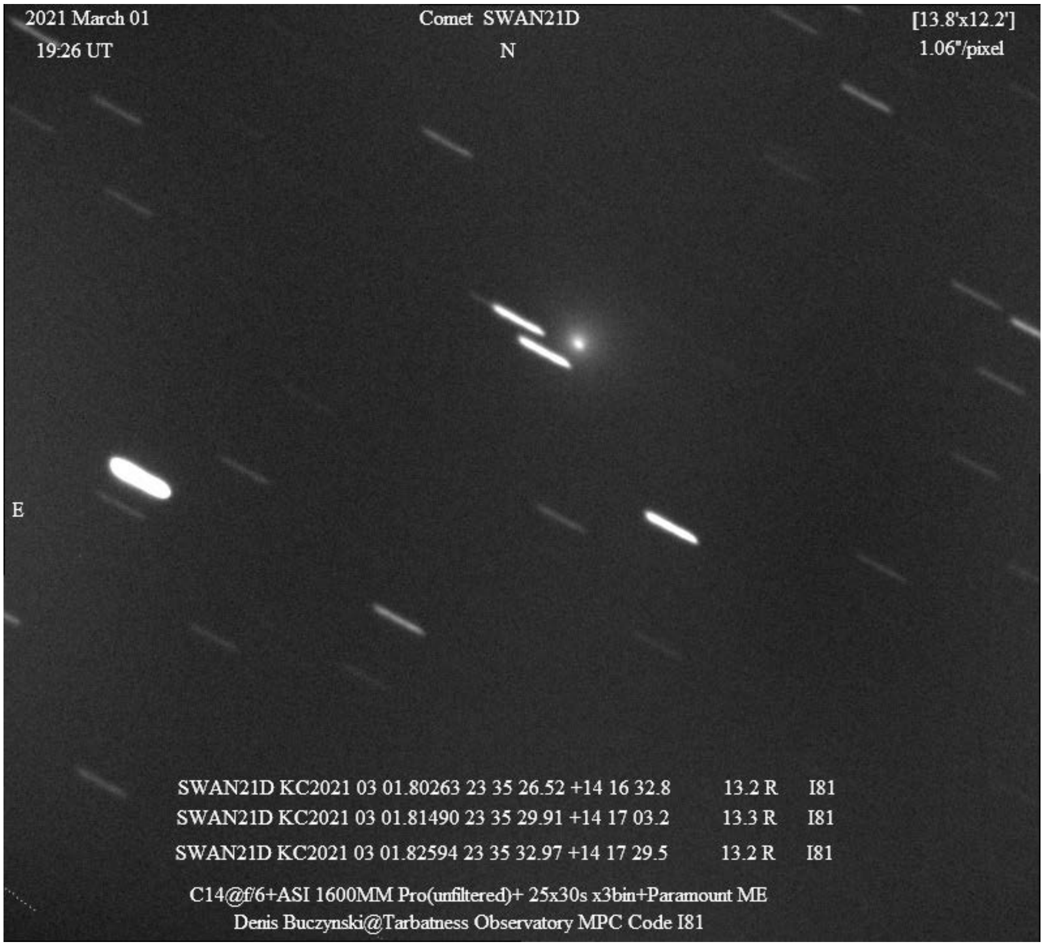


Figure 6 - Denis Buczynski caught C/2021 D1 (SWAN) on March 1 when it was still posted on the PCCP as object SWAN21D.

C/2021 D1 (SWAN)
T = 2021-Feb-27 q = 0.90 au
Long-period comet

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2021-Mar-01	23 31	+13 43	0.895	1.703	24E	Peg	10.8	5	0
2021-Mar- 6	23 55	+17 08	0.902	1.683	25E	Peg	10.8	7	0
2021-Mar-11	00 19	+20 24	0.917	1.671	27E	Psc	10.8	9	0
2021-Mar-16	00 45	+23 26	0.941	1.667	29E	And	10.9	11	0
2021-Mar-21	01 12	+26 10	0.971	1.673	31E	Psc	11.0	13	0
2021-Mar-26	01 40	+28 33	1.008	1.689	32E	Tri	11.2	15	0
2021-Mar-31	02 09	+30 30	1.050	1.714	34E	Tri	11.3	16	0
2021-Apr-05	02 37	+32 02	1.096	1.749	35E	Tri	11.5	18	0

Comet Magnitude Parameters --- H = 10.0, 2.5n = 8.0 [CBET 4939]

New Discoveries, Recoveries and Other Comets in the News

Newly Numbered Comets (from M.P.C. 127300)

410P = 2005 CR16 = 2003 WR168 = 2020 W2 (NEAT-LINEAR)
411P = 2007 B1 = 2020 W3 (Christensen)
412P = 2010 B2 = 2020 Y1 (WISE)
413P = 2014 E1 = 2020 W4 (Larson)
414P = 2016 J3 = 2021 A3 (STEREO)
415P = 2013 EW90 = 2020 Y4 (Tenagra)
416P = 2013 A2 = 2021 A8 (Scotti)
417P = 2015 J3 = 2021 B1 (NEOWISE)
418P = 2010 A5 = 2020 Y5 (LINEAR)

C/2021 C3 (Catalina) – The Catalina Sky Survey used the 0.68-m Catalina Schmidt near Mount Bigelow, north of Tucson, to discover this 19th magnitude comet on February 7. Perihelion occurred on 2021 February 12 at 2.28 au. Minimum distance to the Earth will happen in mid-March at 1.33 au. Around that time C/2021 C3 will reach a maximum brightness around magnitude 18.0.

P/2021 C2 (PANSTARRS) – The Pan-STARRS1 1.8-m Ritchey-Chretien reflector at Haleakala was used to discover this 21st magnitude comet on February 12. The object is a borderline Centaur with a perihelion just inside Jupiter's orbit at 4.89 au, aphelion at 14.2 au, and orbital period of 29.46 years. The object is currently close to its 2021 March 2 perihelion and peak brightness.

C/2021 C1 (Rankin) – David Rankin found the 7th comet to bear his name on February 11 with the Mount Lemmon 1.5-m reflector. Perihelion was back on 2020 December 6 at 3.48 au. Peak brightness will be reached in late March at magnitude 19.1 as C/2021 C1 passes through opposition.

C/2021 B3 (NEOWISE) – The NEOWISE spacecraft discovered its 36th comet on January 22. Of its discoveries, 16 carry the 'WISE' name and 16 the 'NEOWISE' names. C/2021 B3 was around 18-19th magnitude at discovery. It is a Halley-family comet with an orbital period of 136 ± 30 years. Perihelion is on 2021 March 11 at 2.16 au. The comet should have already peaked at 18th magnitude last month.

P/2021 A11 = P/2015 F1 (PANSTARRS) – Erwan Schwab reported his recovery of P/2015 F1 (PANSTARRS) on images taken on 2021 January 13 and February 10, 13, and 14 with the 0.8-m f/3 Schmidt reflector at Calar Alto, Spain and 1.0-m f/4.4 reflector at the European Space Agency's Optical Ground Station at Tenerife. The recovery team also included D. Koschny, M. Micheli, and E. Petrescu. Perihelion is still a few months away on 2021 October 27 at 2.54 au.

P/2015 F1 was discovered on 2015 March 21. During that apparition is peaked at 15th-16th magnitude. Currently the comet is running about 2.5-3 magnitudes fainter than expected. It is unknown if the comet is fainter this apparition or, since it was not observed at a similar point in its orbit last time, it will rapidly brighten in the months prior to perihelion.

C/2021 A10 (NEOWISE) – On January 12th, the NEOWISE spacecraft detected an apparent fast-moving asteroid. After being posted on the MPC PCCP, follow-up observers detected marginal evidence of cometary activity. Seiichi Nakano determined a long-period orbit with a period of ~880 years and perihelion on 2021 March 15 at 1.27 au. A peak brightness of ~18th magnitude should be reached around the time of close approach to Earth (2021 February 10 at 0.58 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!

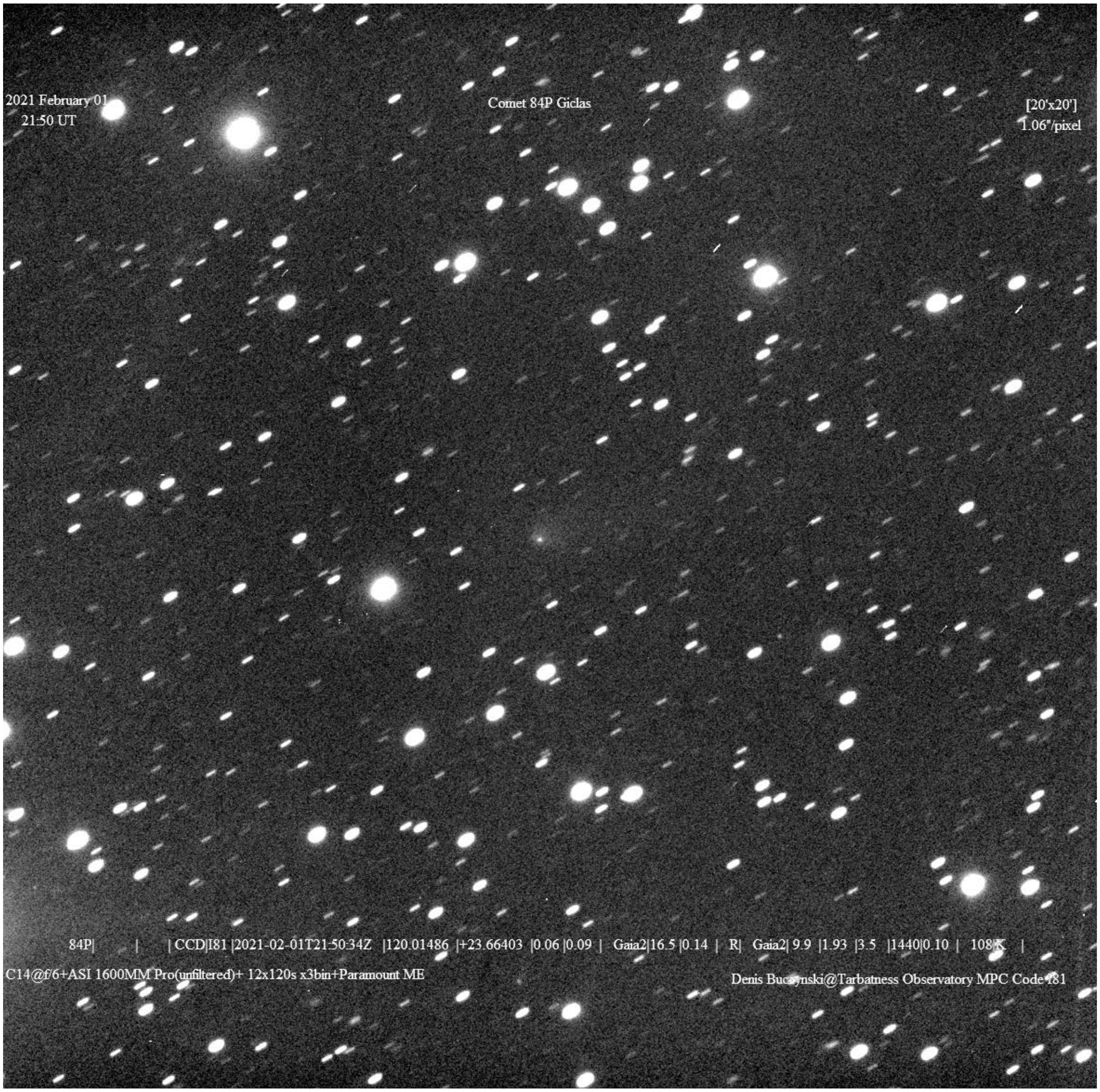
Stay safe and enjoy the sky!
- Carl Hergenrother (ALPO Comets Section Coordinator)

Recent Magnitude Measurements Contributed to the ALPO Comet Section

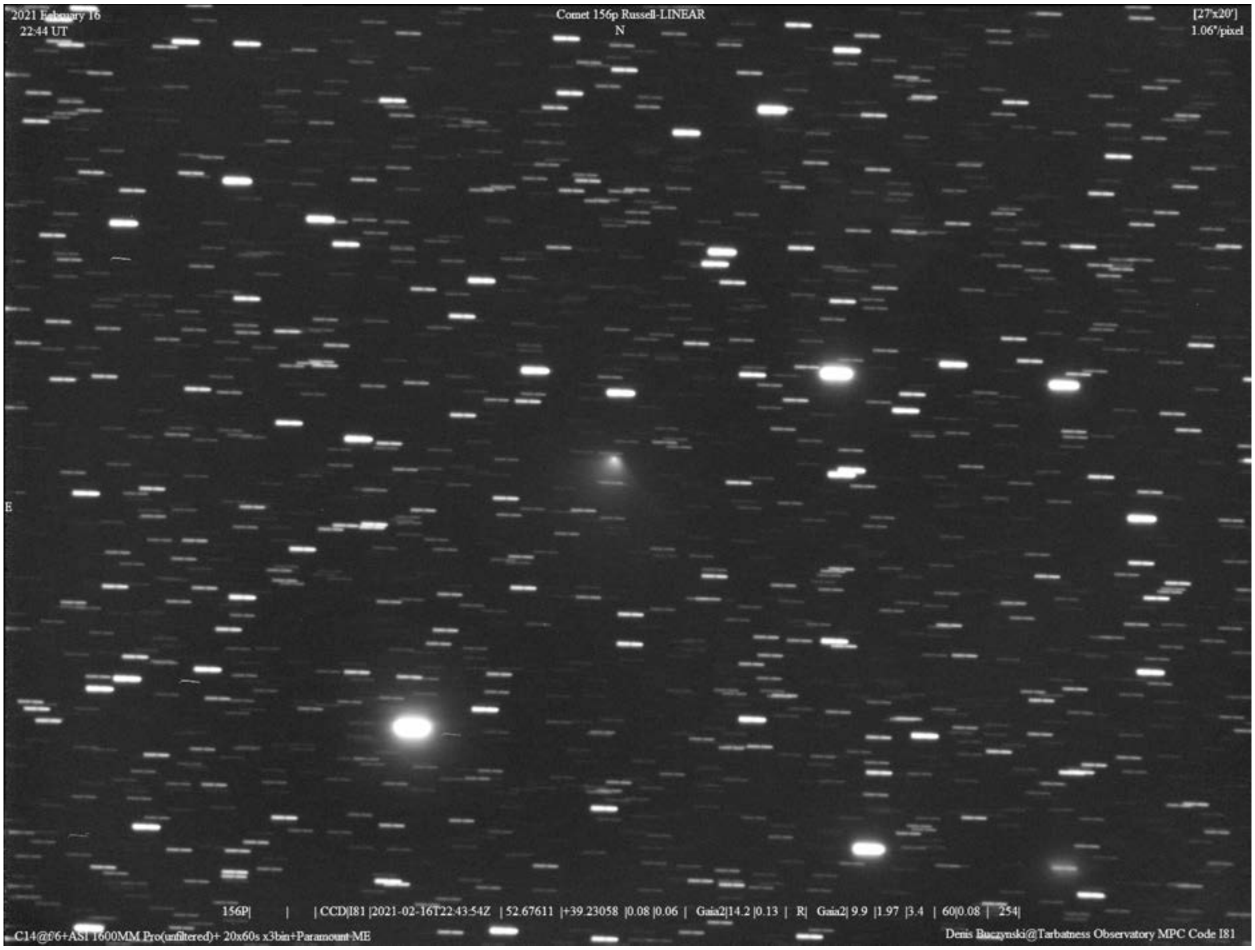
Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL T	POW	COMA Dia	COMA DC	TAIL LENG	TAIL PA	ICQ CODE	Observer Name
C/2021 A2 (NEOWISE)												
2021A2	2021 02 02.46	xM 10.3:	TK	25.0L	5	40	3.5	4			ICQ XX WYA	Christopher Wyatt
C/2021 A1 (Leonard)												
2021A1	2021 02 22.46	C 18.5	U4	61.0Y	7	A440	0.3				ICQ xx HER02	Carl Hergenrother
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 02 09.46	xM 12.9	AQ	25.0L	5	179	0.8	3/			ICQ XX WYA	Christopher Wyatt
156P/Russell-LINEAR												
156	2021 02 06.89	S 11.0	TK	20.3T	10	100	3	3			ICQ XX GON05	J J Gonzalez Suarez
156	2021 02 02.44	xS 12.8	AQ	25.0L	5	74	2	3/			ICQ XX WYA	Christopher Wyatt
141P/Machholz												
141	2021 02 09.44	xS 13.3	AQ	25.0L	5	74	0.8	3			ICQ XX WYA	Christopher Wyatt
141	2021 02 06.83	S 10.5	TK	20.3T	10	77	5	2/			ICQ XX GON05	J J Gonzalez Suarez
141	2021 02 02.45	xS 11.2	AQ	25.0L	5	40	5	3			ICQ XX WYA	Christopher Wyatt
88P/Howell												
88	2021 02 06.80	S 9.7	TK	20.3T	10	77	7	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

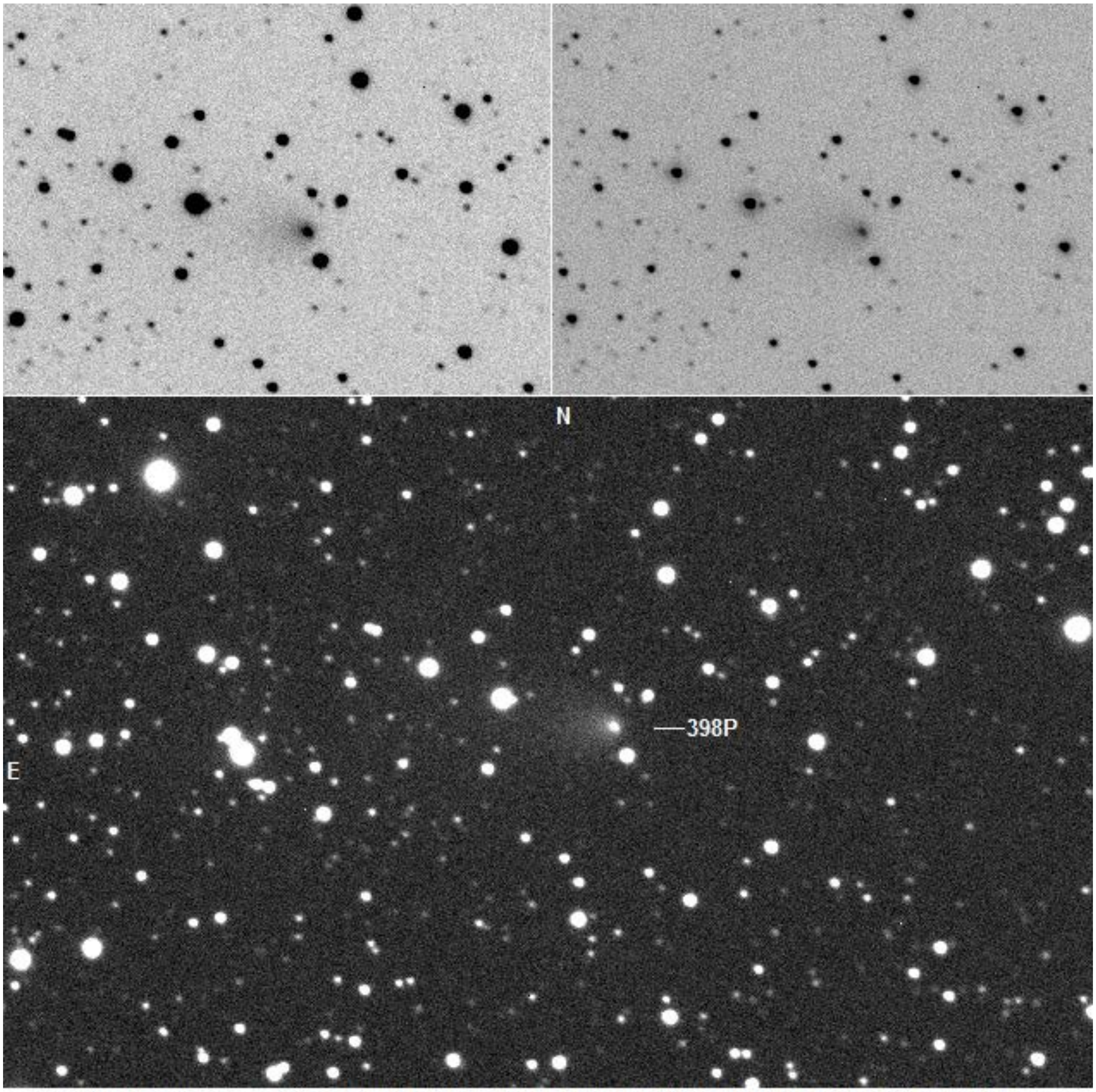
84P/Giclas



156P/Russell-LINEAR

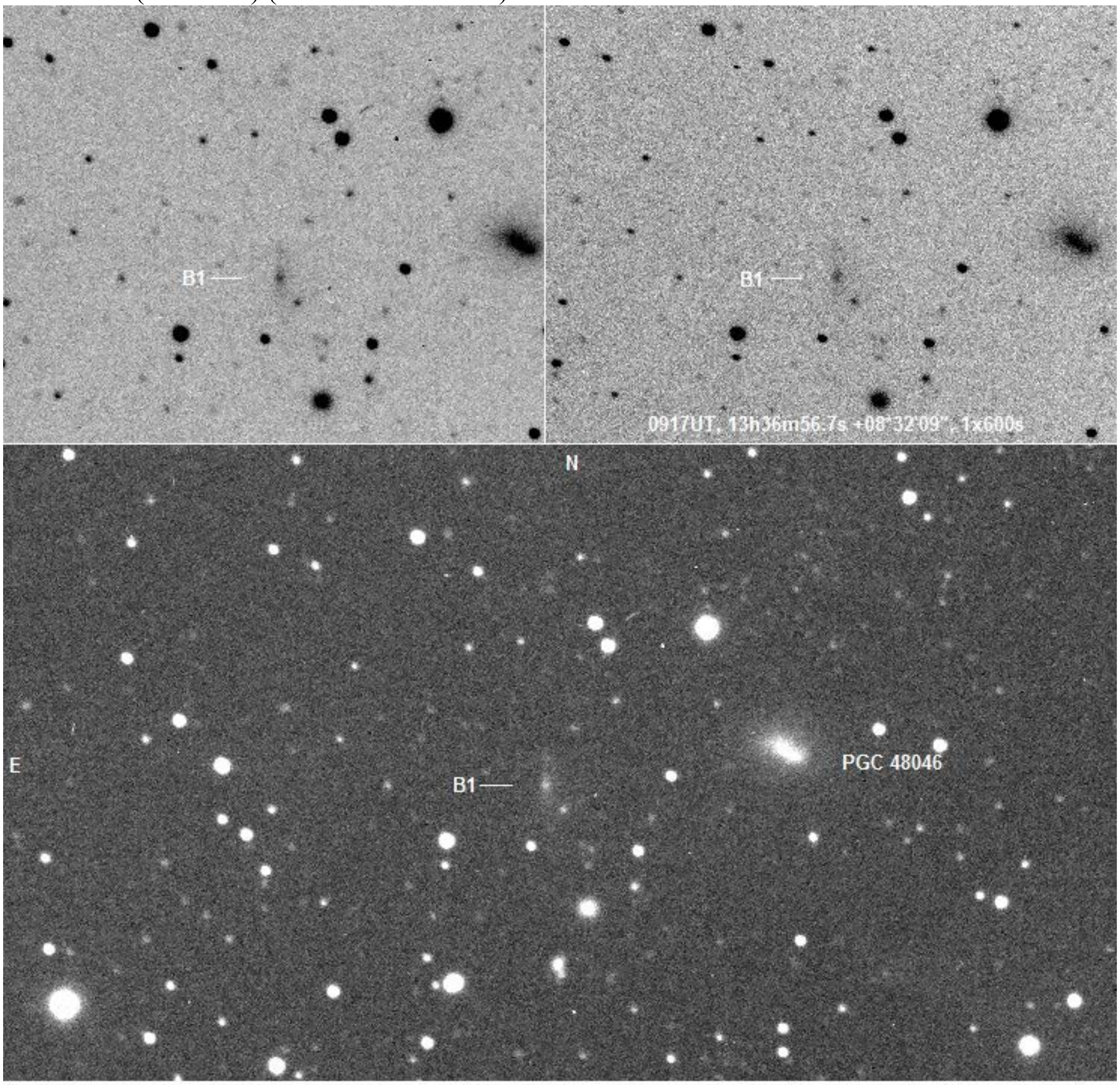


398P/Boattini



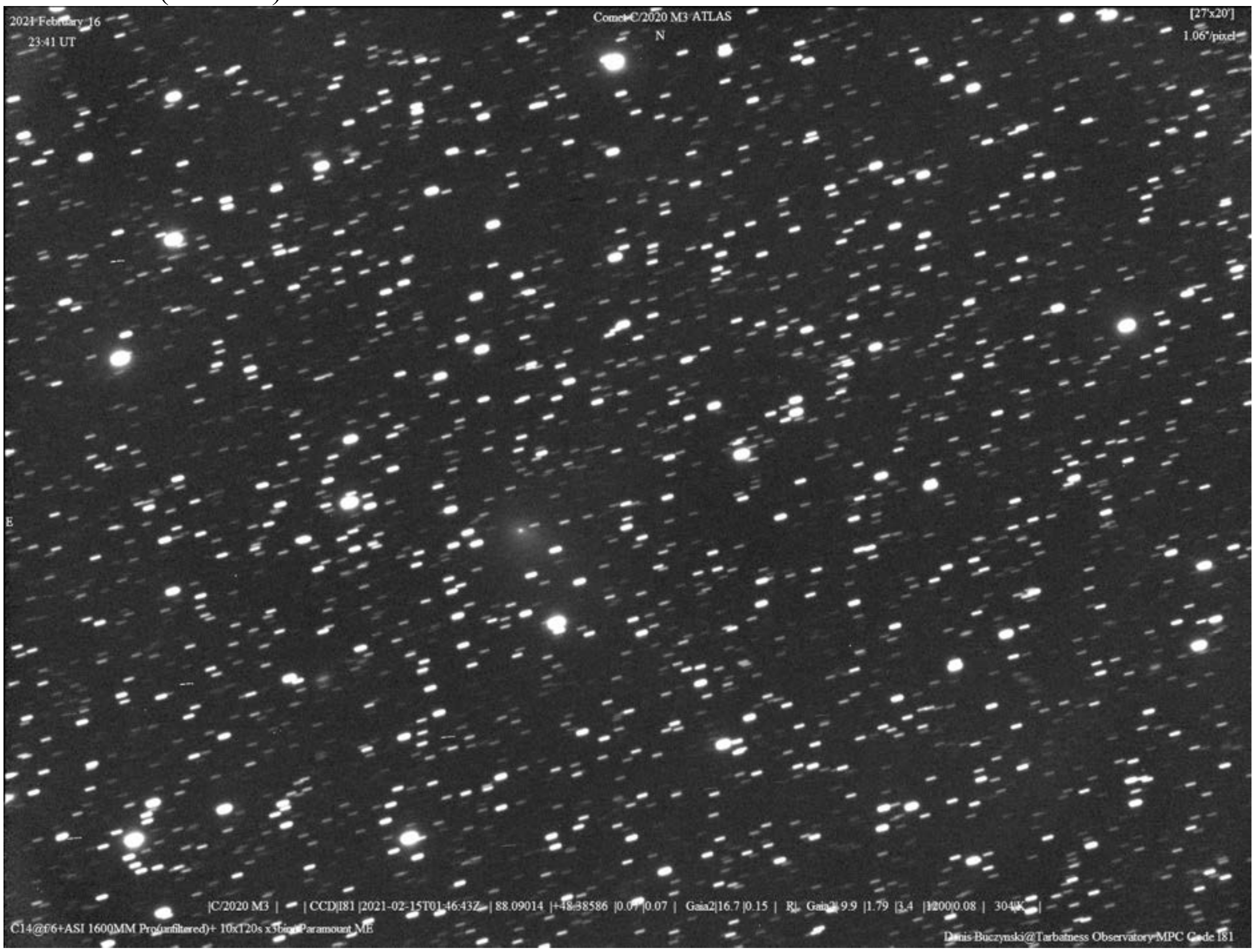
398P/Boattini, m=14.8, fan tail PA 90*, 2021/02/06 0545UT 05h54m06s +20*03'27", 1x120s
11" SCT f/6.4 STF-8300M 1.24"/pixel FOV 13.1'x8.4' Mike Olason, Tucson Arizona

C/2014 B1 (Schwartz) (the "Discus" comet)

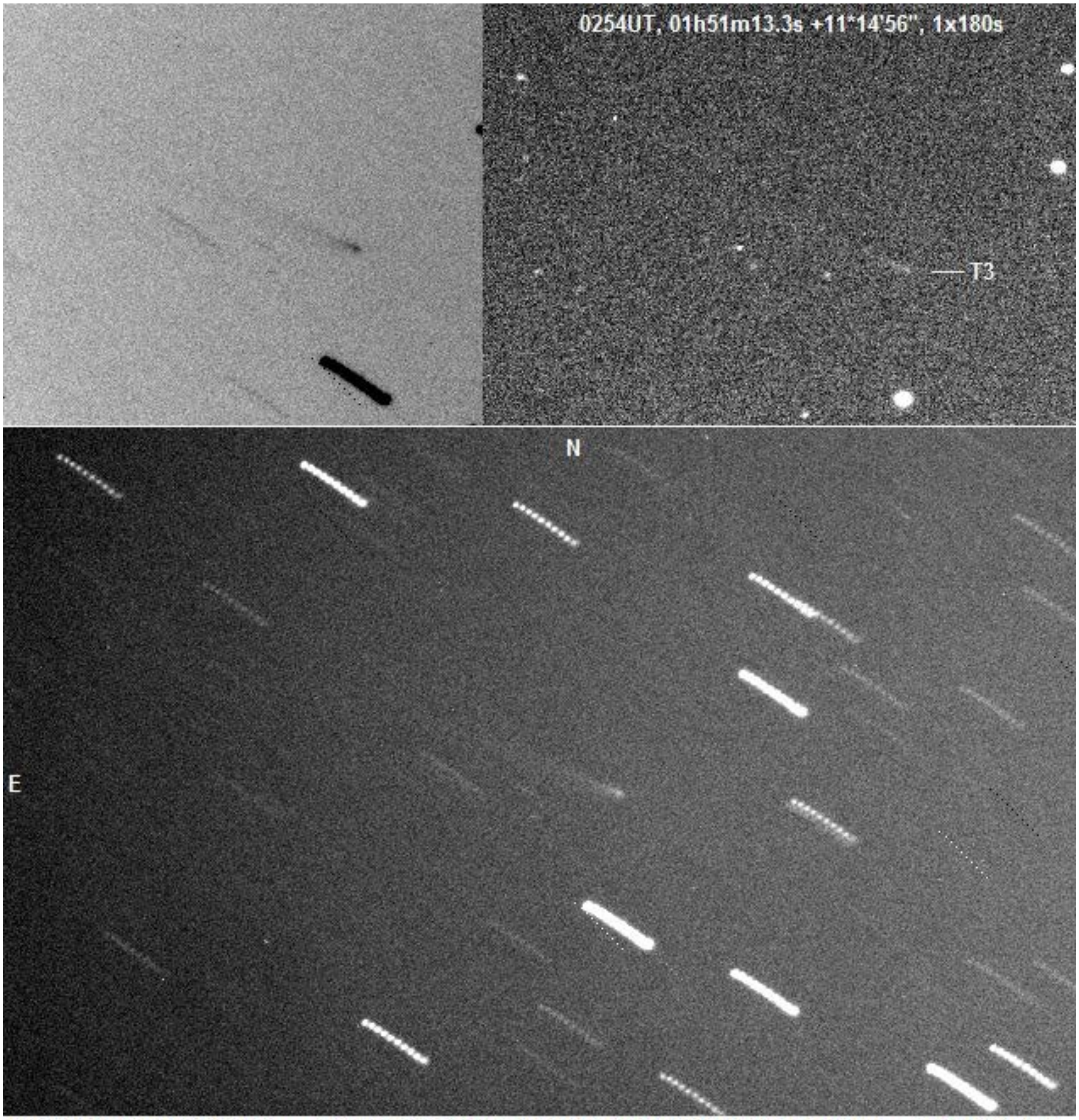


C/2014 B1 (Schwartz), m=18.1, coma/tail complex spans 69"x27", 2021/02/07 0857-0927UT, 3x600s, FOV 15.3'x9.2'
11" SCT f/6.4 STF-8300M 1.24"/pixel Mike Olason, Tucson Arizona

C/2020 M3 (ATLAS)



P/2020 T3 (PANSTARRS)



P/2020 T3 (PANSTARRS), m=18.0, tail 2'43" PA 70*, 2021/01/23 0242-0312UT, 10x180s, FOV 13.1'x8.4'
11" SCT f/6.4 STF-8300M 1.24"/pixel Mike Olason, Tucson Arizona