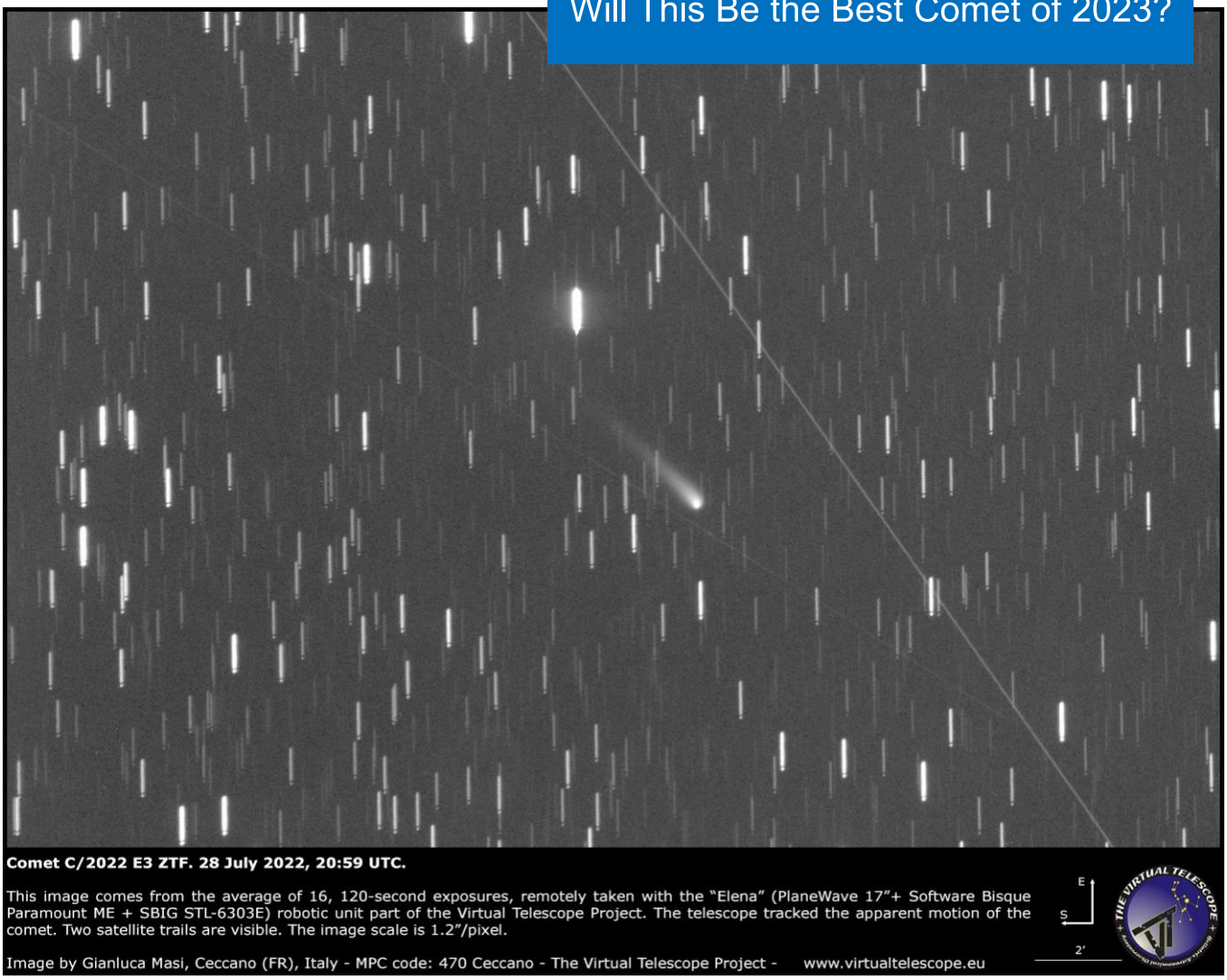
August 2022

ALPO Comet News

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

Will This Be the Best Comet of 2023?



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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/834599-alpo-comet-news-for-august-2022/) All are encouraged to join the discussion over at Cloudy Nights. The ALPO Comets 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 appreciated.

Please send your observations to the Comets Section at < comets@alpo-astronomy.org >, Coordinator Carl Hergenrother < carl.hergenrother@alpo-astronomy.org > and/or Acting Assistant Coordinator Michel Deconinck < michel.deconinck@alpo-astronomy.org >.

To learn more about the ALPO, please visit us @ http://www.alpo-astronomy.org.

Summary

This month's ALPO Comet News will be shorter than usual. Basically, I've been having trouble finding the time to support the production of these reports. To lighten the work load a bit, I am only highlighting comets brighter than magnitude 12.0 rather than 13.0. So, a few comets from the past few months which might be expected to be discussed in these pages have been dropped. The upside is this issue is actually going out on the 1st of the month!

C/2017 K2 (PANSTARRS) is near its peak brightness this month at around magnitude 8. Northern hemisphere observers only have another month or two to observe it before it travels too far south. Southern observers will be able to continue observing K2 for a long time to come. Among the fainter comets, 73P/Schwassmann-Wachmann has split once again. Michael Jäger has reported on the comet-ml list that at least two faint 19th magnitude secondaries have been imaged. With 73P reaching its peak brightness at ~11th magnitude at the end of August, perhaps a few more secondaries will be detected.

C/2022 E3 (ZTF) will be around 12th magnitude this month. The comet is continuing to brighten at a healthy rate increasing confidence that it will become a nice binocular or even borderline naked eye object early next year.

In June the ALPO Comets Section received 72 magnitude estimates and 36 images/sketches of comets C/2022 E3 (ZTF), C/2020 V2 (ZTF), C/2020 R7 (ATLAS), C/2020 K1 (PANSTARRS), C/2019 U5 (PANSTARRS), C/2019 T4 (ATLAS), C/2017 K2 (PANSTARRS), 426P/PANSTARRS, 377P/Scotti, 291P/NEAT, 117P/Helin-Roman-Alu, 73P/Schwassmann-Wachmann, 61P/Shajn-Schaldach, 22P/Kopff, 12P/Pons-Brooks, and 9P/Tempel. A big thanks to our recent contributors: Dan Bartlett, J. J. Gonzalez, Jose Guilherme de Souza Aguiar, Christian Harder, Carl Hergenrother, Eliot Herman, Michael Jäger, John Maikner, Martin Mobberley, Charles Morris, Uwe Pilz, Raymond Ramlow, Michael Rosolina, Gregg Ruppel, John D. Sabia, Chris Schur, Bob Soltys, Tenho Tuomi, and Chris Wyatt.

I'd like to especially thank Charles Morris and Jose Guilherme de Souza Aguiar who have agreed to contribute their observations to the ALPO. Both Charles and Jose were prolific past contributors and we welcome them back!

Request for Observations

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 the Comets Section < comets @ alpo-astronomy . org >, Comets Section Coordinator Carl Hergenrother < carl.hergenrother @ alpo-astronomy . org > and/or Comets Section Acting Assistant Coordinator Michel Deconinck < michel.deconinck @ alpo-astronomy . org >.

Aperture Corrections to Magnitude Measurements

We try to include up-to-date lightcurves for most of the objects discussed in this report as well as applying aperture corrections to the visual observations. All magnitude estimates are affected by many factors including instrumental (aperture, focal length, magnification, type of optics), environmental (sky brightness due to moonlight, light pollution, twilight, aurora activity, zodiacal light, etc.), cometary (degree of condensation, coma color, strength and type of gas emission lines, coma-tail interface) and personal (sensitivity to different wavelengths, personal technique, observational biases). The correction used here only corrects for differences in

aperture [Charles S. Morris, On Aperture Corrections for Comet Magnitude Estimates. Publ Astron Soc Pac 85, 470, 1973]. Visual observations are corrected to a standard aperture of 6.78 cm by 0.019 magnitudes per centimeter for refractors and 0.066 magnitudes per centimeter for reflectors. If a sufficient number of visual observations are submitted for a particular comet, we determine personal corrections for each observer for each individual comet. If the magnitudes shown in the text don't match those plotted in the lightcurves, it is because of the application of aperture and personal bias corrections.

Acknowledgements

In addition to observations submitted directly to the ALPO, we occasionally use data from other sources to augment our analysis. We would like to acknowledge with thanks observations submitted directly to the ALPO as well as those originally submitted to the International Comet Quarterly, Minor Planet Center, and COBS Comet Observation Database. In particular we have been using observations submitted to the COBS site by Thomas Lehmann for our analyzes so we would like to thank Thomas for his COBS observations. We would also like to thank the Jet Propulsion Laboratory for making available their Small-Body Browser and Orbit Visualizer and Seiichi Yoshida for his Comets for Windows programs that are used to produce the lightcurves and orbit diagrams in these pages. And last but not least, we'd like to thank Syuichi Nakano and the Minor Planet Center for their comet orbit elements, the asteroid surveys and dedicated comet hunters for their discoveries, and all of the observers who volunteer their time to adding to our knowledge of these amazing objects.

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

Clear skies!
- Carl Hergenrother

Comets Calendar

Aug 02 - P/2022 M1 (PANSTARRS) at perihelion (q = 2.06 au, 10.9-yr period, V ~ 19-20, discovered on 2022 June 29)
Aug 05 - C/2022 F1 (ATLAS) at perihelion (q = 5.97 au, V ~ 18)
Aug 05 - First Quarter Moon
Aug 06 - P/2022 C2 (PANSTARRS) at perihelion (q = 3.37 au, 14.9-yr period, V ~ 17, discovered on 2022 February 2)
Aug 06 - First Quarter Moon
Aug 06 - 73P/Schwassmann-Wachmann and C/2019 T4 (ATLAS) pass within 40' of each other
Aug 10 - 100P/Hartley at perihelion (q = 2.02 au, 6.4-yr period, V ~ 17, discovered in 1985, 2022 is the 7th observed return)
Aug 10 - 127P/Holt-Olmstead at perihelion (q = 2.21 au, 6.4-yr period, V ~ 18, discovered in 1990, 2022 is the 6th observed return)
Aug 11 - 119P/Parker-Hartley at perihelion (q = 2.33 au, 7.4-yr period, V ~ 15, discovered in 1987, 2022 is the 5th observed return)
Aug 11 - 73P/Schwassmann-Wachmann passes ~30' within 11th mag galaxy NGC 4697
Aug 11 - Full Moon
Aug 12 - 335P/Gibbs at perihelion (q = 1.62 au, 6.8-yr period, V ~ 19-20, discovered in 2009, 2022 is the 3rd observed return)
Aug 13 - C/2021 QM45 (PANSTARRS) at perihelion (q = 2.77 au, V ~ 17)
Aug 17 - P/2022 L5 (Lemmon-PANSTARRS) at perihelion (q = 2.38 au, 8.2-yr period, V ~ 18, discovered in 2014, pre-discovery observation found for 1998 and 2006 returns, 2022 is the 4th observed return)
Aug 18 - 437P/Lemmon-PANSTARRS at perihelion (q = 3.40 au, 9.7-yr period, V ~ 20, discovered in November 2021, pre-discovery observation found for 2004 and 2012 returns, 2022 is the 3rd observed return)
Aug 18 - Last Quarter Moon
Aug 19 - 442P/McNaught at perihelion (q = 2.32 au, 11.1-yr period, V ~ 17-18, discovered in 2011, pre-discovery observation found for 2000 return, 2022 is the 3rd observed return)
Aug 20 - C/2019 L3 (ATLAS) passes through a group of faint galaxies (brightest is NGC 2708)
Aug 20/21 - C/2022 E3 (ZTF) passes ~2deg from the bright Hercules globular M13
Aug 24 - 107P/Wilson-Harrington at perihelion (q = 0.97 au, 4.3-yr period, V ~ 16-17, discovered in 1949, rediscovered in 1979, 2022 is the 12th observed return, only showed cometary activity in 1949, inactive since)
Aug 25 - 73P/Schwassmann-Wachmann at perihelion (q = 0.97 au, 5.4-yr period, V ~ 11, discovered in 1930, rediscovered in 1979, 2022 is the 9th observed return, much more below)
Aug 27 - New Moon
Aug 28 - 189P/NEAT at perihelion (q = 1.21 au, 5.1-yr period, V ~ 19, discovered in 2002, 2022 is the 5th observed return)

Recent Magnitudes Contributed to the ALPO Comets 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
C/2022 E3 (ZTF)												
2022E3	2022 07 29.55	xM 13.5	AQ	40.0L	4	182	0.7	5/	1.2m	129	ICQ XX WYA	Chris Wyatt
2022E3	2022 07 27.92	S 12.6	TI	53.1L		155	0.5	5	1.5m	130	ICQ XX HAR11	Christian Harder
2022E3	2022 07 25.47	xM 13.4	AQ	40.0L	4	182	0.4	6	1.2m	123	ICQ XX WYA	Chris Wyatt
2022E3	2022 07 24.93	S 13.5	TI	53.1L		155	0.25	6	1 m	130	ICQ XX HAR11	Christian Harder
2022E3	2022 07 23.96	S 13.3:	TI	53.1L		155	0.25	5	0.8m	145	ICQ XX HAR11	Christian Harder
2022E3	2022 07 19.96	S 12.7	AQ	20.3T	10	133	0.7	5			ICQ XX GON05	Juan Jose Gonzalez Suarez
2022E3	2022 07 18.93	S 13.1	TI	35.3L		176	0.3	5			ICQ XX HAR11	Christian Harder
2022E3	2022 07 03.97	S 14.1	TI	29.8L	4	238	0.4	5			ICQ XX HAR11	Christian Harder
C/2020 V2 (ZTF)												
2020V2	2022 07 24.98	S 13.1	TI	53.1L		155	0.75	4			ICQ XX HAR11	Christian Harder
2020V2	2022 07 23.93	S 12.6	TI	53.1L		215	0.5	4			ICQ XX HAR11	Christian Harder
C/2020 R7 (ATLAS)												
2020R7	2022 07 25.50	xM 13.7	AQ	40.0L	4	182	0.5	4/			ICQ XX WYA	Chris Wyatt
C/2020 K1 (PANSTARRS)												
2020K1	2022 07 29.56	xM 13.6	AQ	40.0L	4	182	0.9	6			ICQ XX WYA	Chris Wyatt
2020K1	2022 07 27.94	S 12.9	TI	53.1L		155	1.4	3			ICQ XX HAR11	Christian Harder
2020K1	2022 07 25.48	xM 13.2	AQ	40.0L	4	108	0.8	5/			ICQ XX WYA	Chris Wyatt
2020K1	2022 07 24.96	S 13.4	TI	53.1L		155	0.8	3/			ICQ XX HAR11	Christian Harder
2020K1	2022 07 23.95	S 13.5	TI	53.1L		155	0.6	3			ICQ XX HAR11	Christian Harder
2020K1	2022 07 19.97	S 12.3	AQ	20.3T	10	77	2.0	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
2020K1	2022 07 07.06	S 12.4	AQ	20.3T	10	133	2.0	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
2020K1	2022 07 03.98	S 13.5:	TI	29.8L	4	238	0.65	3/			ICQ XX HAR11	Christian Harder
C/2019 U5 (PANSTARRS)												
2019U5	2022 07 31.90	S 12.4	AQ	20.3T	10	133	2.5	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
2019U5	2022 07 27.91	S 14.0	TI	53.1L		155	0.5	4			ICQ XX HAR11	Christian Harder
2019U5	2022 07 24.91	S 13.8:	TI	53.1L		215	0.5	3/			ICQ XX HAR11	Christian Harder
2019U5	2022 07 07.01	S 12.5	AQ	20.3T	10	133	3	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
C/2019 T4 (ATLAS)												
2019T4	2022 07 25.47	xM 12.9	AQ	40.0L	4	108	1.1	6			ICQ XX WYA	Chris Wyatt
C/2017 K2 (PANSTARRS)												
2017K2	2022 07 31.92	S 8.0	TK	5.0B		10	8	5			ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 07 29.55	xM 8.6	TK	7.0B		15	8.3	5	17.0m	032	ICQ XX WYA	Chris Wyatt
2017K2	2022 07 27.90	S 8.9	TI	53.1L		111	3.8	s4			ICQ XX HAR11	Christian Harder
2017K2	2022 07 25.53	xM 8.3	TK	7.0B		15	12.0	5			ICQ XX WYA	Chris Wyatt
2017K2	2022 07 23.92	S 9.3	TI	53.1L		111	3	s4	2 m	45	ICQ XX HAR11	Christian Harder
2017K2	2022 07 23.90	M 8.7	TK	27.0L	5	55	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 23.14	8.8		35.0T	11	163	3.5	5/			ICQ XX ROSxx	Michael Rosolina
2017K2	2022 07 22.93	M 8.8	TK	27.0L	5	55	3	3/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 22.92	M 8.6	TK	10.0B		25	4	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 21.95	M 8.4	TK	10.0B		25	4	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 20.89	M 8.3	TK	10.0B		25	4	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 19.94	S 8.1	TK	5.0B		10	6	6			ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 07 19.92	S 9.0	TI	35.3L		90	4	s4			ICQ XX HAR11	Christian Harder
2017K2	2022 07 19.90	S 8.8	TK	7.0B	6	16	3.6	4			PIL01	Uwe Pilz
2017K2	2022 07 19.89	M 8.3	TK	10.0B		25	4	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 18.92	S 9.0	TI	35.3L		113	3.5	s4			ICQ XX HAR11	Christian Harder
2017K2	2022 07 18.90	M 8.4	TK	10.0B		25	3	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 14.89	M 8.4	TK	10.0B		25	4	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 07.95	M 8.4	TK	10.0B		25	5	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 07.04	S 8.2	TK	5.0B		10	6	6			ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 07 06.95	M 8.4	TK	10.0B		25	5	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 05.95	M 8.4	TK	10.0B		25	6	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 05.01	M 8.4	TK	10.0B		25	5	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 04.18	8.9		35.0T	11	163	4	5/			ICQ XX ROSxx	Michael Rosolina
2017K2	2022 07 04.01	M 8.5	TK	10.0B		25	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 03.96	S 9.2	TI	29.8L	4	79	2.5	s4			ICQ XX HAR11	Christian Harder
2017K2	2022 07 03.03	M 8.6	TK	10.0B		25	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 02.98	M 8.5	TK	7.0B		15	3	4/			ICQ XX SOU01	Willian Souza
2017K2	2022 07 02.10	M 8.6	TK	7.0B		15	3	5			ICQ XX SOU01	Willian Souza
2017K2	2022 07 02.03	M 8.6	TK	10.0B		25	3	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 02.00	S 8.9	TI	29.8L	4	79	3	s4			ICQ XX HAR11	Christian Harder
2017K2	2022 07 01.96	M 8.5	TK	7.0B		15	3	5			ICQ XX SOU01	Willian Souza
2017K2	2022 07 01.04	M 8.6	TK	10.0B		25	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 07 01.02	S 8.7	TK	20.3T	10	77	4	5	0.3	0	ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 07 01.01	S 8.3	TK	5.0B		10	6	6			ICQ XX GON05	Juan Jose Gonzalez Suarez
426P/PANSTARRS												

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426        2022 07 31.18  C 20.5 BG 30.5H 4C000                    ICQ XX MAIab John Maikner
377P/Scotti
377        2022 07 04.19  C 19.0 BG 30.5H 4B880                    ICQ XX MAIab John Maikner
325P/Yang-Gao
325        2022 07 31.14  C 19.7 BG 30.5H 4A500                    ICQ XX MAIab John Maikner
291P/NEAT
291        2022 07 04.31  C 20.5 BG 30.5H 4C840                    ICQ XX MAIab John Maikner
291        2022 07 01.31  C 20.0 BG 30.5H 4B520                    ICQ XX MAIab John Maikner
117P/Helin-Roman-Alu
117        2022 07 29.57 xM 13.5 AQ 40.0L 4 182   0.5  5          ICQ XX WYA   Chris Wyatt
117        2022 07 25.49 xM 13.6 AQ 40.0L 4 182   0.7  5/         ICQ XX WYA   Chris Wyatt
73P/Schwassmann-Wachmann
 73        2022 07 31.89  S  9.8 TK 20.3T10 133   3    3/         ICQ XX GON05 Juan Jose Gonzalez Suarez
 73        2022 07 19.91  S 10.4 TK 20.3T10  77   4    3          ICQ XX GON05 Juan Jose Gonzalez Suarez
61P/Shajn-Schaldach
 61        2022 07 31.33  C 18.5 BG 30.5H 4A800                    ICQ XX MAIab John Maikner
22P/Kopff
 22        2022 07 29.59 xM 13.9 AQ 40.0L 4 108   1.3  3/         ICQ XX WYA   Chris Wyatt
 22        2022 07 07.10  S 10.6 TK 20.3T10  77   4    2/         ICQ XX GON05 Juan Jose Gonzalez Suarez
12P/Pons-Brooks
 12        2022 07 31.09  C 21.0 BG 30.5H 4C000                    ICQ XX MAIab John Maikner
9P/Tempel
  9        2022 07 25.51 xM 15.0 AQ 40.0L 4 182   0.5  3/         ICQ XX WYA   Chris Wyatt
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New Discoveries, Recoveries and Other Comets News

C/2022 N2 (PANSTARRS) – The Pan-STARRS project discovered this new 20th magnitude long-period comet on 2022 July 4 with their 1.8-m Ritchey-Chretien reflector at Haleakala, Hawaii. C/2022 N2 is currently ~9.4 au from the Sun and it will take 3 years for it to reach its 2025 August 3 perihelion at 3.84 au. With a low inclination of 5.5 deg, it will stay close to the ecliptic allowing both hemispheres to observe it. A peak brightness of ~14th magnitude may be reached in 2025-2026. If you are looking for a long-term comet monitoring project, this could make a nice target. With this discovery there are now 279 comets with the PANSTARRS name. [CBET 5146]

C/2022 N1 (Maury-Attard) – Alain Maury and Georges Attard have found their 5th comet together since 2021. C/2022 N1 was 17-18th magnitude when first seen on 2022 July 2 with their 0.28-m f/2.2 Schmidt reflector (Celestron RASA 11") at San Pedro de Atacama, Chile. It should brighten to ~16th magnitude around the time of its 2022 September 8 perihelion at 1.49 au. [CBET 5147, MPEC 2022-N47]

P/2022 M1 (PANSTARRS) – Pan-STARRS also discovered a new short-period comet with an orbital period of 10.9 years. P/2022 M1 was found on the night of 2022 June 29 at 20th magnitude with the Pan-STARRS2 telescope on Haleakala. Pre-discovery observations by Mount Lemmon and with the DECam instrument on the 4-m Cerro Tololo telescope were found back to May. Perihelion occurs this month on the 2nd at 2.06 au. A peak brightness of 19th magnitude is expected. [CBET 5146, MPEC 2022-N46]

P/2022 L5 = P/2014 R5 = P/1998 W9 = P/2006 S14 (Lemmon-PANSTARRS) – Alain Maury and Georges Attard serendipitously recovered this comet on 2022 June 7 at 19-20th magnitude with their Chile-based RASA 11" Schmidt reflector. Perihelion occurs this month on August 17 at 2.38 au when it should peak at 18th magnitude.

The comet was discovered in September 2014 by the Mount Lemmon and Pan-STARRS surveys. At that return, it reached 17-18th magnitude. Syuichi Nakano also found observations at two previous returns in 1998 and 2006 made by the Spacewatch 0.9-m on Kitt Peak and Mount Lemmon 1.5-m. [CBET 5149]

P/2022 G2 = P/2012 O3 (McNaught) – The PanSTARRS2 telescope accidentally recovered this object with their 1.8-m on Haleakala on 2022 June 28 at 20th magnitude. With perihelion back on 2022 May 29 at 1.61 au, P/McNaught is already fading. Rob McNaught discovered the comet during its 2012 return when it reached 16th magnitude. With a 9.8-year period, its next perihelion will be in February 2032. Rob's name is currently on 82 comets. [CBET 5150]

P/2021 R9 (Sheppard-Tholen) – Scott S. Sheppard and David J. Tholen found this faint 22nd magnitude comet in images taken with the 8.2-m f/2.2 Subaru telescope and wide-field SuprimeCam camera on 2021 September 5. Other observations taken by the Pan-STARRS project were found from between June 2021 and January 2022. These observations also allowed even older observations to be found back to December 2008 during its previous return. P/2021 R9 has a 13.4-year orbital period and arrives at perihelion this month on the 18th at 4.63 au. It is unlikely to get brighter than 21st magnitude. Tholen found one other comet, which was also found with Sheppard, C/2015 T1 (Sheppard-Tholen). In addition to C/2015 T1 and P/2021 R9, Sheppard has also discovered 4 other comets: C/2014 F3 (Sheppard-Trujillo), P/2018 V5 (Trujillo-Sheppard), P/2020 B4 (Sheppard), and P/2021 R8 (Sheppard). [CBET 5152, MPEC 2022-O19]

Comets Brighter Than Magnitude 10

C/2017 K2 (PANSTARRS)

Discovered 2017 May 21 by the Pan-STARRS survey with the Pan-STARRS1 1.8-m on Haleakala
Dynamically ??? long-period comet

Orbit (from Minor Planet Center, MPEC 2022-M21)

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    C/2017 K2 (PANSTARRS)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Dec. 19.68283 TT                                  Rudenko
q   1.7969226           (2000.0)            P               Q
z  -0.0004447      Peri.  236.19727     +0.01819887     +0.04924513
 +/-0.0000006      Node    88.23524     -0.18094729     +0.98245586
e   1.0007991      Incl.   87.56193     -0.98332440     -0.17987606
From 8845 observations 2013 May 12-2022 June 20, mean residual 0".5.
1/a(orig) = -0.000019 AU**-1, 1/a(fut) = +0.001173 AU**-1.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

```
C/2017 K2 (PANSTARRS)                                                 Max El
                                                                       (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag    40N  40S
2022-Aug-01  16 27  -10 45    2.506   1.866    117E   Oph    8.1     37   61
2022-Aug-06  16 20  -12 50    2.465   1.900    111E   Sco    8.1     33   63
2022-Aug-11  16 14  -14 52    2.425   1.939    106E   Sco    8.1     30   65
2022-Aug-16  16 08  -16 51    2.386   1.983    100E   Sco    8.1     26   67
2022-Aug-21  16 04  -18 46    2.347   2.029     95E   Sco    8.1     23   67
2022-Aug-26  16 00  -20 38    2.309   2.079     89E   Sco    8.1     20   65
2022-Aug-31  15 58  -22 27    2.272   2.129     84E   Sco    8.1     17   63
2022-Sep-05  15 56  -24 13    2.235   2.180     79E   Sco    8.1     14   59
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Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  4.2 + 5 log d + 6.4 log r [to T-425 days, where T = date of perihelion]
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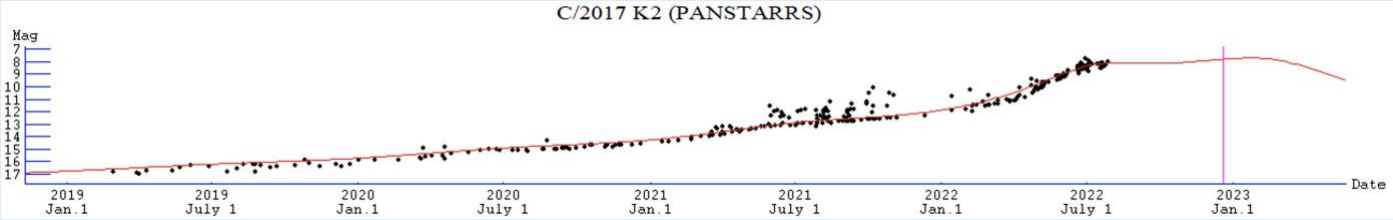

Magnitude Estimates submitted to the ALPO Comets Section in July 2022

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Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ CODE Observer Name
              (UT)                      T          Dia  DC  LENG  PA
   2017K2  2022 07 31.92  S  8.0 TK  5.0B    10    8    5           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2017K2  2022 07 29.55 xM  8.6 TK  7.0B    15    8.3  5   17.0m032 ICQ XX WYA   Chris Wyatt
   2017K2  2022 07 27.90  S  8.9 TI 53.1L   111    3.8 s4          ICQ XX HAR11 Christian Harder
   2017K2  2022 07 25.53 xM  8.3 TK  7.0B    15   12.0  5          ICQ XX WYA   Chris Wyatt
   2017K2  2022 07 23.92  S  9.3 TI 53.1L   111    3   s4    2  m 45 ICQ XX HAR11 Christian Harder
   2017K2  2022 07 23.90  M  8.7 TK 27.0L 5  55    3    4          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 23.14     8.8    35.0T11 163   3.5  5/          ICQ XX ROSxx Michael Rosolina
   2017K2  2022 07 22.93  M  8.8 TK 27.0L 5  55    3    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 22.92  M  8.6 TK 10.0B    25    4    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 21.95  M  8.4 TK 10.0B    25    4    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 20.89  M  8.3 TK 10.0B    25    4    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 19.94  S  8.1 TK  5.0B    10    6    6           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2017K2  2022 07 19.92  S  9.0 TI 35.3L    90    4   s4           ICQ XX HAR11 Christian Harder
   2017K2  2022 07 19.90  S  8.8 TK  7.0B 6  16    3.6  4                PIL01 Uwe Pilz
   2017K2  2022 07 19.89  M  8.3 TK 10.0B    25    4    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 18.92  S  9.0 TI 35.3L   113    3.5 s4          ICQ XX HAR11 Christian Harder
   2017K2  2022 07 18.90  M  8.4 TK 10.0B    25    3    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 14.89  M  8.4 TK 10.0B    25    4    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 07 07.95  M  8.4 TK 10.0B    25    5    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
```

```
2017K2  2022 07 07.04  S  8.2 TK  5.0B    10   6    6            ICQ XX GON05 Juan Jose Gonzalez Suarez
2017K2  2022 07 06.95  M  8.4 TK 10.0B    25   5    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 05.95  M  8.4 TK 10.0B    25   6    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 05.01  M  8.4 TK 10.0B    25   5    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 04.18     8.9    35.0T11 163   4    5/           ICQ XX ROSxx Michael Rosolina
2017K2  2022 07 04.01  M  8.5 TK 10.0B    25   3    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 03.96  S  9.2 TI 29.8L 4  79   2.5 s4            ICQ XX HAR11 Christian Harder
2017K2  2022 07 03.03  M  8.6 TK 10.0B    25   3    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 02.98  M  8.5 TK  7.0B    15   3    4/           ICQ XX SOU01 Willian Souza
2017K2  2022 07 02.10  M  8.6 TK  7.0B    15   3    5            ICQ XX SOU01 Willian Souza
2017K2  2022 07 02.03  M  8.6 TK 10.0B    25   3    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 02.00  S  8.9 TI 29.8L 4  79   3   s4            ICQ XX HAR11 Christian Harder
2017K2  2022 07 01.96  M  8.5 TK  7.0B    15   3    5            ICQ XX SOU01 Willian Souza
2017K2  2022 07 01.04  M  8.6 TK 10.0B    25   3    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
2017K2  2022 07 01.02  S  8.7 TK 20.3T10  77   4    5   0.3    0 ICQ XX GON05 Juan Jose Gonzalez Suarez
2017K2  2022 07 01.01  S  8.3 TK  5.0B    10   6    6            ICQ XX GON05 Juan Jose Gonzalez Suarez
```

Check out the ALPO Comets Section Image Gallery for C/2017 K2 images at http://www.alpo-astronomy.org/gallery3/index.php/Comet-Images-and-Observations/Comets-Discovered-in-2017/C2017K2 .

C/2017 K2 was discovered on 2017 May 21 by the Pan-STARRS1 1.8-m telescope at Haleakala on the Hawaiian island of Maui. At discovery the comet was around 18-19th magnitude and 16 au from the Sun! Pre-discovery observations were found back to May of 2013 when the comet was 23 au from the Sun which is further than the distance of Uranus with evidence of dust production starting as far out as 35 au from the Sun!

Considering all of the !!!'s above, many were hoping K2 would become a reasonably bright object, perhaps even brightening to 5-6th magnitude. A reanalysis of all observations submitted to the ALPO Comets Section as well as observations submitted to the COBS site by Thomas Lehmann show a fairly consistent, though slow, 2.5n ~ 6.4 brightening trend going back to early 2019. If this trend continues then K2 will spend all of August near its brightest at around magnitude 8.1.

Though well placed in the evening sky for all observers this month as it moves south through Ophiuchus (Aug 1-3), Scorpius (3-23), Libra (23-24), and back through Scorpius (24-31), its southward motion will make it a more difficult object to observe by the end of the month. Most northern hemisphere observers will lose sight of it at some point in September. Northerners will once again be able to see K2 from their backyards during the 2nd half of 2023 though it should be a faint visual object for large apertures by then. Southern hemisphere observers will have an uninterrupted view through the middle of 2024.

Visual observers found a coma diameter ranging between 3-12' with a northeastward pointing tail up to 0.3 deg in length. The near nucleus region continues to show the same persistent strongly curved jet-like structure observable since June with little change in orientation. Visual sketches by Michael Rosolina show this "jet" as an asymmetric coma with the coma extending further on the east side of the nuclear region (the brightest part of the coma).

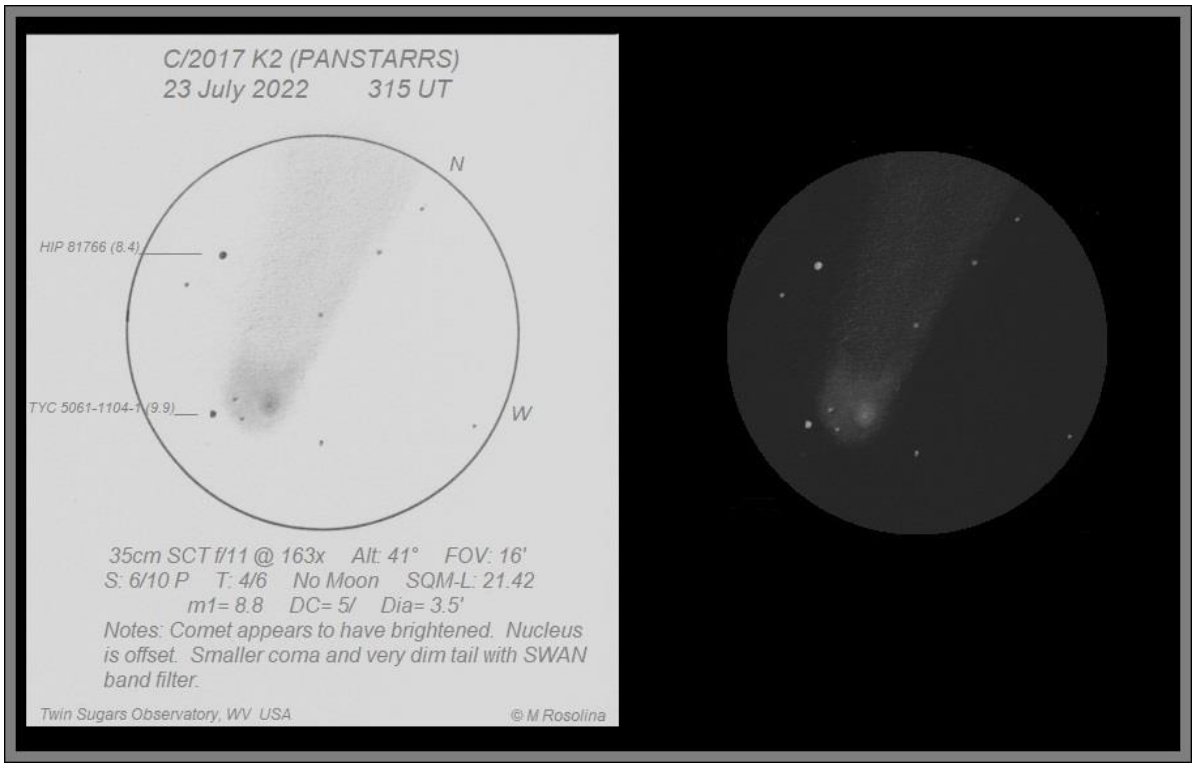


Figure 1 - Drawing of C/2017 K2 (PANSTARRS) by Michael Rosolina from 2022 July 23.

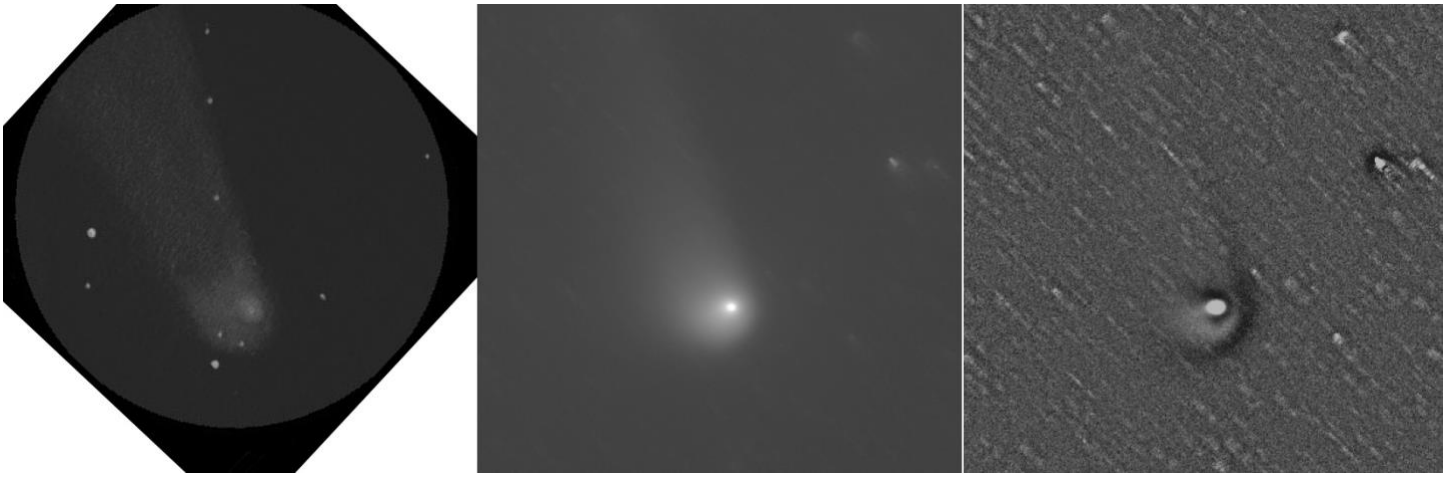


Figure 2 - A direct comparison of the coma and tail of C/2017 K2 (PANSTARRS) as imaged and seen visually. On the left, is the same drawing as above just rotated to match the other images. This is an image by Michael Rosolina made on 2022 July 23 with a 0.35-m SCT at 163x. The middle image was taken by Carl Hergenrother a few days later on July 26 with the SkyGems Observatory 0.5-m iDK telescope in Hakos, Namibia. The right image is a processed version of the middle image enhancing the corkscrew "jet" emanating to the east of the nucleus. North is up and east to the left in all images.

Figure 3 - One of the best comet images that I've seen in quite some time. Dan Bartlett used a RASA 11" and ZWO ASI2600MC Pro camera to image C/2017 K2 (PANSTARRS) on 2022 July 28.

Comets Between Magnitude 10 and 12

73P/Schwassmann-Wachmann

Discovered photographically on 1930 May 30 by Arnold Schwassmann and Arno Arthur Wachmann at Hamburg Observatory in Bergedorf, Germany

Orbit (from Minor Planet Center MPEC 2022-O08)

```
  73P/Schwassmann-Wachmann
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Aug. 25.79258 TT                                  Rudenko
q   0.9729665            (2000.0)            P             Q
n   0.18127572     Peri.  199.48941     -0.02170433     +0.98296417
a   3.0920247      Node    69.60992     -0.88948708     +0.06435976
e   0.6853303      Incl.   11.22786     -0.45644459     -0.17216055
P   5.44
From 2390 observations 2016 Feb. 13-2022 July 18, mean residual 0".8.
```

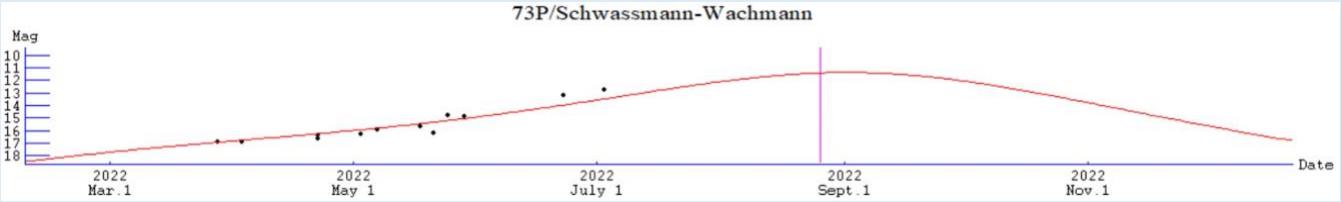
Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

73P/Schwassmann-Wachmann

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	Max El (deg) 40S
2022-Aug-01	12 17	+00 22	1.036	1.189	55E	Vir	12.1	8	33
2022-Aug-06	12 32	-02 20	1.014	1.159	55E	Vir	11.9	7	34
2022-Aug-11	12 48	-05 11	0.996	1.129	55E	Vir	11.7	6	35
2022-Aug-16	13 05	-08 09	0.983	1.099	55E	Vir	11.6	5	35
2022-Aug-21	13 23	-11 13	0.975	1.071	55E	Vir	11.5	4	36
2022-Aug-26	13 42	-14 21	0.973	1.044	56E	Vir	11.4	4	38
2022-Aug-31	14 02	-17 31	0.976	1.020	57E	Vir	11.4	3	39
2022-Sep-05	14 24	-20 41	0.984	1.000	58E	Lib	11.4	3	40

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 = 11.7 + 5 log d + 15.0 log r
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ CODE Observer Name
               (UT)                      T         Dia  DC  LENG  PA
 73        2022 07 31.89  S  9.8 TK 20.3T10 133   3    3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
 73        2022 07 19.91  S 10.4 TK 20.3T10  77   4    3           ICQ XX GON05 Juan Jose Gonzalez Suarez
```

73P should brighten from magnitude 12.1 to it this returns peak at 11.4 as it moves through Virgo low in the evening sky. We received two visual brightness measurements from J. J. Gonzalez that found the comet much brighter at magnitude 9.8 and 10.4, but no other observations have confirmed such a bright value. In fact, J.J.'s observations are the only visual ones of 73P reported so far this apparition.

73P has a long history of splitting. During the current return, in addition to the primary, 'C', a few secondaries have also been imaged. Though they have yet to be officially announced, at least one is listed on the Minor Planet Center's NEO Confirmation Page under the designation 'JD002'. Michael Jäger has posted on the comet-ml mailing list that another secondary designated JD001 has also been observed. The two secondaries were located

17’ and 23’ from the primary on July 23, 24, and 25. Both secondaries are faint at 19th magnitude. We still don’t know if these secondaries have been observed before.

Friedrich Karl Arnold Schwassmann and Arno Arthur Wachmann worked together at the Bergedorf Observatory in Hamburg, Germany where they discovered 4 comets including C/1930 D1 (Peltier-Schwassmann-Wachmann), outburst Centaur 29P/Schwassmann-Wachmann, 31P/Schwassmann-Wachmann, and 73P/Schwassmann-Wachmann. 73P was discovered photographically on 1930 May 2 at 9-10th magnitude. A pre-discovery image was found by H. Schneller of the Berlin-Babelsberg Observatory on plates exposed on April 27 and 29. The 1930 return was excellent with the comet passing 0.062 au from Earth on May 31 and reaching 6-7th magnitude.

A series of poor returns after 1930 led to 73P being lost until it was accidentally rediscovered in 1979 by J. Johnston and M. Buhagiar of Perth Observatory. The 1979 return was very similar to this year’s with 73P reaching 12th magnitude. It was well observed in 1990 when it passed 0.37 au from Earth and peaked at 9th magnitude. The 1995 return was not expected to be a bright one but a series of outbursts resulted in a jump in brightness from 12th to 6th magnitude. The outbursts were the result of a splitting events that saw the release of 3-4 secondary components. The next return in 2000 was poor. Even then, two nuclei were observed. 2006 saw the comet’s best return since 1930 with a close approach to Earth of 0.07 au. Visual observers were treated to a bright double comet with components B and C reaching 4-5th magnitude. Imagers detected dozens of fainter components with some components like B and G shedding hundreds of short-lived smaller components during the course of the apparition. While only a single component, the primary C, was seen in 2011, 2017 saw the C component return as well as a new secondary, designated BT. 2017 also saw 73P experience a ~2 magnitude brightening many months after perihelion.

Looking at 73P’s orbital evolution between 1900 and 2022, perihelion has stayed around 1.0 au with a maximum of 1.07 au and minimum of 0.89 au. Currently, perihelion is at 0.93 au though a close approach to Jupiter in 2025 will drop it further with a new minimum of 0.89 au being reached in the coming decades. As is common when perihelia are around 1 au, most returns see the comet passing at 1 au or further from Earth. The best apparitions between 1900 and 2100 are the aforementioned 1930 and 2006 returns. Three additional good to very good apparitions will occur throughout the remainder of the century (close approaches to Earth of 0.60 au in 2033, 0.20 au in 2054, and 0.12 au in 2070).

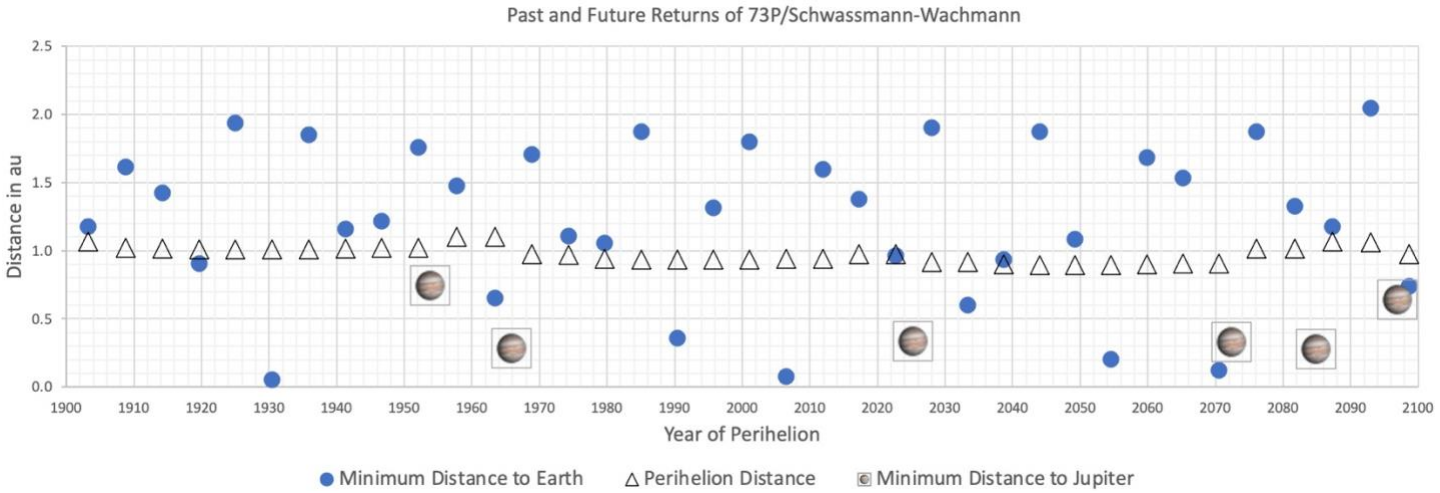


Figure 4 - Orbital evolution of 73P/Schwassmann-Wachmann. From the JPL Horizons service.

C/2019 L3 (ATLAS)

Discovered 2019 June 10 by the ATLAS survey with one of their 0.5-m f/2 Schmidt

Orbit (from Minor Planet Center, MPEC 2022-O01)

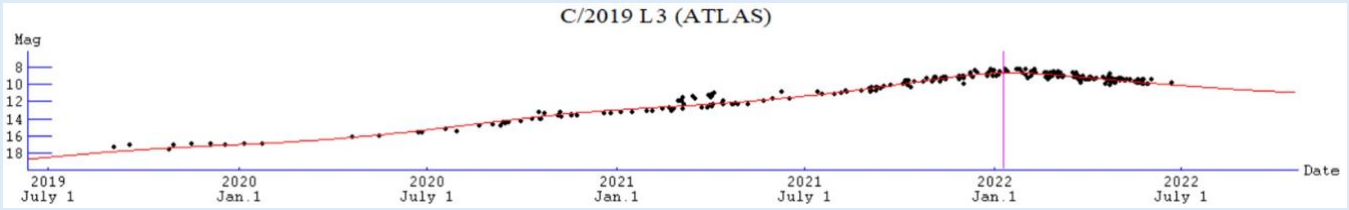
```
    C/2019 L3 (ATLAS)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Jan.  9.61852 TT                                  Rudenko
q   3.5544249           (2000.0)            P               Q
z  -0.0005067      Peri.  171.61011     -0.26046920     -0.66637164
 +/-0.0000003      Node   290.78799     +0.83677328     +0.20516884
e   1.0018011      Incl.   48.35648     +0.48162877     -0.71683651
From 5319 observations 2019 June 10-2022 June 8, mean residual 0".4.
1/a(orig) = +0.000113 AU**-1, 1/a(fut) = -0.000870 AU**-1.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

```
C/2019 L3 (ATLAS)                                                    Max El
                                                                      (deg)
    Date       R.A.    Decl.      r        d     Elong  Const  Mag    40N  40S
2022-Aug-01  08 36  +00 04    4.000    4.952     18M    Hya  10.4      0    0
2022-Aug-06  08 41  -00 45    4.021    4.970     18M    Hya  10.4      0    0
2022-Aug-11  08 46  -01 37    4.041    4.985     19M    Hya  10.5      0    0
2022-Aug-16  08 51  -02 30    4.063    4.996     20M    Hya  10.5      0    2
2022-Aug-21  08 56  -03 24    4.084    5.003     22M    Hya  10.6      0    4
2022-Aug-26  09 00  -04 19    4.106    5.007     24M    Hya  10.6      0    6
2022-Aug-31  09 05  -05 15    4.128    5.007     26M    Hya  10.6      0    8
2022-Sep-05  09 10  -06 12    4.151    5.003     29M    Hya  10.7      0   11
```

Comet Magnitude Formula and Lightcurve (from ALPO and COBS data)

```
m1 = -4.0 + 5 log d + 19.0 log r(t - 69)
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des YYYY MM DD.DD    Mag SC APER FL POW   COMA     TAIL    ICQ CODE Observer Name
               (UT)                  T       Dia  DC  LENG  PA
None
```

C/2019 L3 (ATLAS) was located too close to the Sun in July for any observations. Hopefully that will change this month as the comet slowly climbs to larger solar elongations. Though it will remain unobservable from the northern hemisphere, southern hemisphere observers should be able to reacquire C/2019 L3 by the end of the month as its moves through Hydra in the morning sky. Now 8 months past its 2022 January 9 perihelion (q = 3.55 au), L3 should fade from around magnitude 10.4 to 10.6. Since we haven't seen it since June, the predicted brightness could be off.

C/2020 V2 (ZTF)

Discovered 2020 November 2 by the ZTF survey
Dynamically new long-period comet

Orbit (from Minor Planet Center, MPEC 2022-O08)

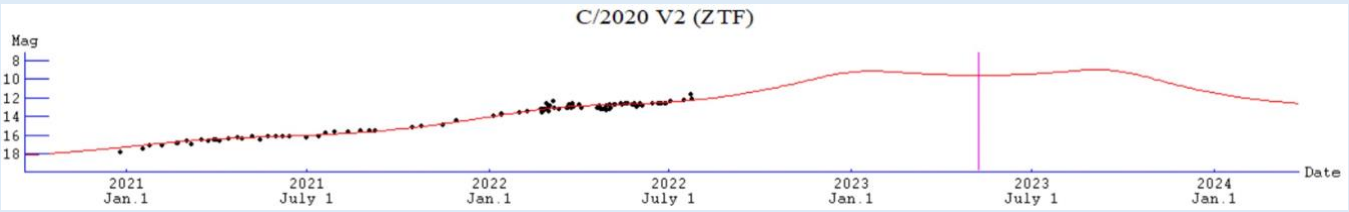
```
    C/2020 V2 (ZTF)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2023 May 8.53741 TT                                  Rudenko
q   2.2280135          (2000.0)            P              Q
z  -0.0004459      Peri.  162.41923     +0.69776713     +0.59404219
 +/-0.0000005      Node   212.37022     +0.53386748     -0.05867532
e   1.0009935      Incl.  131.61104     +0.47760501     -0.80229115
From 2710 observations 2020 Apr. 18-2022 July 17, mean residual 0".4.
1/a(orig) = -0.000146 AU**-1, 1/a(fut) = -0.000384 AU**-1.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

```
C/2020 V2 (ZTF)                                                    Max El
                                                                    (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag   40N  40S
2022-Aug-01  10 03  +53 16    3.776   4.518     38E    UMa  12.2    19    0
2022-Aug-06  10 06  +53 03    3.736   4.479     38E    UMa  12.1    18    0
2022-Aug-11  10 09  +52 52    3.696   4.434     38E    UMa  12.1    17    0
2022-Aug-16  10 12  +52 44    3.657   4.383     39E    UMa  12.0    16    0
2022-Aug-21  10 15  +52 39    3.617   4.326     40E    UMa  11.9    16    0
2022-Aug-26  10 19  +52 37    3.577   4.263     42E    UMa  11.9    15    0
2022-Aug-31  10 22  +52 39    3.538   4.195     43M    UMa  11.8    17    0
2022-Sep-05  10 26  +52 44    3.498   4.122     46M    UMa  11.7    19    0
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  1.3 + 5 log d + 12.4 log r [through -400 days]
m1 =  4.3 + 5 log d +  8.0 log r [-400 days and onward, assumed]
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ    CODE  Observer Name
              (UT)                    T          Dia  DC  LENG  PA
   2020V2  2022 07 24.98  S 13.1 TI 53.1L   155   0.75 4           ICQ XX HAR11 Christian Harder
   2020V2  2022 07 23.93  S 12.6 TI 53.1L   215   0.5  4           ICQ XX HAR11 Christian Harder
```

The Zwicky Transient Facility (ZTF) used the 1.2-m Oschin Schmidt on Mount Palomar to discover C/2020 V2 (ZTF) on 2020 November 2 at 19th magnitude. At discovery, the comet was approximately 2.5 years from perihelion and over 8 au from the Sun. The comet still has a way to go before reaching its 2023 May 8 perihelion at 2.23 au.

Christian Harder observed C/2020 V2 in July between magnitude 12.6 and 13.1 (aperture corrected to between 11.7 and 12.2). As has been the case for months now, V2 is located in the far northern constellation of Ursa Major and only visible to northern observers as it moves from the evening into the morning sky at the end of the month. Currently around magnitude 12.0, V2 may reach magnitude 9 in January-February 2023 when it will still be a northern circumpolar object and again in September 2023 when it will be visible from both hemispheres.

C/2021 E3 (ZTF)

Discovered 2021 March 9 by the Zwicky Transient Facility on Mount Palomar
Dynamically new long-period comet

Orbit (from Minor Planet Center, MPEC 2022-O01)

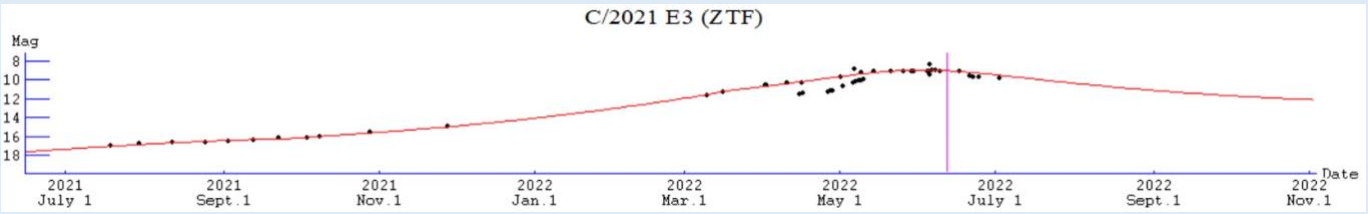
```
    C/2021 E3 (ZTF)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 June 11.91204 TT                                  Rudenko
q   1.7773863           (2000.0)            P              Q
z  -0.0005070      Peri.  228.85105     -0.11525530     -0.43253506
 +/-0.0000006      Node   104.46919     -0.37416662     +0.85281744
e   1.0009011      Incl.  112.55497     -0.92017148     -0.29260184
From 1028 observations 2021 Mar. 9-2022 July 11, mean residual 0".4.
1/a(orig) = -0.000044 AU**-1, 1/a(fut) = +0.000607 AU**-1.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

```
C/2021 E3 (ZTF)                                                      Max El
                                                                      (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag   40N  40S
2022-Aug-01  09 37   -44 44    1.890   2.098     64E    Vel  10.4     0   30
2022-Aug-06  09 42   -43 26    1.912   2.187     60E    Vel  10.5     0   27
2022-Aug-11  09 46   -42 22    1.937   2.271     58E    Vel  10.6     0   23
2022-Aug-16  09 50   -41 28    1.963   2.351     55E    Vel  10.8     0   20
2022-Aug-21  09 54   -40 45    1.990   2.426     53M    Vel  10.9     0   18
2022-Aug-26  09 57   -40 11    2.019   2.496     51M    Ant  11.0     0   19
2022-Aug-31  10 00   -39 45    2.049   2.560     49M    Ant  11.1     0   20
2022-Sep-05  10 03   -39 26    2.081   2.617     47M    Ant  11.2     0   21
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 = 8.7 + 5 log d +  9.0 log r [through T-255 days]
m1 = 3.0 + 5 log d + 19.4 log r [T-255 to T-100 days and onwards]
m1 = 5.3 + 5 log d + 12.5 log r [T-100 and onwards]
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ    CODE  Observer Name
               (UT)                    T         Dia  DC  LENG  PA
None
```

Not too much to report with this one. Though well placed for southern hemisphere observers, very few observations were been posted online in July including 2 on COBS and 3 sets of astrometry at the Minor Planet Center. This is somewhat surprising since the two COBS observations placed the C/2021 E3 at magnitude 9.9 (on July 2 by Thomas Lehmann) and 10.3 (on the 24th by Jose Chambo).

With perihelion on June 11 at 1.78 au, C/2021 E3 is now fading as it is moving away from the Sun (1.89 to 2.05 au in August) and Earth (2.10 to 2.57 au) from around magnitude 10.4 to 11.1.

C/2021 E3 is only visible from the southern hemisphere as it is located in the southern constellations of Vela (Aug 1-24) and Antlia (24-31) in the morning sky. Northern observers will have to wait till November to get another chance at C/2021 E3 though by then it may be no brighter than 12th magnitude.

C/2022 E3 (ZTF)

Discovered 2021 August 10 by the ATLAS survey
Dynamically old long-period comet

Orbit (from Minor Planet Center, MPEC 2022-O08)

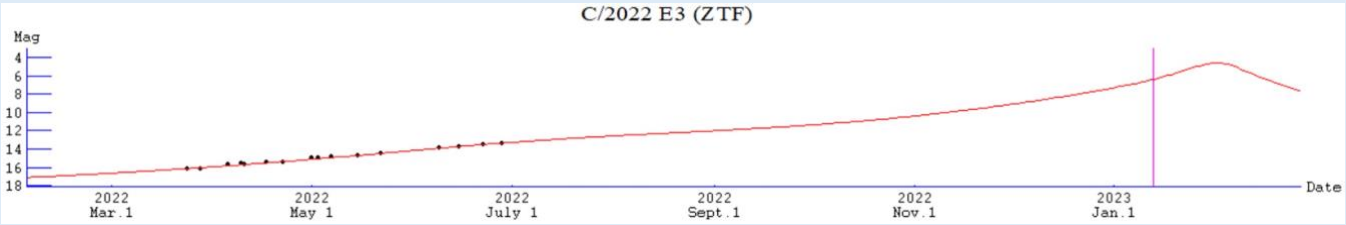
```
    C/2022 E3 (ZTF)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2023 Jan. 12.78611 TT                                  Rudenko
q   1.1122561           (2000.0)            P              Q
z  -0.0002543      Peri.  145.81440     -0.60062771     -0.07339891
 +/-0.0000038      Node   302.55394     +0.33752590     +0.87941778
e   1.0002828      Incl.  109.16862     +0.72479144     -0.47035834
From 1491 observations 2021 Oct. 25-2022 July 18, mean residual 0".4.
1/a(orig) = +0.000754 AU**-1, 1/a(fut) = -0.000036 AU**-1.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

```
C/2022 E3 (ZTF)                                                      Max El
                                                                      (deg)
    Date       R.A.    Decl.     r       d     Elong  Const  Mag    40N  40S
2022-Aug-01  17 34  +35 54   2.641   2.117    109E    Her   12.5     86   14
2022-Aug-06  17 20  +35 46   2.584   2.117    105E    Her   12.4     83   14
2022-Aug-11  17 08  +35 26   2.526   2.123    101E    Her   12.4     79   15
2022-Aug-16  16 56  +34 56   2.469   2.133     96E    Her   12.3     74   15
2022-Aug-21  16 45  +34 19   2.412   2.147     92E    Her   12.2     70   16
2022-Aug-26  16 35  +33 37   2.354   2.163     87E    Her   12.2     66   16
2022-Aug-31  16 27  +32 50   2.296   2.181     83E    Her   12.1     62   15
2022-Sep-05  16 20  +32 01   2.239   2.198     79E    CrB   12.0     58   14
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  6.3 + 5 log d + 10.8 log r [Through 200 days before perihelion]
m1 =  6.7 + 5 log d + 10.0 log r [After 200 days after perihelion, assumed]
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ    CODE  Observer Name
              (UT)                    T          Dia  DC  LENG  PA
   2022E3  2022 07 29.55 xM 13.5 AQ 40.0L 4 182   0.7  5/   1.2m129 ICQ XX WYA   Chris Wyatt
   2022E3  2022 07 27.92  S 12.6 TI 53.1L   155   0.5  5    1.5m130 ICQ XX HAR11 Christian Harder
   2022E3  2022 07 25.47 xM 13.4 AQ 40.0L 4 182   0.4  6    1.2m123 ICQ XX WYA   Chris Wyatt
   2022E3  2022 07 24.93  S 13.5 TI 53.1L   155   0.25 6    1  m130 ICQ XX HAR11 Christian Harder
   2022E3  2022 07 23.96  S 13.3:TI 53.1L   155   0.25 5    0.8m145 ICQ XX HAR11 Christian Harder
   2022E3  2022 07 19.96  S 12.7 AQ 20.3T10 133   0.7  5            ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022E3  2022 07 18.93  S 13.1 TI 35.3L   176   0.3  5            ICQ XX HAR11 Christian Harder
   2022E3  2022 07 03.97  S 14.1 TI 29.8L 4 238   0.4  5            ICQ XX HAR11 Christian Harder
```

Though C/2022 E3 (ZTF) is expected to remain magnitude 12.0 or fainter this month, just barely, we'll highlight it since it may become a nice object at the end of this year and early next year. C/2022 E3 (ZTF) was discovered on 2022 March 2 at 17th magnitude by the Zwicky Transient Facility with the 1.2-m f/2.4 Schmidt on Mount Palomar when it was 4.3 au from the Sun. With perihelion on 2023 January 13 at 1.11 au and a close approach to Earth of 0.29 au on February 1, C/2022 E3 may get as bright as 4-6th magnitude.

When at its brightest in late January/early February, C/2022 E3 will be well located for northern observers as a northern circumpolar object. Though it will spend the period between October 2022 and early February 2023 invisible from the southern hemisphere, southern observers will be able to pick up the comet again only a week or after closest approach to Earth when it will still be within 0.5-1.0 magnitude of peak brightness.

The comet was well observed in July. Visual observations by Christian Harder, J. J. Gonzalez and Chris Wyatt found the comet between the aperture corrected magnitudes of 12.4 and 13.7 with a small coma (<1') and a nice tail (up to 1.5' in length). Images by Thomas Lehmann (submitted to COBS) found the tail to be as long as 4'.

In August, C/2022 E3 is visible from both hemispheres though it is better placed for northern observers as it moves through the dense star fields of Hercules in the evening sky. C/2022 E3 should brighten from around magnitude 12.5 to 12.1 by the end of August.

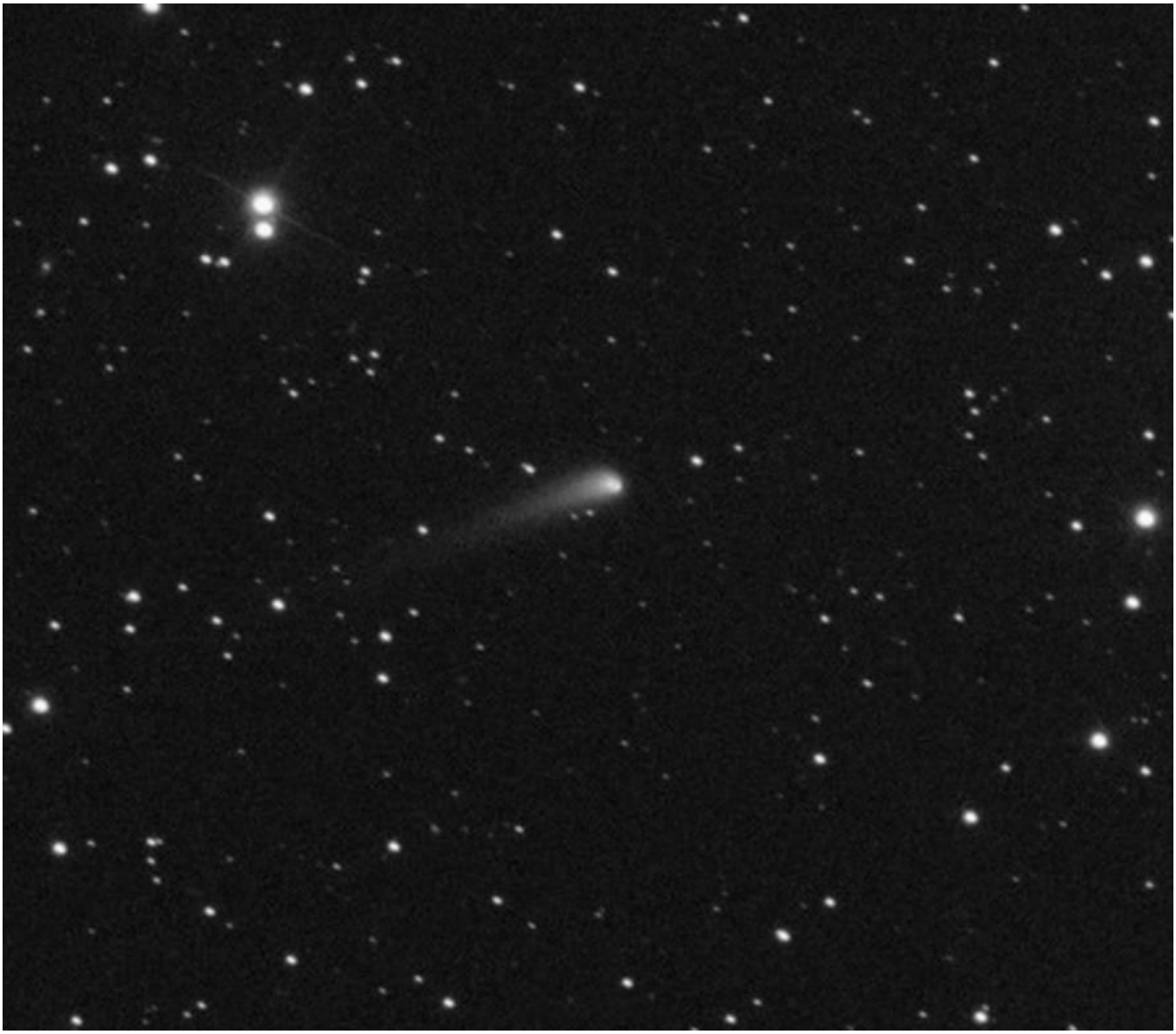


Figure 5 - C/2022 E3 (ZTF) was imaged on 2022 July 27 by Eliot Herman with the iTelescopes T18 scope in Spain. The image is a co-add of 3 x 120s luminance exposures.