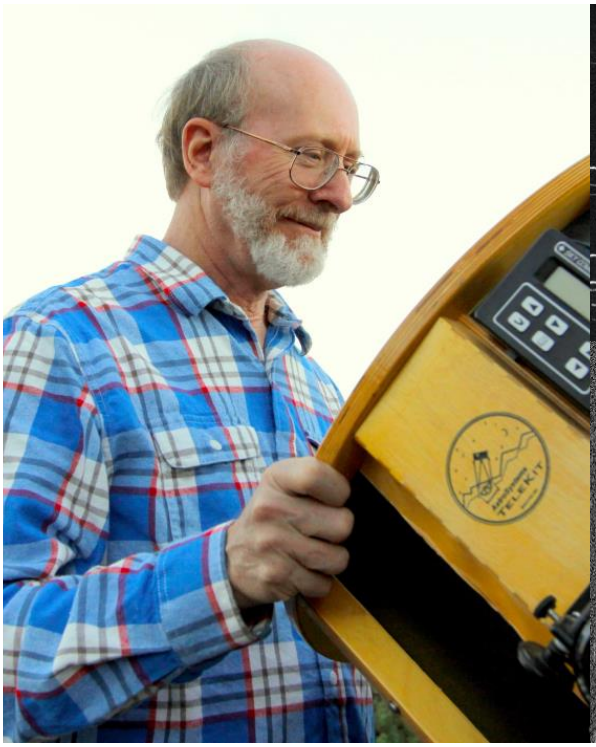
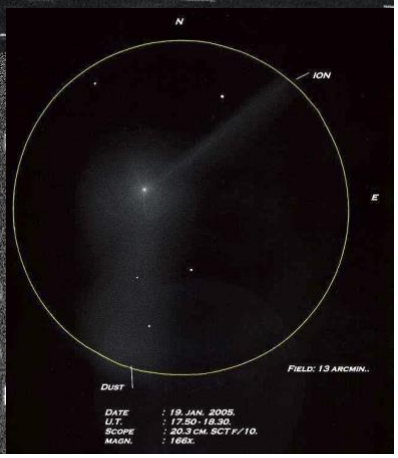
September 2022

ALPO Comet News

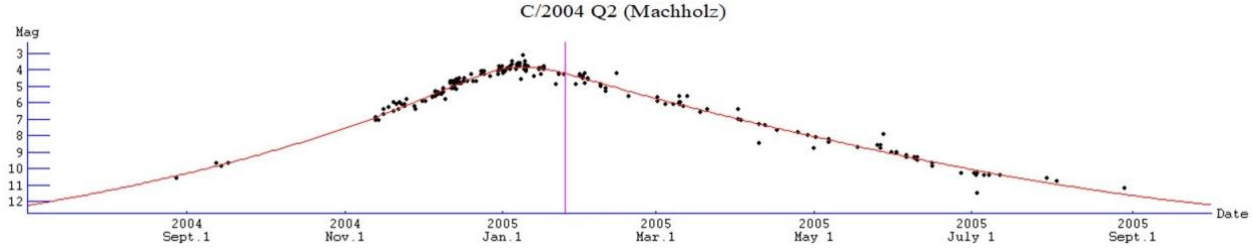
A Publication of the Comets Section of the Association of Lunar and Planetary Observers

Donald Machholz (1952-2022)





C/2004 Q2 (Machholz)



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On the Front Cover:

A celebration of the life and comets of Don Machholz. *Upper left* image: Don and one of his large comet hunting telescopes. Credit: Michele AnneLouise Machholz. The remaining images come from the ALPO Comets Section archive. *Upper right*: 141P/Machholz and secondary imaged by Gregg Ruppel on 2021 January 16 during its most recent return. *Center*: C/2018 V1 (Machholz-Fujikawa-Iwamoto) imaged by Mike Olason on 2018 November 20. *Center right*: Drawing of C/2004 Q2 (Machholz) by Per-Jonny Bremseth on 2005 January 18. *Bottom*: Lightcurve of C/2004 Q2 (Machholz) from a re-reduction of data submitted to the ALPO Comets Section.

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/839442-alpo-comet-news-for-september-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

C/2017 K2 (PANSTARRS) continues to dominate the attention of comet observers. It is currently the brightest comet in the sky at around magnitude 8, a position it should hold for a couple more months. Unfortunately for those at northern latitudes, September will probably be the last month to observe C/2017 K2 before it is lost in the glow of dusk. Southern observers will be able to follow the comet without interruption for many months to come.

Five other comets will be brighter than magnitude 12 though all may be fainter than magnitude 10.5 to 11.0. 73P/Schwassmann-Wachmann continues its habit of shedding secondary nuclei and so far, 5 new ones have been reported (though all are faint at 17-19th magnitude). C/2019 L3 (ATLAS) should return to view after its solar conjunction, first for southern observers, and later in the month for the northern hemisphere. C/2020 V2 (ZTF) and C/2022 E3 (ZTF) will brighten to around magnitude 11 by the end of September but will both get even brighter in 2023. Finally, C/2022 P1 (NEOWISE) is a brand-new discovery and due to its very rapid rate of brightening may be a 11th magnitude object this month.

Last month the ALPO Comets Section received 60 magnitude estimates and 38 images/sketches of comets C/2022 L1 (Catalina), C/2022 E3 (ZTF), C/2021 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), 285P/LINEAR, 117P/Helin-Roman-Alu, 116P/Wild, 73P/Schwassmann-Wachmann, 29P/Schwassmann-Wachmann, and 22P/Kopff. A big thanks to our recent contributors: Dan Bartlett, Denis Buczynski, J. J. Gonzalez, Jose Guilherme de Souza Aguiar, Christian Harder, Carl Hergenrother, Eliot Herman, Michael Jäger, Gianluca Masi, Martin Mobberley, Uwe Pilz, Michael Rosolina, Tenho Tuomi, and Chris Wyatt.

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 >.

Photometric Corrections to Magnitude Measurements

We try to include up-to-date lightcurves for the comets discussed in these reports as well as applying aperture and personal corrections to the visual observations and personal just corrections to digital 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 first correction used here 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. After applying the aperture correction and if a sufficient number of visual observations are submitted for a particular comet, we also determine personal corrections for each observer for each individual comet. For digital observations only a personal correction is applied. A single observer submitting both visual and digital magnitude measurements may also have separate corrections for each observing method. If the magnitudes shown in the text don't match those plotted in the lightcurves, it is because of the application of these 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

Lunar Phases

Sep 03 - First Quarter Moon
Sep 10 - Full Moon
Sep 17 - Last Quarter Moon
Sep 25 - New Moon

Comets at Perihelion

Sep 02 - 327P/Van Ness at perihelion (q = 1.56 au, 6.7-yr period, V ~ 15, discovered in 2002, it was seen at returns in 2002, 2015 and now 2022, it was missed at its 2009 return)
Sep 06 - P/2015 X1 =P/2022 Q1 (PANSTARRS) at perihelion (q = 2.11 au, 6.9-yr period, V ~ 21, discovered on in 2015, recovered on 2022 August 23, this is its first return since discovery)
Sep 07 - 255P/Levy at perihelion (q = 0.85 au, 5.3-yr period, V ~ 15, visually discovered in 2006 when in outburst at 9th magnitude, also observed at 2012 return though missed at its last return in 2017, yet to be seen at this return)
Sep 09 - 157P/Tritton at perihelion (q = 1.57 au, 6.7-yr period, V ~ 16, very faint photographic discovery in 1977, lost till rediscovered in 2003 when it experienced an outburst to 11th magnitude, also seen in 2010 and 2016, 2016 saw a 5+ magnitude outburst ~1 year after perihelion)
Sep 09 - C/2022 N1 (Attard-Maury) at perihelion (q = 1.48 au, V ~ 18, discovered on 2022 July 2)
Sep 13 - 41P/Tuttle-Giacobini-Kresak at perihelion (q = 1.05 au, 5.4-yr period, V ~ 12, visual discovery by Tuttle in 1858, rediscovered visually by Giacobini in 1907, rediscovered visually yet again by Mrkos in 1951, 2022 is a poor return with the comet at low solar elongation while bright, if observed this return it would be the comet's 12th observed return, long history of outbursts: two large outbursts to 4th magnitude in 1973, a ~8 magnitude outburst to 8th mag in 1995, 2 large outbursts to 10th and 8th magnitude in 2000, of course during it last return when it passed 0.14 au from Earth and reached 6th magnitude it didn't have an outburst)
Sep 16 - C/2020 R7 (ATLAS) at perihelion (q = 2.96 au, V ~ 12)
Sep 26 - 214P/LINEAR at perihelion (q = 1.86 au, 6.9-yr period, V ~ 20??, discovered in 2002 and also seen at 2009 return, missed in 2015 and currently awaiting recovery in 2022 though poorly placed when bright)
Sep 28 - C/2022 L1 (Catalina) at perihelion (q = 1.59 au, V ~ 15)
Sep 26 - 224P/LINEAR-NEAT at perihelion (q = 1.86 au, 6.3-yr period, V ~ 19??, discovered in 2003 and also seen at 2009 return, missed in 2016 and currently awaiting recovery in 2022)

Photo Opportunities

Sep 02 - A 6.8-day old Moon (43% illumination) within a degree of C/2017 K2 (PANSTARRS)
Sep 07 - 73P/Schwassmann-Wachmann passes 7' from 13th mag galaxy IC 4468
Sep 07-11 - C/2017 K2 (PANSTARRS) passes through a rich nebula field region near the stars 3,4, & 6 Sco
Sep 21 - C/2020 V2 (ZTF) within 5' of the 12th magnitude galaxy NGC 3310 (Bow & Arrow Galaxy)
Sep 22 - C/2017 K2 (PANSTARRS) and 73P/Schwassmann-Wachmann within 0.5 deg of each other

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 L1 (Catalina)												
2022L1	2022 08 24.85	S 15.0:T	I	53.1L		298	0.2	4			ICQ XX HAR11	Christian Harder
C/2022 E3 (ZTF)												
2022E3	2022 08 31.87	S 12.5 T	I	35.3L		144	0.6	5	1.7 m	100	ICQ XX HAR11	Christian Harder
2022E3	2022 08 30.83	S 12.0 T	I	35.3L		144	0.8	5	1.5 m	90	ICQ XX HAR11	Christian Harder
2022E3	2022 08 29.87	S 12.7 T	I	35.3L		144	0.7	5	1.5 m	100	ICQ XX HAR11	Christian Harder
2022E3	2022 08 27.84	S 12.8 T	I	53.1L		155	0.6	5 & 2	m	90	ICQ XX HAR11	Christian Harder
2022E3	2022 08 24.89	S 12.7 T	I	53.1L		155	0.7	5	1.8 m	100	ICQ XX HAR11	Christian Harder
2022E3	2022 08 23.86	S 12.4 T	I	53.1L		139	0.8	5	3.1 m	105	ICQ XX HAR11	Christian Harder
2022E3	2022 08 23.83	S 12.0 T	K	32.0L	5	80	0.4	7	0.03	111	PIL01	Uwe Pilz
2022E3	2022 08 20.88	S 12.7 T	I	53.1L		139	0.6	5	1.8 m	110	ICQ XX HAR11	Christian Harder
2022E3	2022 08 20.40	xM 12.9 A	Q	40.0L	4	108	0.8	6	1.5m	116	ICQ XX WYA	Chris Wyatt
2022E3	2022 08 14.99	M 12.1 A	Q	27 L	5	109	1	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022E3	2022 08 09.01	S 12.9 T	I	35.3L		176	0.8	s5	0.8 m	120	ICQ XX HAR11	Christian Harder
2022E3	2022 08 08.02	S 13.3:T	I	53.1L		215	0.5	s5	2 m	120	ICQ XX HAR11	Christian Harder
2022E3	2022 08 05.95	S 13.0 T	I	25.2L	4	113	0.65	5	1.5 m	110	ICQ XX HAR11	Christian Harder
2022E3	2022 08 04.93	S 12.6 T	I	25.2L	4	113 &	0.6	5			ICQ XX HAR11	Christian Harder
2022E3	2022 08 03.90	S 12.5 H	S	32.0L	5	80	0.5	6			PIL01	Uwe Pilz
2022E3	2022 08 01.93	S 13.2 T	I	25.2L	4	113 &	0.4	5			ICQ XX HAR11	Christian Harder
2022E3	2022 08 01.02	S 12.5 A	Q	20.3T	10	133	0.6	6			ICQ XX GON05	Juan Jose Gonzalez Suarez
C/2021 E3 (ZTF)												
2021E3	2022 08 20.38	xS 12.8 A	Q	40.0L	4	182	1.2	3			ICQ XX WYA	Chris Wyatt
C/2020 V2 (ZTF)												
2020V2	2022 08 31.86	S 12.5 T	I	35.3L		144	1.1	4			ICQ XX HAR11	Christian Harder
2020V2	2022 08 30.84	S 12.3 T	I	35.3L		144	0.9	4			ICQ XX HAR11	Christian Harder
2020V2	2022 08 27.89	S 12.6 T	I	53.1L		155	1	4			ICQ XX HAR11	Christian Harder
2020V2	2022 08 24.88	S 12.8 T	I	53.1L		155	1.1	4			ICQ XX HAR11	Christian Harder
2020V2	2022 08 23.84	S 11.7 T	K	32.0L	5	80	0.5	5			PIL01	Uwe Pilz
2020V2	2022 08 20.91	S 12.7 T	I	53.1L		155	0.8	4/			ICQ XX HAR11	Christian Harder
2020V2	2022 08 17.88	S 11.6 A	Q	20.3T	10	77	3.5	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
2020V2	2022 08 07.97	S 12.7 T	I	53.1L		215	0.7	4			ICQ XX HAR11	Christian Harder
2020V2	2022 08 03.88	S 12.0 T	K	32.0L	5	80	0.5				PIL01	Uwe Pilz
C/2020 R7 (ATLAS)												
2020R7	2022 08 20.42	xS 14.0 A	Q	40.0L	4	261	0.5	3			ICQ XX WYA	Chris Wyatt
C/2020 K1 (PANSTARRS)												
2020K1	2022 08 31.85	S 12.5 T	I	35.3L		144	1.2	3			ICQ XX HAR11	Christian Harder
2020K1	2022 08 30.85	S 12.5 T	I	35.3L		144	0.9	3			ICQ XX HAR11	Christian Harder
2020K1	2022 08 27.88	S 12.7 T	I	53.1L		155	0.9	3			ICQ XX HAR11	Christian Harder
2020K1	2022 08 24.85	S 13.3:T	I	53.1L		155	0.6	3			ICQ XX HAR11	Christian Harder
2020K1	2022 08 20.87	S 12.9 T	I	53.1L		155	0.9	3			ICQ XX HAR11	Christian Harder
2020K1	2022 08 20.45	xM 14.3 A	Q	40.0L	4	261	0.3	4	0.6m	260	ICQ XX WYA	Chris Wyatt
2020K1	2022 08 14.98	M 13.5 A	Q	27 L	5	109	1	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020K1	2022 08 01.00	S 12.1 A	Q	20.3T	10	100	2.5	4			ICQ XX GON05	Juan Jose Gonzalez Suarez
C/2019 T4 (ATLAS)												
2019T4	2022 08 20.39	xM 13.4 A	Q	40.0L	4	108	1.4	4			ICQ XX WYA	Chris Wyatt
C/2017 K2 (PANSTARRS)												
2017K2	2022 08 30.12	S 8.1 T	K	5.0B		10	7	3			ICQ xx HER02	Carl Hergenrother
2017K2	2022 08 24.90	M 9.3 T	K	27 L	5	80	3	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 22.89	M 9.1 T	K	27 L	5	80	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 20.44	xM 9.2 T	K	40.0L	4	59	4.0	6	4.5m	110	ICQ XX WYA	Chris Wyatt
2017K2	2022 08 19.88	S 8.2 T	K	5.0B		10	8	5			ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 08 17.89	S 8.2 T	K	5.0B		10	8	5			ICQ XX GON05	Juan Jose Gonzalez Suarez
2017K2	2022 08 15.89	M 8.9 T	K	27 L	5	80	4	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 14.89	M 9.0 T	K	27 L	5	80	4	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 13.90	M 9.0 T	K	27 L	5	55	4	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 12.89	M 8.9 T	K	27 L	5	55	4	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 04.99	M 8.8 T	K	27.0L	5	55	4	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 03.90	M 8.7 T	K	27.0L	5	55	4	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 03.88	S 9.5:T	K	32.0L	5	80	1.7	5/			PIL01	Uwe Pilz
2017K2	2022 08 02.97	M 8.6 T	K	27.0L	5	55	4	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 01.99	M 8.8 T	K	27.0L	5	80		3/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2022 08 01.91	S 8.5:T	I	25.2L	4	68	4	3/			ICQ XX HAR11	Christian Harder
285P/LINEAR												
285	2022 08 20.41	xM 14.8 A	Q	40.0L	4	261	0.3	3/			ICQ XX WYA	Chris Wyatt
117P/Helin-Roman-Alu												
117	2022 08 20.43	xM 14.3 A	Q	40.0L	4	261	0.4	5/			ICQ XX WYA	Chris Wyatt
116P/Wild												

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116        2022 08 20.38 xM 13.8 AQ 40.0L 4 182   0.9  5/           ICQ XX WYA   Chris Wyatt
73P/Schwassmann-Wachmann
 73        2022 08 20.40 xM 12.2 AQ 40.0L 4 108   1.3  6    3.0m089 ICQ XX WYA   Chris Wyatt
 73        2022 08 17.86  S  8.4 TK 20.3T10  77   5    3/           ICQ XX GON05 Juan Jose Gonzalez Suarez
22P/Kopff
 22        2022 08 08.03  S 14.0:TI 53.1L   215   0.7              ICQ XX HAR11 Christian Harder
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New Discoveries, Recoveries and Other Comets News

Sad News
The comet community was saddened on 2022 August 9 by the news of the passing of Donald Machholz at the age of 69. Not only was Don a fixture of the visual comet observing community, but led the ALPO Comets Section between 1988 and 1999. Don is best known as the discoverer of 12 comets which were all found visually. His last find, C/2018 V1 (Machholz-Fujikawa-Iwamoto), is the last comet to be discovered visually.

Don's 12 finds are listed here with links to his discovery stories for each.

C/1978 R3 (Machholz)
C/1985 K1 (Machholz)
96P/1986 J2 (Machholz)
C/1988 P1 (Machholz)
C/1992 F1 (Tanaka-Machholz)
C/1992 N1 (Machholz)
C/1994 N1 (Nakamura-Nishimura-Machholz)
141P/1994 P1 (Machholz)
C/1994 T1 (Machholz)
C/2004 Q2 (Machholz)
C/2010 F4 (Machholz)
C/2018 V1 (Machholz-Fujikawa-Iwamoto)

Other stories about Don's life can be found at
Don's website
Sky and Telescope
Astronomy magazine
EarthSky
Space.com

New Periodic Comet Numbering
From WGSBN Bull. 2, #11
446P/2012 O3 = P/2022 G2 (McNaught)
445P/2014 R5 = P/1998 W9 = P/2006 S14 = P/2022 L5 (Lemmon-PANSTARRS)
444P/2016 PM1 = P/2010 LK36 = P/2016 MD = P/2022 C4 (WISE-PANSTARRS)

New Discoveries and Recoveries
P/2022 Q1 = P/2015 X1 = P/2008 T13 (PANSTARRS) – The only comet recovery in August was reported by Erwin Schwab of Egelsbach, Germany on images taken with a 0.8-m f/3 Schmidt telescope at Calar Alto, Spain. The images were taken on the nights of 2022 August 23 and 24 as part of an observing program that also included D. Koschny, M. Micheli, and R. Kresken. PANSTARRS was around magnitude 21.0 at the time of recovery which is ~1-2 magnitudes fainter than expected based on the brightness at its 2008 and 2015 returns. With perihelion only a week away on 2022 September 6 at 2.11 au, this PANSTARRS may not be getting much brighter.

P/2015 X1 (PANSTARRS) was discovered on 2015 December 1 at 20th magnitude. It reached 19th magnitude at that return. After its 2022 recovery, Syuchi Nakano found observations made on 2008 October 1 and 2008

December 31 by the Catalina Sky Survey, hence the other designation P/2008 T13. The comet was around magnitude 19.0 in the 2008 observations. [CBET 5164, MPEC 2022-Q153]

C/2022 P2 (ZTF) – The Zwicky Transient Facility found a new 17th magnitude comet on 2022 August 15 with the 1.2-m f/2.44 Oschin Schmidt telescope on Mount Palomar. 17th magnitude is rather bright for a professional all-sky survey. Its brightness is explained by the comet being discovered when only about 38 degrees from the Sun. C/2022 P2 (ZTF) passed perihelion on 2022 July 7 at 1.96 au. While the comet may be of the short-period variety with a period of ~8 years, a long-period parabolic orbit is still possible. [CBET 5165, MPEC 2022-Q201]

C/2022 P1 (NEOWISE) – This new discovery may be brighter than 12th magnitude in September. More details below. [CBET 5158, MPEC 2022-Q03]

P/2022 O2 (PANSTARRS) – Yudish Ramanjooloo of the Institute for Astronomy at the University of Hawaii reported a new 20th magnitude comet in image taken on 2022 August 17 by the Pan-STARRS2 1.8-m reflector on Haleakala. Pre-discovery images were found back to 2022 June 9. P/2022 O2 (PANSTARRS) is a short-period comet with an orbital period of 15.8 years. Perihelion will be on 2023 January 7 at 1.76 au though closest approach to Earth will be around September 1 at 1.32 au. As a result, the comet will peak around 19th magnitude in November. [CBET 5160, MPEC 2022-Q25]

C/2022 O1 (ATLAS) – A. Fitzsimmons of the ATLAS program reported the discovery of a new 18th magnitude comet from images taken with a 0.5-m f/2 Schmidt reflector at Sutherland, South Africa on 2022 July 26. The came to perihelion on 2022 March 12 at a large perihelion distance of 7.44 au. It is a slow moving, far southern object at a declination of -62 deg at the start of September. It is currently near its brightest at 18th magnitude. [CBET 5157, MPEC 2022-Q02]

P/2020 A4 (PANSTARRS-LEMMON) – Our knowledge of P/2020 A4 (PANSTARRS-Lemmon) is due to the detective work of amateur astronomer Sam Deen of Simi Valley, California. Sam was looking at unlinked observations in the Minor Plane Center's "isolated tracklet file". Starting with a 19th magnitude tracklet produced by the Mount Lemmon Survey on 2022 February 3, he found numerous detections of this object in publicly available images and in other tracklets. This includes images taken by the VLT in January 2021 when the comet was 25th magnitude! Rob Weryk also identified a number of observations within Pan-STARRS data. In total, 105 observations were found between 2019 October 14 and 2021 January 15 which is a testament to the level of sky coverage achieved by modern surveys, the ease at which even the public can access this data, and the hard work of image sleuths like Sam and Rob. P/2020 A4 was at perihelion on 2019 November 22 at 2.84 au. It reached a peak brightness around magnitude 19 but is currently beyond the grasp of most, if not all, telescopes. With a 23.5-year orbital period, its next perihelion will be in May 2043. [CBET 5156, MPEC 2022-P91]

C/2019 G4 (PANSTARRS) – This object was discovered on 2019 April 9 with the Pan-STARRS1 1.8-m Ritchey-Chretien reflector at Haleakala at 21st magnitude. At the time no cometary activity was noted and it was designated A/2019 G4. Sam Deen found the object to show a cometary appearance in publicly available images taken with multiple large telescopes during 2018 and 2019. The object has now been redesignated C/2019 G4 (PANSTARRS). Perihelion was back on 2018 September 15 at 5.86 au. The last observation at the Minor Planet Center was from 2020 November 11 when the comet was 23rd-24th magnitude. [CBET 5154, MPEC 2022-P96]

A/2018 W3 – MPEC 2022-Q17 reported 3,649 observations(!!!) of A/2018 W3 between 2018 February 7 and 2021 June 21. The MPEC doesn't go into any of the discovery details but it appears this object was first found on an image taken on 2018 November 29 with the DECam wide-field instrument on the Cerro Tololo 4-m. It isn't clear from the MPEC but it appears the discovery was made, yet again, by Sam Deen. Almost all of the

observations, all but 7, were made by TESS (Transiting Exoplanet Survey Satellite) which saw the object at magnitude 17-18 in 2020-2021 when it was located deep in the southern sky. Though perihelion was back on 2021 April 13 at 4.29 au, A/2018 W3 should still be around 19th magnitude. The object is now located close to the celestial equator. The fact that the last observation was taken on 2021 June 11 suggests it may be much fainter than 19th magnitude. [MPEC 2022-Q17]

C/2018 S2 (TESS) – Similar to the discovery story of A/2018 W3, this object was found on images taken by the TESS spacecraft on consecutive nights between 2018 September 23 and November 11 at around magnitude 18 at a southern declination of -48 to -49 deg. Amateur comet sleuth K. Ly of El Monet, California found additional ground-based observations taken with the Cerro Paranal 2.65-m, Cerro Tololo 4-m + DECam, and Siding Spring-based SkyMapper 1.35-m telescopes back to 2017 August 2 (at around magnitude 19.7) and as late as 2019 March 10 (when it was around magnitude 20). The comet appears to have been too faint for detection after March 2019. DECam observations taken in February 2020 reached a limiting magnitude of 24.

C/2018 S2 (TESS) has a Centaur-like orbit with a perihelion distance of 5.47 au, aphelion at 23.04 au, and orbital period of 53.8 years. Its latest perihelion was on 2018 November 5 and it is predicted to be at perihelion again in December 2072. [CBET 5163, MPEC 2022-Q126]

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-Q33)

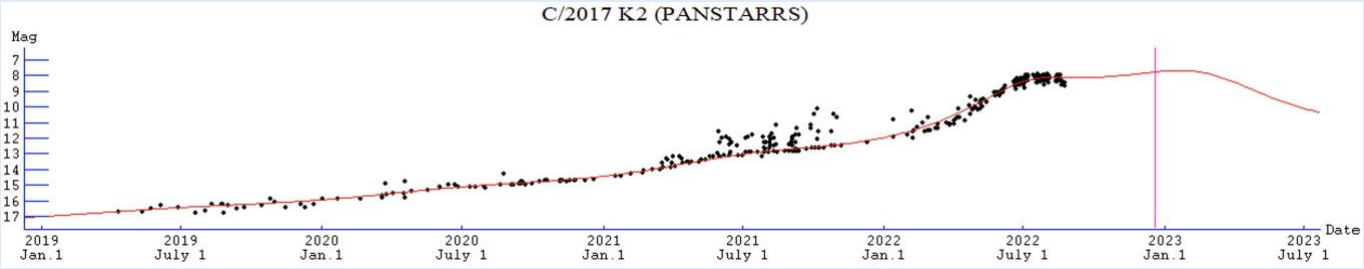
```
    C/2017 K2 (PANSTARRS)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Dec. 19.68311 TT                                  Rudenko
q   1.7969074           (2000.0)            P               Q
z  -0.0004416      Peri.  236.19778     +0.01819643     +0.04924648
 +/-0.0000001      Node    88.23508     -0.18093859     +0.98245737
e   1.0007935      Incl.   87.56202     -0.98332605     -0.17986744
From 10782 observations 2015 Nov. 23-2022 Aug. 19, mean residual 0".5.
1/a(orig) = +0.000059 AU**-1, 1/a(fut) = +0.001150 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-Sep-01  15 57  -22 48    2.264   2.139     83E    Sco    8.1    16   62
2022-Sep-06  15 55  -24 33    2.228   2.190     78E    Sco    8.1    13   59
2022-Sep-11  15 54  -26 16    2.193   2.240     74E    Sco    8.1    10   55
2022-Sep-16  15 54  -27 56    2.158   2.288     69E    Sco    8.1     8   51
2022-Sep-21  15 55  -29 34    2.125   2.335     65E    Sco    8.1     5   47
2022-Sep-26  15 56  -31 12    2.093   2.379     61E    Lup    8.1     2   43
2022-Oct-01  15 57  -32 48    2.062   2.420     57E    Lup    8.1     0   40
2022-Oct-06  16 00  -34 23    2.032   2.457     53E    Lup    8.1     0   36
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  4.1 + 5 log d + 6.7 log r [to T-425 days, where T = date of perihelion]
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Estimates submitted 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
   2017K2  2022 08 30.12  S  8.1 TK  5.0B    10   7    3            ICQ xx HER02 Carl Hergenrother
   2017K2  2022 08 24.90  M  9.3 TK 27.0L 5  80   3    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 22.89  M  9.1 TK 27.0L 5  80   3    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 20.44 xM  9.2 TK 40.0L 4  59   4.0  6    4.5m110 ICQ XX WYA   Chris  Wyatt
   2017K2  2022 08 19.88  S  8.2 TK  5.0B    10   8    5            ICQ XX GON05 Juan Jose Gonzalez Suarez
   2017K2  2022 08 17.89  S  8.2 TK  5.0B    10   8    5            ICQ XX GON05 Juan Jose Gonzalez Suarez
   2017K2  2022 08 15.89  M  8.9 TK 27.0L 5  80   4    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 14.89  M  9.0 TK 27.0L 5  80   4    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 13.90  M  9.0 TK 27.0L 5  55   4    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 12.89  M  8.9 TK 27.0L 5  55   4    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 04.99  M  8.8 TK 27.0L 5  55   4    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 03.90  M  8.7 TK 27.0L 5  55   4    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 03.88  S  9.5:TK 32.0L 5  80   1.7  5/                  PIL01 Uwe Pilz
   2017K2  2022 08 02.97  M  8.6 TK 27.0L 5  55   4    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 01.99  M  8.8 TK 27.0L 5  80        3/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2017K2  2022 08 01.91  S  8.5:TI 25.2L 4  68   4    3/           ICQ XX HAR11 Christian Harder
```

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 (PANSTARRS) starts the month just to the west of the head of Scorpius. It moves slowly south exiting Scorpius and entering Lupus on September 21. Being located south of the Sun and with a solar elongation dropping to 57 deg this month, September will probably mark the last time observers at northern mid-latitudes will be able to see C/2017 K2 (PANSTARRS) from their backyards. The comet is much better placed for southern hemisphere observers. Northerners won't see K2 from their backyards again until the 2nd half of next year 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.

Observations from August found the comet near its brightest at around magnitude 8. It should stay around that brightness this month and into early next year. Visual observers have consistently measured a moderately condensed coma with a diameter between 3' and 8'. Chris Wyatt observed a 4.5' tail on August 20. The tail is an obvious feature in images as well as a drawing made by Michael Rosolina on August 25.

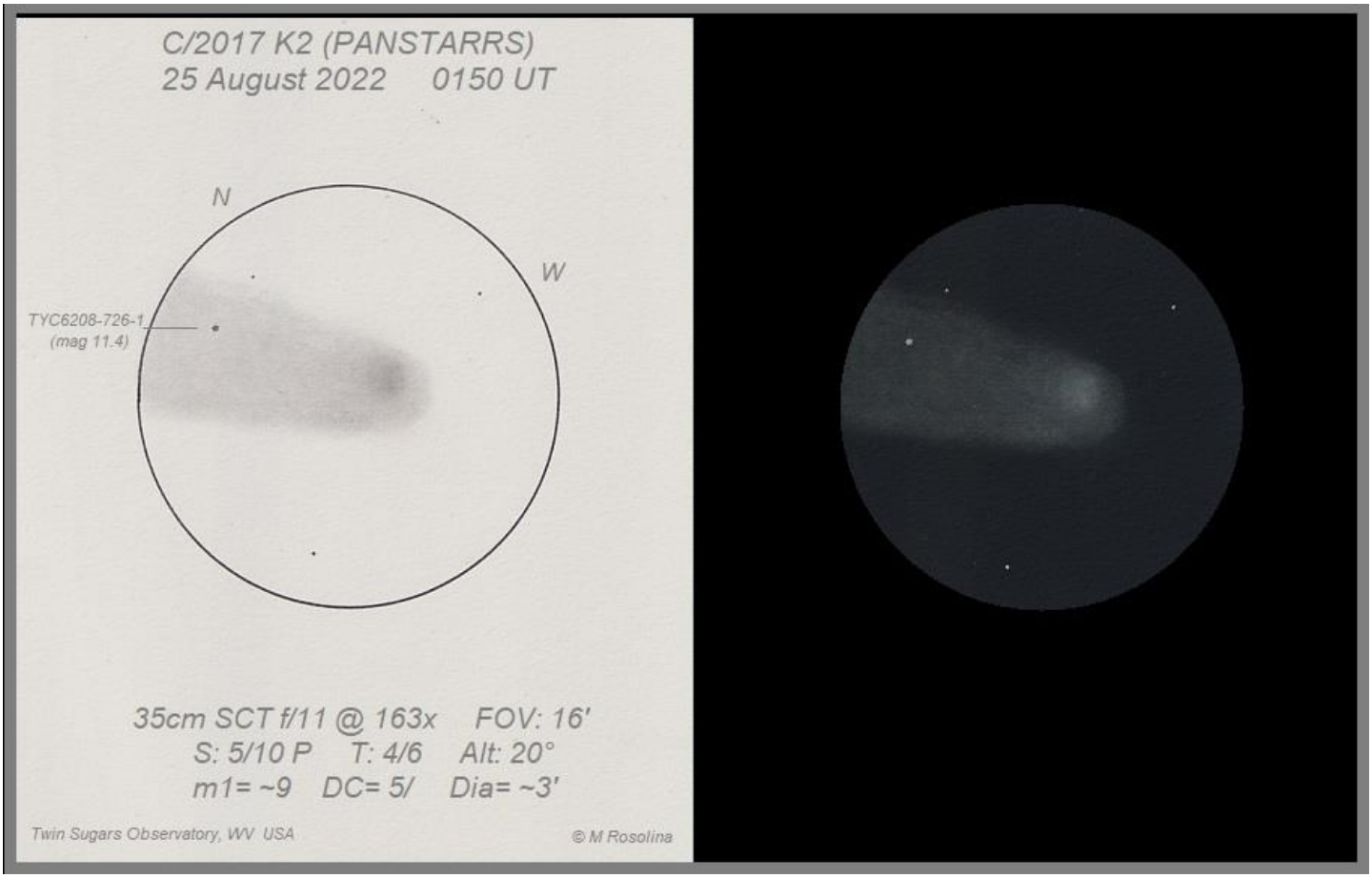


Figure 1 - Drawing of C/2017 K2 (PANSTARRS) by Michael Rosolina from 2022 August 25.

Figure 2 – Martin Mobberley used an iTelescopes 0.51-m CDK reflector and FLI PL09000 camera to image C/2017 K2 (PANSTARRS) on 2022 August 28. A broad tail of old dust can be seen extending to the upper left. A short faint bluish ion tail can be seen extending to the left (at around 8 o'clock from the coma.

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-Q33)

```
  73P/Schwassmann-Wachmann
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Aug. 25.78970 TT                                  Rudenko
q   0.9729618            (2000.0)            P              Q
n   0.18127596     Peri.  199.48887     -0.02170981     +0.98296419
a   3.0920220      Node    69.61014     -0.88948792     +0.06435428
e   0.6853315      Incl.   11.22780     -0.45644268     -0.17216250
P   5.44
From 2500 observations 2016 Feb. 13-2022 Aug. 17, mean residual 0".8.
```

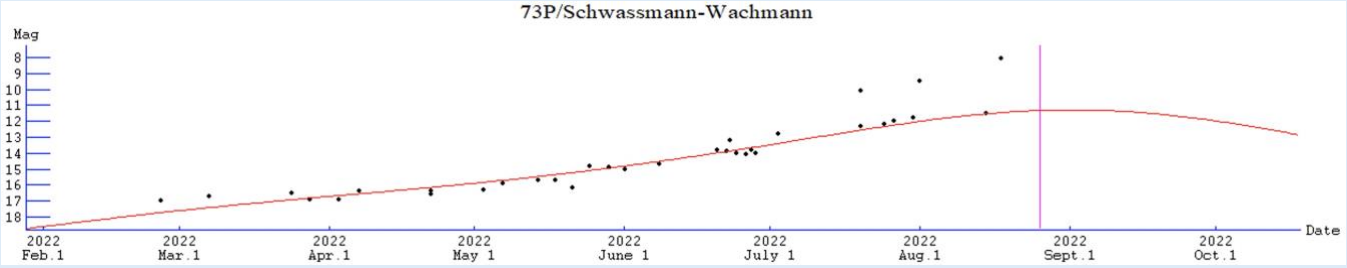
Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

73P/Schwassmann-Wachmann

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg) 40N	40S
2022-Sep-01	14 07	-18 10	0.977	1.016	57E	Vir	11.3	3	39
2022-Sep-06	14 29	-21 18	0.986	0.996	58E	Lib	11.3	3	41
2022-Sep-11	14 53	-24 21	1.001	0.980	60E	Lib	11.4	3	42
2022-Sep-16	15 19	-27 13	1.019	0.970	62E	Lib	11.5	3	44
2022-Sep-21	15 47	-29 49	1.043	0.966	63E	Lib	11.6	4	46
2022-Sep-26	16 16	-32 03	1.070	0.968	65E	Sco	11.8	4	48
2022-Oct-01	16 47	-33 50	1.101	0.976	67E	Sco	12.0	5	50
2022-Oct-06	17 18	-35 07	1.134	0.992	69E	Sco	12.2	6	51

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 08 17.86  S  8.4 TK 20.3T10  77   5    3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
```

73P/Schwassmann-Wachmann was one of four comets discovered by the team of Friedrich Karl Arnold Schwassmann and Arno Arthur Wachmann at Bergedorf Observatory in Hamburg, Germany. 73P was discovered photographically on 1930 May 2 at 9-10th magnitude. 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 the current one 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.

73P continues to experience splitting events as a number of faint secondaries have been observed so far this return. Michael Jäger found two secondaries on July 23 that have been officially announced as BU and BV. Both were around 19th magnitude at discovery failed to survive the month of August. On comets-ml, Michael Jäger also reported that he, Gerald Rhemann and Lukas Demetz found three more new fragments at distances of 75" to 50'. All were around 18th magnitude. These secondaries have yet to be announced and designated by the MPC. It will be interesting to see if any more secondaries are imaged this return.

73P has likely peaked in brightness and should fade from around magnitude 11 to 12 this month. It remains a difficult object low on the horizon at the end of astronomical twilight for northern observers. It is much better placed for observers south of the equator as it moves through Virgo (Sep 1-4), Libra (4-21), Lupus (21-24), and Scorpius (24-30).

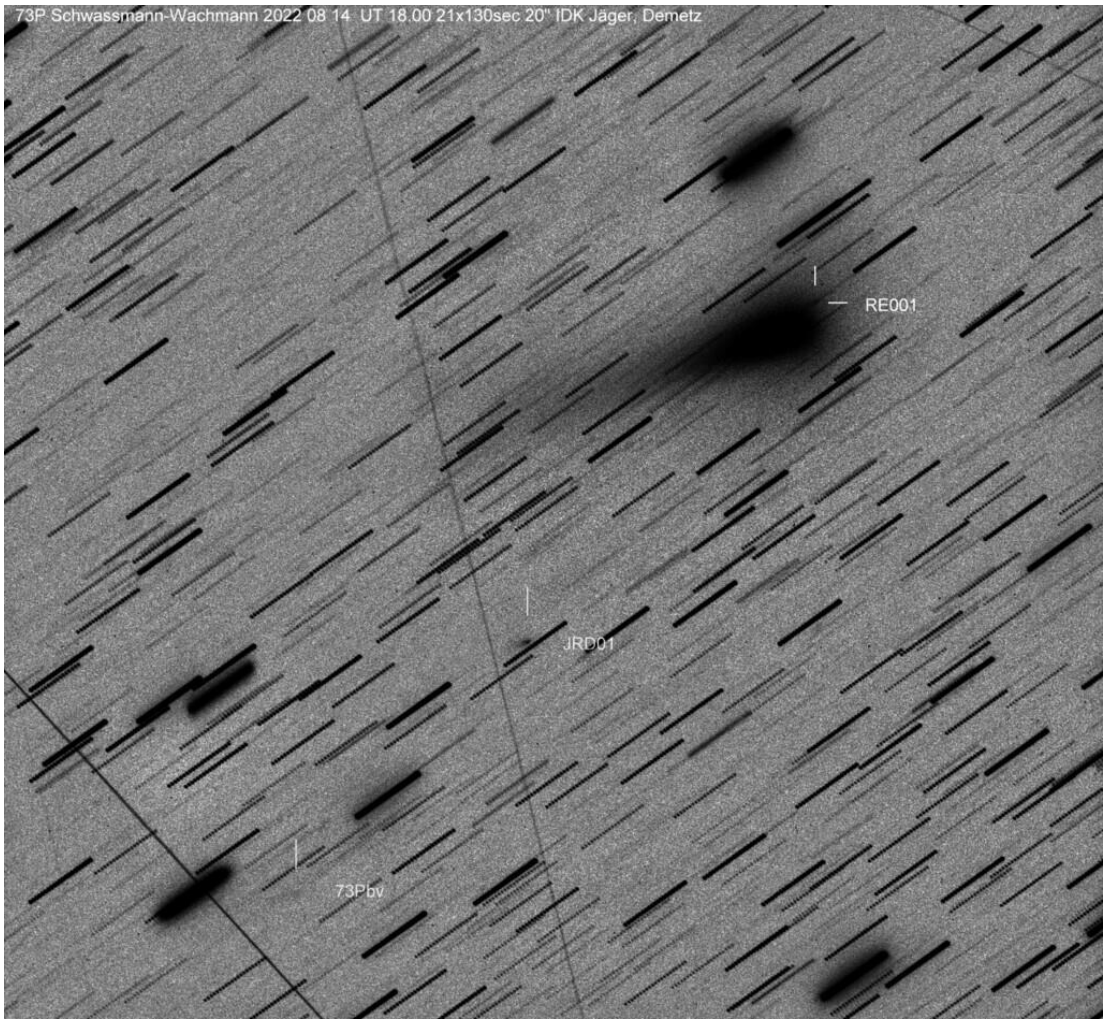


Figure 3 -Michael Jäger and Lukas Demetz imaged 73P on 2022 August 14 with a 0.3-m astrograph at Farm Tivoli in Namibia. In addition to the main comet three secondaries were also recorded. Secondary BV was officially announced but it nearly gone in this image. Tentatively named RE001 and JRD01 were new secondaries at the time of this image and have yet to receive official designations.

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-Q33)

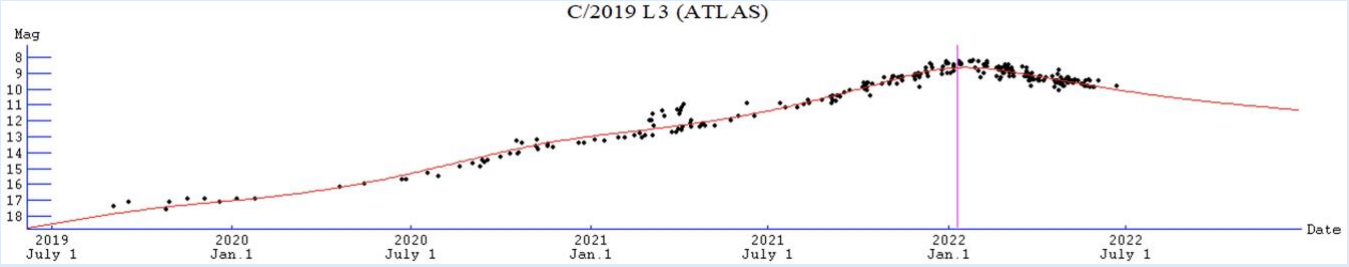
```
    C/2019 L3 (ATLAS)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Jan.  9.61852 TT                                  Rudenko
q   3.5544248           (2000.0)            P               Q
z  -0.0005067      Peri.  171.61011     -0.26046920     -0.66637163
 +/-0.0000003      Node   290.78799     +0.83677329     +0.20516883
e   1.0018010      Incl.   48.35648     +0.48162876     -0.71683652
From 5327 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-Sep-01  09 06   -05 26   4.134   5.008    27M    Hya   10.6     0    9
2022-Sep-06  09 11   -06 24   4.157   5.003    29M    Hya   10.7     0   11
2022-Sep-11  09 15   -07 22   4.180   4.996    32M    Hya   10.7     0   13
2022-Sep-16  09 19   -08 21   4.203   4.985    35M    Hya   10.7     0   15
2022-Sep-21  09 24   -09 22   4.226   4.971    38M    Hya   10.8     3   17
2022-Sep-26  09 28   -10 23   4.250   4.953    41M    Hya   10.8     7   19
2022-Oct-01  09 32   -11 26   4.274   4.933    44M    Hya   10.8    10   21
2022-Oct-06  09 35   -12 29   4.298   4.910    47M    Hya   10.9    13   23
```

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
```

No observations of C/2019 L3 (ATLAS) were submitted to the ALPO, MPC or COBS during July and August. This is due to the comet being located at small solar elongations with solar conjunction on July 29. This month should see the reappearance of C/2019 L3, first early in the month from the southern hemisphere and by the end of the month in the northern hemisphere. Since perihelion was back in January at 3.55 au, the comet is in full retreat from the Sun.

September finds the comet between 4.1 and 4.3 au from the Sun and around 5.0 au from Earth. As a morning object in Hydra, L3 should be fading from around magnitude 10.6 to 10.8. Since we haven't seen it since June, this prediction 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-Q33)

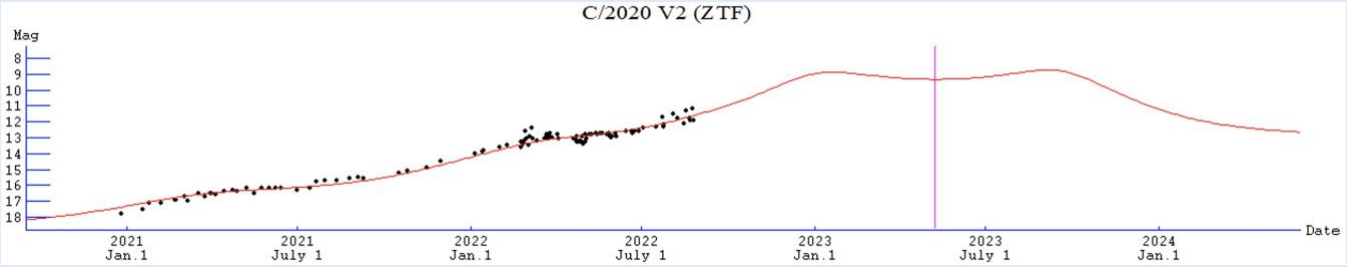
```
    C/2020 V2 (ZTF)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2023 May 8.53766 TT                                  Rudenko
q   2.2280136          (2000.0)            P              Q
z  -0.0004455      Peri.  162.41925     +0.69776745     +0.59404185
 +/-0.0000005      Node   212.37021     +0.53386738     -0.05867555
e   1.0009926      Incl.  131.61104     +0.47760467     -0.80229138
From 2741 observations 2020 Apr. 18-2022 Aug. 20, mean residual 0".4.
1/a(orig) = -0.000145 AU**-1, 1/a(fut) = -0.000383 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-Sep-01  10 23  +52 39    3.530    4.181     44M    UMa   11.5     17    0
2022-Sep-06  10 26  +52 45    3.491    4.106     46M    UMa   11.4     20    0
2022-Sep-11  10 30  +52 56    3.452    4.026     49M    UMa   11.3     22    0
2022-Sep-16  10 34  +53 10    3.413    3.942     51M    UMa   11.2     25    0
2022-Sep-21  10 37  +53 30    3.374    3.852     54M    UMa   11.2     28    0
2022-Sep-26  10 41  +53 55    3.335    3.758     57M    UMa   11.1     31    0
2022-Oct-01  10 45  +54 26    3.297    3.661     61M    UMa   11.0     34    0
2022-Oct-06  10 49  +55 04    3.259    3.559     64M    UMa   10.9     37    0
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  1.3 + 5 log d + 12.4 log r [through T-250 days]
m1 =  4.3 + 5 log d +  8.0 log r [T-250 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 08 31.86  S 12.5 TI 35.3L   144   1.1  4           ICQ XX HAR11 Christian Harder
   2020V2  2022 08 30.84  S 12.3 TI 35.3L   144   0.9  4           ICQ XX HAR11 Christian Harder
   2020V2  2022 08 27.89  S 12.6 TI 53.1L   155   1    4           ICQ XX HAR11 Christian Harder
   2020V2  2022 08 24.88  S 12.8 TI 53.1L   155   1.1  4           ICQ XX HAR11 Christian Harder
   2020V2  2022 08 23.84  S 11.7 TK 32.0L 5  80   0.5  5                  PIL01 Uwe Pilz
   2020V2  2022 08 20.91  S 12.7 TI 53.1L   155   0.8  4/          ICQ XX HAR11 Christian Harder
   2020V2  2022 08 17.88  S 11.6 AQ 20.3T10  77   3.5  4           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2020V2  2022 08 07.97  S 12.7 TI 53.1L   215   0.7  4           ICQ XX HAR11 Christian Harder
   2020V2  2022 08 03.88  S 12.0 TK 32.0L 5  80   0.5                  PIL01 Uwe Pilz
```

J. J. Gonzalez, Christian Harder, and Uwe Pilz observed V2 in August between magnitude 11.6 and 12.8 (aperture and personal bias corrected to between 11.2 and 11.9). This month V2 is a 11th magnitude object in the far northern morning sky in Ursa Major. Surprisingly for a dynamically new long-period comet, it has been brightening at a rapid 2.5n ~ 12.4 rate. Assuming a slower 2.5n = 8 rate going forward, 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. Perihelion occurs on 2023 May 8 at 2.23 au.

C/2022 E3 (ZTF)

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

Orbit (from Minor Planet Center, MPEC 2022-Q33)

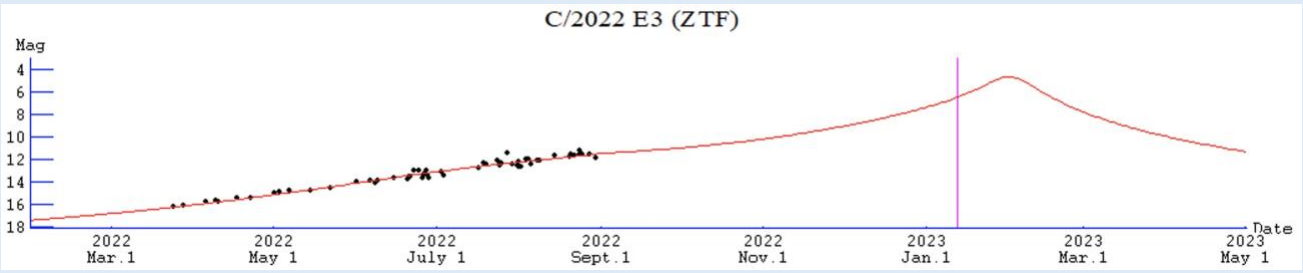
```
    C/2022 E3 (ZTF)
Epoch 2023 Jan. 16.0 TT = JDT 2459960.5
T 2023 Jan. 12.78407 TT                                  Rudenko
q   1.1122437           (2000.0)            P               Q
z  -0.0002958      Peri.  145.81457     -0.60064320     -0.07340955
 +/-0.0000027      Node   302.55528     +0.33751514     +0.87941604
e   1.0003290      Incl.  109.16879     +0.72478361     -0.47035994
From 2442 observations 2021 Oct. 25-2022 Aug. 19, mean residual 0".7.
1/a(orig) = +0.000757 AU**-1, 1/a(fut) = -0.000033 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-Sep-01  16 25  +32 41    2.285   2.184     82E    Her   11.5     61   15
2022-Sep-06  16 18  +31 52    2.227   2.202     78E    CrB   11.4     58   14
2022-Sep-11  16 12  +31 02    2.170   2.218     74E    CrB   11.3     54   12
2022-Sep-16  16 07  +30 13    2.112   2.233     69E    CrB   11.2     51   10
2022-Sep-21  16 02  +29 25    2.054   2.245     66E    CrB   11.2     47    7
2022-Sep-26  15 59  +28 39    1.997   2.253     62E    CrB   11.1     44    4
2022-Oct-01  15 56  +27 56    1.940   2.257     58E    CrB   11.0     41    0
2022-Oct-06  15 54  +27 15    1.883   2.255     55E    CrB   10.9     38    0
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  5.1 + 5 log d + 13.0 log r [Through 140 days before perihelion]
m1 =  6.8 + 5 log d +  8.0 log r [After 140 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 08 31.87  S 12.5 TI 35.3L   144   0.6  5   1.7 m100 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 30.83  S 12.0 TI 35.3L   144   0.8  5   1.5 m 90 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 29.87  S 12.7 TI 35.3L   144   0.7  5   1.5 m100 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 27.84  S 12.8 TI 53.1L   155   0.6  5 & 2   m 90 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 24.89  S 12.7 TI 53.1L   155   0.7  5   1.8 m100 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 23.86  S 12.4 TI 53.1L   139   0.8  5   3.1 m105 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 23.83  S 12.0 TK 32.0L 5  80   0.4  7   0.03 111         PIL01 Uwe Pilz
   2022E3  2022 08 20.88  S 12.7 TI 53.1L   139   0.6  5   1.8 m110 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 20.40 xM 12.9 AQ 40.0L 4 108   0.8  6    1.5m116 ICQ XX WYA   Chris Wyatt
   2022E3  2022 08 14.99  M 12.1 AQ 27  L 5 109   1    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2022E3  2022 08 09.01  S 12.9 TI 35.3L   176   0.8 s5   0.8 m120 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 08.02  S 13.3:TI 53.1L   215   0.5 s5   2   m120 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 05.95  S 13.0 TI 25.2L 4 113   0.65 5   1.5 m110 ICQ XX HAR11 Christian Harder
   2022E3  2022 08 04.93  S 12.6 TI 25.2L 4 113 & 0.6  5            ICQ XX HAR11 Christian Harder
   2022E3  2022 08 03.90  S 12.5 HS 32.0L 5  80   0.5  6                  PIL01 Uwe Pilz
   2022E3  2022 08 01.93  S 13.2 TI 25.2L 4 113 & 0.4  5            ICQ XX HAR11 Christian Harder
   2022E3  2022 08 01.02  S 12.5 AQ 20.3T10 133   0.6  6            ICQ XX GON05 Juan Jose Gonzalez Suarez
```

C/2022 E3 (ZTF) continued to brighten at a healthy pace in August. The ALPO received numerous observations of this still relatively faint object from Jose Guilherme de Souza Aguiar, J. J. Gonzalez, Christian Harder, Uwe Pilz, and Chris Wyatt. During the 2nd half of August, they reported magnitudes between 12.0 and 12.9 (aperture and bias corrected to 11.2 to 11.8). Thomas Lehmann also reported digital magnitude estimates to the COBS site on August 14 and 21. He found the comet at magnitude 11.7 on both nights with a 3.6' to 4.5' coma. Visually the observed coma has been smaller at between 0.4' and 0.8'. Quite unexpectedly for such a faint object, many observers have been reporting a tail up to 3' long visually and 7' in images.

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 is on pace to 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 see the comet again a week or so after closest approach to Earth when it should still be within 0.5-1.0 magnitude of peak brightness.

This month, C/2022 E3 is well placed for northern observers as it moves through the dense star fields of Hercules (Sep 1) and Corona Borealis (Sep 1-30) in the evening sky. It becomes a very low difficult object for southern hemisphere observers by the end of September.

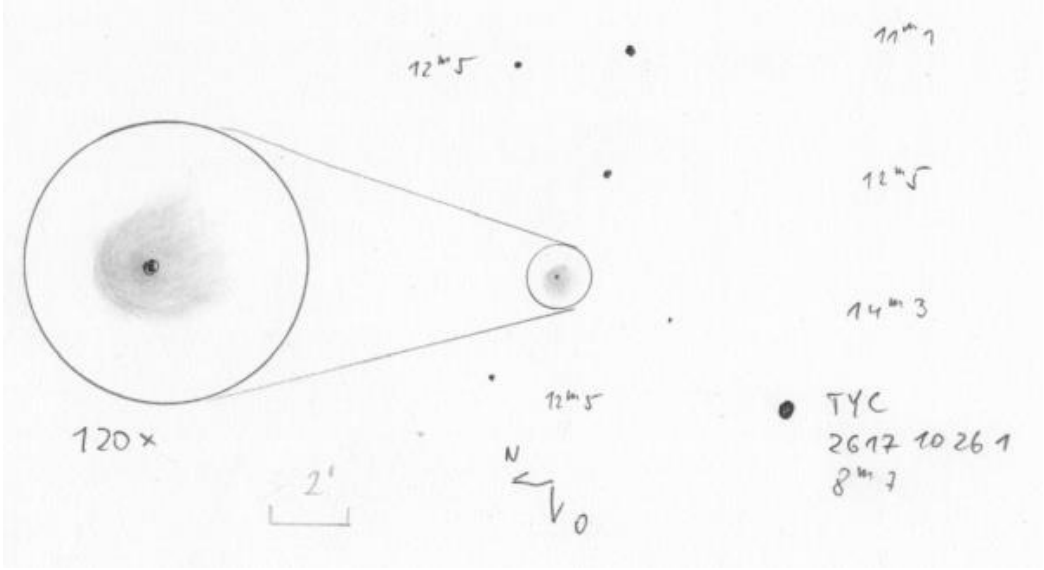


Figure 4 – Uwe Pilz found C/2022 E3 (ZTF) to be well condensed in a 12" dobsonian on 2022 August 2.

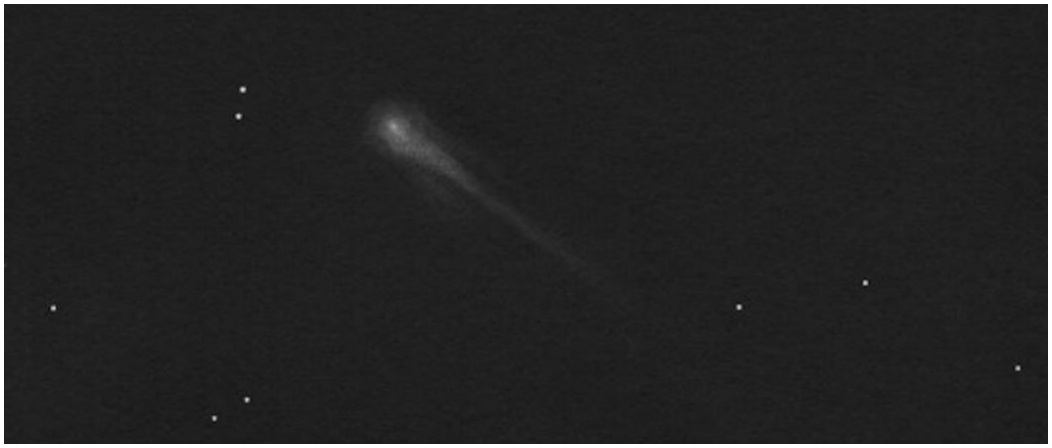


Figure 5 – Christian Harder sketched C/2022 E3 (ZTF) on 2022 August 23 with a 21" dobsonian at 215x.

C/2022 P2 (NEOWISE)

Discovered 2022 August 8 by the NEOWISE spacecraft
Halley-family comet

Orbit (from Minor Planet Center, MPEC 2022-Q139)

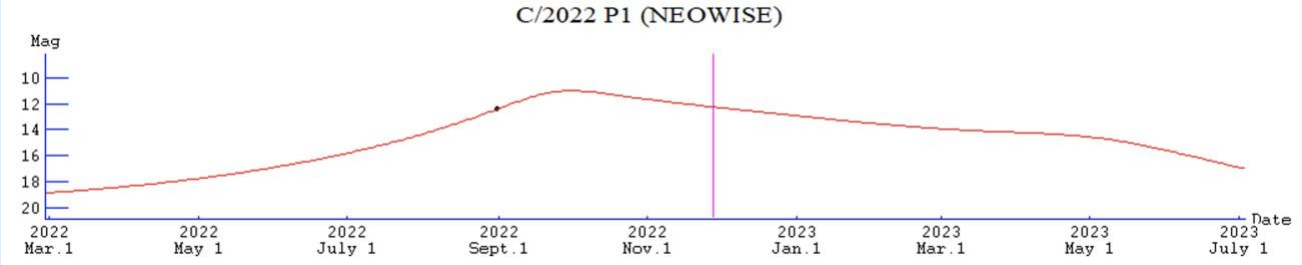
```
    C/2022 P1 (NEOWISE)
Epoch 2022 Aug. 9.0 TT = JDT 2459800.5
T 2022 Nov. 28.02226 TT                                  Rudenko
q   1.5970767            (2000.0)            P              Q
n   0.01045186     Peri.  249.74239     +0.67330322     -0.71662645
a  20.7176486      Node   205.11936     -0.40929487     -0.56621401
e   0.9229123      Incl.  154.61878     -0.61574384     -0.40724468
P  94.3
From 109 observations 2022 Aug. 8-25, mean residual 0".4.
```

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-Sep-01  02 25  +01 24    1.955   1.213    122M    Cet   12.3     51   49
2022-Sep-06  02 09  -02 58    1.920   1.093    132M    Cet   12.0     47   53
2022-Sep-11  01 49  -08 21    1.886   0.990    141M    Cet   11.7     41   59
2022-Sep-16  01 23  -14 43    1.854   0.911    150M    Cet   11.5     35   65
2022-Sep-21  00 50  -21 42    1.823   0.863    154M    Cet   11.3     28   72
2022-Sep-26  00 11  -28 32    1.793   0.851    150M    Scl   11.2     21   79
2022-Oct-01  23 27  -34 18    1.765   0.876    140E    Scl   11.2     16   84
2022-Oct-06  22 43  -38 25    1.739   0.932    128E    Gru   11.3     12   88
```

Comet Magnitude Formula

```
m1 =  7.6 + 5 log d + 15.0 log r [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
None.
```

Jana P. Chesley of the Jet Propulsion Laboratory reported the discovery of C/2022 P1 (NEOWISE) in images taken on 2022 August 8 by the NEOWISE spacecraft. In the days after discovery, ground-based observations found the new comet at around 16-17th magnitude. Perihelion occurs on 2022 November 28 at 1.60 au but closest approach to Earth comes two months earlier on September 25 at 0.85 au. With an orbital period of 94 years, P/2022 P2 is dynamically a Halley type comet.

Halley type comets can brighten rapidly. This appears to be the case as Michael Mattiazzo has reported on comets-ml a much brighter object than expected at magnitude 12.4 on images taken on August 31. Like Halley, P2 has a retrograde orbit (154 deg) and will rapidly shift from the morning through opposition into the evening sky as its moves through Cetus (Sep 1-23) and Sculptor (23-30). Though it has been brightening rapidly, it is likely the comet will peak at the end of this month around magnitude 11. Keep your eye on this one in case it gets even brighter.