

August 2023

# ALPO Comet News

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

PermID: 12P  
ProvID:  
TrkSub: ABC4440  
Speed: 0.58"/min  
PA: 268.3 deg

Date: 2023 07 24.115974  
RA: 18 12 46.89  
Dec: +55 49 46.7  
Exp: 32.500m (195x10s)

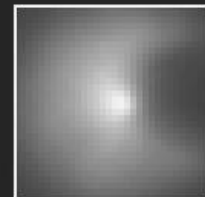
Pop goes 12P/Pons-Brooks!

Sol: 151 deg

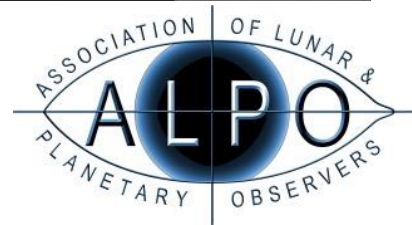


Elong: 100.1 deg  
Phase: 15.1 deg  
Alt: 74.4 deg  
Az: 12.3 deg  
Earth: 3.537 AU  
Sun: 3.848 AU  
PABL: 288.5 deg  
PABB: 71.9 deg  
Speed: 0.58"/min  
PA: 268.3 deg

Obs: J. Maikner  
Msr: J. Maikner  
Stn: W62  
Tel: 0.30-m f/3.8 Riccardi-Honders  
PSc: 0.69"/px  
FOV: 4.4 x 4.4 arcmin  
Cam: 71.7 x 47.8 arcmin



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### **On the Front Cover:**

Comet 12P/Pons-Brooks arrives on the celestial stage for the first time since its last perihelion in 1954. Prone to frequent outbursts, 12P experienced a 4- to 5-magnitude outburst on July 20. Four days later, John Maikner imaged 12P's expanding dust coma with a 0.30-m f/3.8 Riccardi-Honders astrograph at the Comet Hunter Observatory<sup>2</sup> in New Ringgold, PA.

The monthly ALPO Comet News PDF can be found on the ALPO Comets Section website (<http://www.alpo-astronomy.org/cometblog/> and in the [Comets Section Image Gallery](#)). A shorter version of this report is posted on a dedicated Cloudy Nights forum (<https://www.cloudynights.com/topic/886130-alpo-comet-news-for-august-2023/>). 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](mailto:comets@alpo-astronomy.org) >, Coordinator Carl Hergenrother < [carl.hergenrother@alpo-astronomy.org](mailto:carl.hergenrother@alpo-astronomy.org) >, and/or Acting Assistant Coordinator Michel Deconinck < [michel.deconinck@alpo-astronomy.org](mailto:michel.deconinck@alpo-astronomy.org) >.

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

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## Summary

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This month we welcome two returning periodic comets breaking the 12<sup>th</sup> magnitude barrier. In April 2024, Halley-type comet 12P/Pons-Brooks will make its first perihelion passage since 1954. On July 20th, it experienced a 4- to 5-magnitude outburst and is now an 11<sup>th</sup>-magnitude object in the evening sky. Due to peak at 7<sup>th</sup> magnitude this October, 103P/Hartley is returning for the second time since its superb return in 2010. By the end of this month, 103P should brighten to magnitude 9.5 in the morning sky.

Also visible this month are 8<sup>th</sup> magnitude C/2021 T4 (Lemmon), 9<sup>th</sup> magnitude C/2020 V2 (ZTF) and C/2023 E1 (ATLAS), and 11<sup>th</sup> magnitude C/2017 K2 (PANSTARRS).

Last month the ALPO Comets Section received 180 observations of comets C/2023 E1 (ATLAS), C/2023 A3 (Tsuchishan-ATLAS), C/2022 W3 (Leonard), C/2022 E3 (ATLAS), C/2022 A2 (PANSTARRS), C/2021 T4 (Lemmon), C/2020 V2 (ZTF), C/2020 K1 (PANSTARRS), C/2019 U5 (PANSTARRS), C/2019 T4 (ATLAS), C/2019 L3 (ATLAS), 237P/LINEAR, 126P/IRAS, 103P/Hartley, 80P/Peters-Hartley, 32P/Comas Sola, 12P/Pons-Brooks, and 2P/Encke. A big thanks to our July contributors: Dan Bartlett, J. J. Gonzalez, Jose Guilherme de Souza Aguiar, Christian Harder, Carl Hergenrother, Eliot Herman, John Maikner, Martin Mobberley, Charles Morris, Gary T. Nowak, Uwe Pilz, Michael Rosolina, Greg Shanos, Tenho Tuomi, and Chris Wyatt.

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## Request for Observations

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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](mailto:comets@alpo-astronomy.org) >, Comets Section Coordinator Carl Hergenrother < [carl.hergenrother@alpo-astronomy.org](mailto:carl.hergenrother@alpo-astronomy.org) > and/or Comets Section Acting Assistant Coordinator Michel Deconinck < [michel.deconinck@alpo-astronomy.org](mailto:michel.deconinck@alpo-astronomy.org) >.

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## Photometric Corrections to Magnitude Measurements

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We include up-to-date lightcurves for the comets discussed in these reports and apply aperture and personal corrections to the visual observations and only personal 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 reflectors and 0.066 magnitudes per centimeter for refractors. 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 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.

## Acknowledgments

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In addition to observations submitted directly to the ALPO, we occasionally use data from other sources to augment our analysis. Therefore, we acknowledge with thanks observations submitted directly to the ALPO and those submitted initially 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 analysis and would like to thank Thomas for his COBS observations. We would also like to thank the Jet Propulsion Laboratory for making their Small-Body Browser and Orbit Visualizer available and Seiichi Yoshida for his Comets for Windows programs that produced 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 add to our knowledge of these fantastic objects.

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

Clear skies!

- Carl Hergenrother

# Comets Calendar

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## Lunar Phases

- Aug 01 - Full Moon
- Aug 08 - Last Quarter Moon
- Aug 16 - New Moon
- Aug 24 - First Quarter Moon

## Comets at Perihelion

- Aug 03 - C/2022 U4 (Bok) [q = 2.90 au, V ~ 17]
- Aug 04 - 280P/Larsen [q = 2.64 au, 9.6-yr period, V ~ 21-22, found in 2004, also observed at 2013 return, running ~5 magnitudes fainter than expected this return]
- Aug 07 - 199P/Shoemaker [q = 2.91 au, 14.3-yr period, V ~ 14, found in 1994, also observed at 2009 and 2023 returns, experienced a 4 magnitude outburst to 14<sup>th</sup> mag in 2008]
- Aug 08 - 225P/LINEAR [q = 1.32 au, 6.0-yr period, V ~ 19, discovered in 2002, also seen at returns in 2009 and 2016]
- Aug 08 - A/2023 H4 [q = 2.12 au, V ~ 22, apparently inactive object on long-period ~1700-yr orbit]
- Aug 21 - 322P/SOHO [q = 0.05 au, 5.0-yr period, V ~ 5-6 but only in SOHO spacecraft data, observed from the ground and with the Spitzer IR space telescope in 2015, appears spectrally to be a typical rocky asteroid rather than a comet]
- Aug 30 - 339P/Gibbs [q = 1.32 au, 6.0-yr period, V ~ 20, poor return, close to Sun at perihelion, found in 2009, also seen at 2016 return]

## Photo Opportunities

- Aug 09-22 - C/2020 K1 (PANSTARRS) passes through a region of nebulosity in Chamaeleon
- Aug 10 - C/2023 E1 (ATLAS) within 0.5 deg of 8<sup>th</sup> mag open cluster NGC 7086
- Aug 11-12 - C/2023 E1 (ATLAS) passes through bright open cluster M39
- Aug 27-28 - 103P/Hartley passes within 0.5 deg of 10<sup>th</sup> mag galaxy NGC 891
- Aug 31 - 103P/Hartley passes just south of bright open cluster M34

# Recent Magnitudes Contributed to the ALPO Comets Section

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
					T					
C/2023 E1 (ATLAS)										
2023E1	2023 07 27.02	S 8.8	TI	19.6L	5	38	8.5 3		ICQ XX HAR11	Christian Harder
2023E1	2023 07 25.95	S 8.8	TI	19.6L	5	56	7 3		ICQ XX HAR11	Christian Harder
2023E1	2023 07 24.14	C 9.9	BG	30.5H	4A	485	4.1		ICQ XX MAIab	John Maikner
2023E1	2023 07 22.00	S 9.0	TI	19.6L	5	56	7 2/		ICQ XX HAR11	Christian Harder
2023E1	2023 07 21.94	S 8.7	TK	7.0B		15	11 3		ICQ XX GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 18.93	S 8.7	TK	7.0B		15	11 3		ICQ XX GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 18.92	S 8.5	TK	5.0B		10	8 4		ICQ XX GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 16.96	S 9.1	TK	32.0L	5	48	5 3/		PIL01	Uwe Pilz
2023E1	2023 07 16.91	S 9.7	TI	35.3L		105	4 3		ICQ XX HAR11	Christian Harder
2023E1	2023 07 13.00	S 8.9	TI	19.6L	5	40	6.5 2/		ICQ XX HAR11	Christian Harder
2023E1	2023 07 11.18	S 10.0		35.6T	11	98	6 2		ICQ xx ROSxx	Michael Rosolina
2023E1	2023 07 10.93	S 8.8	TK	7.0B		15	11 3		ICQ XX GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 10.92	S 8.6	TK	5.0B		10	8 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 07.17	S 9.2	TK	12.5B		30	6 2		ICQ xx HER02	Carl Hergenrother
C/2023 A3 (Tsuchinshan-ATLAS)										
2023A3	2023 07 12.09	C 16.4	BG	30.5H	4B	400	0.4		ICQ XX MAIab	John Maikner
2023A3	2023 07 07.85	V 16.7	U4	50.0Y	7a	600	0.5	0.3m110	ICQ xx HER02	Carl Hergenrother
C/2022 E3 (ZTF)										
2022E3	2023 02 15.04	B 7.4	TT	10.0B		25	5 2		ICQ XX NOW	Gary T. Nowak
2022E3	2023 02 12.02	B 6.4	TT	10.0B		25	10 3		ICQ XX NOW	Gary T. Nowak
2022E3	2023 02 02.19	B 5.4	TT	8.0B		16	32 6		ICQ XX NOW	Gary T. Nowak
2022E3	2023 02 01.98	B 5.4	TT	5.6B		11	20 2		ICQ XX NOW	Gary T. Nowak
C/2022 A2 (PANSTARRS)										
2022A2	2023 07 27.03	S 13.0	TI	35.3L		144	1.8 0/		ICQ XX HAR11	Christian Harder
2022A2	2023 07 24.34	M 13.1	AQ	30 L	5	121	1 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 07 23.23	C 12.4	BG	13.0R	6A	020	1.2		ICQ XX MAIab	John Maikner
2022A2	2023 07 22.02	S 11.8	TI	35.3L		122	1.8 2		ICQ XX HAR11	Christian Harder
2022A2	2023 07 20.34	M 12.9	AQ	30 L	5	121	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 07 16.98	S 12.6	TI	35.3L		176	1.4 2		ICQ XX HAR11	Christian Harder
2022A2	2023 07 16.98	S 12.9	HS	32.0L	5	80	0.8		PIL01	Uwe Pilz
2022A2	2023 07 15.34	M 12.7	AQ	30 L	5	121	1 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 07 14.35	M 12.7	AQ	30 L	5	100	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 07 01.35	M 12.6	AQ	30 L	5	100	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 06 30.34	M 12.5	AQ	30 L	5	100	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 06 29.34	M 12.5	AQ	30 L	5	100	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 06 27.34	M 12.4	AQ	30 L	5	100	1 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 06 26.34	M 12.4	AQ	30 L	5	100	1 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2022A2	2023 06 22.34	M 12.3	AQ	30 L	5	100	1 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2021 T4 (ZTF)										
2021T4	2023 07 22.97	M 9.0	TK	8 B		20	1 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 22.97	S 9.0	TK	8.0B		20	2 4		ICQ XX SOU01	Willian Souza
2021T4	2023 07 22.52	xM 9.0	TK	7.0B		15	11 3/		ICQ XX WYA	Christopher Wyatt
2021T4	2023 07 21.27	M 9.0	TK	30 L	5	88	4 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 20.41	xM 9.0	TK	7.0B		15	8 4		ICQ XX WYA	Christopher Wyatt
2021T4	2023 07 20.27	M 9.1	TK	30 L	5	88	4 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 16.14	Z 8.0	U4	20.0L	3a	540	26.2	0.4 230	ICQ xx HER02	Carl Hergenrother
2021T4	2023 07 15.33	M 9.3	TK	30 L	5	88	4 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 14.45	xM 8.9	TK	7.0B		15	8 3/		ICQ XX WYA	Christopher Wyatt
2021T4	2023 07 14.33	M 9.4	TK	30 L	5	88	4 4/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 01.33	M 10.4	AQ	30 L	5	88	3 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 06 30.31	M 10.5	TK	30 L	5	88	3 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 06 29.32	M 10.5	TK	30 L	5	88	3 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 06 27.32	M 10.6	TK	30 L	5	88	3 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 06 26.32	M 10.6	TK	30 L	5	88	3 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 06 22.33	M 10.9	TK	30 L	5	88	3 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2020 V2 (ZTF)										
2020V2	2023 07 25.35	M 9.8	TK	10 B		25	2 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 24.35	M 10.0	TK	30 L	5	88	4 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 22.35	M 9.9	TK	30 L	5	88	4 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 21.35	M 10.0	TK	30 L	5	88	4 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 20.35	M 10.0	TK	30 L	5	88	4 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 15.34	M 9.9	TK	30 L	5	88	4 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 14.35	M 9.8	TK	30 L	5	88	4 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 06.35	M 10.0	TK	30 L	5	88	3 4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 05.35	M 10.1	TK	30 L	5	88	3 3/		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 04.35	M 10.1	TK	30 L	5	88	3 3		ICQ XX DES01	Jose Guilherme de Souza Aguiar

2020V2	2023 07 01.35	M 10.2 TK 30 L 5 88	2	3	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 06 30.35	M 10.3 TK 30 L 5 88	2	3	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 06 29.35	M 10.3 TK 30 L 5 88	2	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 06 27.35	M 10.3 TK 30 L 5 88	2	3	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 06 26.35	M 10.4 TK 30 L 5 88	2	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 06 22.35	M 10.4 TK 30 L 5 88	2	3	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 02 15.00	B 10.6 TT 10.0B 25	2	1	ICQ XX NOW	Gary T. Nowak
2020V2	2023 02 12.01	B 9.8 TT 10.0B 25	3	1	ICQ XX NOW	Gary T. Nowak
C/2020 K1 (PANSTARRS)						
2020K1	2023 07 22.51	xM 13.1 AQ 25.0L 5 125	1	4	ICQ XX WYA	Christopher Wyatt
2020K1	2023 07 14.42	xM 13.8 AQ 40.0L 4 108	1.2	5/	ICQ XX WYA	Christopher Wyatt
2020K1	2023 06 29.32	M 12.7 AQ 30 L 5 100	1	3	ICQ XX DES01	Jose Guilherme de Souza Aguiar
2020K1	2023 06 26.31	M 12.6 AQ 30 L 5 100	1	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2019 U5 (PANSTARRS)						
2019U5	2023 07 14.42	xM 13.7 AQ 40.0L 4 182	0.9	4	ICQ XX WYA	Christopher Wyatt
C/2019 T4 (Lemmon)						
2019T4	2023 07 22.48	xM 13.0 AQ 25.0L 5 125	1.3	3	ICQ XX WYA	Christopher Wyatt
2019T4	2023 07 14.43	xM 13.6 AQ 40.0L 4 108	1.2	5	ICQ XX WYA	Christopher Wyatt
C/2019 L3 (ATLAS)						
2019L3	2023 07 14.41	xM 13.2 AQ 40.0L 4 108	1.7	3/	ICQ XX WYA	Christopher Wyatt
237P/LINEAR						
237	2023 07 22.49	xM 12.3 AQ 25.0L 5 74	1.6	3/	ICQ XX WYA	Christopher Wyatt
237	2023 07 22.01	S 12.4 TI 35.3L 144	0.9	3	ICQ XX HAR11	Christian Harder
237	2023 07 20.43	xM 12.6 AQ 25.0L 5 125	1.3	4/	ICQ XX WYA	Christopher Wyatt
237	2023 07 16.97	S 12.5 HS 32.0L 5 80	0.6		PIL01	Uwe Pilz
237	2023 07 16.91	S 11.3 TI 35.3L 144	1.3	3	ICQ XX HAR11	Christian Harder
237	2023 07 14.43	xM 12.2 AQ 40.0L 4 108	1.2	4/	ICQ XX WYA	Christopher Wyatt
237	2023 07 11.99	M 12.6 AQ 30 L 5 100	1	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
237	2023 06 28.26	M 12.3 AQ 30 L 5 100	2	4	ICQ XX DES01	Jose Guilherme de Souza Aguiar
237	2023 06 26.28	M 12.1 AQ 30 L 5 100	2	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
237	2023 06 22.30	M 11.9 AQ 30 L 5 100	2	3/	ICQ XX DES01	Jose Guilherme de Souza Aguiar
126P/IRAS						
126	2023 07 24.31	C 16.1 BG 30.5H 4A650	1.1	1 m	ICQ XX MAIab	John Maikner
103P/Hartley						
103	2023 07 16.97	S 13.5 HS 32.0L 5 80	1.6		PIL01	Uwe Pilz
103	2023 07 06.30	C 17.1 BG 13.0R 6A800			ICQ XX MAIab	John Maikner
80P/Peters-Hartley						
80	2023 07 23.22	C 20.2 BG 30.5H 4D740			ICQ XX MAIab	John Maikner
80	2023 07 06.22	C 19.4 BG 13.0R 6G200			ICQ XX MAIab	John Maikner
32P/Comas Sola						
32	2023 07 06.33	C 17.8 BG 13.0R 6B100			ICQ XX MAIab	John Maikner
12P/Pons-Brooks						
12	2023 07 29.97	S 11.1 TK 32.0L 5 80	1.5	2	PIL01	Uwe Pilz
12	2023 07 27.23	C 11.9 AQ 40.6T 7a690	2.0		ICQ XX MOR	Charles Morris
12	2023 07 28.21	C 11.9 AQ 40.6T 7a630	2.4		ICQ XX MOR	Charles Morris
12	2023 07 27.07	S 12.0 TK 32.0L 5 240	0.4		PIL01	Uwe Pilz
12	2023 07 27.00	S 11.9 TI 35.3L 144	1.8	3	ICQ XX HAR11	Christian Harder
12	2023 07 26.24	S 11.2 35.6T11 230	2.3	3	ICQ xx ROSxx	Michael Rosolina
12	2023 07 26.23	C 12.0 AQ 40.6T 7a600	1.8		ICQ XX MOR	Charles Morris
12	2023 07 25.94	S 11.4 TI 19.6L 5 38	1.3	3/	ICQ XX HAR11	Christian Harder
12	2023 07 25.92	S 11.4 TI 35.3L 105	1.7	3/	ICQ XX HAR11	Christian Harder
12	2023 07 25.23	C 11.9 AQ 40.6T 6a630	1.4		ICQ XX MOR	Charles Morris
12	2023 07 25.20	C 11.9 AQ 40.6T 6a600	1.3		ICQ XX MOR	Charles Morris
12	2023 07 25.02	Z 11.5 U4 50.0Y 7A080	4.5		ICQ xx HER02	Carl Hergenrother
12	2023 07 24.12	C 11.6 BG 30.5H 4a975	1.8		ICQ XX MAIab	John Maikner
12	2023 07 23.97	Z 11.6 U4 50.0Y 7A080	1.7		ICQ xx HER02	Carl Hergenrother
12	2023 07 23.16	S 11.9 35.6T11 230	1.3	3/	ICQ xx ROSxx	Michael Rosolina
12	2023 07 23.11	Z 11.6 U4 50.0Y 7A080	1.8		ICQ xx HER02	Carl Hergenrother
12	2023 07 22.51	xM 11.5 AQ 25.0L 5 125	0.7	4/	ICQ XX WYA	Christopher Wyatt
12	2023 07 22.28	C 11.8 U4 40.6T 7a540	0.9		ICQ XX MOR	Charles Morris
12	2023 07 21.99	S 11.6 TI 35.3L 144	0.5	8	ICQ XX HAR11	Christian Harder
12	2023 07 21.93	Z 11.8 U4 50.0Y 7a600	0.4		ICQ xx HER02	Carl Hergenrother
12	2023 07 21.91	I 11.6 TK 20.3T10 77		9	ICQ XX GON05	Juan Jose Gonzalez Suarez
12	2023 07 21.15	Z 11.6 U4 50.0Y 7a600	0.3		ICQ xx HER02	Carl Hergenrother
12	2023 07 20.28	C 16.5 AQ 40.6T 6a540	0.5		ICQ XX MOR	Charles Morris
12	2023 07 18.28	C 16.4 AQ 40.6T 6a600	0.6		ICQ XX MOR	Charles Morris
12	2023 07 15.31	C 16.6 AQ 40.6T 6a810	0.6		ICQ XX MOR	Charles Morris
12	2023 07 14.30	C 16.6 AQ 40.6T 6a750	0.2		ICQ XX MOR	Charles Morris
12	2023 07 11.90	Z 16.5 U4 50.0Y 7a600	0.5	0.3m110	ICQ xx HER02	Carl Hergenrother
12	2023 07 11.10	C 16.9 BG 30.5H 4B400	0.6		ICQ XX MAIab	John Maikner
12	2023 07 10.30	C 16.8 AQ 40.6T 6a780	0.5		ICQ XX MOR	Charles Morris
12	2023 07 06.14	C 16.8 BG 13.0R 6D680			ICQ XX MAIab	John Maikner
12	2023 06 26.29	C 17.2 AQ 40.6T 6a510	0.3		ICQ XX MOR	Charles Morris
12	2023 06 22.30	C 17.1 AQ 40.6T 6a690	0.5		ICQ XX MOR	Charles Morris
12	2023 06 21.27	C 17.0 AQ 40.6T 6a480	0.6		ICQ XX MOR	Charles Morris

2P/Encke  
2

2023 07 24.34 C 18.8 BG 30.5H 4A525 1.5

ICQ XX MAIab John Maikner



## Comets News

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### Recent Periodic Comet Numberings

466P/2015 T3 = P/2023 M3 (PANSTARRS)	MPC 163244
465P/2008 L2 = P/2023 L1 (Hill)	MPC 163244
464P/2014 OL465 (PANSTARRS)	MPC 163244
463P/2018 HT3 (NEOWISE)	MPC 163244
462P/2022 M1 = P/2000 OZ21 (LONEOS-PANSTARRS)	MPC 163244
461P/2010 OE101 = P/2021 LJ31 (WISE)	MPC 163244

### New Discoveries and Recoveries

*P/2023 O1 = P/2004 V3 (Siding Spring)* – Martin Masek of the Institute of Physics in Prague, Czechia, recovered 19<sup>th</sup> magnitude P/2004 V3 (Siding Spring) on July 18 and 19 with the "F/(Ph)otometric Robotic Atmospheric Monitor" 0.3-m f/6.8 reflector at the Pierre Auger Observatory at Malarguee, Argentina. H. Sato of Tokyo, Japan, also reported pre-recovery observations with a 0.51-m f/6.8 astrograph at Siding Spring, Australia, on June 19. P/Siding Spring is a short-period comet with an orbital period of 19.0 years and perihelion on 2023 November 21, at 3.95 au. It should reach a peak brightness of 18<sup>th</sup> magnitude this month though it may stay within a magnitude of that through the rest of the year and most of 2024. [CBET 5282, MPEC 2023-O89]

*P/2023 M4 (ATLAS)* - The "Asteroid Terrestrial-Impact Last Alert System" (ATLAS) search program found a very condensed 16<sup>th</sup> magnitude short-period comet on June 21 with a 0.5-m f/2 Schmidt reflector at Sutherland, South Africa. K. Ly of El Monte, California, found archival images from 2021 when the comet was at 21<sup>st</sup> magnitude. With perihelion on 2022 April 14 at 3.93 au, the large difference in M4's pre- vs post-perihelion brightness suggests the possibility of a recent outburst. Its current orbit has a 12.8-year orbital period. [CBET 5281, MPEC 2023-O51]

*P/2023 M3 = P/2015 T3 (PANSTARRS)* - Jacqueline B. Fazekas of the Catalina Sky Survey reported the discovery of a new 19<sup>th</sup> magnitude comet on images taken with the Mount Lemmon 1.5-m on June 26. The new comet was identified by M. Suzuki (Kitami, Japan) as a recovery of P/2015 T3 (PANSTARRS). Now designated 466P/PANSTARRS, this short-period comet with an 8.1-year orbital period was at perihelion back on May 3 at 2.15 au. This time around, it should peak at 18<sup>th</sup> magnitude in September, a magnitude brighter than it reached in 2015. [CBET 5277, MPEC 2023-N18]

*P/2023 M2 (PANSTARRS)* - R. Weryk (University of Western Ontario) reported the discovery of P/2023 M2 on June 22 at 20<sup>th</sup> magnitude with the Pan-STARRS1 1.8-m Ritchey-Chretien reflector at Haleakala. P/2023 M2 is a short-period comet with a 13.1-year orbital period. Perihelion was last month on July 17 at 3.50 au. M2 is at its brightness this month around magnitude 19. [MPEC 5276, CBET 2023-N15]

*P/2023 H6 = P/2010 TO20 (LINEAR-Grauer)* – M. Micheli and C. Schambeau used the large 8.1-m Gemini South telescope at Cerro Pachon, Chile, to recover P/2010 TO20 at 23<sup>rd</sup> magnitude on April 20 and May 25. This comet has been dynamically quite active of late with several close approaches to Jupiter and Saturn (the comet passed 0.24 AU from Saturn in 1960 August, 0.35 AU from Jupiter on 2003 Aug. 26, and 0.075 AU from Jupiter on 2009 Oct. 22 UT [from CBET 5283]). As a result, its current orbit is 29P-like, with a perihelion distance of 5.51 au and aphelion only slightly farther out at 5.81 au. Its most recent perihelion was last year on November 27. [CBET 5283, MPEC 2023-O88]

*C/2023 F1 (ATLAS)* - ATLAS found an apparently asteroidal object with a 0.5-m f/2 Schmidt reflector at Rio Hurtado on March 28 at 18<sup>th</sup> magnitude. Subsequent observations found the object to be cometary. *C/2023 F1* is a distant object not arriving at perihelion until 2025 February 2 at 5.19 au. It may reach 15<sup>th</sup> magnitude in 2025. [CBET 5279, MPEC 2023-O43]

# Comets Brighter than Magnitude 10

## C/2023 E1 (ATLAS)

Discovered 2023 March 1 by the Asteroid Terrestrial-Impact Last Alert System program from Sutherland, South Africa. Halley-type comet

### Orbit (from Minor Planet Center, MPEC 2023-O106)

C/2023 E1 (ATLAS)  
 Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
 T 2023 July 1.10945 TT Rudenko  
 q 1.0266338 (2000.0) P Q  
 n 0.01159299 Peri. 105.89865 +0.06333839 +0.98427267  
 a 19.3347692 Node 164.57356 -0.97143272 +0.02293713  
 e 0.9469022 Incl. 38.31343 +0.22870660 -0.17516051  
 P 85.0  
 From 1827 observations 2022 Dec. 25-2023 July 27, mean residual 0".5.

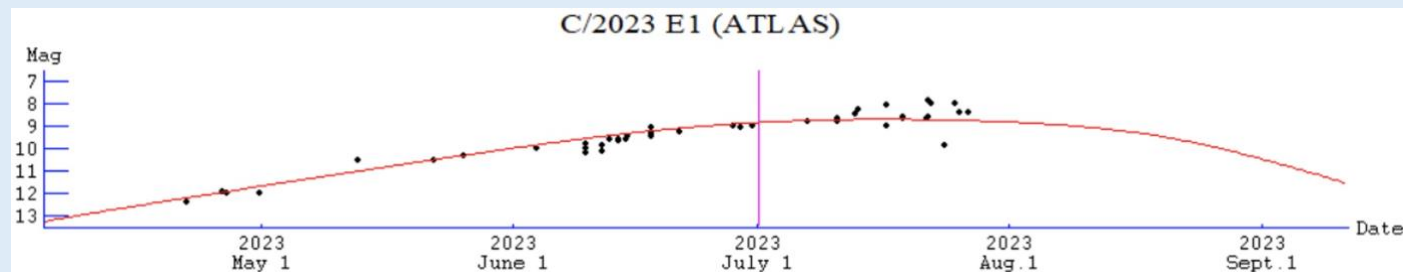
### Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg)	
								40N	40S
2023-Aug-01	20 53	+66 08	1.144	0.438	95E	Cep	8.8	64	0
2023-Aug-06	21 14	+59 07	1.182	0.409	103E	Cep	8.9	71	0
2023-Aug-11	21 29	+50 37	1.223	0.387	113E	Cyg	9.1	80	0
2023-Aug-16	21 40	+40 51	1.267	0.376	125E	Cyg	9.3	90	10
2023-Aug-21	21 48	+30 18	1.314	0.377	137E	Cyg	9.6	80	20
2023-Aug-26	21 54	+19 48	1.363	0.393	149E	Peg	9.9	69	31
2023-Aug-31	21 59	+10 12	1.414	0.424	158E	Peg	10.4	60	40
2023-Sep-05	22 04	+01 58	1.467	0.469	164E	Aqr	10.9	52	48

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

$$m1 = 9.6 + 5 \log d + 17.5 \log r$$

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 (UT)	Mag	SC	APER	FL	POW	COMA Dia	TAIL DC	ICQ LENG	CODE PA	Observer Name
2023E1	2023 07 27.02	S 8.8	TI	19.6L	5	38	8.5	3	ICQ XX	HAR11	Christian Harder
2023E1	2023 07 25.95	S 8.8	TI	19.6L	5	56	7	3	ICQ XX	HAR11	Christian Harder
2023E1	2023 07 24.14	C 9.9	BG	30.5H	4A485		4.1		ICQ XX	MAIab	John Maikner
2023E1	2023 07 22.00	S 9.0	TI	19.6L	5	56	7	2/	ICQ XX	HAR11	Christian Harder
2023E1	2023 07 21.94	S 8.7	TK	7.0B		15	11	3	ICQ XX	GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 18.93	S 8.7	TK	7.0B		15	11	3	ICQ XX	GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 18.92	S 8.5	TK	5.0B		10	8	4	ICQ XX	GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 16.96	S 9.1	TK	32.0L	5	48	5	3/	ICQ XX	PIL01	Uwe Pilz
2023E1	2023 07 16.91	S 9.7	TI	35.3L		105	4	3	ICQ XX	HAR11	Christian Harder
2023E1	2023 07 13.00	S 8.9	TI	19.6L	5	40	6.5	2/	ICQ XX	HAR11	Christian Harder
2023E1	2023 07 11.18	S 10.0		35.6T11		98	6	2	ICQ xx	ROSxx	Michael Rosolina
2023E1	2023 07 10.93	S 8.8	TK	7.0B		15	11	3	ICQ XX	GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 10.92	S 8.6	TK	5.0B		10	8	3/	ICQ XX	GON05	Juan Jose Gonzalez Suarez
2023E1	2023 07 07.17	S 9.2	TK	12.5B		30	6	2	ICQ xx	HER02	Carl Hergenrother

C/2023 E1 (ATLAS) is one of two relatively bright Halley-type comets visible this month. The other, 12P/Pons-Brooks, will be discussed later in this report. C/2023 E1 was discovered in March of this year by the Asteroid

Terrestrial-impact Last Alert System (ATLAS) with their 0.5-m f/2 Schmidt reflector at Sutherland, South Africa. It is making its first return in 85 years, with its previous (unseen) perihelion back in 1937. Perihelion was last month on July 1 at 1.03 au. Though now moving away from the Sun, it is still moving towards the Earth, with the closest approach on August 18 at 0.37 au.

Several visual observers (Juan Jose Gonzalez Suarez, Christian Harder, Carl Hergenrother, John Maikner, Michael Rosolina, and Uwe Pilz) reported observations of E1 in July. Most visual observations found the comet between magnitude 8.5 and 9.7 with a concentration around 8.7-8.8. A somewhat diffuse coma (DC = 2.5 to 4) with a diameter as large as 11' was also seen. While Dan Bartlett detected a faint but long, narrow gas tail in his images, the tail was not reported by any visual observers.

C/2023 E1 has spent most of this apparition as a far northern object. This month E1 heads south enough to be visible to southern hemisphere observers as it moves through Cepheus (Aug 1-8), Cygnus (8-21), and Pegasus (21-31) in the evening sky and opposition sky. The comet's brightness this month depends on how quickly it will fade after perihelion. If it fades at the same rate as it brightened (2.5n ~ 17.5), it may fade rapidly from around magnitude 8.8 on August 1 to 10.5 on September 1.



Figure 1: C/2023 E1 (ATLAS) shines next to Gyulbudaghian's Nebula in this image taken by Martin Moberley with an iTelescopes 0.61-m CDK and FLI PL09000 camera. The image was taken on July 30, consisting of an LRGB composite of 180:120:120:120 seconds.

## C/2021 T4 (Lemmon)

Discovered 2021 October 7 by the Mount Lemmon Survey  
Dynamically new long-period comet

### Orbit (from Minor Planet Center, MPEC 2023-O106)

C/2021 T4 (Lemmon)  
Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
T 2023 July 31.53909 TT Rudenko  
q 1.4832787 (2000.0) P Q  
z +0.0000838 Peri. 329.82238 +0.28264707 -0.90359482  
+/-0.0000006 Node 257.88463 -0.80103746 -0.40696305  
e 0.9998757 Incl. 160.77706 -0.52768326 +0.13378143  
From 1300 observations 2021 Aug. 7-2023 July 23, mean residual 0".6.  
1/a(orig) = +0.000005 AU\*\*<sup>-1</sup>, 1/a(fut) = +0.000948 AU\*\*<sup>-1</sup>.

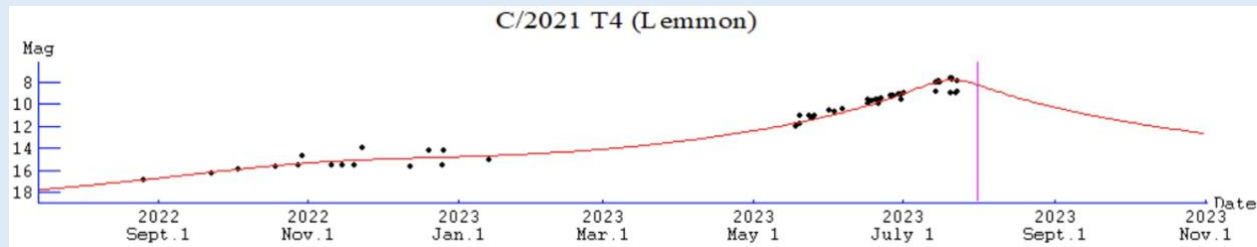
### Ephemerides (produced with Seiichi Yoshida's Comets for Windows program)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2023-Aug-01	16 19	-42 23	1.483	0.689	119E	Nor	8.3	6	88
2023-Aug-06	15 43	-35 24	1.485	0.814	108E	Lup	8.7	9	85
2023-Aug-11	15 23	-30 07	1.491	0.957	98E	Lup	9.0	11	78
2023-Aug-16	15 11	-26 10	1.499	1.107	89E	Lib	9.4	12	70
2023-Aug-21	15 03	-23 12	1.511	1.261	82E	Lib	9.7	12	62
2023-Aug-26	14 58	-20 55	1.526	1.415	75E	Lib	10.0	11	56
2023-Aug-31	14 54	-19 08	1.544	1.566	69E	Lib	10.3	11	50
2023-Sep-05	14 52	-17 43	1.565	1.715	64E	Lib	10.5	10	44

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

$$m_1 = 7.4 + 5 \log d + 10.0 \log r$$

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 (UT)	Mag	SC	APER	FL	POW	COMA Dia	TAIL DC	ICQ	CODE	Observer Name
2021T4	2023 07 22.97	M 9.0	TK	8	B	20	1	3/	ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 22.97	S 9.0	TK	8.0B		20	2	4	ICQ XX	SOU01	Willian Souza
2021T4	2023 07 22.52	xM 9.0	TK	7.0B		15	11	3/	ICQ XX	WYA	Christopher Wyatt
2021T4	2023 07 21.27	M 9.0	TK	30	L 5	88	4	4	ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 20.41	xM 9.0	TK	7.0B		15	8	4	ICQ XX	WYA	Christopher Wyatt
2021T4	2023 07 20.27	M 9.1	TK	30	L 5	88	4	4	ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 16.14	Z 8.0	U4	20.0L	3a540	26.2		0.4 230	ICQ xx	HER02	Carl Hergenrother
2021T4	2023 07 15.33	M 9.3	TK	30	L 5	88	4	4	ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 14.45	xM 8.9	TK	7.0B		15	8	3/	ICQ XX	WYA	Christopher Wyatt
2021T4	2023 07 14.33	M 9.4	TK	30	L 5	88	4	4/	ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2021T4	2023 07 01.33	M 10.4	AQ	30	L 5	88	3	3	ICQ XX	DES01	Jose Guilherme de Souza Aguiar

C/2021 T4 (Lemmon) was a photometric enigma last month, with a large scatter in magnitude estimates between 8.0 and 9.4 during the 2<sup>nd</sup> half of the month. While visual estimates had about a magnitude of scatter, imagers found the comet near the bright end of that range at 7.8 to 8.0. A large coma may be part of the issue, with visual observers reporting a massive range in diameters between 1' and 11'. The coma was even larger in images, approaching nearly a half degree in size.



C/Lemmon was located far to the south during July, making it a difficult observation for northern observers. This month it moves to the north again, allowing northern mid-latitude observers another chance to observe it. Even then, it will be a low object in the southern to southwestern sky for northern mid-latitude observers. South of the equator, Lemmon will be well placed in the evening sky as it moves through Norma (Aug 1), Scorpius (1-2), Lupus (2-11), and Libra (11-31).

Now past its July 31 perihelion at 1.48 au and closest approach to Earth on July 20 at 0.54 au, Lemmon should start fading from around magnitude 8.3 on the 1<sup>st</sup> to 10.3 at the end of the month.



Figure 2 – Eliot Herman (Tucson, AZ) used the iTelescope T69 Celestron RASAS11 at Siding Spring, Australia, to obtain this 5x60 sec exposure of C/2021 T4 (Lemmon) on 2023 July 14.

## C/2020 V2 (ZTF)

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

### Orbit (from Minor Planet Center, MPEC 2023-O106)

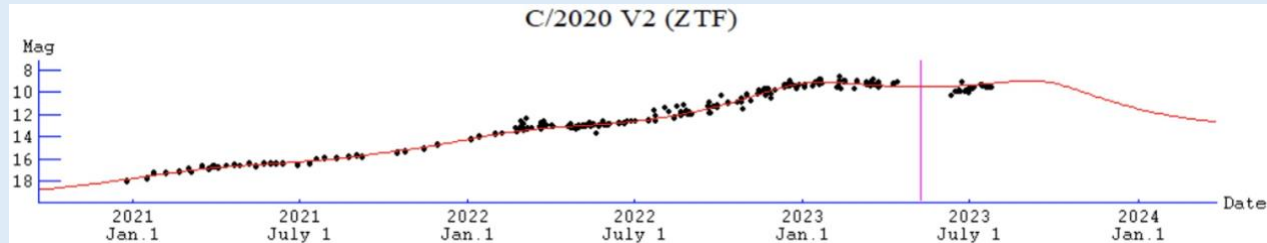
C/2020 V2 (ZTF)  
Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
T 2023 May 8.50509 TT Rudenko  
q 2.2276338 (2000.0) P Q  
z -0.0005145 Peri. 162.40451 +0.69760157 +0.59423279  
+/-0.0000002 Node 212.37117 +0.53389658 -0.05853995  
e 1.0011461 Incl. 131.61181 +0.47781429 -0.80215988  
From 4417 observations 2020 Apr. 18-2023 July 28, mean residual 0".5.  
1/a(orig) = -0.000142 AU\*\*<sup>-1</sup>, 1/a(fut) = -0.000380 AU\*\*<sup>-1</sup>.

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

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2023-Aug-01	03 10	+05 11	2.429	2.358	81M	Cet	9.2	33	43
2023-Aug-06	03 08	+03 02	2.452	2.277	87M	Cet	9.1	36	46
2023-Aug-11	03 06	+00 40	2.475	2.199	93M	Cet	9.1	39	49
2023-Aug-16	03 02	-01 54	2.500	2.125	99M	Eri	9.1	40	52
2023-Aug-21	02 57	-04 43	2.526	2.056	105M	Eri	9.0	41	55
2023-Aug-26	02 52	-07 44	2.553	1.995	112M	Eri	9.0	41	58
2023-Aug-31	02 45	-10 57	2.581	1.942	118M	Eri	9.0	39	61
2023-Sep-05	02 37	-14 20	2.609	1.901	124M	Eri	9.0	35	65

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

$m_1 = -1.4 + 5 \log d + 15.9 \log r$  [up to T-580 days]  
 $m_1 = 3.2 + 5 \log d + 10.1 \log r$  [between T-580 and T-220 days]  
 $m_1 = 4.0 + 5 \log d + 8.6 \log r$  [T-220 days and onward, assumed]  
 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 (UT)	Mag	SC	APER	FL	POW	COMA		TAIL		ICQ	CODE	Observer Name
							Dia	DC	LENG	PA			
2020V2	2023 07 25.35	M 9.8	TK	10	B	25	2	4			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 24.35	M 10.0	TK	30	L	5 88	4	3/			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 22.35	M 9.9	TK	30	L	5 88	4	3/			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 21.35	M 10.0	TK	30	L	5 88	4	3			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 20.35	M 10.0	TK	30	L	5 88	4	3			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 15.34	M 9.9	TK	30	L	5 88	4	3/			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 14.35	M 9.8	TK	30	L	5 88	4	4			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 06.35	M 10.0	TK	30	L	5 88	3	4			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 05.35	M 10.1	TK	30	L	5 88	3	3/			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 04.35	M 10.1	TK	30	L	5 88	3	3			ICQ XX	DES01	Jose Guilherme de Souza Aguiar
2020V2	2023 07 01.35	M 10.2	TK	30	L	5 88	2	3			ICQ XX	DES01	Jose Guilherme de Souza Aguiar

C/2020 V2 (ZTF) is well placed for observation in the morning sky this month. It is a few months past its perihelion but still approaching a late September opposition. As a result, V2 should slowly brighten this month, perhaps to another peak at ~9<sup>th</sup> magnitude. It is now visible from both hemispheres as it moves through Cetus (Aug 1-14) and Eridanus (14-31).

## 103P/Hartley

Discovered photographically on 1986 March 15 by Malcolm Hartley at Siding Spring Observatory in Australia  
Jupiter-family comet

### Orbit (from Minor Planet Center, MPEC 2023-O106)

103P/Hartley  
Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
T 2023 Oct. 12.51322 TT Rudenko  
q 1.0640929 (2000.0) P Q  
n 0.15210748 Peri. 181.30156 +0.75452605 -0.63878667  
a 3.4756470 Node 219.75006 +0.60422226 +0.76566664  
e 0.6938432 Incl. 13.61046 +0.25613649 +0.07553924  
P 6.48

From 6669 observations 2004 Sept. 20-2023 July 28, mean residual 0".6.  
Nongravitational parameters A1 = +0.13, A2 = +0.0243.

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

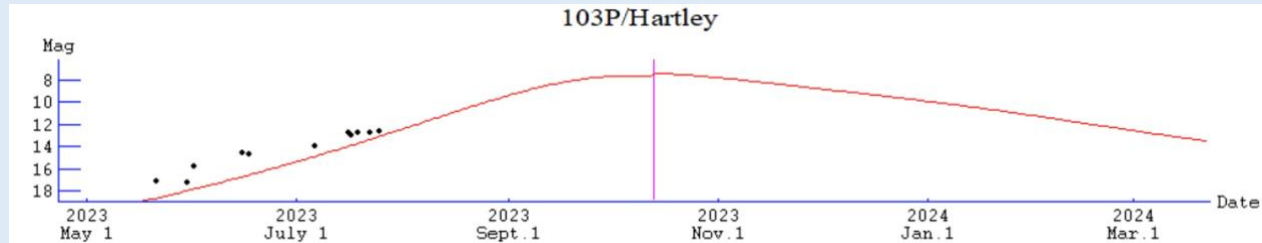
Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg)	
								40N	40S
2023-Aug-01	00 08	+29 11	1.442	0.718	111M	And	12.4	79	20
2023-Aug-06	00 24	+31 37	1.401	0.665	111M	And	11.9	82	18
2023-Aug-11	00 42	+34 04	1.361	0.615	111M	And	11.4	84	16
2023-Aug-16	01 03	+36 28	1.323	0.569	110M	And	10.9	87	13
2023-Aug-21	01 28	+38 44	1.286	0.527	109M	And	10.4	89	11
2023-Aug-26	01 56	+40 44	1.251	0.490	107M	And	9.9	89	9
2023-Aug-31	02 29	+42 17	1.218	0.458	105M	And	9.5	87	7
2023-Sep-05	03 06	+43 08	1.187	0.430	103M	Per	9.1	85	7

### Comet Magnitude Formula (from 2010 ALPO data)

$m_1 = 8.9 + 5 \log d + 26.6 \log r$  [Pre-perihelion]

$m_1 = 9.1 + 5 \log d + 10.0 \log r$  [Post-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 (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
103	2023 07 16.97	S 13.5	HS	32.0L	5	80	1.6			PIL01 Uwe Pilz
103	2023 07 06.30	C 17.1	BG	13.0R	6A800				ICQ XX	MAIab John Maikner

Officially designated 103P/Hartley, this comet is also known by its former moniker of Comet Hartley 2. A member of the Jupiter family of comets, the comet returns to perihelion every 6.5 years. Its current orbit takes it to 1.06 AU of the Sun (just beyond Earth's orbit) and as far out as 5.89 AU (about 60 million miles beyond Jupiter's orbit). In 2010, the Deep Impact spacecraft flew by 103P, providing high-resolution imaging of its nucleus (though the spacecraft was renamed EPOXI for the Hartley flyby extended mission).

103P was first seen on photographic plates obtained on 1986 March 15, 17, and 20 by Malcolm Hartley at the Siding Spring Observatory in Australia. At the time, the comet was a 17th-magnitude object and 9 months past perihelion. At its first two predicted returns in 1991 and 1997, the comet brightened to become a nice 8th magnitude object easily visible in small telescopes and binoculars.



Until experiencing a very close approach to Jupiter in 1971 (0.09 au), 103P had much larger perihelia. As a result, the comet never became bright enough to be discovered. Though the comet was probably very active during the 1973 and 1979 returns, perihelion occurred on the other side of the Sun and out of view from Earth. The same was true in 1985, so its discovery in 1986 was despite a poor apparition.

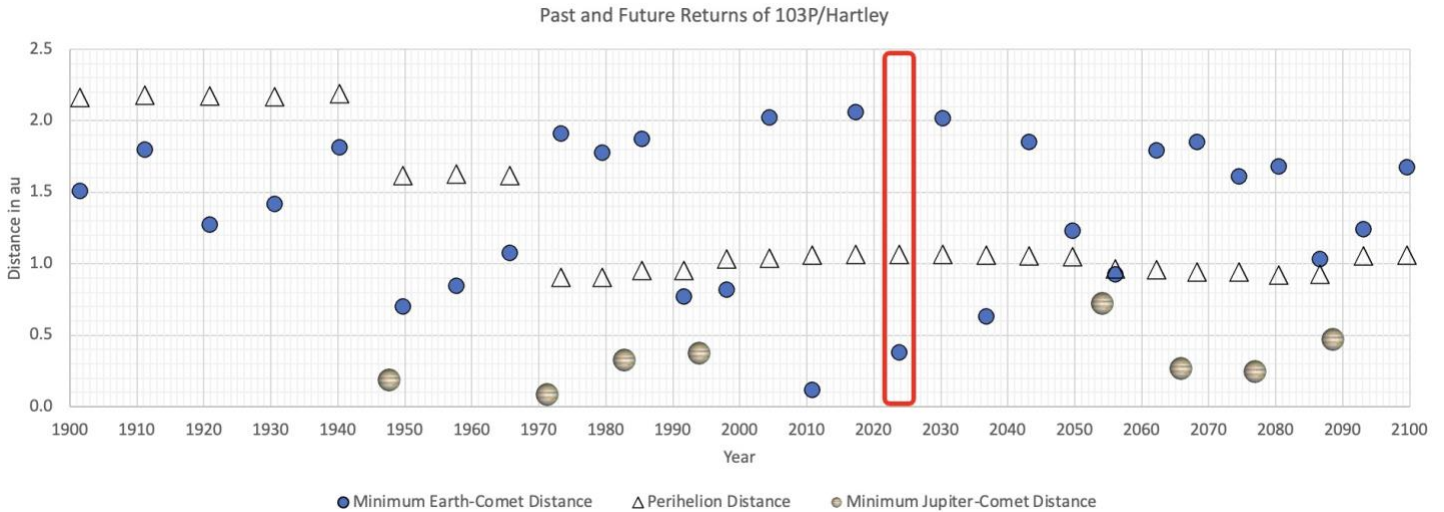


Figure 3 - Orbital evolution of 103P/Hartley. The current return is highlighted within the red rectangle.

This year Hartley 2 reaches perihelion on 2023 October 12, at 1.06 au from the Sun, with the closest approach to Earth occurring a few weeks earlier, on September 26 at 0.38 au. While not as good as the 2010 return, the current return is the second-best between 1900 and 2100.

If Hartley follows the same brightness trend as in 2010, it will peak around magnitude 7.4 in mid-October. This month, the comet will still be brightening from magnitude 12.4 on August 1 to 9.5 at the end of the month. Recent magnitude measurements have been a little brighter than expected, so it might be brighter than predicted as the month begins. As will be the case for most of the apparition, it will be a morning object. It will be well placed for northern observers as it moves through the northern constellations of Andromeda (Aug 1-31) and Perseus (31), but a low-elevation object for those in the southern hemisphere.

# Comets Between Magnitude 10 and 12

## C/2017 K2 (PANSTARRS)

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

### Orbit (from Minor Planet Center, MPEC 2023-H131)

C/2017 K2 (PANSTARRS)  
Epoch 2023 Feb. 25.0 TT = JDT 2460000.5  
T 2022 Dec. 19.68872 TT Rudenko  
q 1.7968936 (2000.0) P Q  
z -0.0004373 Peri. 236.20152 +0.01818934 +0.04921873  
+/-0.0000001 Node 88.23602 -0.18087333 +0.98247050  
e 1.0007857 Incl. 87.56336 -0.98333819 -0.17980330  
From 11224 observations 2015 Nov. 23-2022 Sept. 27, mean residual 0".5.  
1/a(orig) = +0.000059 AU\*\*<sup>-1</sup>, 1/a(fut) = +0.001151 AU\*\*<sup>-1</sup>.

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

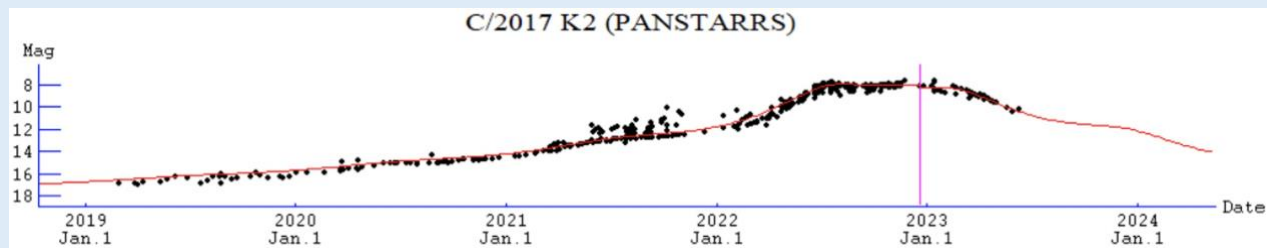
Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg)	
								40N	40S
2023-Aug-01	06 27	-09 04	3.235	3.902	43M	Mon	11.1	0	25
2023-Aug-06	06 31	-08 50	3.280	3.914	45M	Mon	11.2	0	27
2023-Aug-11	06 34	-08 39	3.325	3.921	47M	Mon	11.2	0	29
2023-Aug-16	06 37	-08 30	3.370	3.924	50M	Mon	11.3	0	31
2023-Aug-21	06 40	-08 24	3.416	3.922	53M	Mon	11.3	5	33
2023-Aug-26	06 42	-08 19	3.461	3.915	56M	Mon	11.3	9	35
2023-Aug-31	06 45	-08 15	3.507	3.904	59M	Mon	11.4	13	37
2023-Sep-05	06 46	-08 13	3.552	3.890	63M	Mon	11.4	18	38

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

$m_1 = 4.4 + 5 \log d + 6.2 \log r$  [Before perihelion]

$m_1 = 4.5 + 5 \log d + 7.2 \log r$  [After 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)						Dia	DC	LENG	PA
None.										

There isn't much new to report about C/2017 K2 (PANSTARRS). Surprisingly no observations were reported to the ALPO, COBS, or even the Minor Planet Center in July. Hopefully, its increasing solar elongation will allow more observations in August. After spending much of the previous year invisible to northern observers, it will again be visible up north by the end of the month as it moves through Monoceros in the morning sky at 11<sup>th</sup> magnitude.

# 12P/Pons-Brooks

Discovered visually on 1812 July 12 by Jean-Louis Pons and rediscovered visually on 1883 September 2 by William R. Brooks  
Halley-type comet

## Orbit (from Minor Planet Center, MPEC 2023-O106)

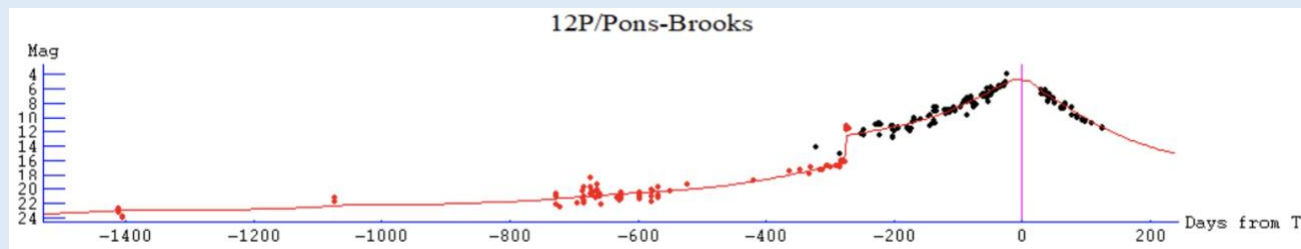
12P/Pons-Brooks  
 Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
 T 2024 Apr. 21.14644 TT  
 q 0.7808971 (2000.0) P Q  
 n 0.01384380 Peri. 198.98867 +0.14511610 -0.32930905  
 a 17.1777324 Node 255.85538 +0.98566083 +0.13018041  
 e 0.9545402 Incl. 74.19105 +0.08610483 -0.93520512  
 P 71.2  
 From 1394 observations 2020 June 10-2023 July 28, mean residual 0".6.

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

12P/Pons-Brooks										Max El	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	(deg)	
2023-Aug-01	18 00	+55 36	3.766	3.478	98E	Dra	12.3	74	0		
2023-Aug-06	17 52	+55 18	3.714	3.443	97E	Dra	12.3	75	0		
2023-Aug-11	17 45	+54 53	3.661	3.409	96E	Dra	12.2	75	0		
2023-Aug-16	17 39	+54 22	3.608	3.377	94E	Dra	12.1	75	0		
2023-Aug-21	17 34	+53 45	3.555	3.346	93E	Dra	12.0	74	0		
2023-Aug-26	17 29	+53 04	3.502	3.316	92E	Dra	11.9	73	0		
2023-Aug-31	17 25	+52 18	3.448	3.287	90E	Dra	11.9	72	0		
2023-Sep-05	17 22	+51 29	3.394	3.258	89E	Dra	11.8	71	0		

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

$m_1 = 4.4 + 5 \log d + 6.2 \log r$  [Before perihelion]  
 $m_1 = 4.5 + 5 \log d + 7.2 \log r$  [After perihelion]  
 where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au



## Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY	MM	DD.DD	Mag	SC	APER	FL	POW	COMA	TAIL	ICQ	CODE	Observer	Name
								Di	DC	LENG	PA			
12	2023	07	29.97	S 11.1	TK	32.0L	5	80	1.5	2			PIL01	Uwe Pilz
12	2023	07	27.23	C 11.9	AQ	40.6T	7a	690	2.0		ICQ	XX	MOR	Charles Morris
12	2023	07	28.21	C 11.9	AQ	40.6T	7a	630	2.4		ICQ	XX	MOR	Charles Morris
12	2023	07	27.07	S 12.0	TK	32.0L	5	240	0.4				PIL01	Uwe Pilz
12	2023	07	27.00	S 11.9	TI	35.3L		105	1.8	3	ICQ	XX	HAR11	Christian Harder
12	2023	07	26.24	S 11.2		35.6T11		230	2.3	3	ICQ	xx	ROSxx	Michael Rosolina
12	2023	07	26.23	C 12.0	AQ	40.6T	7a	600	1.8		ICQ	XX	MOR	Charles Morris
12	2023	07	25.94	S 11.4	TI	19.6L	5	38	1.3	3/	ICQ	XX	HAR11	Christian Harder
12	2023	07	25.92	S 11.4	TI	35.3L		105	1.7	3/	ICQ	XX	HAR11	Christian Harder
12	2023	07	25.23	C 11.9	AQ	40.6T	6a	630	1.4		ICQ	XX	MOR	Charles Morris
12	2023	07	25.20	C 11.9	AQ	40.6T	6a	600	1.3		ICQ	XX	MOR	Charles Morris
12	2023	07	25.02	Z 11.5	U4	50.0Y	7A	080	4.5		ICQ	xx	HER02	Carl Hergenrother
12	2023	07	24.12	C 11.6	BG	30.5H	4a	975	1.8		ICQ	XX	MAIab	John Maikner
12	2023	07	23.97	Z 11.6	U4	50.0Y	7A	080	1.7		ICQ	xx	HER02	Carl Hergenrother
12	2023	07	23.16	S 11.9		35.6T11		230	1.3	3/	ICQ	xx	ROSxx	Michael Rosolina
12	2023	07	23.11	Z 11.6	U4	50.0Y	7A	080	1.8		ICQ	xx	HER02	Carl Hergenrother
12	2023	07	22.51	xM 11.5	AQ	25.0L	5	125	0.7	4/	ICQ	XX	WYA	Christopher Wyatt
12	2023	07	22.28	C 11.8	U4	40.6T	7a	540	0.9		ICQ	XX	MOR	Charles Morris
12	2023	07	21.99	S 11.6	TI	35.3L		144	0.5	8	ICQ	XX	HAR11	Christian Harder
12	2023	07	21.93	Z 11.8	U4	50.0Y	7a	600	0.4		ICQ	xx	HER02	Carl Hergenrother

12	2023 07 21.91	I 11.6 TK 20.3T10 77	9	ICQ XX GON05	Juan Jose Gonzalez Suarez
12	2023 07 21.15	Z 11.6 U4 50.0Y 7a600	0.3	ICQ xx HER02	Carl Hergenrother
12	2023 07 20.28	C 16.5 AQ 40.6T 6a540	0.5	ICQ XX MOR	Charles Morris
12	2023 07 18.28	C 16.4 AQ 40.6T 6a600	0.6	ICQ XX MOR	Charles Morris
12	2023 07 15.31	C 16.6 AQ 40.6T 6a810	0.6	ICQ XX MOR	Charles Morris
12	2023 07 14.30	C 16.6 AQ 40.6T 6a750	0.2	ICQ XX MOR	Charles Morris
12	2023 07 11.90	Z 16.5 U4 50.0Y 7a600	0.5	0.3m110 ICQ xx HER02	Carl Hergenrother
12	2023 07 11.10	C 16.9 BG 30.5H 4B400	0.6	ICQ XX MAIab	John Maikner
12	2023 07 10.30	C 16.8 AQ 40.6T 6a780	0.5	ICQ XX MOR	Charles Morris
12	2023 07 06.14	C 16.8 BG 13.0R 6D680		ICQ XX MAIab	John Maikner
12	2023 06 26.29	C 17.2 AQ 40.6T 6a510	0.3	ICQ XX MOR	Charles Morris
12	2023 06 22.30	C 17.1 AQ 40.6T 6a690	0.5	ICQ XX MOR	Charles Morris
12	2023 06 21.27	C 17.0 AQ 40.6T 6a480	0.6	ICQ XX MOR	Charles Morris

12P/Pons-Brooks should be one of the highlights of 2024. This Halley-type comet has a 71-year orbital period and is making its first return since 1954. Jean-Louis Pons was the first to see this comet on 1812 July 21. During that return, the comet reached 4<sup>th</sup> magnitude with a 3-degree long tail. William R. Brooks at Phelps, New York, re-discovered 12P on 1883 September 2. In 1884, it approached within 0.63 au of Earth and brightened to 3<sup>rd</sup> magnitude with a tail up to 20 degrees long. The most recent return in 1954 saw the comet reach 5<sup>th</sup> magnitude. Maik Meyer recently published a paper identifying comets seen in 1457 and 1385 as previous returns of 12P. It is also possible that it was seen for 23 days in 245 AD.

This time, 12P arrives at perihelion on 2024 April 21, at 0.78 au. It was recovered three years ago on 2020 June 10 and 17, with the 4.3-m Lowell Discovery Telescope at 11.9 au from the Sun. Even at that considerable distance, the comet was active with a short tail. Analysis of that dust tail suggests the comet may have been active as far out as 30 au (Ye et al. 2020. Res. Notes AAS 4, 101).

12P is notorious for its outbursts. During the 1884 return, it experienced several outbursts. That was also true during the 1954 return with multiple multi-magnitude outbursts on its inbound leg. On 2023 July 20, a 4-5 magnitude outburst erupted, brightening the comet from 16<sup>th</sup> to 11<sup>th</sup> magnitude. Since then, the resulting dust cloud has expanded, resulting in a coma shape that some have likened to a pair of horns or even the Millennium Falcon.

Based on the comet's brightness during the 1954 return, the current return was running about 4 magnitudes too faint [in the lightcurve shown above observations from 1953-54 are in black while those from the current apparition are in red]. That has all changed with the July outburst, with the brightness now close to what was seen in 1954. The above prediction is based on the 1954 lightcurve with the comet at magnitude 12.4 on August 1 and 11.9 by the end of the month though this could be off if other outbursts occur. This month, Pons-Brooks will be riding high in the northern evening sky in Draco.

Looking forward to the rest of the apparition, 12P is observable only from the northern hemisphere before perihelion. If it follows the same brightness behavior as in 1954, it will reach magnitude 10.0 by December 1, 9.0 by January 1, 8.0 by late January, 7.0 by mid-February, 6.0 by mid-March, and 5.0 around April 1. Northern observers will lose the comet by mid-April when it should be near its brightest at magnitude 4.6. About a week later, in late April, southern hemisphere observers will be able to pick up the comet. Since it will be post-perihelion, the comet will fade to magnitude 5.0 by early May, 7.0 by early June, and 9.0 by early July.



Figure 4 - 12P/Pons-Brooks as imaged by Gianluca Masi on 2023 July 28, with a Celestron C14 and SBIG ST8-XME camera located in Rome, Italy.

# Fainter Comets of Interest

## C/2023 A3 (Tsuchinshan-ATLAS)

Discovered on 2023 January 9 at the Purple Mountain Observatory's XuYi Station and on February 22 by ATLAS  
Dynamically new long-period comet

### Orbit (from Minor Planet Center, MPEC 2022-O106)

C/2023 A3 (Tsuchinshan-ATLAS)  
Epoch 2023 Sept. 13.0 TT = JDT 2460200.5  
T 2024 Sept. 27.71850 TT  
q 0.3914389 (2000.0) P Q Rudenko  
z -0.0003909 Peri. 308.48413 +0.36131385 +0.90090159  
+/-0.0000214 Node 21.55691 +0.91858959 -0.29961182  
e 1.0001530 Incl. 139.11907 -0.16014199 +0.31402084  
From 1931 observations 2022 Apr. 9-2023 July 28, mean residual 0".3.  
1/a(orig) = -0.000215 AU\*\*<sup>-1</sup>, 1/a(fut) = -0.000187 AU\*\*<sup>-1</sup>.

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

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El (deg)	
								40N	40S
2023-Aug-01	14 03	+02 01	5.842	5.931	80E	Vir	16.6	29	45
2023-Aug-06	14 03	+01 45	5.794	5.965	75E	Vir	16.6	26	43
2023-Aug-11	14 02	+01 29	5.745	5.997	70E	Vir	16.6	24	41
2023-Aug-16	14 03	+01 11	5.696	6.027	66E	Vir	16.5	22	38
2023-Aug-21	14 03	+00 53	5.646	6.053	61E	Vir	16.5	20	35
2023-Aug-26	14 04	+00 34	5.597	6.077	57E	Vir	16.5	18	31
2023-Aug-31	14 05	+00 15	5.547	6.096	52E	Vir	16.5	16	28
2023-Sep-05	14 06	-00 04	5.497	6.111	48E	Vir	16.5	14	24

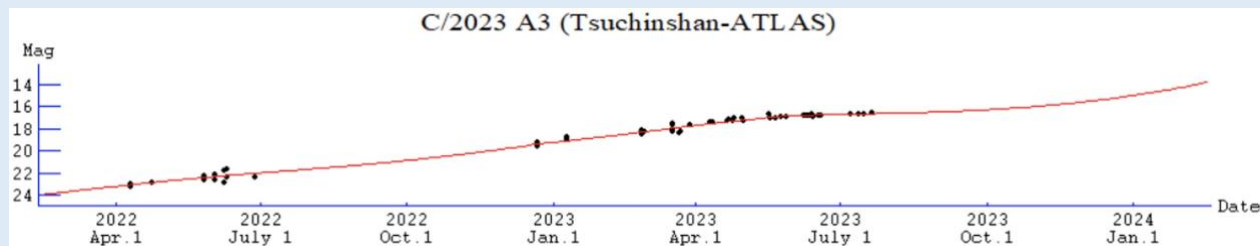
### Comet Magnitude Formula (from ALPO and COBS data)

$m_1 = -16.6 + 5 \log d + 35.0 \log r$  [Through T-650 days]

$m_1 = -2.3 + 5 \log d + 19.0 \log r$  [Between T-650 and T-490 days]

$m_1 = 6.6 + 5 \log d + 8.0 \log r$  [After T-490 days, assumed]

where "t" is the 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 (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ	CODE	Observer Name
2023A3	2023 07 12.09	C 16.4	BG	30.5H	4B400	0.4			ICQ XX	MAIab	John Maikner
2023A3	2023 07 07.85	V 16.7	U4	50.0Y	7a600	0.5	0.3m110		ICQ xx	HER02	Carl Hergenrother

We continue to watch what should be the brightest comet of 2024 continue to brighten. Imaging photometry of C/2023 A3 (Tsuchinshan-ATLAS) found the comet at magnitude 16.4-16.7 in July. After a period of rapid brightening, a slower and more typical brightening rate (2.5n ~ 8) has been the case since May. We'll have to wait and see if this rate continues.

In August, C/2023 A3 will be located in Virgo in the evening sky and visible from both hemispheres due to its location near the celestial equator. Though moving closer to the Sun (5.84 to 5.54 au), it will also be moving away from the Earth (5/93 to 6.10 au), so its apparent brightness should stay fairly constant this month.