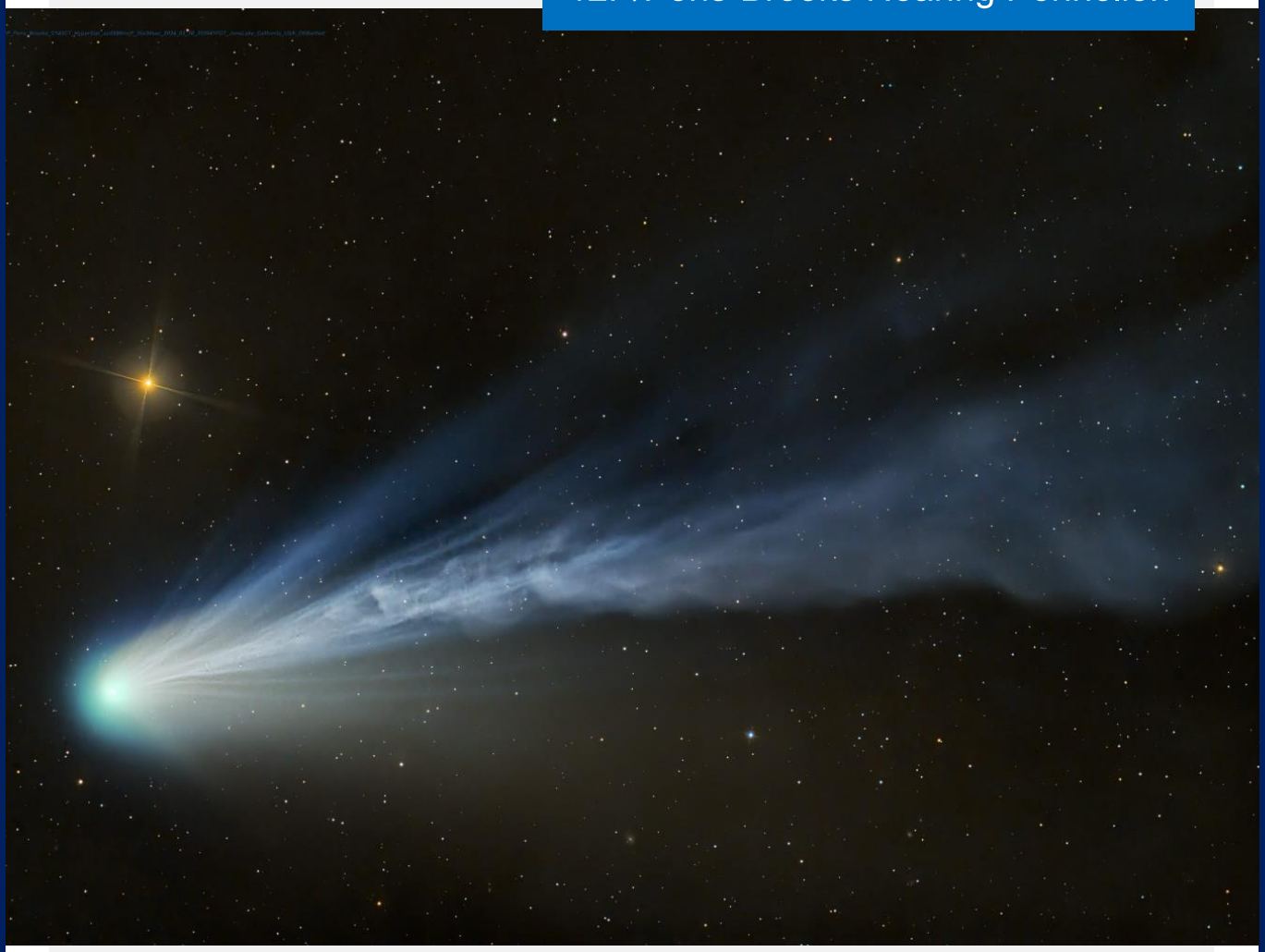
April 2024

ALPO Comet News

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

12P/Pons-Brooks Nearing Perihelion



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On the Front Cover:

12P/Pons-Brooks is a classic Halley-type comet. Though it doesn't usually get as bright as 1P/Halley, it is just as dynamic with complex inner coma morphology and a long-mottled gas tail. The cover image was taken by Dan Bartlett on 2024 March 20 from June Lake, California with a Hyperstar equipped Celestron C14 at f/2. The image consists of 25 x 30-sec exposures.

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/917108-alpo-comet-news-for-april-2024/). 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

Halley-type comet 12P/Pons-Brooks arrives at perihelion this month after a 70-year journey since its last return in 1954. Though 4th magnitude this month, it will be a horizon-hugger in the evening sky. Northern hemisphere observers will be able to observe the comet until mid-month, while southern hemisphere observers will be able to pick it up at about the same time northerners lose sight of it.

Pons-Brooks isn't the only Halley-type comet in the evening sky. Inbound 13P/Olbers is returning for the first time since 1956 and will brighten to 9th magnitude this month on its way to 7th magnitude in June and July.

Other comets in the sky this month are C/2021 S3 (PANSTARRS) at 9-10th magnitude in the morning sky, fading 144P/Kushida at 11-12th magnitude in the evening, and C/2023 A3 (Tsuchinshan-ATLAS) at 10th magnitude near opposition. Tsuchinshan-ATLAS is steadily brightening and may become a prominent naked-eye object in October.

Last month, the ALPO Comets Section received 160 images and 148 magnitude estimates of 24 comets: C/2024 E1 (Wierzchos), C/2023 H2 (Lemmon), C/2023 A3 (Tsuchinshan-ATLAS), C/2022 W3 (Leonard), C/2022 E2 (ATLAS), C/2021 S3 (PANSTARRS), C/2021 G2 (ATLAS), C/2020 V2 (ZTF), C/2020 K1 (PANSTARRS), C/2019 U5 (PANSTARRS), C/2017 K2 (PANSTARRS), P/2014 VF40 (PANSTARRS), 479P/Elenin, 473P/NEAT, 207P/NEAT, 433P/(248370) 2005 QN173, 144P/Kushida, 62P/Tsuchinshan, 44P/Reinmuth, 32P/Comas Sola, 29P/Schwassmann-Wachmann, 13P/Olbers, 12P/Pons-Brooks, and 10P/Tempel.

A big thanks to our recent contributors: Salvador Aguirre, Anthony Amato, Michael Amato, Dan Bartlett, Michel Besson, Denis Buczynski, Dan Crowson, Michel Deconinck, Jose Guilherme de Souza Aguiar, Uwe Glahn, Juan Jose Gonzalez Suarez, Christian Harder, Carl Hergenrother, Eliot Herman, Rik Hill, Michael Jäger, Manos Kardasis, Patrick Lemaitre, John Maikner, Gianluca Masi, Erwin Matys, Frank J Melillo, Karoline Mrazek, Gary T. Nowak, Michael Olason, Ludovic Perbet, Allan Rahill, Michael Rosolina, Gregg Ruppel, Chris Schur, Greg T. Shanos, Tenho Tuomi, and Christopher 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 include 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. Though we try to keep these lightcurves up to date, observations submitted in the days before publication may not be included in the lightcurves until next month's News. 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

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. 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

Lunar Phases (UTC)

Apr 02 - Last Quarter Moon
Apr 08 - New Moon
Apr 15 - First Quarter Moon
Apr 23 - Full Moon

Comets at Perihelion

Apr 01 - 355P/LINEAR-NEAT [q = 1.71 au, 6.5-yr period, V ~ 17-18, discovered in 2004, missed at 2011 return, 4th observed return]
Apr 14 - 130P/McNaught-Hughes [q = 1.82 au, 6.2-yr period, V ~ 15, discovered in 1991, 6th observed return]
Apr 20 - 32P/Comas Sola [q = 2.02 au, 9.7-yr period, V ~ 13, discovered in 1926, seen at every return since discovery, 12th observed return, 1-4 mag outbursts well after perihelion in 1997 & 2006]
Apr 21 - 12P/Pons-Brooks [q = 0.78 au, 71-yr period, V ~ 4, discovered visually in 1812, visually rediscovered in 1883, also seen at returns in 1953, 1457, 1385 and perhaps 245 AD, known to experience multiple major outbursts including in the current return, more below]
Apr 22 - P/2023 X3 (PANSTARRS) [q = 3.03 au, 8.8-yr period, V ~ 21-22, first observed return]
Apr 24 - 267P/LONEOS [q = 1.34 au, 6.0-yr period, V ~ ??, discovered in 2006, will be 4th observed return]
Apr 25 - 212P/NEAT [q = 1.61 au, 7.7-yr period, V ~ 19-20, discovered in 2001, 4th observed return]
Apr 28 - C/2024 A2 (ATLAS) [q = 1.88 au, 184-yr period, V ~ 16-17]
Apr 30 - 299P/Catalina-PANSTARRS [q = 3.16 au, 9.2-yr period, V ~ 16, discovered in 2015, also seen at 1988 and 2006 returns, 4th observed return]

Photo Opportunities

Apr 08 - Will 12P/Pons-Brooks be observed or imaged during the Total Solar Eclipse?
Apr 10 - 12P/Pons-Brooks is close to 2-day old crescent moon
Apr 10-11 - C/2021 S3 (PANSTARRS) passes within 1 deg of 7th mag open cluster NGC 6834
Apr 13-14 - 12P/Pons-Brooks passes ~3 deg from Jupiter
Apr 19 - C/2021 S3 (PANSTARRS) passes within ~0.5 deg of 5th mag open cluster NGC 6871
Apr 23 - C/2021 S3 (PANSTARRS) passes within ~0.6 deg of the Crescent Nebula (NGC 6888)
Apr 30 - 13P/Olbers passes in front of the dark nebulosity (LBN 813) near the Little Flame Nebula (IC 2087)

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/2024 E1 (Wierzchos)												
2024E1	2024 03 14.28	C 19.9	BG	30.5H	4F	300					ICQ XX MAI01	John Maikner
C/2023 H2 (Lemmon)												
2023H2	2023 11 18.96	B 7.3	TT	8.0B		16	5	0			ICQ xx NOW	Gary T. Nowak
2023H2	2023 11 12.96	B 7.6	TT	8.0B		16	16	2			ICQ xx NOW	Gary T. Nowak
C/2023 A3 (Tsuchinshan-ATLAS)												
2023A3	2024 03 13.28	M 12.4	AQ	30	L	5 100	1	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 03 12.28	M 12.5	AQ	30	L	5 100	1	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 03 11.28	M 12.5	AQ	30	L	5 100	1	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 03 09.02	S 12.6	TI	53.1L			0.8	4/			ICQ XX HAR11	Christian Harder
2023A3	2024 03 08.03	S 12.0	TI	53.1L		162	0.8	4/	2	m300	ICQ XX HAR11	Christian Harder
2023A3	2024 03 05.52	xM 12.6	AQ	40.0L	4	108	0.6	6/			ICQ XX WYA	Christopher Wyatt
C/2022 E2 (ATLAS)												
2022E2	2024 03 12.42	xM 13.8	AQ	40.0L	4	182	0.8	4/			ICQ XX WYA	Christopher Wyatt
2022E2	2024 03 08.86	S 13.8	TI	53.1L		194	0.8	4			ICQ XX HAR11	Christian Harder
2022E2	2024 03 07.91	S 13.8	TI	53.1L		194	0.6	4			ICQ XX HAR11	Christian Harder
2022E2	2024 03 07.48	xM 13.5	AQ	40.0L	4	182	0.7	6			ICQ XX WYA	Christopher Wyatt
2022E2	2024 03 05.46	xM 13.5	AQ	40.0L	4	108	0.7	6	1.2	m126	ICQ XX WYA	Christopher Wyatt
2022E2	2024 03 04.30	Z 13.1	GG	28.0L	6a	420	2.5				OLAaa	Michael Olason
2022E2	2024 03 03.88	S 12.6	TI	53.1L		162	0.8	4			ICQ XX HAR11	Christian Harder
2022E2	2024 03 02.81	S 13.2	TI	53.1L		139	0.8	4/			ICQ XX HAR11	Christian Harder
C/2021 S3 (PANSTARRS)												
2021S3	2024 03 25.29	M 10.8	AQ	30	L	5 65	1	3			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 03 15.28	M 10.4	TK	30	L	5 65	2	3/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 03 13.29	M 10.3	TK	30	L	5 65	2	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 03 12.29	M 10.2	TK	30	L	5 65	2	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 03 11.29	M 10.2	TK	30	L	5 65	2	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 03 09.09	S 10.0	TI	53.1L		112	1.8	4	5	m280	ICQ XX HAR11	Christian Harder
2021S3	2024 03 08.12	S 9.9	TI	53.1L		112	3	4	6.5	m260	ICQ XX HAR11	Christian Harder
2021S3	2024 03 07.29	M 10.0	TK	30	L	5 65	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2021 G2 (ATLAS)												
2021G2	2024 03 12.46	xM 14.0	AQ	40.0L	4	108	1	6			ICQ XX WYA	Christopher Wyatt
2021G2	2024 03 07.45	xM 13.7	AQ	40.0L	4	108	0.8	4/			ICQ XX WYA	Christopher Wyatt
2021G2	2024 03 05.51	xM 14.3	AQ	40.0L	4	182	0.5	4/			ICQ XX WYA	Christopher Wyatt
C/2020 V2 (ZTF)												
2020V2	2024 03 05.40	xM 13.1	AQ	40.0L	4	108	1.1	4			ICQ XX WYA	Christopher Wyatt
C/2020 K1 (PANSTARRS)												
2020K1	2024 03 12.45	xM 15.1	AQ	40.0L	4	182	0.5	4			ICQ XX WYA	Christopher Wyatt
2020K1	2024 03 07.44	xM 15.0	AQ	40.0L	4	182	0.6	4/			ICQ XX WYA	Christopher Wyatt
2020K1	2024 03 05.49	xM 15.3	AQ	40.0L	4	261	0.4	4/			ICQ XX WYA	Christopher Wyatt
C/2019 U5 (PANSTARRS)												
2019U5	2024 03 12.46	xM 14.6	AQ	40.0L	4	182	0.4	5			ICQ XX WYA	Christopher Wyatt
2019U5	2024 03 07.46	xM 14.3	AQ	40.0L	4	261	0.5	4			ICQ XX WYA	Christopher Wyatt
2019U5	2024 03 05.50	xM 14.3	AQ	40.0L	4	182	0.4	5/			ICQ XX WYA	Christopher Wyatt
C/2017 K2 (PANSTARRS)												
2017K2	2024 03 12.43	xM 13.8	AQ	40.0L	4	182	0.9	5			ICQ XX WYA	Christopher Wyatt
2017K2	2024 03 08.82	S 14.1	TI	53.1L		242	0.7	3			ICQ XX HAR11	Christian Harder
2017K2	2024 03 07.95	M 13.5	AQ	30	L	5 100	1	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2024 03 07.42	xM 13.8	AQ	40.0L	4	108	0.4	4			ICQ XX WYA	Christopher Wyatt
2017K2	2024 03 06.95	M 13.4	AQ	30	L	5 100	1	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2024 03 05.47	xM 13.1	AQ	40.0L	4	108	1.4	3/			ICQ XX WYA	Christopher Wyatt
2017K2	2024 03 03.95	M 13.3	AQ	30	L	5 100	1	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2024 03 03.87	S 12.7	TI	53.1L		162	0.8	2/			ICQ XX HAR11	Christian Harder
2017K2	2024 03 02.95	M 13.3	AQ	30	L	5 100	1	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2017K2	2024 03 02.87	S 13.7	TI	53.1L		194	0.9	2/			ICQ XX HAR11	Christian Harder
P/2014 VF40 (PANSTARRS)												
P2014VF40	2024 03 08.27	C 19.9	BG	30.5H	4E	040	0.5	D5	1.1	m262	ICQ XX MAI01	John Maikner
479P/Elenin												
479	2024 03 05.52	xM 15.0	AQ	40.0L	4	261	0.5	4			ICQ XX WYA	Christopher Wyatt
473P/NEAT												
473	2024 03 09.80	S 13.0:TI		53.1L		162	0.8	3			ICQ XX HAR11	Christian Harder
433P/(248370) 2005 QN173												
433	2024 03 08.04	C 19.7	BG	30.5H	4F	000					ICQ XX MAI01	John Maikner
207P/NEAT												
207	2024 03 10.19	Z 14.5	GG	28.0R	6a	360	0.4				OLAaa	Michael Olason
207	2024 03 05.48	xM 14.7	AQ	40.0L	4	261	0.5	3/			ICQ XX WYA	Christopher Wyatt
207	2024 03 02.96	M 13.8	AQ	30	L	5 121	1	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar

144P/Kushida
144 2024 03 28.83 S 10.4 TI 25.2L 4 78 3.2 1/ ICQ XX HAR11 Christian Harder
144 2024 03 28.15 Z 11.1 GG 5.0R 5a240 3 OLAaa Michael Olason
144 2024 03 13.95 M 11.4 AQ 27 L 5 90 1 3/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 13.15 I[10.3 AC 20.0T10 36 AGU01 AGU01 Salvador Aguirre
144 2024 03 12.95 M 11.2 AQ 30 L 5 65 1 4 ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 12.42 xM 10.1 AQ 40.0L 4 59 4.5 3/ ICQ XX WYA Christopher Wyatt
144 2024 03 11.95 M 11.2 AQ 30 L 5 65 1 4 ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 10.21 Z 10.7 GG 28.0L 6a420 5 OLAaa Michael Olason
144 2024 03 10.20 S 10.1 TK 12.5B 30 4 3 ICQ XX HER02 Carl Hergenrother
144 2024 03 08.81 S 10.1 TI 29.8L 4 3.5 1 ICQ XX HAR11 Christian Harder
144 2024 03 07.95 M 10.8 AQ 30 L 5 65 1 4 ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 07.43 xM 10.0 AQ 40.0L 4 59 2.9 3/ ICQ XX WYA Christopher Wyatt
144 2024 03 06.95 M 10.7 AQ 30 L 5 65 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 06.81 S 9.5 TI 29.8L 4 65 4 1 ICQ XX HAR11 Christian Harder
144 2024 03 05.86 S 9.7 TK 20.3T10 77 5 2/ ICQ XX GON05 Juan Jose Gonzalez Suarez
144 2024 03 05.42 xM 9.7 TK 40.0L 4 59 4.5 4/ ICQ XX WYA Christopher Wyatt
144 2024 03 03.95 M 10.5 TK 30 L 5 65 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 03.86 S 9.6 TI 29.8L 4 69 5 2 ICQ XX HAR11 Christian Harder
144 2024 03 02.94 M 10.5 TK 30 L 5 65 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
144 2024 03 02.79 S 9.8 TI 53.1L 81 6 2/ ICQ XX HAR11 Christian Harder
62P/Tsuchinshan
62 2024 03 28.16 Z 11.8 GG 5.0R 5a600 4 OLAaa Michael Olason
62 2024 03 13.08 M 10.6 TK 30 L 5 65 2 4 ICQ XX DES01 Jose Guilherme de Souza Aguiar
62 2024 03 12.47 xM 10.5 AQ 40.0L 4 59 4.6 4 ICQ XX WYA Christopher Wyatt
62 2024 03 08.93 S 11.3 TI 53.1L 112 3.5 2 ICQ XX HAR11 Christian Harder
62 2024 03 07.93 S 10.9 TI 53.1L 112 3 2 ICQ XX HAR11 Christian Harder
62 2024 03 07.47 xM 10.0 TK 40.0L 4 59 5.1 3/ ICQ XX WYA Christopher Wyatt
62 2024 03 05.51 xM 10.0:TK 40.0L 4 59 7 5 ICQ XX WYA Christopher Wyatt
62 2024 03 03.92 S 10.0 TI 53.1L 81 5 2 ICQ XX HAR11 Christian Harder
62 2024 03 03.24 M 10.4 TK 30 L 5 65 2 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
44P/Reinmuth
44 2024 03 14.04 C 20.0 BG 30.5H 4B400 ICQ XX MAI01 John Maikner
32P/Comas Sola
32 2024 03 12.40 &S 14.1 AQ 40.0L 4 182 0.6 3 ICQ XX WYA Christopher Wyatt
29P/Schwassmann-Wachmann
29 2024 03 09.83 S 14.7 TI 53.1L 194 0.6 6 ICQ XX HAR11 Christian Harder
29 2024 03 05.47 xS 14.9 AQ 40.0L 4 182 0.5 3/ ICQ XX WYA Christopher Wyatt
13P/Olbers
13 2024 03 28.13 Z 10.1 GG 5.0R 5a240 4 OLAaa Michael Olason
13 2024 03 16.81 S 11.5 TI 29.6L 4 132 0.8 4 ICQ XX HAR11 Christian Harder
13 2024 03 12.94 M 11.5 AQ 30 L 5 100 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
13 2024 03 12.41 xM 11.1 AQ 40.0L 4 59 3.3 4 ICQ XX WYA Christopher Wyatt
13 2024 03 10.17 Z 11.5 GG 28.0L 6a360 3 OLAaa Michael Olason
13 2024 03 09.79 S 11.9 TI 53.1L 162 0.9 3/ ICQ XX HAR11 Christian Harder
13 2024 03 08.94 M 11.7 AQ 30 L 5 100 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
13 2024 03 08.79 S 11.8 TI 53.1L 194 1.5 3 ICQ XX HAR11 Christian Harder
13 2024 03 07.94 M 11.7 AQ 30 L 5 100 1 4/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
13 2024 03 07.41 xM 11.3 AQ 40.0L 4 59 3.2 5/ ICQ XX WYA Christopher Wyatt
13 2024 03 06.79 S 12.4:TI 53.1L 194 0.6 4 ICQ XX HAR11 Christian Harder
13 2024 03 05.84 S 10.9 TK 20.3T10 77 3.5 3 ICQ XX GON05 Juan Jose Gonzalez Suarez
13 2024 03 05.41 xM 11.4 AQ 40.0L 4 59 3.4 6 ICQ XX WYA Christopher Wyatt
13 2024 03 03.94 M 11.9 AQ 30 L 5 100 1 5/ ICQ XX DES01 Jose Guilherme de Souza Aguiar
12P/Pons-Brooks
12 2024 03 31.12 S 4.9 TK 5.0B 10 6 7 ICQ XX HER02 Carl Hergenrother
12 2024 03 30.81 I 4.8 S 7.0B 10 6/ ICQ XX DEC Michel Deconinck
12 2024 03 30.11 Z 4.9 GG 0.5R 4a330 10 OLAaa Michael Olason
12 2024 03 28.84 M 4.7 TI 25.2L 4 56 4 6 30 m 40 ICQ XX HAR11 Christian Harder
12 2024 03 28.82 E 4.5 S 12.0B 5 25 20 6/ 3 40 ICQ XX DEC Michel Deconinck
12 2024 03 28.12 S 4.9 TK 5.0B 10 6 7 0.4 40 ICQ XX HER02 Carl Hergenrother
12 2024 03 28.11 Z 4.9 GG 0.5R 5a120 10 OLAaa Michael Olason
12 2024 03 25.83 M 5.0 TI 10.0L 4 22 6 6 55 m 45 ICQ XX HAR11 Christian Harder
12 2024 03 23.82 M 5.0 TI 10.0L 4 22 7 6 35 m 40 ICQ XX HAR11 Christian Harder
12 2024 03 22.76 I 5.0 S 15.0R 8 171 5 6/ ICQ XX DEC Michel Deconinck
12 2024 03 22.75 E 4.8 S 7.0B 10 6 ICQ XX DEC Michel Deconinck
12 2024 03 22.12 Z 4.9 GG 0.3R 4a420 10 OLAaa Michael Olason
12 2024 03 20.13 M 5.2 TK 5.0B 10 7 5 ICQ XX HER02 Carl Hergenrother
12 2024 03 20.12 Z 5.2 GG 0.3R 4a300 10 OLAaa Michael Olason
12 2024 03 19.12 M 5.1 TK 5.0B 10 7 5 ICQ XX HER02 Carl Hergenrother
12 2024 03 18.13 M 5.3 TK 5.0B 4 10 7 6 ICQ XX HER02 Carl Hergenrother
12 2024 03 17.12 Z 5.3 GG 0.3R 4a720 10 OLAaa Michael Olason
12 2024 03 16.81 S 5.7:TI 10.0L 4 17 7 6 45 m 30 ICQ XX HAR11 Christian Harder
12 2024 03 16.78 S 5.5 TK 2.4B 4 8 6 6/ 0.27 30 PIL01 Uwe Pilz
12 2024 03 15.81 E 5.4 S 15.0R 8 40 8 6/ 35 m 25 ICQ XX DEC Michel Deconinck
12 2024 03 15.79 I 5.3 S 15.0R 8 240 5 6 ICQ XX DEC Michel Deconinck
12 2024 03 15.78 E 5.3 S 15.0R 8 30 7 6 ICQ XX DEC Michel Deconinck

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 12        2024 03 13.78  I  5.0 S   5.0B    10        7            ICQ XX DEC   Michel Deconinck
 12        2024 03 13.77  E  5.1 S  12.0R 5  25        6  22   m 20 ICQ XX DEC   Michel Deconinck
 12        2024 03 13.10  S  5.0 AC 20.0T10  36   3.5  3/           AGU01  AGU01 Salvador Aguirre
 12        2024 03 13.00  B  5.6 TT  5.6B    11   9    6   0.7  330 ICQ xx NOW   Gary T. Nowak
 12        2024 03 11.84  B  5.4 TK  5.0B    10   6    7   1.8   20 ICQ XX GON05 Juan Jose Gonzalez Suarez
 12        2024 03 11.83  I  5.3 TK     E     1   5    8            ICQ XX GON05 Juan Jose Gonzalez Suarez
 12        2024 03 12.12  M  5.5 TK  5.0B 4  10   8    6            ICQ XX HER02 Carl Hergenrother
 12        2024 03 10.14  Z  5.6 GG  0.3R 4a500  10                      OLAaa Michael Olason
 12        2024 03 09.78  S  5.7 TI 29.8L 4  50   8    5  40   m 28 ICQ XX HAR11 Christian Harder
 12        2024 03 09.11  Z  5.6 GG  0.5R 4a300  10                      OLAaa Michael Olason
 12        2024 03 08.79  S  5.9 TI  5.0B     7  10    5            ICQ XX HAR11 Christian Harder
 12        2024 03 08.01  B  6.4 TT  8.0B    16   9    4   0.5  315 ICQ xx NOW   Gary T. Nowak
 12        2024 03 06.79  S  6.2 TI 29.8L 4  65   5    5            ICQ XX HAR11 Christian Harder
 12        2024 03 06.78  I  5.5 S   5.0B     7        6            ICQ XX DEC   Michel Deconinck
 12        2024 03 06.11  Z  5.9 GG  0.5R 4a150  10                      OLAaa Michael Olason
 12        2024 03 05.82  B  5.7 TK  5.0B    10   5    7   1.2   10 ICQ XX GON05 Juan Jose Gonzalez Suarez
 12        2024 03 05.10  M  5.9 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
 12        2024 03 04.13  M  6.1 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
 12        2024 03 04.13  Z  6.2 GG  0.3R 4a400  10                      OLAaa Michael Olason
 12        2024 03 02.00  B  6.5 TT  8.0B    16   8    4   0.5  315 ICQ xx NOW   Gary T. Nowak
 12        2024 03 01.79  E  5.9 S  12.6B 5  40   4.5  7   1     25 ICQ XX DEC   Michel Deconinck
 12        2024 03 01.13  M  6.0 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
 12        2024 03 01.10  Z  5.9 GG  0.3R 4a300  10                      OLAaa Michael Olason
 12        2024 01 02.88  B  8.3 TT  7.0B    15   2    1            ICQ xx NOW   Gary T. Nowak
 12        2023 11 18.88  B  9.8 TT 10.0B    25   2    2            ICQ xx NOW   Gary T. Nowak
10P/Tempel
 10        2024 03 01.09  C 19.7 BG 30.5H 4C000                     ICQ XX MAI01 John Maikner
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Comets News

Looking Ahead to the Next 12 Months

The chart below shows those comets expected to become brighter than magnitude 10 in 2024. The number in each date bin is the expected brightness for that date. Magnitudes are only shown for dates when the comet is above the horizon during the dark of night (between the end of astronomical twilight in the evening and the start of astronomical twilight in the morning). The only exceptions are the dates bolded in red for C/2023 A3 (Tsuchinshan-ATLAS) when the comet will only be above the horizon in bright twilight but may still be bright enough to be observed.

All brightness predictions are just that, predictions, and may be off by many magnitudes. Additionally, C/2023 A3 may be 1 or more magnitudes brighter than shown in early October due to forward scattering by dust.

Northern Hemisphere	03/31/24	04/10/24	04/20/24	04/30/24	05/10/24	05/20/24	05/30/24	06/09/24	06/19/24	06/29/24	07/09/24	07/19/24	07/29/24	08/08/24	08/18/24	08/28/24	09/07/24	09/17/24	09/27/24	10/07/24	10/17/24	10/27/24	11/06/24	11/16/24	11/26/24	12/06/24	12/16/24	12/26/24	01/10/25	01/20/25	01/30/25	02/09/25	02/19/25	03/01/25	03/11/25	03/21/25	03/31/25
C/2021 S3 (PANSTARRS)	9	9	9																																	
12P/Pons-Brooks	4	4																																		
13P/Olbers			9	9	8	8	8	7	7	7	7	7	7	8	8	9	9																			
C/2023 A3 (Tsuchinshan-ATLAS)					9	9	9	9	9	9	9	9	8	7	6	6	4	3	1	1	2	4	5	6	7	8	9	9									
333P/LINEAR																									9											
Southern Hemisphere																																				
C/2021 S3 (PANSTARRS)	9	9	9																																	
12P/Pons-Brooks				4	5	5	6	6	7	8	8	9	9																							
13P/Olbers			9											8	8	9	9																			
C/2023 A3 (Tsuchinshan-ATLAS)					9	9	9	9	9	9	9	9	8	7	6	6	4	3	1	1	2	4	5	6	7	8	9	9									
333P/LINEAR																									9											

Figure 1 - Observability and brightness of comets expected to become brighter than magnitude 10 over the next 12 months.

Last 10 Periodic Comet Numberings (from WGSBN Bull. 4, #4)

```
480P/2014 A3    = P/2023 X6  (PANSTARRS)                    MPC 169139
479P/2011 NO1   = P/2023 WM26 (Elenin)                      MPC 169139
478P/2023 Y3    = P/2017 BQ100 (ATLAS)                      MPC 169139
477P/2018 P3    = P/2023 V8  (PANSTARRS)                    MPC 169139
476P/2015 HG16  = P/2023 W2  (PANSTARRS)                    MPC 169139
475P/2004 DO29  = P/2023 V7  (Spacewatch-LINEAR)            MPC 169139
474P/2023 S4    = P/2017 O4  (Hogan)                        MPC 169139
473P/2001 Q6    = P/2023 W1  (NEAT)                         MPC 169139
472P/2002 T6    = P/2023 RL75 (NEAT-LINEAR)                 MPC 167069
471P/2023 KF3   = P/2010 YK3                                MPC 164694
```

New Discoveries

C/2024 E2 (Bok) – The University of Arizona 2.3-m Bok telescope on Kitt Peak was used by a collaboration between the Catalina Sky Survey and Spacewatch to find this 21st-22nd magnitude comet on March 10 and 11. There was some excitement about this comet on comets-ml when an incorrectly linked set of observations resulted in an orbit with a small perihelion distance and a close approach to Earth. Unfortunately, C/2024 E2's real orbit is much less exciting, with a very large perihelion distance of 7.67 au (T = 2023 July 24). Now past perihelion, the comet is fading. [CBET 5378, MPEC 2024-F91]

C/2024 E1 (Wierzchos) – Kacper Wierzchos of the University of Arizona Catalina Sky Survey found a new 20th magnitude comet on 2024 March 3 with the Mount Lemmon 1.5-m. C/2024 E1 (Wierzchos) was 8 au from the Sun at discovery. With a close perihelion on 2026 January 21 at 0.56 au, it should brighten into a binocular and small telescope object in late 2025 and early 2026.

A conservative 8 log r brightening rate results in a maximum brightness of 7.1 in late January around the time of perihelion. The comet will be located on the far side of the Sun at perihelion and will be located at small solar elongations. In fact, the comet will be invisible to ground-based observers for most of December and much of January due to its proximity to the Sun, though it may be observable in SOHO imagery taken during the last week of December. Around the time of perihelion, it will become visible in the southern hemisphere and become rapidly better placed in the evening sky into February. Northern hemisphere observers will need to wait till mid-February to observe C/2024 E1. By then, it will have already faded to around magnitude 8.0.

C/2024 E1's current orbit suggests it is a dynamically new long-period comet. It is very possible that it may be destined to disintegrate at some point during this apparition. [CBET 5364, MPEC 2024-E102]

C/2024 E1 (Wierzchos)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S
2025-Dec-01	17 39	-07 39	1.178	2.028	22E	Oph	10.6	5	0
2025-Dec-11	18 02	-13 23	1.016	1.931	15E	Ser	10.0	0	0
2025-Dec-21	18 29	-19 37	0.858	1.817	8E	Sgr	9.3	0	0
2025-Dec-31	19 02	-26 26	0.713	1.684	6E	Sgr	8.5	0	0
2026-Jan-10	19 45	-33 44	0.604	1.524	12E	Sgr	7.7	0	0
2026-Jan-20	20 48	-40 26	0.564	1.338	22E	Mic	7.1	0	4
2026-Jan-30	22 18	-43 36	0.613	1.155	32E	Gru	7.1	0	15
2026-Feb-09	00 06	-39 25	0.727	1.027	42E	Phe	7.5	0	25
2026-Feb-19	01 40	-27 51	0.874	1.003	52E	Scl	8.0	8	31
2026-Mar-01	02 46	-14 06	1.033	1.091	59E	Eri	8.8	21	32
2026-Mar-11	03 33	-02 30	1.195	1.265	62E	Eri	9.6	30	29
2026-Mar-21	04 09	+06 04	1.356	1.489	62E	Tau	10.4	34	25
2026-Mar-31	04 37	+12 13	1.514	1.739	60E	Tau	11.1	33	21

C/2021 X2 (Bok) - The Bok collaboration (Catalina Sky Survey and Spacewatch) found this object on 2021 December 1 at 21st magnitude. Though given the designation of an inactive object, A/2021 X2, further observations in 2021 and 2022 revealed cometary activity. With perihelion occurring on 2022 July 8 at 2.99 au, the comet is now a faint object beyond the reach of most telescopes and hasn't been observed since November 2022. [CBET 5363, CBET 2024-E8)

C/2019 G2 (PANSTARRS) – The Pan-STARRS1 1.8-m at Haleakala discovered C/2019 O2 on 2019 July 24 at 20st magnitude. The object was originally designated as A/2019 O2, an inactive object on a long-period cometary orbit. Pre-discovery observations have been found as far back as 2011 in Pan-STARRS and 3.6-m Canada-France-Hawaii Telescope data when the comet was 20.9 au from the Sun. Kacper Wierzchos reported a cometary coma and tail in Mount Lemmon images taken in June 2023. Perihelion was on 2023 April 7, at a distant 9.68 au. The comet is currently 19th magnitude. It is a dynamically old comet with an orbital period of 440 years. [CBET 5362, MPEC 2024-E07)

Comets Brighter than Magnitude 6

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 2024-F34)

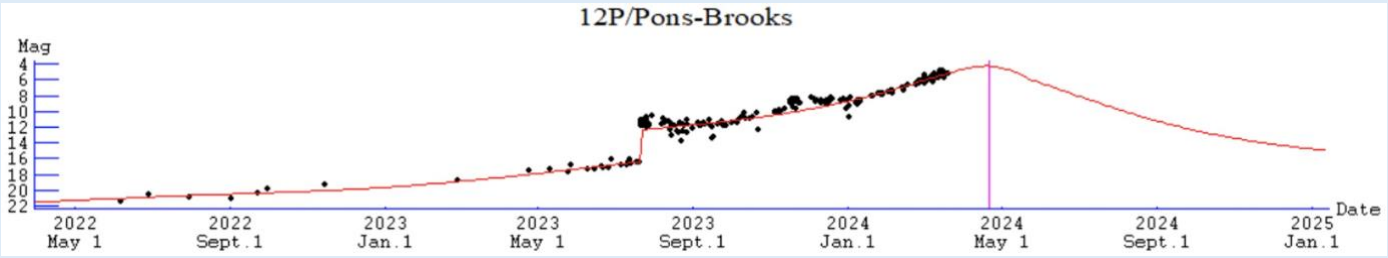
```
12P/Pons-Brooks
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Apr. 21.12375 TT                                  Rudenko
q   0.7807784            (2000.0)            P              Q
n   0.01380966      Peri.  198.98908     +0.14510775     -0.32930047
a  17.2060336       Node   255.85590     +0.98566269     +0.13016963
e   0.9546218       Incl.   74.19153     +0.08609759     -0.93520964
P  71.4
From 7361 observations 2023 Feb. 27-2024 Mar. 18, mean residual 0".6.
```

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

```
12P/Pons-Brooks                                                    Max El
                                                                    (deg)
    Date       R.A.    Decl.      r        d     Elong  Const  Mag  40N  40S
2024-Apr-01   02 09   +23 03    0.869    1.612    28E    Ari    4.7   11    0
2024-Apr-06   02 30   +20 01    0.832    1.611    25E    Ari    4.5    8    0
2024-Apr-11   02 50   +16 47    0.805    1.610    23E    Ari    4.4    5    0
2024-Apr-16   03 09   +13 24    0.788    1.609    22E    Ari    4.3    1    0
2024-Apr-21   03 27   +09 56    0.782    1.606    22E    Tau    4.2    0    1
2024-Apr-26   03 44   +06 23    0.787    1.602    23E    Tau    4.4    0    4
2024-May-01   04 01   +02 50    0.804    1.595    24E    Tau    4.5    0    7
2024-May-06   04 18   -00 43    0.830    1.587    27E    Eri    4.8    0   10
```

Comet Magnitude Formula (from ALPO and COBS data for the 1954 and 2023 returns)

```
m1 =  6.8 + 5 log d + 11.6 log r [between T-684 and T-275 days]
m1 =  4.2 + 5 log d +  7.2 log r [between T-275 days and perihelion]
m1 =  5.0 + 5 log d + 15.5 log r [between perihelion and T+30 days]
m1 =  5.1 + 5 log d + 11.4 log r [after T+30 days]
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
 12        2024 03 31.12  S  4.9 TK  5.0B    10   6    7           ICQ XX HER02 Carl Hergenrother
 12        2024 03 30.81  I  4.8 S   7.0B    10        6/           ICQ XX DEC   Michel Deconinck
 12        2024 03 30.11  Z  4.9 GG  0.5R 4a330  10                       OLAaa Michael Olason
 12        2024 03 28.84  M  4.7 TI 25.2L 4  56   4    6  30   m 40 ICQ XX HAR11 Christian Harder
 12        2024 03 28.82  E  4.5 S  12.0B 5  25  20    6/  3     40 ICQ XX DEC   Michel Deconinck
 12        2024 03 28.12  S  4.9 TK  5.0B    10   6    7   0.4   40 ICQ XX HER02 Carl Hergenrother
 12        2024 03 28.11  Z  4.9 GG  0.5R 5a120  10                       OLAaa Michael Olason
 12        2024 03 25.83  M  5.0 TI 10.0L 4  22   6    6  55   m 45 ICQ XX HAR11 Christian Harder
 12        2024 03 23.82  M  5.0 TI 10.0L 4  22   7    6  35   m 40 ICQ XX HAR11 Christian Harder
 12        2024 03 22.76  I  5.0 S  15.0R 8 171   5    6/           ICQ XX DEC   Michel Deconinck
 12        2024 03 22.75  E  4.8 S   7.0B    10        6           ICQ XX DEC   Michel Deconinck
 12        2024 03 22.12  Z  4.9 GG  0.3R 4a420  10                       OLAaa Michael Olason
 12        2024 03 20.13  M  5.2 TK  5.0B    10   7    5           ICQ XX HER02 Carl Hergenrother
 12        2024 03 20.12  Z  5.2 GG  0.3R 4a300  10                       OLAaa Michael Olason
 12        2024 03 19.12  M  5.1 TK  5.0B    10   7    5           ICQ XX HER02 Carl Hergenrother
 12        2024 03 18.13  M  5.3 TK  5.0B 4  10   7    6           ICQ XX HER02 Carl Hergenrother
```

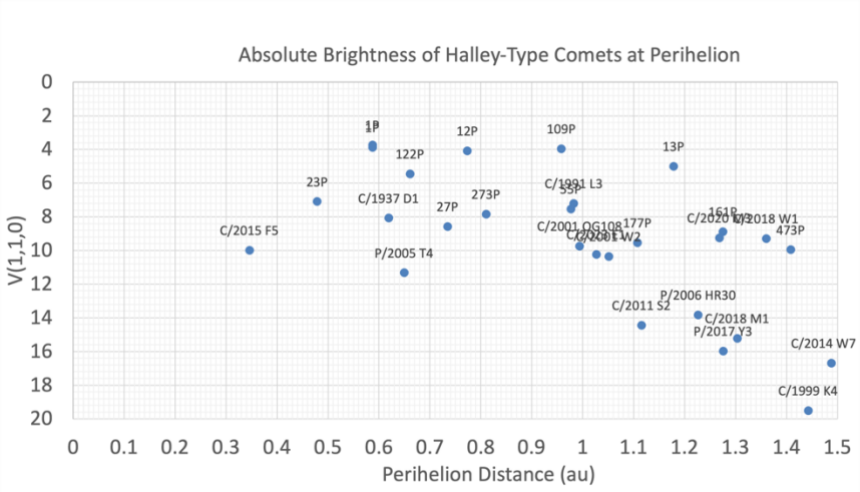
```
12        2024 03 17.12  Z  5.3 GG   0.3R 4a720  10                        OLAaa Michael Olason
12        2024 03 16.81  S  5.7:TI 10.0L 4  17   7    6  45   m 30 ICQ XX HAR11 Christian Harder
12        2024 03 16.78  S  5.5 TK  2.4B 4   8   6    6/  0.27  30        PIL01 Uwe Pilz
12        2024 03 15.81  E  5.4 S  15.0R 8  40   8    6/ 35   m 25 ICQ XX DEC   Michel Deconinck
12        2024 03 15.79  I  5.3 S  15.0R 8 240   5    6            ICQ XX DEC   Michel Deconinck
12        2024 03 15.78  E  5.3 S  15.0R 8  30   7    6            ICQ XX DEC   Michel Deconinck
12        2024 03 13.78  I  5.0 S   5.0B    10       7            ICQ XX DEC   Michel Deconinck
12        2024 03 13.77  E  5.1 S  12.0R 5  25       6  22   m 20 ICQ XX DEC   Michel Deconinck
12        2024 03 13.10  S  5.0 AC 20.0T10  36   3.5 3/           AGU01  AGU01 Salvador Aguirre
12        2024 03 13.00  B  5.6 TT  5.6B    11   9    6   0.7  330 ICQ xx NOW   Gary T. Nowak
12        2024 03 11.84  B  5.4 TK  5.0B    10   6    7   1.8   20 ICQ XX GON05 Juan Jose Gonzalez Suarez
12        2024 03 11.83  I  5.3 TK     E     1   5    8            ICQ XX GON05 Juan Jose Gonzalez Suarez
12        2024 03 12.12  M  5.5 TK  5.0B 4  10   8    6            ICQ XX HER02 Carl Hergenrother
12        2024 03 10.14  Z  5.6 GG   0.3R 4a500  10                        OLAaa Michael Olason
12        2024 03 09.78  S  5.7 TI 29.8L 4  50   8    5  40   m 28 ICQ XX HAR11 Christian Harder
12        2024 03 09.11  Z  5.6 GG   0.5R 4a300  10                        OLAaa Michael Olason
12        2024 03 08.79  S  5.9 TI  5.0B     7  10    5            ICQ XX HAR11 Christian Harder
12        2024 03 08.01  B  6.4 TT  8.0B    16   9    4   0.5  315 ICQ xx NOW   Gary T. Nowak
12        2024 03 06.79  S  6.2 TI 29.8L 4  65   5    5            ICQ XX HAR11 Christian Harder
12        2024 03 06.78  I  5.5 S   5.0B     7       6            ICQ XX DEC   Michel Deconinck
12        2024 03 06.11  Z  5.9 GG   0.5R 4a150  10                        OLAaa Michael Olason
12        2024 03 05.82  B  5.7 TK  5.0B    10   5    7   1.2   10 ICQ XX GON05 Juan Jose Gonzalez Suarez
12        2024 03 05.10  M  5.9 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
12        2024 03 04.13  M  6.1 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
12        2024 03 04.13  Z  6.2 GG   0.3R 4a400  10                        OLAaa Michael Olason
12        2024 03 02.00  B  6.5 TT  8.0B    16   8    4   0.5  315 ICQ xx NOW   Gary T. Nowak
12        2024 03 01.79  E  5.9 S  12.6B 5  40   4.5  7   1     25 ICQ XX DEC   Michel Deconinck
12        2024 03 01.13  M  6.0 TK  5.0B 4  10   8    5            ICQ XX HER02 Carl Hergenrother
12        2024 03 01.10  Z  5.9 GG   0.3R 4a300  10                        OLAaa Michael Olason
```

This month, comet 12P/Pons-Brooks reaches perihelion and its brightest. Its last perihelion was 70 years ago in May 1954, while its next perihelion won't be for another 71 years in August 2095.

April will not only see Pons-Brooks transition from an inbound to an outbound object after perihelion on April 21 at 0.78 au., but this month will also see it change from an only observable from the northern hemisphere to only observable from the southern hemisphere.

Pons-Brooks has definitely delivered this return. Though a relatively poor apparition with a "close" approach to Earth of 1.55 au on June 2, the comet has been a joy to watch, with multiple large outbursts, a long tail (up to 3 deg has been reported visually, and over 5 deg in images), and the appearance of jets, shells, and other inner coma morphology.

Pons-Brooks is a Halley-type comet (HTC), a comet with an orbital period between 20 and 200 years. So how does Pons-Brooks compare with the most famous HTC of all time, 1P/Halley? The plot below shows the peak absolute brightness of HTCs at perihelion with perihelia less than 1.5 au.



Figure—Peak absolute brightness of Halley-type comets at perihelion for comets with perihelia less than 1.5 au. Peak brightness is normalized to 1 au from the Earth and Sun and a 0 deg phase angle.

The peak absolute brightness is the apparent brightness at perihelion normalized to 1 au from the Earth and Sun and 0 degrees phase angle. The double data points for 1P/Halley are based on its last two apparitions (1910 and 1986). While Halley is the brightest HTC on the plot, its absolute magnitude at perihelion is only a little brighter than 12P and 109P/Swift-Tuttle. But what this plot means is that Halley is close to the same brightness at perihelion (0.59 au) as 12P and 109P are at their respective perihelia (0.77 and 0.96 au). If 12P and 109P were on the same orbit as Halley, they would be even brighter than Halley. Even this month's other HTC, 13P/Olbers, would be a brighter object than Halley if it were transported to Halley's orbit and assuming an increase in activity at an 8-log r rate between 13P's perihelion distance (1.18 au) and Halley's.

In pre-telescope days, a comet needed to be brighter than 3rd magnitude to be obvious and detectable, even in a dark sky. We know that Pons-Brooks was detected at past apparitions in 1954, 1883, 1812, 1457, 1385, and possibly 245 AD. The 1884 apparition saw Pons-Brooks reach 3rd magnitude so it is possible it would have been detected by pre-telescopic observers. Assuming the same lightcurve as measured in 1954, it would gave peaked at 3-4th magnitude in 1457, 2nd magnitude in 1385, and 2-3rd magnitude in 245 AD. It should also have been bright in 959 (3-4th mag), 742 (mag 1.5), 673 (2nd mag), and 386 AD (mag 3.5). While there were comets noticed in some of those years, not enough details have survived to make a definitive link. (For more info on past returns of Pons-Brooks, see Maik Meyer's paper at https://arxiv.org/abs/2012.15583)

But Halley has been observed to be a bright naked-eye object at nearly every return over the past 2300 years. The faintest return of the past 2300 years, of course, being the one many of us saw in 1986. Other than the fact that Halley gets closer to the Sun than Pons-Brooks, why is it so consistently spectacular? Halley's orbit has a retrograde inclination of 162 degrees, meaning it moves in the opposite direction as the Earth, like two cars passing in opposite directions. This results in every return of Halley experiencing a close approach with Earth of less than 0.5 au, and occasionally much closer (of the 30 returns over the past 2300 years, 12 saw close approaches within 0.2 au, with 3 within 0.1 au). Even during a "poor" apparition like in 1986 when the comet was on the other side of the Sun at perihelion (1.55 au from Earth at perihelion), its opposite orbital direction resulted in two close approaches to Earth: 0.62 au pre-perihelion and 0.42 au post-perihelion. The retrograde orbit also results in some apparitions having enhanced brightness at large phase angles due to dust forward scattering (such as in 1910).

Pons-Brooks' inclination is 74 degrees, which means its orbit is nearly perpendicular to the Earth's orbit. Only perihelia that occur between mid-October to mid-February result in a peak brighter than magnitude 3.0, and only perihelia from mid-December to mid-January result in a close approach to Earth of < 0.5 au. In case you're wondering, a perihelion on December 17 results in the best apparition with a close approach of 0.18 au and a path directly between the Earth and the Sun. Without any dust scattering enhancement, Pons-Brooks would reach 0th magnitude and likely a few magnitudes brighter due to dust forward scattering.

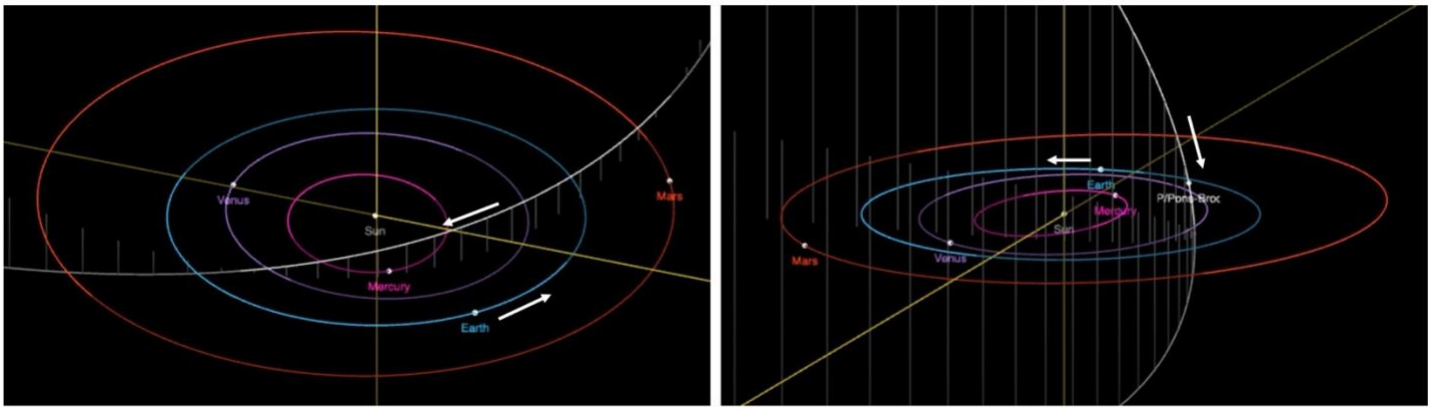


Figure 2 - Orbits of 1P/Halley (left) and 12P/Pons-Brooks (right) in the inner solar system. Orbit diagrams made with the JPL Small-Body Browser orbit visualization tool.

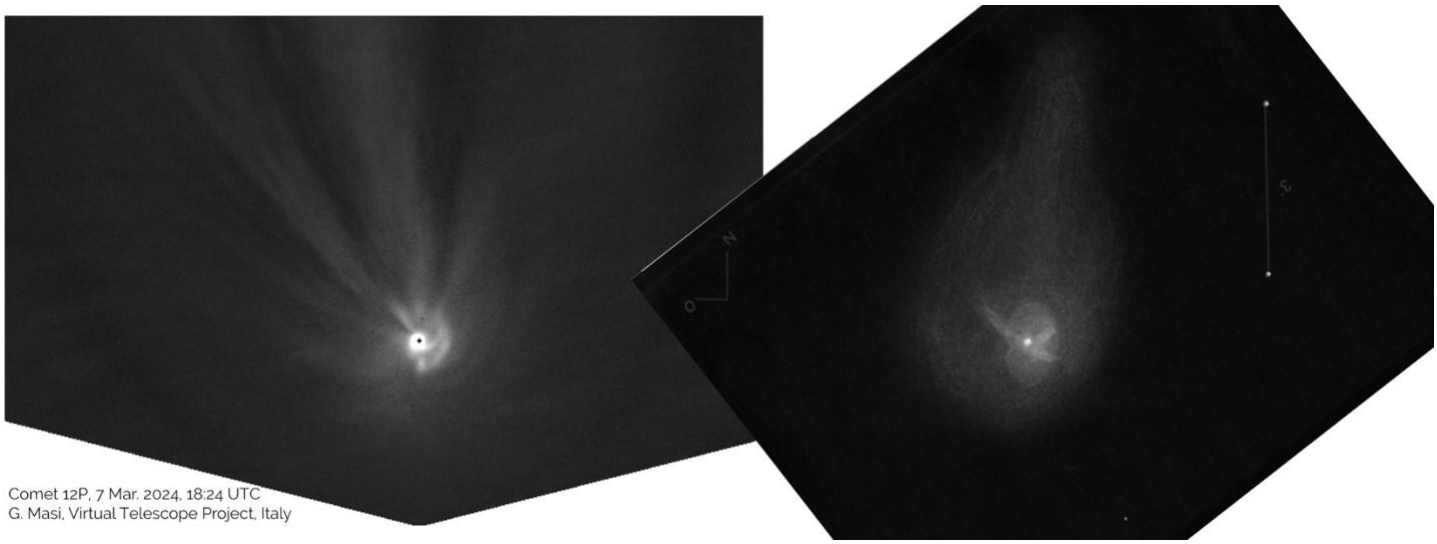


Figure 3 - Dust jets and inner coma morphology imaged by Gianluca Masi with a C14 on March 7 (left) and a visual sketch by Christian Harder made with a 21" Dobsonian on March 6 (right).

Bright active comets provide an opportunity to observe phenomena that aren't usually seen with fainter comets. Both visual and digital observers have observed dust jets and other inner coma morphology. As was shown on the front cover of the March 2024 ALPO Comet News, Pons-Brooks has shown strong jet activity at past apparitions. Observations of changing inner coma morphology allowed a team using the Lowell Observatory Hall 42" (1.1-m) and U.S. Naval Academy Hopper Hall 0.5-m to measure a 57 ± 1 hr rotation period for the nucleus of 12P (ATel 16508, https://www.astronomerstelegram.org/?read=16508).

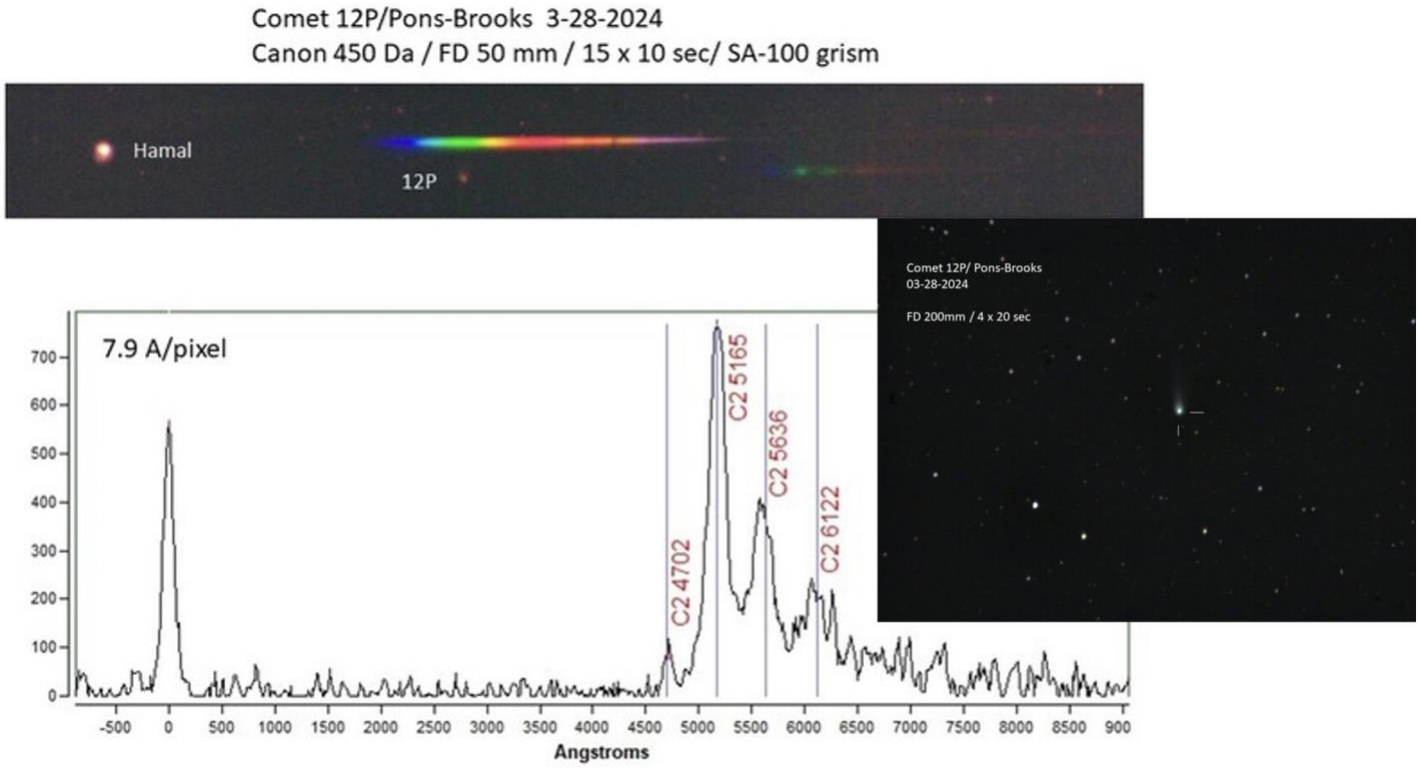


Figure 4 - Greg T. Shanos used a Star Analyzer SA-100 grism, Canon 450D, and 50 mm lens to spectrally detect the comet's Swan band emission.

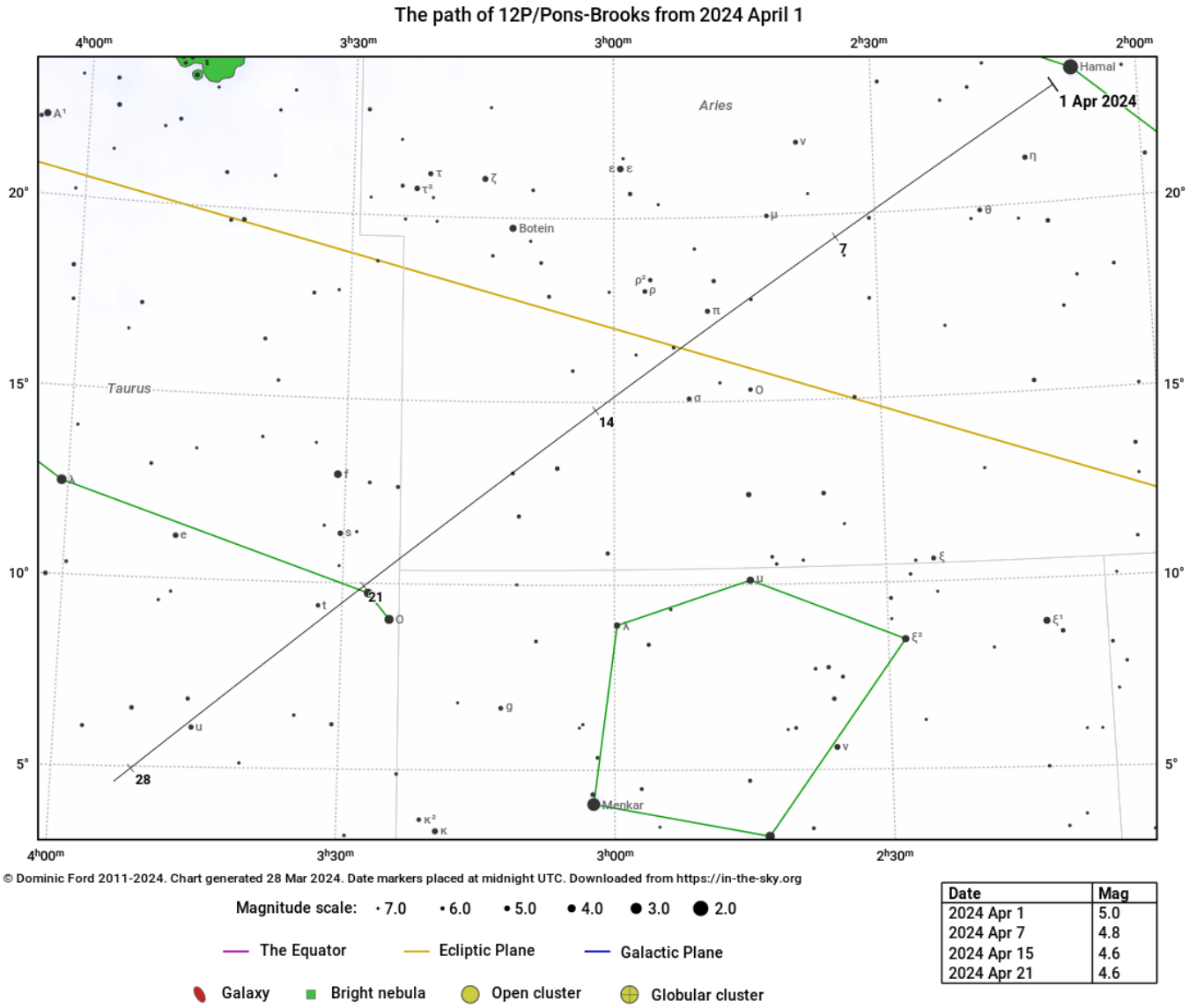
Figure 5 – A side-by-side comparison of an image and sketch made close in time on March 2. The image on the left is 40-min exposure taken by Michael Jäger with a Celestron RASA11 and QHY600 camera. The sketch on the right is roughly to scale with the Jäger image and was made by Uwe Glahn with a 27" telescope at 113 power.

Though the comet will start the month around magnitude 4.7, peak at 4.2, and only fade to 4.5 by the end of the month, it will not be an obvious naked-eye object for most observers. If it were located high in a dark sky, it would be visible to the naked eye, but Pons-Brooks is now a low object. Northern hemisphere observers at 40N will be able to observe the comet at an elevation of only 11 degrees at the end of astronomical twilight on the 1st. That elevation will only get worse till the middle of the month, when it won't be above the horizon at all when the sky is dark. Southern hemisphere observers will see the opposite, with the comet only becoming visible at the end of astronomical twilight on the 21st. Placement will get slightly better for southern observers as the month progresses.

Pons-Brooks is an evening object for observers from both hemispheres as it moves southward through Aries (Apr 1-19) and Taurus (19-30). With perihelion on April 21, the comet will fade from here on out, though observers should always be on the lookout for further outbursts.

If you are lucky enough to be within the Path of Totality for the Total Solar Eclipse on April 8, Pons-Brooks may be observable. At 4th magnitude, it won't be a naked-eye object, but telescopic observers, especially those with GOTO capability, may be able to see it.

Photo Ops:
Apr 08 - Will 12P/Pons-Brooks be observed or imaged during the Total Solar Eclipse?
Apr 10 - 12P/Pons-Brooks is close to 2-day old crescent moon
Apr 13-14 - 12P/Pons-Brooks passes ~3 deg from Jupiter



Date	Mag
2024 Apr 1	5.0
2024 Apr 7	4.8
2024 Apr 15	4.6
2024 Apr 21	4.6

Figure 6 - Finder chart for 12P in April 2024 from in-the-sky.org.

Comets Between Magnitude 6 and 10

13P/Olbers

Discovered visually on 1815 March 6 by Heinrich Olbers in Bremen, Germany
Halley-type comet

Orbit (from Minor Planet Center, MPEC 2024-F34)

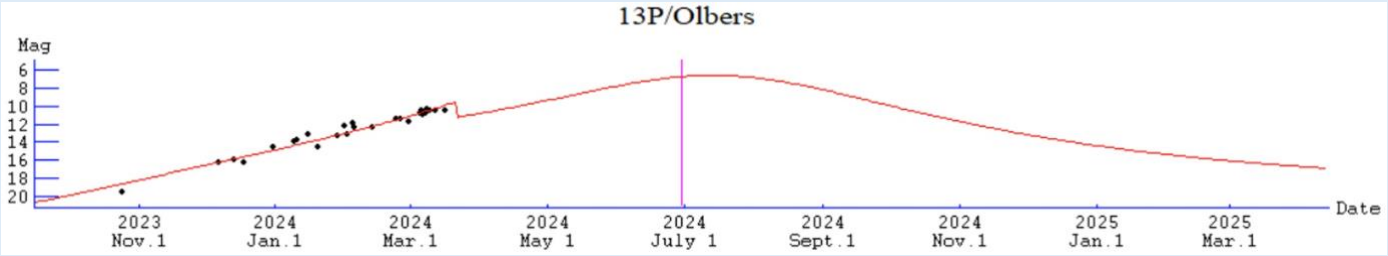
```
13P/Olbers
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 June 30.04684 TT                                  Rudenko
q   1.1755340            (2000.0)            P              Q
n   0.01420742     Peri.    64.41313     -0.60851355     -0.37167570
a  16.8833724      Node     85.84690     +0.18562278     -0.92568696
e   0.9303733      Incl.    44.66540     +0.77152799     -0.07043310
P  69.4
From 1151 observations 2023 Aug. 13-2024 Mar. 19, mean residual 0".5.
    Nongravitational parameters A1 = +1.71, A2 = +0.5618.
```

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

```
13P/Olbers                                                          Max El
                                                                     (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag  40N  40S
2024-Apr-01  03 41  +15 23    1.764   2.318     45E    Tau  10.8   23    9
2024-Apr-06  03 49  +17 14    1.714   2.312     42E    Tau  10.6   21    7
2024-Apr-11  03 57  +19 05    1.665   2.303     39E    Tau  10.4   19    5
2024-Apr-16  04 06  +20 56    1.616   2.292     37E    Tau  10.2   16    3
2024-Apr-21  04 16  +22 48    1.569   2.278     35E    Tau   9.9   15    1
2024-Apr-26  04 27  +24 40    1.523   2.262     33E    Tau   9.7   13    0
2024-May-01  04 38  +26 31    1.479   2.243     31E    Tau   9.4   11    0
2024-May-06  04 51  +28 22    1.436   2.222     29E    Tau   9.2   10    0
```

Comet Magnitude Formula (from 1956 ICQ and 2023 ALPO data)

```
m1 = -1.3 + 5 log d + 33.2 log r [Up through T-100 days]
m1 =  4.0 + 5 log d + 18.0 log r (T – 13) [After T-100 days]
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
 13        2024 03 28.13  Z 10.1 GG  5.0R 5a240   4                      OLAaa Michael Olason
 13        2024 03 16.81  S 11.5 TI 29.6L 4 132   0.8  4           ICQ XX HAR11 Christian Harder
 13        2024 03 12.94  M 11.5 AQ 30  L 5 100   1    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
 13        2024 03 12.41 xM 11.1 AQ 40.0L 4  59   3.3  4           ICQ XX WYA   Christopher Wyatt
 13        2024 03 10.17  Z 11.5 GG 28.0L 6a360   3                      OLAaa Michael Olason
 13        2024 03 09.79  S 11.9 TI 53.1L   162   0.9  3/          ICQ XX HAR11 Christian Harder
 13        2024 03 08.94  M 11.7 AQ 30  L 5 100   1    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
 13        2024 03 08.79  S 11.8 TI 53.1L   194   1.5  3           ICQ XX HAR11 Christian Harder
 13        2024 03 07.94  M 11.7 AQ 30  L 5 100   1    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
 13        2024 03 07.41 xM 11.3 AQ 40.0L 4  59   3.2  5/          ICQ XX WYA   Christopher Wyatt
 13        2024 03 06.79  S 12.4:TI 53.1L   194   0.6  4           ICQ XX HAR11 Christian Harder
 13        2024 03 05.84  S 10.9 TK 20.3T10  77   3.5  3           ICQ XX GON05 Juan Jose Gonzalez Suarez
 13        2024 03 05.41 xM 11.4 AQ 40.0L 4  59   3.4  6           ICQ XX WYA   Christopher Wyatt
 13        2024 03 03.94  M 11.9 AQ 30  L 5 100   1    5/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
```

Pons-Brooks isn't the only Halley-type comet to observe in April. Though not as bright as Pons-Brooks, 13P/Olbers is expected to reach 7th magnitude in June and July.

Heinrich Olbers discovered 13P in 1815 when the comet reached 5th magnitude. A peak of 6-7th magnitude was reached at the next two returns, in 1887 and 1956. This year, Olbers arrives at perihelion on June 30 at 1.18 au, though it will come no closer to the Earth than 1.90 au (on July 20).

Visual observers found Olbers at between magnitude 11.1 and 11.9 in mid-April (aperture corrected to between 10.4 and 10.8). This is about a magnitude brighter than expected based on its 1956 lightcurve. For now, our predictions will follow the 1956 lightcurve. If it continues to run brighter than predicted, we'll change our predictions next month.

Olbers will be an evening object low in the western sky when at its best and even then, visible only from the northern hemisphere. April sees Olbers brightening from magnitude 10.8 to 9.4 as it moves northeastward through Taurus.

Photo Op:
Apr 30 - 13P/Olbers passes in front of the dark nebulosity (LBN 813) near the Little Flame Nebula (IC 2087)

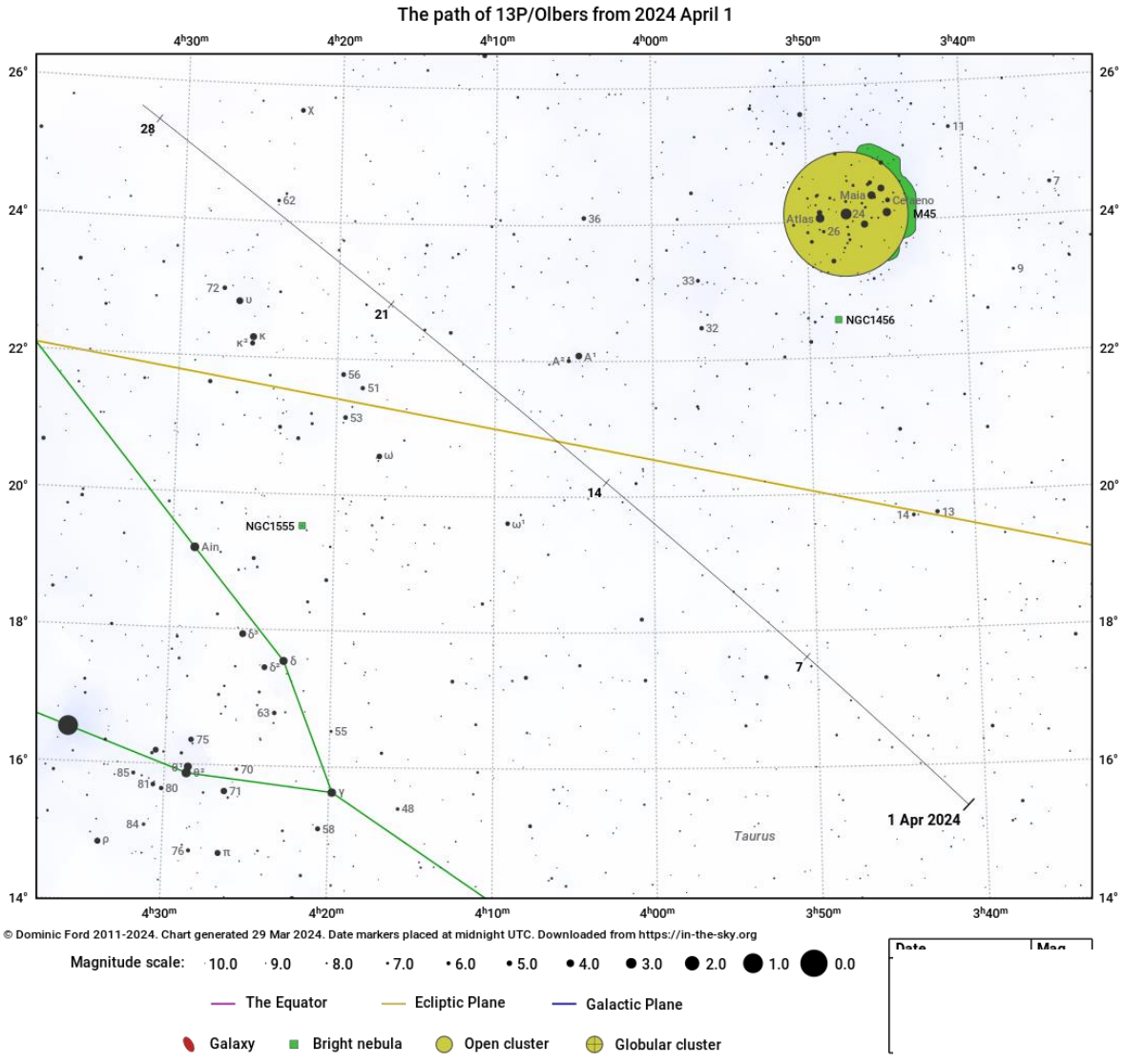


Figure 7 - Finder chart for 13P in April 2024 from in-the-sky.org.

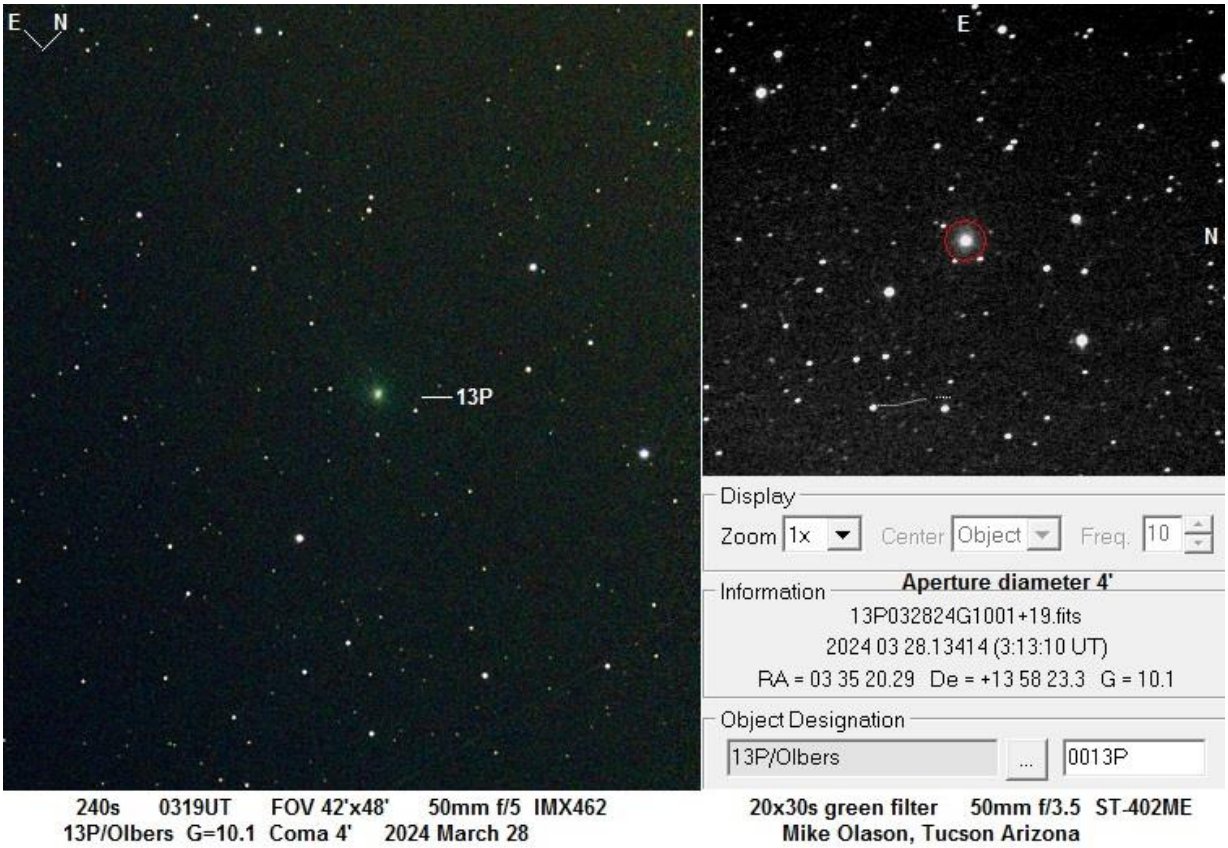


Figure 8 - 13P/Olbers was imaged by Mike Olason on 2024 March 10 with a C11 at f/6.4 and SBIG STF-8300M camera.

C/2021 S3 (PANSTARRS)

Discovered 2021 September 24 by PANSTARRS with the Pan-STARRS2 1.8-m Ritchey-Chretien reflector at Haleakala
Long-period comet

Orbit (from Minor Planet Center, MPEC 2024-F34)

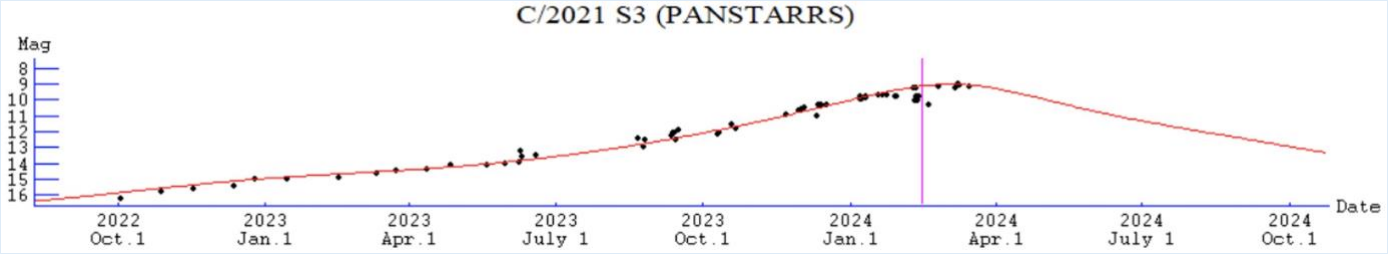
```
   C/2021 S3 (PANSTARRS)
Epoch 2024 Feb. 20.0 TT = JDT 2460360.5
T 2024 Feb. 14.71203 TT                                  Rudenko
q   1.3202181           (2000.0)            P               Q
z  -0.0002250      Peri.    6.85540     -0.77078391     +0.39888422
 +/-0.0000005      Node   215.62117     -0.61751080     -0.65960439
e   1.0002971      Incl.   58.53308     -0.15675640     +0.63703487
From 1327 observations 2020 Dec. 6-2024 Mar. 18, mean residual 0".5.
1/a(orig) = +0.000015 AU**-1, 1/a(fut) = +0.000015 AU**-1.
```

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

```
C/2021 S3 (PANSTARRS)                                                 Max El
                                                                       (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag  40N  40S
2024-Apr-01  19 28  +21 49    1.488   1.337     77M    Vul    9.3   52   21
2024-Apr-06  19 38  +25 54    1.522   1.362     78M    Vul    9.4   54   19
2024-Apr-11  19 48  +29 47    1.559   1.391     79M    Cyg    9.5   57   16
2024-Apr-16  19 57  +33 26    1.598   1.425     80M    Cyg    9.6   58   14
2024-Apr-21  20 05  +36 51    1.640   1.461     81M    Cyg    9.7   60   11
2024-Apr-26  20 12  +40 02    1.682   1.501     81M    Cyg    9.8   62    9
2024-May-01  20 19  +42 60    1.726   1.542     82M    Cyg   10.0   63    6
2024-May-06  20 24  +45 43    1.772   1.585     83M    Cyg   10.1   64    4
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  7.7 + 5 log d +  5.6 log r [pre-T]
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     Mag SC APER FL POW    COMA     TAIL    ICQ    CODE  Observer Name
              (UT)                    T         Dia  DC  LENG  PA
   2021S3  2024 03 25.29  M 10.8 AQ 30  L 5  65   1    3           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 03 15.28  M 10.4 TK 30  L 5  65   2    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 03 13.29  M 10.3 TK 30  L 5  65   2    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 03 12.29  M 10.2 TK 30  L 5  65   2    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 03 11.29  M 10.2 TK 30  L 5  65   2    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 03 09.09  S 10.0 TI 53.1L   112   1.8  4   5   m280 ICQ XX HAR11 Christian Harder
   2021S3  2024 03 08.12  S  9.9 TI 53.1L   112   3    4   6.5 m260 ICQ XX HAR11 Christian Harder
   2021S3  2024 03 07.29  M 10.0 TK 30  L 5  65   3    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
```

Kind of forgotten with all of the attention on Pons-Brooks is C/2021 S3 (PANSTARRS) which has been the brightest comet in the morning sky.

C/2021 S3 was discovered in September 2021 at 8.9 au, with pre-discovery observations back to December 2020 when it was 11.0 au from the Sun. Perihelion was on February 14 at 1.32 au and a minimum comet-Earth distance on March 14 at 1.30 au. Now that the comet is moving away from both the Earth and Sun, it should be fading in April from around magnitude 9.3 to 10.0. The comet was very slow to brighten prior to perihelion; if it fades faster than it brightened, it could be fainter than 10.0 at the end of the month.

As has been the case for the last two months, C/2021 S3 is moving along the Milky Way. This month, it moves through Vulpecula (Apr 1-8), Cygnus (8-9), back into Vulpecula (9-10), and back again into Cygnus (10-30), resulting in several photo opportunities with several Milky Way clusters and nebulae. Imagers are also asked to monitor the comet around the time of an orbital plane crossing on April 25 though an anti-tail is not expected to be seen.

Photo Ops:
Apr 10-11 - C/2021 S3 (PANSTARRS) passes within 1 deg of 7th mag open cluster NGC 6834
Apr 19 - C/2021 S3 (PANSTARRS) passes within ~0.5 deg of 5th mag open cluster NGC 6871
Apr 23 - C/2021 S3 (PANSTARRS) passes within ~0.6 deg of the Crescent Nebula (NGC 6888)

Figure 9 - C/2021 S3 was observed by Chris Schur passing by the Coat Hanger on March 30. The image is a 54-minute LRGB composite. It is a 60-minute exposure with a 10" f/2.8 and Atik 16200 camera from Payson AZ.

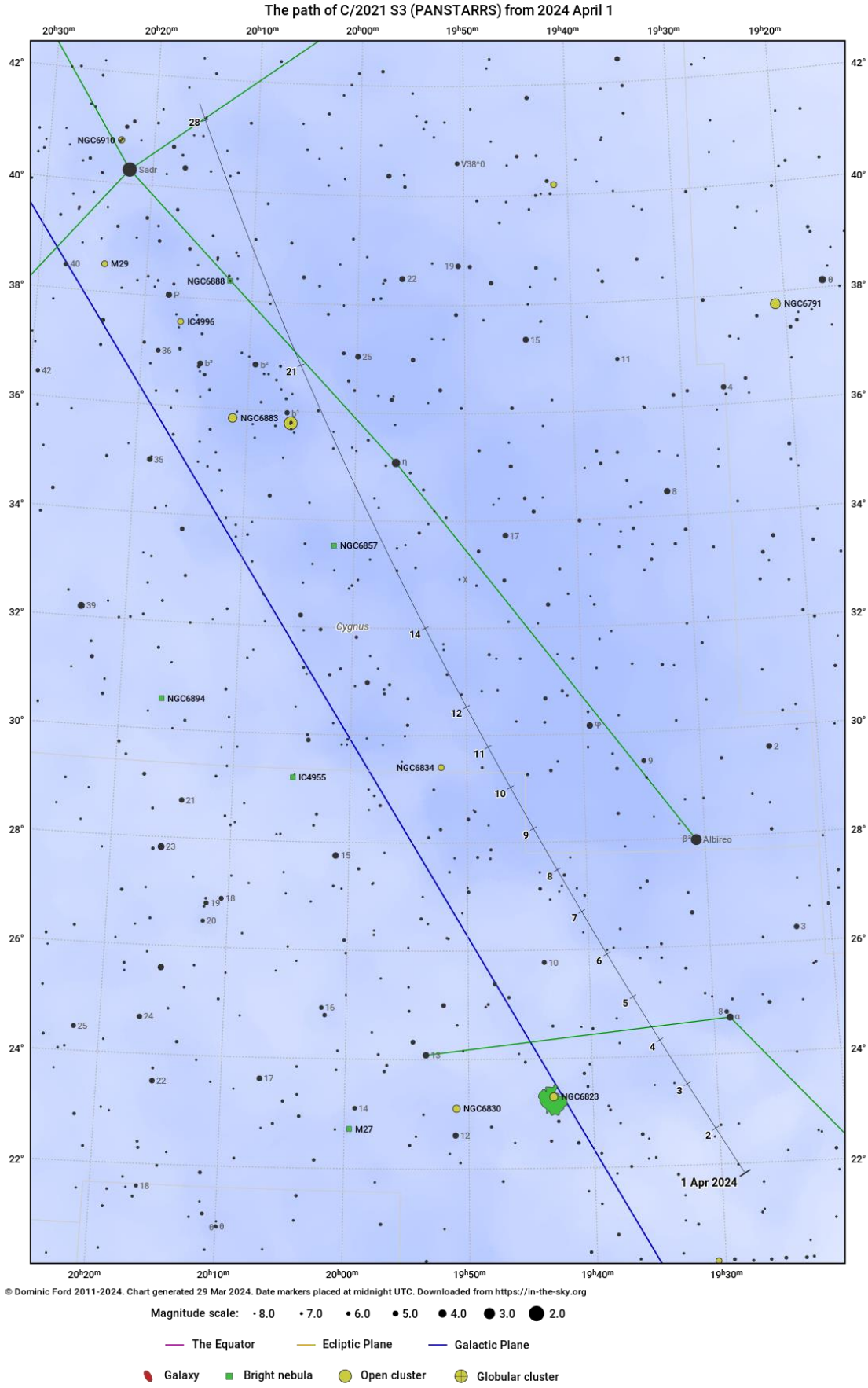


Figure 10 - Star chart for C/2021 S3 (PANSTARRS) for April. Chart made at in-the-sky.org.

Comets Between Magnitude 10 and 12

144P/Kushida

Discovered photographically on 1994 January 8 by Yoshio Kushida (Yatsugatake South Base Observatory, Japan)
Short-period comet

Orbit (from Minor Planet Center, MPEC 2023-F34)

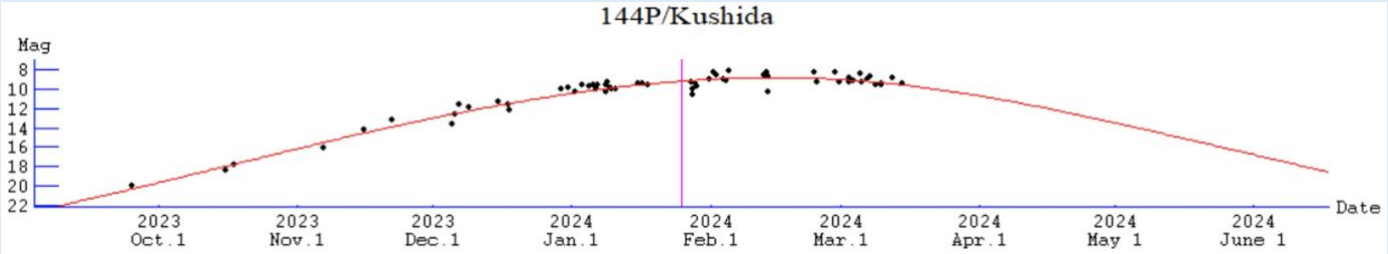
```
144P/Kushida
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Jan. 25.77101 TT                                    Rudenko
q   1.3988578           (2000.0)            P                Q
n   0.13143719     Peri.  216.32175     -0.15945390     -0.98531547
a   3.8311034      Node   242.92551     +0.92113234     -0.12625072
e   0.6348682      Incl.    3.93189     +0.35509108     -0.11495295
P   7.50
From 2684 observations 2016 July 31-2024 Mar. 15, mean residual 0".5.
    Nongravitational parameters A1 = +0.17, A2 = -0.0879.
```

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

```
144P/Kushida                                                        Max El
                                                                     (deg)
    Date       R.A.    Decl.      r        d     Elong  Const  Mag  40N   40S
2024-Apr-01  07 13  +16 48    1.580    1.122     96E    Gem   10.6   61    32
2024-Apr-06  07 27  +16 27    1.607    1.178     94E    Gem   11.0   59    33
2024-Apr-11  07 42  +16 03    1.635    1.236     93E    Gem   11.5   57    33
2024-Apr-16  07 56  +15 35    1.665    1.297     91E    Gem   11.9   55    34
2024-Apr-21  08 09  +15 04    1.695    1.361     90E    Cnc   12.4   53    34
2024-Apr-26  08 22  +14 30    1.727    1.427     88E    Cnc   12.9   50    35
2024-May-01  08 35  +13 53    1.759    1.495     86E    Cnc   13.4   47    35
2024-May-06  08 48  +13 14    1.791    1.566     85E    Cnc   13.9   44    36
```

Comet Magnitude Formula (from 2023-2024 ALPO photometry)

m1 = 1.4 + 5 log d + 56.0 log r (t – 30)
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
144        2024 03 28.83  S 10.4 TI 25.2L 4  78   3.2  1/           ICQ XX HAR11 Christian Harder
144        2024 03 28.15  Z 11.1 GG  5.0R 5a240   3                      OLAaa Michael Olason
144        2024 03 13.95  M 11.4 AQ 27  L 5  90   1    3/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 13.15  I[10.3 AC 20.0T10  36                     AGU01  AGU01 Salvador Aguirre
144        2024 03 12.95  M 11.2 AQ 30  L 5  65   1    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 12.42 xM 10.1 AQ 40.0L 4  59   4.5  3/           ICQ XX WYA   Christopher Wyatt
144        2024 03 11.95  M 11.2 AQ 30  L 5  65   1    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 10.21  Z 10.7 GG 28.0L 6a420   5                      OLAaa Michael Olason
144        2024 03 10.20  S 10.1 TK 12.5B    30   4    3            ICQ XX HER02 Carl Hergenrother
144        2024 03 08.81  S 10.1 TI 29.8L 4       3.5  1            ICQ XX HAR11 Christian Harder
144        2024 03 07.95  M 10.8 AQ 30  L 5  65   1    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 07.43 xM 10.0 AQ 40.0L 4  59   2.9  3/           ICQ XX WYA   Christopher Wyatt
144        2024 03 06.95  M 10.7 AQ 30  L 5  65   1    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 06.81  S  9.5 TI 29.8L 4  65   4    1            ICQ XX HAR11 Christian Harder
144        2024 03 05.86  S  9.7 TK 20.3T10  77   5    2/           ICQ XX GON05 Juan Jose Gonzalez Suarez
144        2024 03 05.42 xM  9.7 TK 40.0L 4  59   4.5  4/           ICQ XX WYA   Christopher Wyatt
144        2024 03 03.95  M 10.5 TK 30  L 5  65   1    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 03.86  S  9.6 TI 29.8L 4  69   5    2            ICQ XX HAR11 Christian Harder
```

```
144        2024 03 02.94  M 10.5 TK 30  L 5  65   1    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 03 02.79  S  9.8 TI 53.1L    81   6    2/          ICQ XX HAR11 Christian Harder
```

The Jupiter-family comet 144P/Kushida is currently in an orbit with a 7.5-year orbital period. 2024 marks its 5th observed return, with the comet being seen at every return since its 1994 discovery by Japanese seismologist and amateur astronomer Yoshio Kushida. 144P is one of two comets that Kushida discovered with both comets being photographic discoveries. Both were discovered only a month apart in December 1993 (147P/Kushida-Muramatsu) and January 1994 (144P/Kushida). 144P was discovered on the night of 1994 January 8 with a 0.10-m f/4 patrol telescope.

The 1994 discovery apparition saw the comet reach 9th magnitude. The 2009 return was also good, with a peak brightness of 8th magnitude. Kushida has its best returns when perihelion is in December or January.

The current return is also a good one with a close approach to Earth on 2023 December 12 at 0.57 au and perihelion on January 25 at 1.40 au. Thanks to a seasonal effect 144P doesn't peak in activity and intrinsic brightness until about a month after perihelion.

It is now a few months after closest approach and perihelion, and a month or so after peak brightness. As a result, Kushida will be fading this month from magnitude 10.6 to 13.4 as it moves through Gemini (Apr 1-17) and Cancer (17-30).

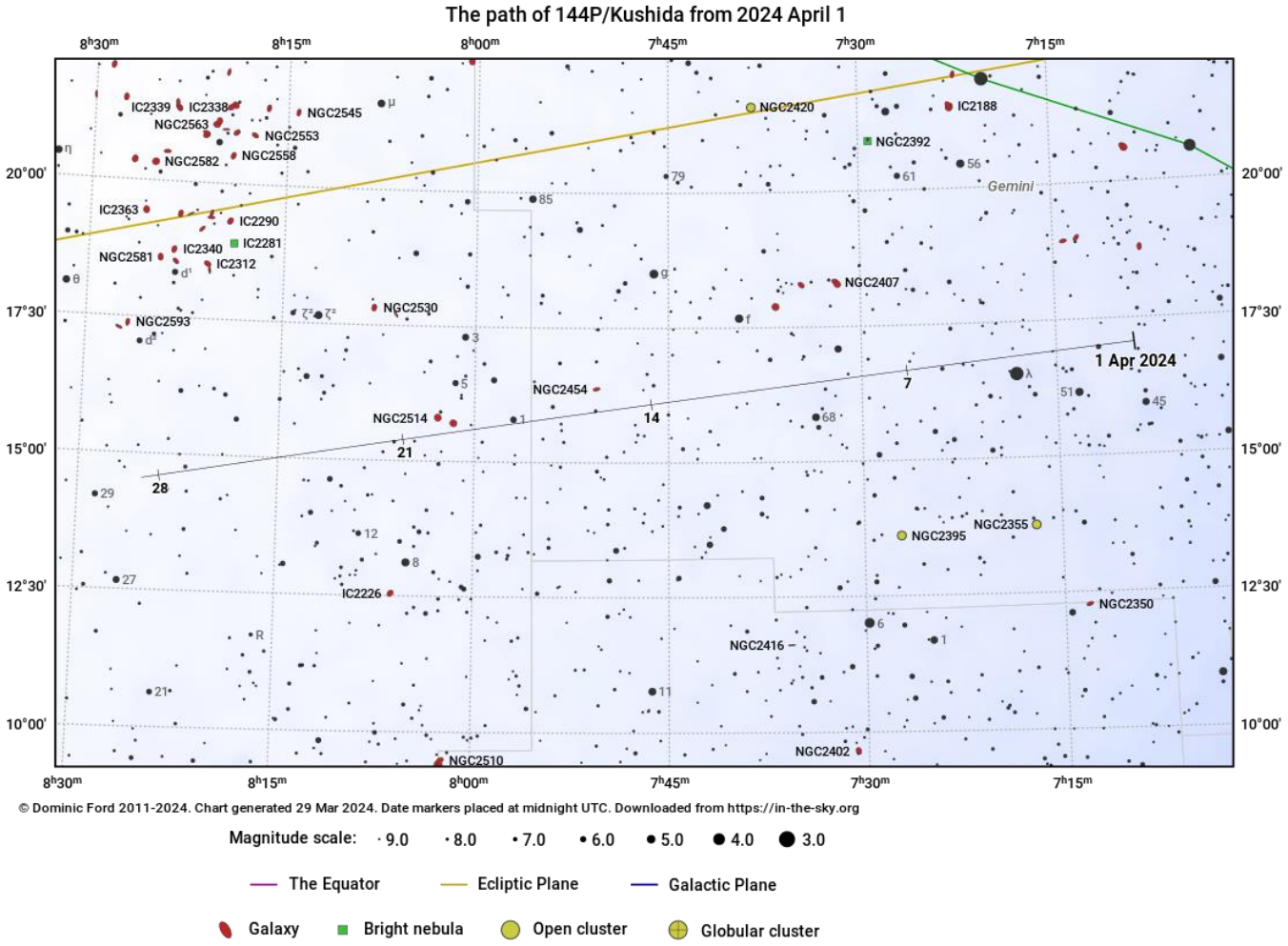


Figure 11 - Finder chart for 144P in April 2024 from in-the-sky.org.

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 2024-F34)

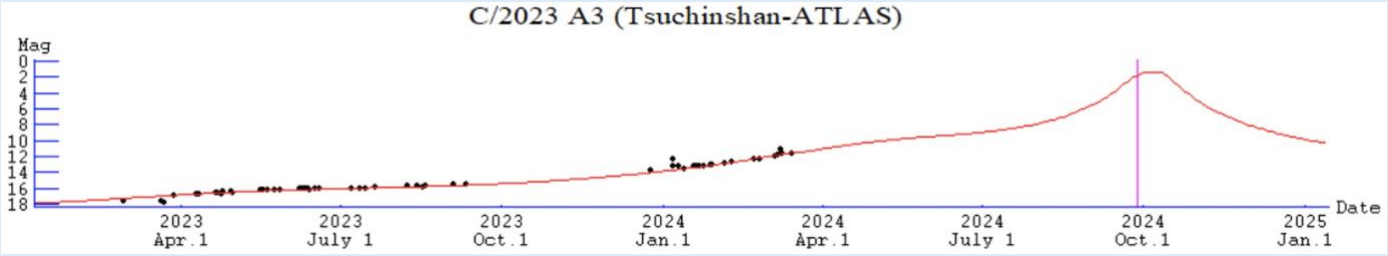
```
   C/2023 A3 (Tsuchinshan-ATLAS)
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Sept. 27.74602 TT                                  Rudenko
q   0.3914525           (2000.0)            P               Q
z  -0.0002762       Peri.  308.49011     +0.36139050     +0.90085375
 +/-0.0000073       Node    21.55983     +0.91855127     -0.29964650
e   1.0001081       Incl.  139.11227     -0.16018884     +0.31412497
From 2726 observations 2022 Apr. 9-2024 Mar. 18, mean residual 0".3.
1/a(orig) = -0.000219 AU**-1, 1/a(fut) = -0.000191 AU**-1.
```

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

```
C/2023 A3 (Tsuchinshan-ATLAS)                                          Max El
                                                                        (deg)
    Date       R.A.    Decl.     r       d     Elong  Const  Mag   40N   40S
2024-Apr-01  14 32   -04 59    3.160   2.240    152M   Vir   11.0    45    55
2024-Apr-06  14 23   -04 23    3.095   2.139    159M   Vir   10.9    46    54
2024-Apr-11  14 13   -03 45    3.031   2.049    165M   Vir   10.7    46    54
2024-Apr-16  14 01   -03 03    2.965   1.970    170M   Vir   10.5    47    53
2024-Apr-21  13 49   -02 19    2.899   1.903    170E   Vir   10.4    48    52
2024-Apr-26  13 36   -01 35    2.832   1.849    164E   Vir   10.3    48    52
2024-May-01  13 22   -00 50    2.765   1.807    157E   Vir   10.1    49    51
2024-May-06  13 08   -00 06    2.696   1.777    149E   Vir   10.0    50    50
```

Comet Magnitude Formula (from ALPO, COBS, and MPC data)

```
m1 = -16.6 + 5 log d + 35.0 log r [Through T-650 days]
m1 =   3.5 + 5 log d + 11.1 log r [Between T-650 and T-195 days]
m1 =   5.3 + 5 log d +  8.0 log r [After T-195 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     Mag SC APER FL POW    COMA     TAIL    ICQ    CODE  Observer Name
              (UT)                    T         Dia  DC  LENG  PA
   2023A3  2024 03 13.28  M 12.4 AQ 30  L 5 100   1    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 03 12.28  M 12.5 AQ 30  L 5 100   1    4            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 03 11.28  M 12.5 AQ 30  L 5 100   1    4/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 03 09.02  S 12.6 TI 53.1L         0.8  4/           ICQ XX HAR11 Christian Harder
   2023A3  2024 03 08.03  S 12.0 TI 53.1L   162   0.8  4/  2   m300 ICQ XX HAR11 Christian Harder
   2023A3  2024 03 05.52 xM 12.6 AQ 40.0L 4 108   0.6  6/           ICQ XX WYA   Christopher Wyatt
```

While 12P/Pons-Brooks may be the comet of the moment, attention will soon shift to the next potentially bright comet, C/2023 A3 (Tsuchinshan-ATLAS). Though a dynamically new long-period comet, Tsuchinshan-ATLAS has been brightening at a steady and slightly above-average clip since early 2023. Dynamically new comets are prone to underperform near perihelion and even disintegrate, but they also usually brighten at slower than average rates. Whether Tsuchinshan-ATLAS will develop into a bright object this October is still a big question mark, though its steady and healthy rate of brightening is a positive development and one we will be watching over the next few months.

Still located around 3 au from the Sun, Tsuchinshan-ATLAS was observed visually by several observers at 12th magnitude (though aperture corrections suggest it is a brighter 11th magnitude object). A conservative 8 log r brightening trend has the comet starting the month at magnitude 11.0 and ending April at 10.1. As the comet brightens into the range of more small telescope observers, we should get a better idea of how bright it really is.

This month, Tsuchinshan-ATLAS is well placed for all observers at opposition in Virgo.

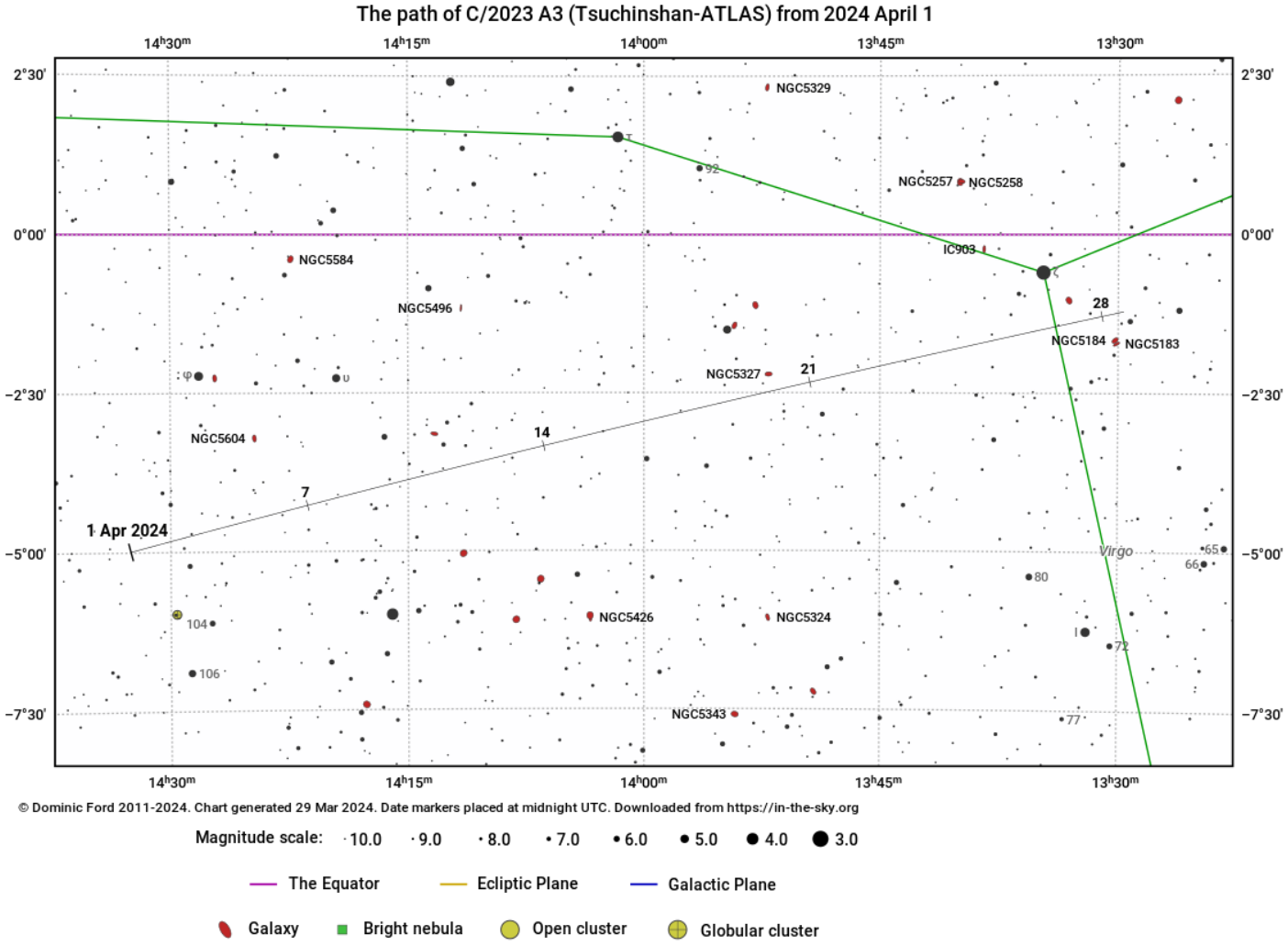


Figure 12 - Star chart for C/2023 A3 in April 2024. Chart produced at in-the-sky.org.

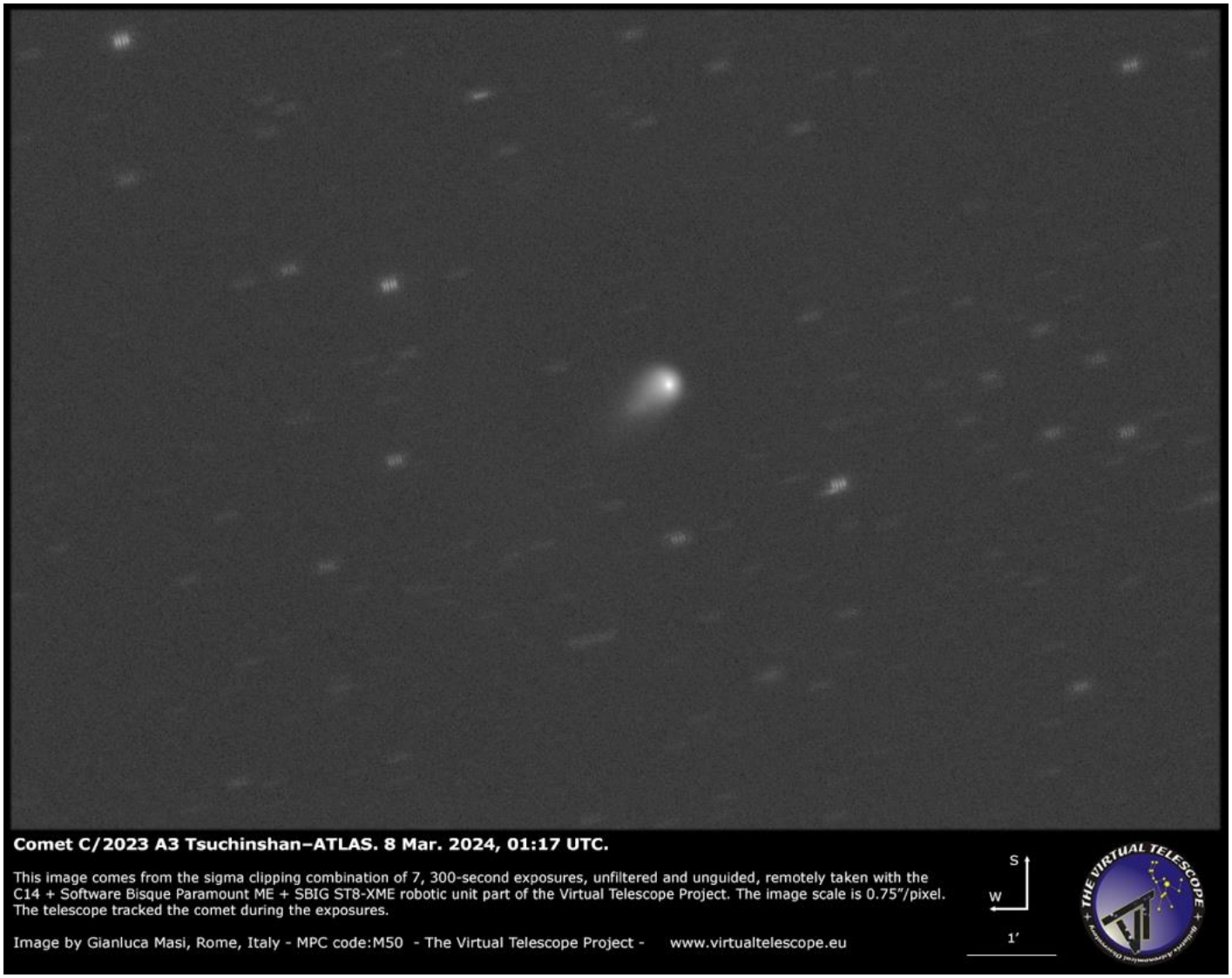


Figure 13 – C/2023 A3 on 2024 March 8, as imaged by Gianluca Masi with a Celestron C14 and SBIG ST8-XME camera. Image is a composite of 7 x 300 s exposures.

Fainter Comets of Interest

29P/Schwassmann-Wachmann

Discovered 1927 November 15 by Arnold Schwassmann and Arno Arthur Wachmann at the Hamburg Observatory in Bergedorf, Germany
Centaur comet with orbital period of ~14.9 years

Orbit (from Minor Planet Center, MPEC 2024-F34)

```
29P/Schwassmann-Wachmann
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2019 May 2.75161 TT                                  Rudenko
q   5.7859627            (2000.0)            P             Q
n   0.06618423     Peri.   51.95355     +0.98936628     -0.08207066
a   6.0529402      Node   312.40588     +0.01231221     +0.86988468
e   0.0441071      Incl.    9.35915     +0.14492331     +0.48637954
P  14.9
From 18733 observations 2018 June 18-2024 Mar. 18, mean residual 0".6.
```

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

```
29P/Schwassmann-Wachmann                                              Max El
                                                                       (deg)
    Date      R.A.   Decl.     r       d    Elong  Const  Mag    40N  40S
2024-Apr-01  08 03  +21 15   6.191   5.820   107E   Cnc  11-14   70   29
2024-Apr-06  08 04  +21 10   6.192   5.899   102E   Cnc  11-14   68   29
2024-Apr-11  08 04  +21 04   6.193   5.979    97E   Cnc  11-14   65   29
2024-Apr-16  08 05  +20 58   6.194   6.060    92E   Cnc  11-14   61   29
2024-Apr-21  08 06  +20 51   6.196   6.142    88E   Cnc  11-14   56   29
2024-Apr-26  08 08  +20 43   6.197   6.223    83E   Cnc  11-14   52   28
2024-May-01  08 10  +20 34   6.198   6.303    79E   Cnc  11-14   47   28
2024-May-06  08 11  +20 25   6.199   6.383    75E   Cnc  11-14   42   27
```

Comet Magnitude Formula

```
None, due to frequent outbursts.
```

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
 29        2024 03 09.83  S 14.7 TI 53.1L   194   0.6  6           ICQ XX HAR11 Christian Harder
 29        2024 03 05.47 xS 14.9 AQ 40.0L 4 182   0.5  3/          ICQ XX WYA   Christopher Wyatt
```

Large Centaur comet 29P/Schwassmann-Wachmann is an object in a class of its own. While 12P/Pons-Brooks has experienced several multi-magnitude outbursts over the past few months, 29P has several multi-magnitude outbursts almost every year. What is even more amazing is that it currently never gets closer than 5.79 au from the Sun.

The most recent outburst was detected on March 24. This follows another major outburst on 2023 December 8 and smaller ones on December 9, 14, 23, January 3, 16, February 5, 12, 25, and March 8. Visual observations reported to COBS after the recent outburst found the comet around magnitude 12.7 to 13.2.

The comet is now an evening object and well placed in Cancer for observers in both hemispheres.

If you image 29P, please consider contributing to two pro-am programs spearheading the effort to understand this amazing object better: the British Astronomical Society's (BAA) Mission 29P monitoring program coordinated by Richard Miles. (https://britastro.org/node/18562 & https://britastro.org/node/25120).

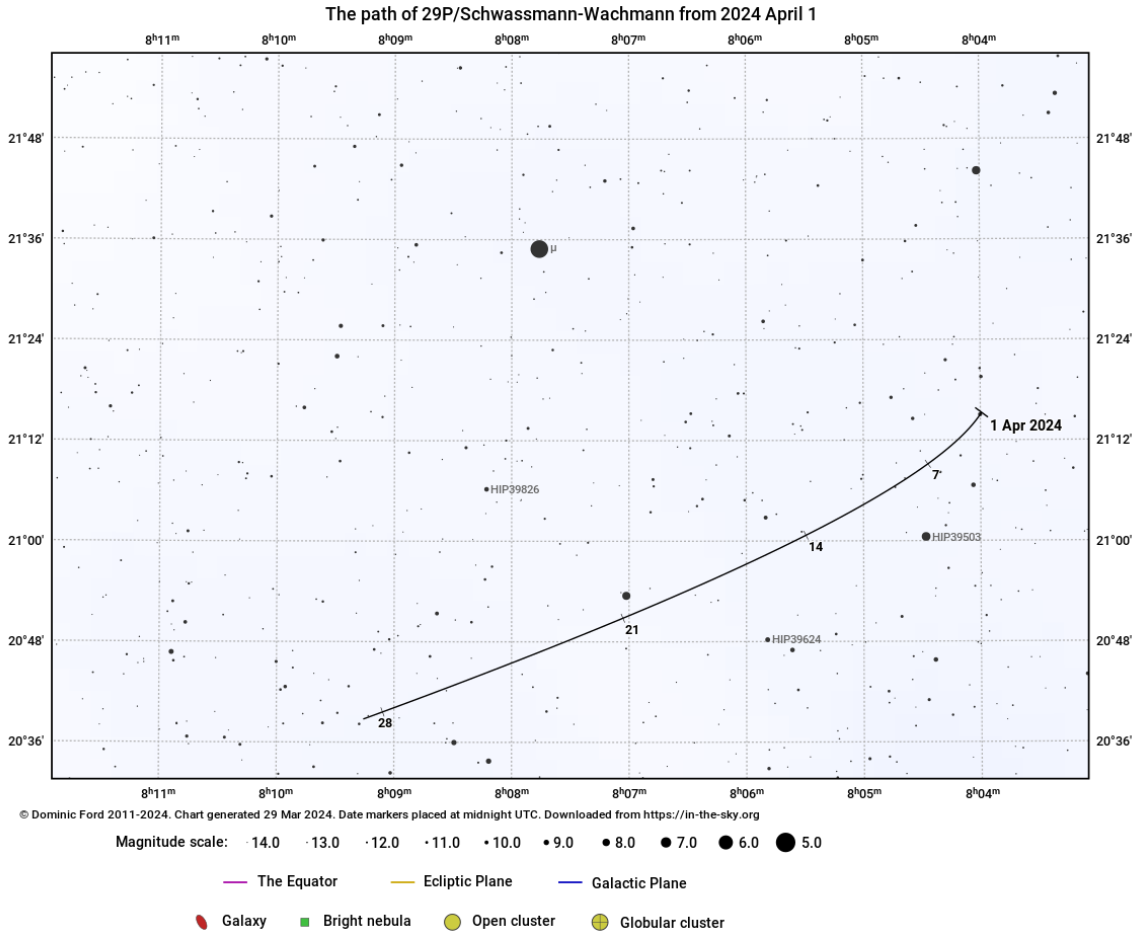


Figure 14 - Finder chart for 29P in April 2024 from in-the-sky.org.

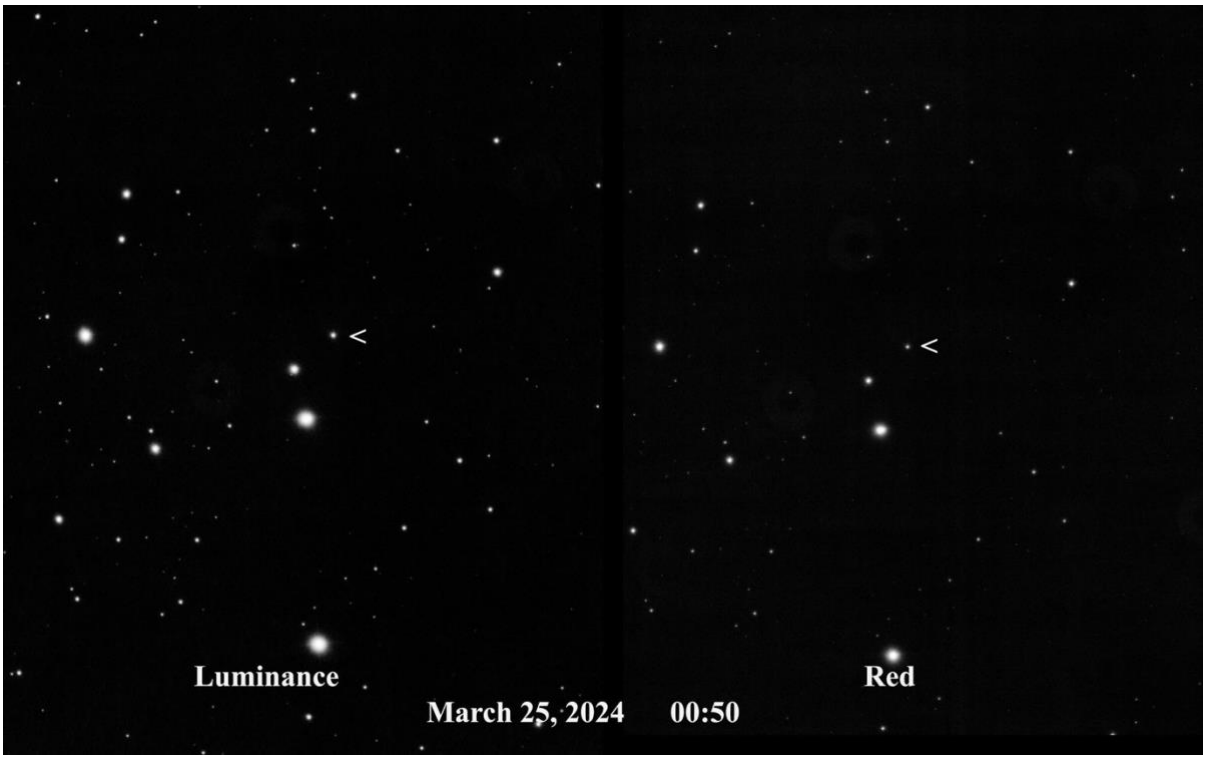


Figure 15 - Eliot Herman caught 29P after its latest outburst in green and red image taken on March 25.