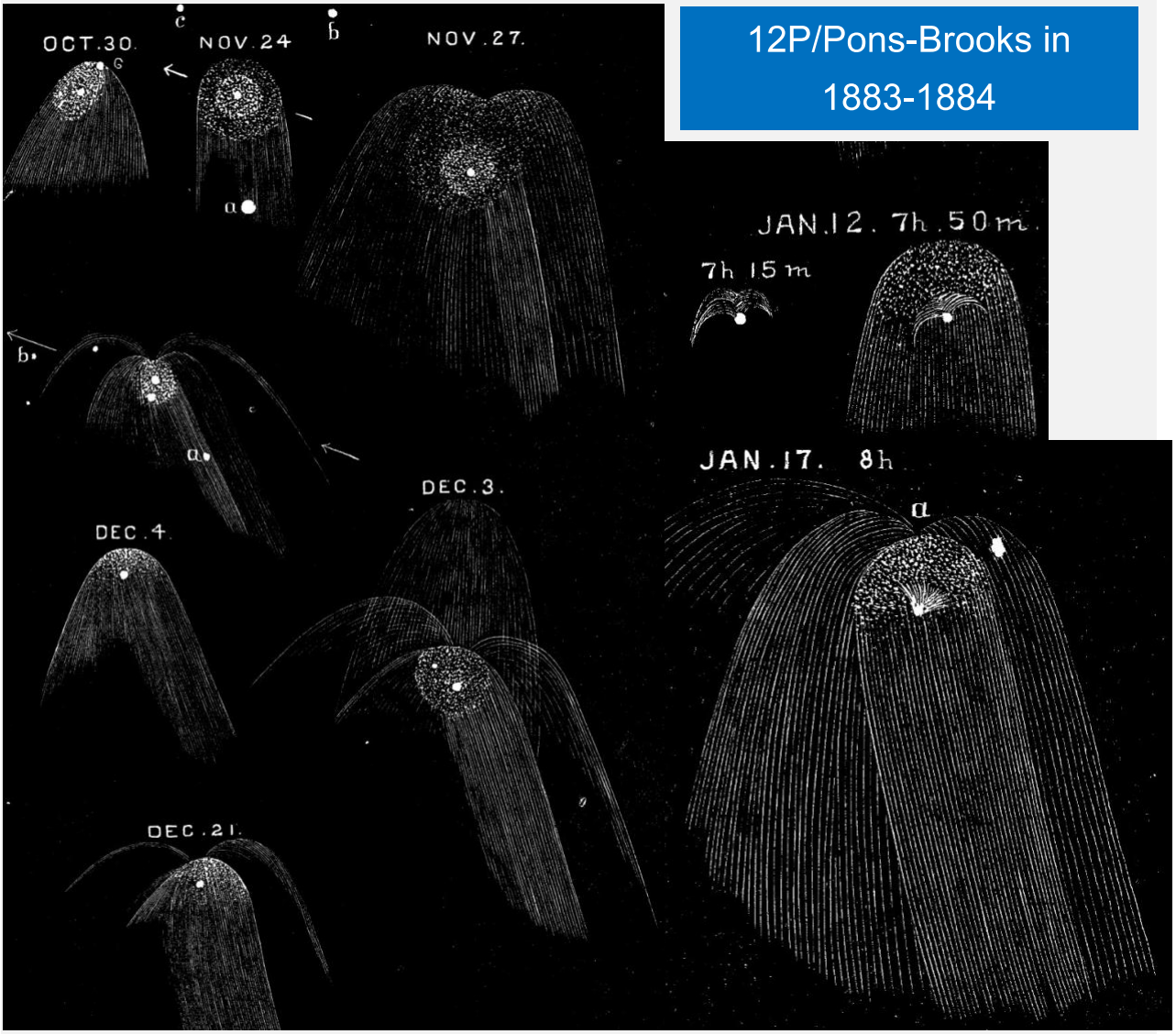
March 2024

ALPO Comet News

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



12P/Pons-Brooks in 1883-1884

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On the Front Cover:

This selection of sketches was published by H. C. Wilson in the article titled “Notes on the Pons-Brooks’ Comet” in the Sidereal Messenger (vol. 3, pp. 137-147, 1884). From October 1883 through January 1884, Wilson used a 11” telescope and its 2 ½” finder to study the comet. 12P showed a lot of near-nucleus structure in the weeks before its 1884 January 26 perihelion. Hopefully, it will repeat the show in 2024 though its more distant return will make inner coma structure smaller and more difficult to resolve.

Wilson’s paper can be seen at https://adsabs.harvard.edu/full/1884SidM....3..137W .

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/912985-alpo-comet-news-for-march-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

March will be all about comet 12P/Pons-Brooks, at least for those of us in the northern hemisphere. While the comet will be at perihelion and a bit brighter and more active in April, March will be the last month to observe the comet in a dark sky at a reasonable elevation. The comet starts March at 6th magnitude and could be as bright as 4th magnitude by the end of the month. I suspect that observers under a dark sky will report naked-eye observations. The comet is also proving to be very photogenic with a multi-degree long gas tail already easily imaged.

Pons-Brooks isn't the only comet to observe in March. The following will be visible from both hemispheres. In the evening sky, we have 144P/Kushida fading from 9th to 11th magnitude. 12P/Pons-Brooks isn't the only Halley-family comet in the evening sky. 13P/Olbers will be visible brightening from 11th to 10th magnitude.

Near opposition, 62P/Tsuchinshan will be fading from 10th to 13th magnitude. The morning sky sees two reasonably bright long-period comets; C/2021 S3 (PANSTARRS) will be around 9th magnitude, and incoming C/2023 A3 (Tsuchinshan-ATLAS) will brighten from 12th to 11th magnitude.

Last month, the ALPO Comets Section received 147 images and 71 magnitude estimates of 30 comets: C/2024 B2 (Lemmon), C/2023 A3 (Tsuchinshan-ATLAS), C/2022 E2 (ATLAS), C/2021 T4 (Lemmon), C/2021 S3 (PANSTARRS), C/2021 G2 (ATLAS), C/2020 V2 (ZTF), C/2020 S4 (PANSTARRS), C/2020 K1 (PANSTARRS), C/2019 U5 (PANSTARRS), C/2017 K2 (PANSTARRS), 479P/Elenin, 475P/Spacewatch-LINEAR, 473P/NEAT, 244P/Scotti, 234P/LINEAR, 227P/Catalina-LINEAR, 216P/LINEAR, 207P/NEAT, 150P/LONEOS, 144P/Kushida, 121P/Shoemaker-Holt, 103P/Hartley, 65P/Gunn, 62P/Tsuchinshan, 37P/Forbes, 32P/Comas Sola, 29P/Schwassmann-Wachmann, 13P/Olbers, and 12P/Pons-Brooks.

A big thanks to our recent contributors: Dan Bartlett, Michel Besson, Denis Buczynski, Dan Crowson, Michel Deconinck, Jose Guilherme de Souza Aguiar, Juan Jose Gonzalez Suarez, Eliot Herman, Michael Jäger, Christian Harder, Manos Kardasis, John Maikner, Gianluca Masi, Erwin Matys, Martin Mobberley, Karoline Mrazek, Mike Olason, Uwe Pilz, Greg Ruppel, Chris Schur, Gregory T. Shanos, Willian Souza, Tenho Tuomi, Russell Wheeler, 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)

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

Comets at Perihelion

Mar 05 - P/2010 T2 (PANSTARRS) [q = 3.78 au, 13.1-yr period, V ~ ???, discovered in 2010, reached V ~ 19 (outburst?) but faded to invisibility before perihelion, yet to be seen in 2024]
Mar 07 - 125P/Spacewatch [q = 1.53 au, 5.5-yr period, V ~ 15, discovered in 1990, 7th observed return]
Mar 08 - 227P/Catalina-LINEAR [q = 1.62 au, 6.4-yr period, V ~ 16, discovered in 2003, pre-discovery obs from 1997, 5th observed return]
Mar 12 - C/2022 L2 (ATLAS) [q = 2.69 au, V ~ 13-14]
Mar 12 - 150P/LONEOS [q = 1.75 au, 7.6-yr period, V ~ 16, discovered in 2000, pre-discovery obs from 1978 and 1985, very low activity comet]
Mar 25 - C/2021 Q6 (PANSTARRS) [q = 8.71 au, V ~ 18]
Mar 25 - C/2022 U1 (Leonard) [q = 4.20 au, V ~ 16-17]
Mar 26 - 89P/Russell [q = 2.22 au, 7.3-yr period, V ~ 16, discovered in 1980, 7th observed return, usually brighter after perihelion]
Mar 30 - 309P/LINEAR [q = 1.67 au, 9.4-yr period, V ~ 18, discovered in 2005, 3rd observed return]

Photo Opportunities

Mar 10-11 - 62P/Tsuchinshan passes ~35' from 11th mag galaxy NGC 4442
Mar 12-13 - C/2021 S3 (PANSTARRS) skirts the outer parts of the large 4th mag open cluster IC 4756
Mar 13 - 62P/Tsuchinshan passes within arc minutes of 13th mag galaxy NGC 4390
Mar 16 - 12P/Pons-Brooks passes within 30' of 11th magnitude galaxy NGC 315
Mar 19-20 - C/2021 S3 (PANSTARRS) passes over 8th mag open cluster NGC 6738
Mar 21 - 12P/Pons-Brooks passes ~3 deg from bright galaxy M33
Mar 25-26 - 12P/Pons-Brooks passes ~1.5 deg from 11-12th mag galaxy pair NGC 672 and IC 1727
Mar 27 - 144P/Kushida passes ~40' from 10th mag open cluster NGC 2304
Mar 29-30 - C/2021 S3 (PANSTARRS) passes through the large bright asterism Brocchi's Cluster (the Coathanger)

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/2023 A3 (Tsuchinshan-ATLAS)												
2023A3	2024 02 05.39	Z 12.9	GG	0.5R	4		1.4				OLAaa	Michael Olason
C/2022 E2 (ATLAS)												
2022E2	2024 02 13.48	xM 13.1	AQ	40.0L	4	108	0.8	6	1.3	m130	ICQ XX WYA	Christopher Wyatt
2022E2	2024 02 05.31	Z 12.8	GG	0.5R	4		1.7				OLAaa	Michael Olason
2022E2	2024 02 03.98	S 12.8	TI	29.8L	4	108	1.3	4			ICQ XX HAR11	Christian Harder
2022E2	2024 02 02.48	xM 13.4	AQ	40.0L	4	108	0.7	6			ICQ XX WYA	Christopher Wyatt
2022E2	2024 02 01.79	S 12.6	TI	29.8L	4	132	0.9	s6			ICQ XX HAR11	Christian Harder
C/2021 S3 (PANSTARRS)												
2021S3	2024 02 19.29	M 10.2	TK	30 L	5	65	3	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 02 13.30	S 10.0	TK	15.0L	5	37	2	3			ICQ XX SOU01	Willian Souza
2021S3	2024 02 12.29	M 10.0	TK	30 L	5	65	3	4/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2021S3	2024 02 11.30	S 10.0	TK	15.0L	5	37	2	3			ICQ XX SOU01	Willian Souza
2021S3	2024 02 10.28	M 10.0	TK	30 L	5	65	4	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2021 G2 (ATLAS)												
2021G2	2024 02 13.52	xM 14.6	AQ	40.0L	4	182	0.6	5/			ICQ XX WYA	Christopher Wyatt
C/2020 V2 (ZTF)												
2020V2	2024 02 02.42	xM 12.6	AQ	40.0L	4	108	1.7	4/			ICQ XX WYA	Christopher Wyatt
C/2020 K1 (PANSTARRS)												
2020K1	2024 02 13.51	xS 15.0	AQ	40.0L	4	182	0.6	3/			ICQ XX WYA	Christopher Wyatt
2020K1	2024 02 02.50	xM 14.7	AQ	40.0L	4	182	0.4	3/			ICQ XX WYA	Christopher Wyatt
2020K1	2024 02 02.47	xM 15.0	AQ	40.0L	4	261	0.5	4			ICQ XX WYA	Christopher Wyatt
C/2019 U5 (PANSTARRS)												
2019U5	2024 02 13.52	xM 14.7	AQ	40.0L	4	261	0.5	5/			ICQ XX WYA	Christopher Wyatt
2019U5	2024 02 05.32	Z 13.7	GG	0.5R	4		1				OLAaa	Michael Olason
2019U5	2024 02 02.48	xM 13.9	AQ	40.0L	4	182	0.4	6			ICQ XX WYA	Christopher Wyatt
C/2017 K2 (PANSTARRS)												
2017K2	2024 02 13.47	xM 13.2	AQ	40.0L	4	108	1.1	5/			ICQ XX WYA	Christopher Wyatt
2017K2	2024 02 05.24	Z 13.1	GG	0.5R	4		1				OLAaa	Michael Olason
2017K2	2024 02 02.45	xM 13.6	AQ	40.0L	4	108	1.4	6			ICQ XX WYA	Christopher Wyatt
2017K2	2024 02 01.78	S 12.8	TI	29.8L	4	132	0.8	3/			ICQ XX HAR11	Christian Harder
475P/Spacewatch-LINEAR												
475	2024 02 20.18	C 18.6	BG	30.5H	4	C600					ICQ XX MAI01	John Maikner
234P/LINEAR												
234	2024 02 05.09	C 20.8	BG	30.5H	4	C120					ICQ XX MAI01	John Maikner
227P/Catalina-LINEAR												
227	2024 02 05.29	Z 15.0	GG	0.5R	4		1				OLAaa	Michael Olason
216P/LINEAR												
216	2024 02 20.24	C 18.4	BG	30.5H	4	D800					ICQ XX MAI01	John Maikner
207P/NEAT												
207	2024 02 24.14	Z 14.3	GG	0.5R	4		1				OLAaa	Michael Olason
207	2024 02 13.46	xM 14.6	AQ	40.0L	4	182	0.7	3/			ICQ XX WYA	Christopher Wyatt
207	2024 02 02.44	xM 14.3	AQ	40.0L	4	182	0.7	4/			ICQ XX WYA	Christopher Wyatt
144P/Kushida												
144	2024 02 28.77	S 9.4	TK	7.0B	6	16					PIL01	Uwe Pilz
144	2024 02 24.20	Z 9.6	GG	0.5R	4		5				OLAaa	Michael Olason
144	2024 02 13.95	M 10.8	AQ	30 L	5	65	2	4			ICQ XX DES01	Jose Guilherme de Souza Aguiar
144	2024 02 13.77	S 10.1	TK	12.0R	7	50	3				PIL01	Uwe Pilz
144	2024 02 13.47	xM 8.9	TK	7.0B		15	12	3			ICQ XX WYA	Christopher Wyatt
144	2024 02 12.88	S 9.0	TI	29.8L	4	65	5.5	2/			ICQ XX HAR11	Christian Harder
144	2024 02 05.20	Z 9.4	GG	0.5R	4		6				OLAaa	Michael Olason
144	2024 02 03.97	S 9.5	TI	29.8L	4	65	5	2			ICQ XX HAR11	Christian Harder
144	2024 02 02.44	xS 9.2	TK	5.0R		10	6.5	2			ICQ XX WYA	Christopher Wyatt
144	2024 02 01.77	S 8.8	TI	29.8L	4	65	7	2			ICQ XX HAR11	Christian Harder
121P/Shoemaker-Holt												
121	2024 02 20.03	C 19.8	BG	30.5H	4	D800					ICQ XX MAI01	John Maikner
103P/Hartley												
103	2024 02 13.50	xS 15.1	AQ	40.0L	4	261	0.3	3/			ICQ XX WYA	Christopher Wyatt
103	2024 02 05.26	Z 14.4	GG	0.5R	4		1.4				OLAaa	Michael Olason
103	2024 02 02.46	xS 14.7	AQ	40.0L	4	261	0.6	3/			ICQ XX WYA	Christopher Wyatt
62P/Tsuchinshan												
62	2024 02 24.22	Z 10.0	GG	0.5R	4		6				OLAaa	Michael Olason
62	2024 02 13.53	xS 8.9	TK	7.0B		15	12.5	4			ICQ XX WYA	Christopher Wyatt
62	2024 02 13.17	S 9.8	TK	15.0L	5	37	4	4			ICQ XX SOU01	Willian Souza
62	2024 02 11.16	S 9.8	TK	15.0L	5	37	4	4			ICQ XX SOU01	Willian Souza
62	2024 02 05.34	Z 8.9	GG	0.5R	4		9				OLAaa	Michael Olason
62	2024 02 04.02	S 9.2	TI	29.8L	4	65	8	3			ICQ XX HAR11	Christian Harder

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37P/Forbes
 37        2024 02 05.34  C 20.3 BG 30.5H 4E520                    ICQ XX MAI01 John Maikner
32P/Comas Sola
 32        2024 02 24.17  Z 13.8 GG  0.5R 4       1                      OLAaa Michael Olason
 32        2024 02 13.45 xM 13.8 AQ 40.0L 4 108   1    3/                ICQ XX WYA   Christopher Wyatt
 32        2024 02 05.23  Z 13.8 GG  0.5R 4       2                      OLAaa Michael Olason
29P/Schwassmann-Wachmann
 29        2024 02 13.48 xS 14.7 AQ 40.0L 4 182   0.3  6                 ICQ XX WYA   Christopher Wyatt
 29        2024 02 05.31  Z 12.8 GG  0.5R 4       1.7                    OLAaa Michael Olason
 29        2024 02 02.49 xS 12.4 AQ 40.0L 4  59   2    3                 ICQ XX WYA   Christopher Wyatt
 29        2024 02 01.80  S 13.5 TI 29.8L 4 170   0.6  3                 ICQ XX HAR11 Christian Harder
13P/Olbers
 13        2024 02 24.15  Z 12.5 GG  0.5R 4       2                      OLAaa Michael Olason
 13        2024 02 13.45 xM 13.0 AQ 40.0L 4 108   1.3  4                 ICQ XX WYA   Christopher Wyatt
 13        2024 02 05.21  Z 13.4 GG  0.5R 4       2                      OLAaa Michael Olason
 13        2024 02 02.43 xM 13.7 AQ 40.0L 4 108   1.3  4/                ICQ XX WYA   Christopher Wyatt
12P/Pons-Brooks
 12        2024 02 25.76  S  6.0 TK  5.0B 4   7   8    5/                     PIL01 Uwe Pilz
 12        2024 02 24.11  Z  6.5 GG  0.5R 4       9       >1     13          OLAaa Michael Olason
 12        2024 02 23.78  E  6.8 S  12.6B 5  25   6    7   5   m 10 ICQ XX DEC   Michel Deconinck
 12        2024 02 17.78  S  7.1 TI 29.8L 4  79   5    4                ICQ XX HAR11 Christian Harder
 12        2024 02 13.82  S  6.9 TK  5.0B    10   6    6                ICQ XX GON05 Juan Jose Gonzalez Suarez
 12        2024 02 13.75  S  7.3 TK  7.0B 6  16   5    6                       PIL01 Uwe Pilz
 12        2024 02 05.09  M  7.7 TK  5.0B    10   3    3                ICQ xx HER02 Carl Hergenrother
 12        2024 02 05.08  Z  7.4 GG  0.5R 4       7                      OLAaa Michael Olason
 12        2024 02 01.76  S  7.9 TI 29.8L 4  65   6    4                ICQ XX HAR11 Christian Harder
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Comets News

Looking Ahead to the rest of 2024

The chart below shows those comets expected to become brighter than magnitude 10.0 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 twilight but still may 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 become 1 or more magnitudes brighter than shown in early October due to forward scattering by dust.

Northern Hemisphere	03/01/24	03/11/24	03/21/24	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
C/2021 S3 (PANSTARRS)	9	9	9	9																											
144P/Kushida	9	9																													
12P/Pons-Brooks	6	5	5	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	8	8	7	6	5	4	2	1	2	4	6	7	8	9	9	
333P/LINEAR																													9		
Southern Hemisphere																															
C/2021 S3 (PANSTARRS)	9	9	9	9																											
144P/Kushida	9	9																													
12P/Pons-Brooks							5	5	6	7	7	8	8	9	9																
13P/Olbers						9											8	8	9	9											
C/2023 A3 (Tsuchinshan-ATLAS)															9	8	8	7	6	5	4	2	1	2	4	6	7				
333P/LINEAR																													9		

Figure 1 - Observability and brightness of comets expected to become brighter than magnitude 10.0 during the rest of 2024.

Latest Periodic Comet Numberings (from WGSBN Bull. 4, #3)

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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
470P/2014 W1    = P/2023 O2 (PANSTARRS)                    MPC 164694
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New Discoveries

C/2024 C4 (ATLAS) - C/2024 A4 (ATLAS) was found on February 14 at 16-17th magnitude with a 0.5-m f/2 Schmidt reflector at Sutherland, South Africa, operated by the "Asteroid Terrestrial-Impact Last Alert System" (ATLAS) search program. C/2024 C4 was found only weeks after perihelion on 2024 January 30 at 1.48 au.

The comet will move closer to Earth in March, reaching a peak around 15-16th magnitude late in March. [CBET 5354, MPEC 2024-D98]

C/2024 C3 (PANSTARRS) – C/2024 C3 was found at 21st magnitude on 2024 February 9. Pre-discovery observations were found back to March 2023. It has an orbital period of 39 years with a perihelion at 6.71 au on 2023 November 8. Barring an outburst or steep brightening rate, C/2024 C3 is probably already at peak brightness. [CBET 5353, MPEC 2024-D97]

C/2024 C2 (PANSTARRS) – The Pan-STARRS2 telescope also found C/2024 C2 (PANSTARRS). With an orbital period of 65 years, perihelion at 8.99 au (T = 2025 March 16), and aphelion at 23.38 au, C/2024 C2 is classified as a Centaur object (objects with orbits that lie entirely between the orbits of the outer planets). Like C/2024 C3, it is probably already at peak brightness, barring an outburst or steep brightening rate. [CBET 5350, MPEC 2024-C178]

C/2024 C1 (PANSTARRS) – The third intermediate-period comet found by the Pan-STARRS2 telescope is also a Centaur object. C/2024 C1 was found at 21st magnitude on 2024 February 9, with pre-discovery images going back to December 2023. The comet is an intermediate-period object with an orbital period of 34 years. Perihelion occurs on 2024 August 31, at 4.41 AU. [CBET 5348, MPEC 2024-C177]

C/2024 B2 (Lemmon) – The Mount Lemmon 1.5-m was also used to find this 20th magnitude comet on 2024 January 31. Also, a long-period comet, C/2024 B2 has probably already peaked in brightness since it is now past its perihelion on 2023 October 5 at 4.08 au. [CBET 5345, MPEC 2024-C87]

C/2024 B1 (Lemmon) – The Catalina Sky Survey's Mount Lemmon 1.5-m was used to find this 20th magnitude comet on 2024 January 16. This long-period comet is predicted to reach 16th magnitude around the time of its 2024 October 7 perihelion at 1.63 au. [CBET 5344, MPEC 2024-C86]

C/2024 A2 (ATLAS) – C/2024 A3 (ATLAS) was found on January 15 at 17-18th magnitude in the far southern sky with an ATLAS 0.5-m f/2 Schmidt reflector at Rio Hurtado, Chile. C/2024 A3 is a Halley-type comet with an orbital period of 185 years. Perihelion will be on 2024 April 28, at 1.88 au, with a peak brightness around magnitude 16.5 in mid-March. [CBET 5349, MPEC 2023-C180]

C/2023 X7 (PANSTARRS) – On 2023 December 10, a 20th magnitude object was picked up by the Pan-STARRS2 1.8-m Ritchey-Chretien reflector at Haleakala. The object had an obvious long-period comet orbit and remained on the MPC PCCP page for months, awaiting confirmation of cometary activity. That confirmation came in early February with a report by Rob Weryk of a diffuse coma and broad 3" long tail in Pan-STARRS2 follow-up images. C/2023 X7 is currently at 5.9 au from the Sun. It should brighten to around magnitude 18.5 when at opposition in January 2025. Perihelion will occur on 2025 May 15 at 4.82 au. [CBET 5355, MPEC 2024-D102]

C/2019 G2 (PANSTARRS) – The Pan-STARRS1 1.8-m at Haleakala discovered C/2019 G2 on 2019 April 2 at 21st magnitude. The object was originally designated as A/2019 G2, an inactive object on a long-period cometary orbit. Though observations in 2020 reported cometary activity, the object is only now being re-classified as a comet and redesignated C/2019 G2 (PANSTARRS). Perihelion was on 2019 December 10 at 2.29 au. The comet is now very faint and was last seen in September 2020. [CBET 5361, MPEC 2024-E01)

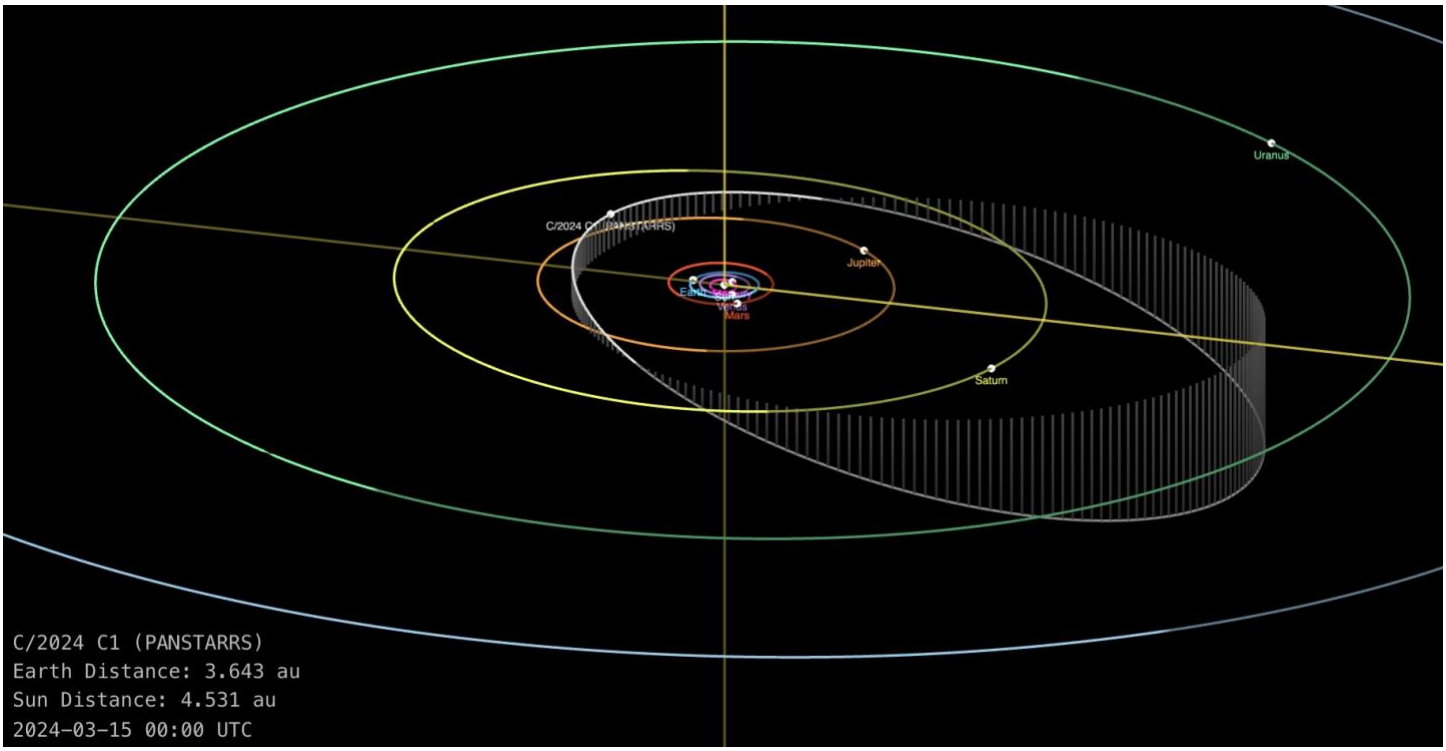


Figure 2 - Orbit of newly discovered comet C/2024 C1 (PANSTARRS). Image made with the JPL Small-Body Database orbit viewer.

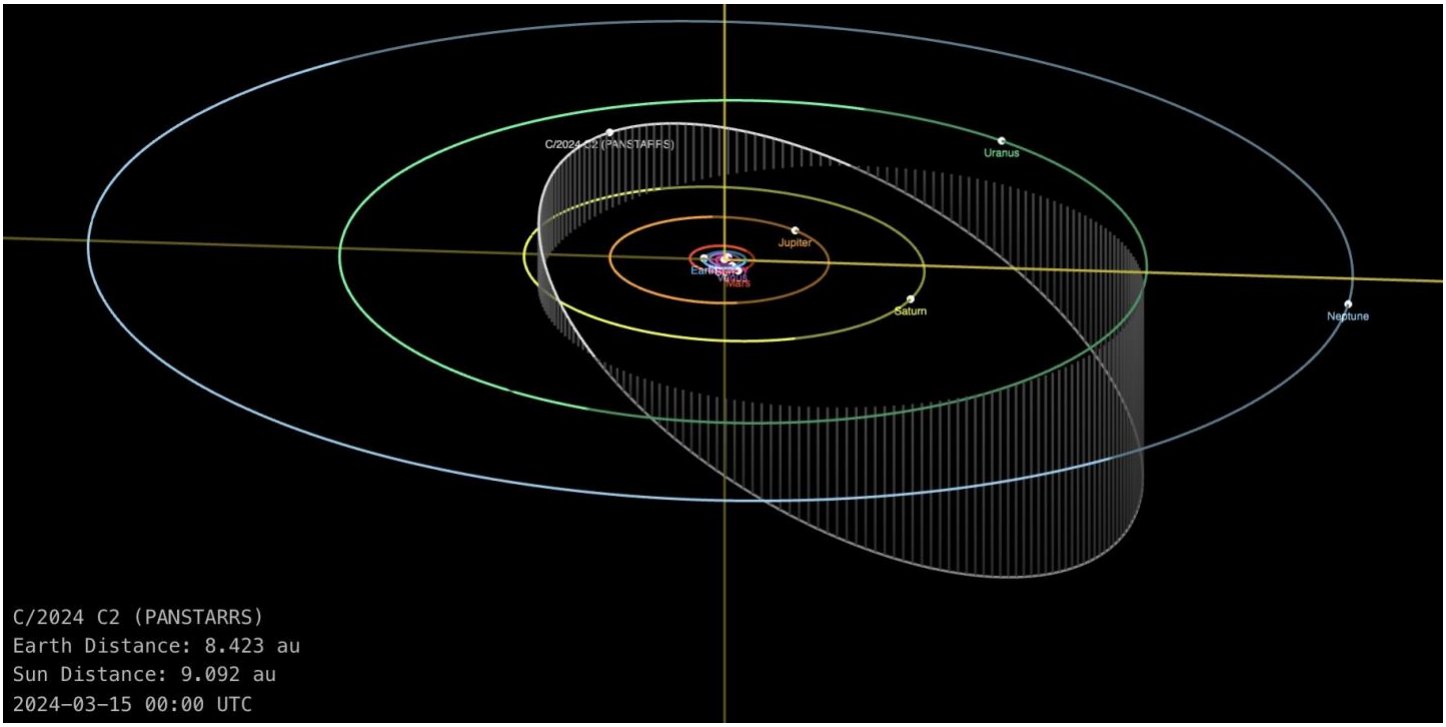


Figure 3 - Orbit of newly discovered comet C/2024 C2 (PANSTARRS). Image made with the JPL Small-Body Database orbit viewer.

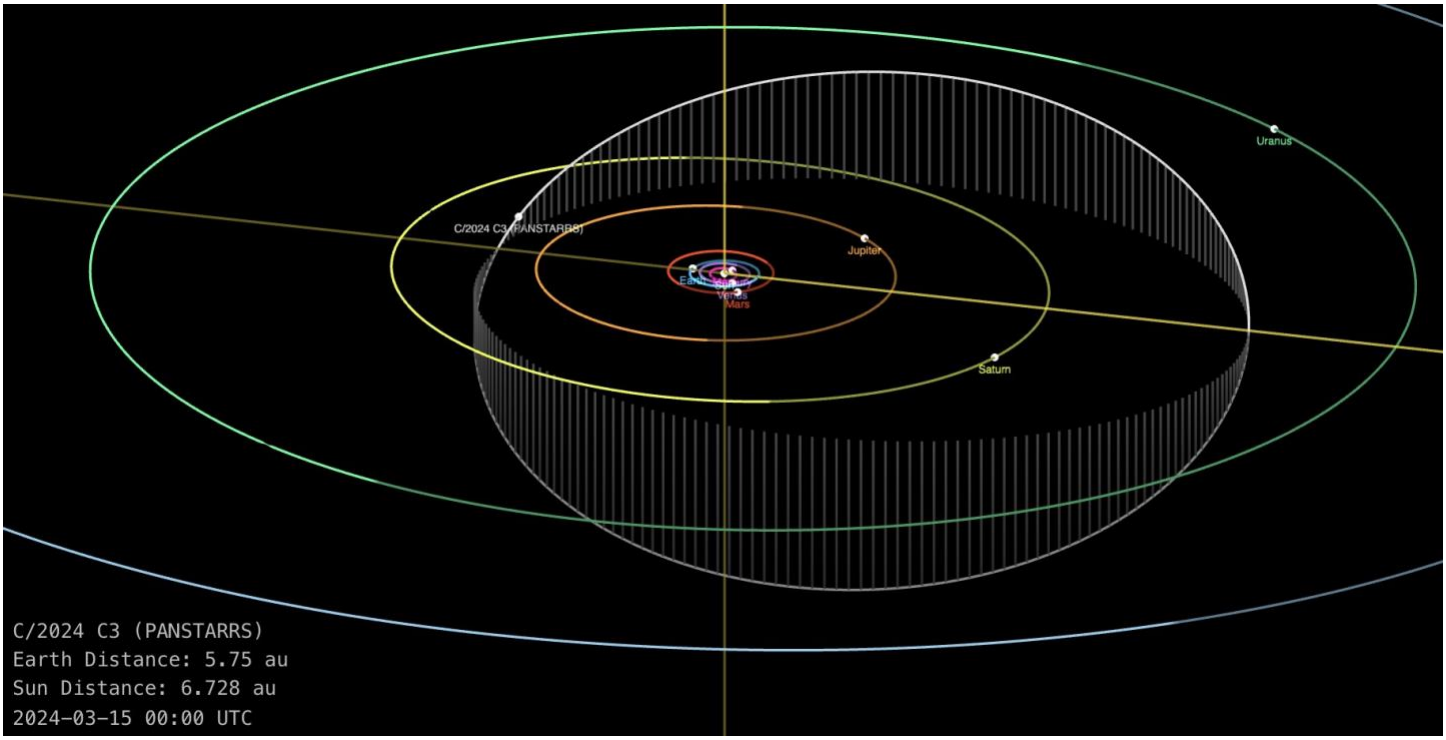


Figure 4 - Orbit of newly discovered comet C/2024 C3 (PANSTARRS). Image made with the JPL Small-Body Database orbit viewer.

P/2014 VF40 (PANSTARRS) – An apparently asteroidal object was discovered by the Pan-STARRS survey with their Pan-STARRS1 1.8-m telescope on Haleakala on 2014 November 10 at 20th magnitude. Several observers have reported cometary activity in January and February of 2024. P/2-14 VF40 is a short-period comet with an orbital period of 7.3 years. During its discovery apparition, it was at perihelion on 2015 May 8 at 2.35 au. Due to a close approach to Jupiter of 0.30 au in February 2021, its current perihelion distance has dropped to 1.91 au (T = 2023 June 1). It is currently around 20th magnitude and fading. [CBET 5359, MPEC 2024-D133]

P/2005 XR132 (Spacewatch) – Similar to P/2014 VF40, P/2005 XR132 (Spacewatch) was considered only an inactive asteroid when discovered. The Spacewatch survey at the University of Arizona used their Kitt Peak-based 0.9-m f/3 reflector to find XR132 on 2005 December 5 at 20th magnitude. Observers using the Lulin 1-m and ZTF 1.2-m telescopes in 2021 found the object to have a stellar coma but an up to 10" long tail. Additional 2021 follow-up observations were made by L. Buzzi and H. Sato. XR132 was last at perihelion on 2020 November 26 at 2.14 au, so about 4-6 months prior to the 2021 observations, which occurred in February and April. The comet has a 7.3-year orbital period and will be at perihelion again on 2028 March 10. [CBET 5360, MPEC 2024-D135]

New Recoveries

P/2024 C5 = P/2012 WA34 (Lemmon-PANSTARRS) – E. Schwab of Egelsbach, Germany, recovered short-period comet P/2012 WA34 (Lemmon-PANSTARRS) on 2024 February 12 at 20th magnitude with a 1.0-m f/4.4 reflector at the ESA Optical Ground Station on Tenerife. The recovery was made in collaboration with F. Ocana, D., Abreu, M. Busch, L. Conversi, R. Kresken, and M. Micheli. Before the recovery was announced on its own MPEC or CBET, the observations were posted by the MPC, allowing Sam Deen to find 21-22nd magnitude images on 2022 September 18 and 19 in Cerro Tololo 4-m images made with the DECam instrument.

P/2012 WA34 has a 10.1-year orbital period with perihelion back on 2023 July 8, at 3.07 au. Hence, the comet is now fading. At its discovery return in 2013, it peaked at 19th magnitude. [CBET 5356, MPEC 2024-D103]

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-D126)

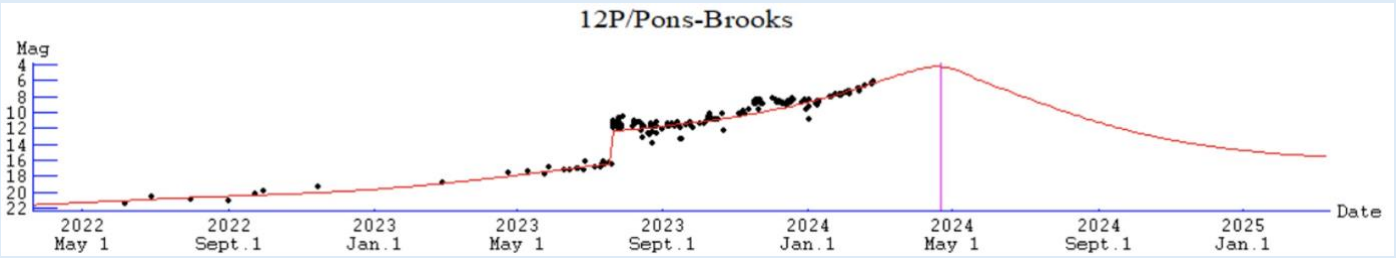
```
12P/Pons-Brooks
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Apr. 21.12365 TT                                  Rudenko
q   0.7807778           (2000.0)            P               Q
n   0.01380932     Peri.  198.98908     +0.14510796     -0.32930049
a  17.2063108      Node   255.85589     +0.98566266     +0.13016977
e   0.9546226      Incl.   74.19153     +0.08609766     -0.93520961
P  71.4
From 6968 observations 2023 Feb. 27-2024 Feb. 24, 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-Mar-01  23 38  +35 42    1.211    1.691     44E    And   6.1   20    0
2024-Mar-06  00 04  +34 27    1.148    1.667     42E    And   5.9   19    0
2024-Mar-11  00 29  +32 54    1.087    1.647     39E    And   5.6   18    0
2024-Mar-16  00 54  +31 02    1.028    1.633     36E    Psc   5.4   17    0
2024-Mar-21  01 18  +28 51    0.973    1.623     34E    Psc   5.1   15    0
2024-Mar-26  01 42  +26 22    0.922    1.616     31E    Psc   4.9   14    0
2024-Mar-31  02 04  +23 37    0.877    1.613     28E    Ari   4.7   11    0
2024-Apr-05  02 26  +20 38    0.839    1.611     26E    Ari   4.5    8    0
```

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 02 25.76  S  6.0 TK  5.0B 4   7   8    5/                  PIL01 Uwe Pilz
 12        2024 02 24.11  Z  6.5 GG  0.5R 4       9       >1     13        OLAaa Michael Olason
 12        2024 02 23.78  E  6.8 S  12.6B 5  25   6    7   5   m 10 ICQ XX DEC   Michel Deconinck
 12        2024 02 17.78  S  7.1 TI 29.8L 4  79   5    4            ICQ XX HAR11 Christian Harder
 12        2024 02 13.82  S  6.9 TK  5.0B    10   6    6            ICQ XX GON05 Juan Jose Gonzalez Suarez
 12        2024 02 13.75  S  7.3 TK  7.0B 6  16   5    6                  PIL01 Uwe Pilz
 12        2024 02 05.09  M  7.7 TK  5.0B    10   3    3            ICQ xx HER02 Carl Hergenrother
 12        2024 02 05.08  Z  7.4 GG  0.5R 4       7                       OLAaa Michael Olason
 12        2024 02 01.76  S  7.9 TI 29.8L 4  65   6    4            ICQ XX HAR11 Christian Harder
```

12P/Pons-Brooks is approaching its best! After 70 years, Pons-Brooks is once again nearing perihelion, making its first return since 1954 and its sixth or seventh observed return in total after being discovered in 1812, rediscovered in 1883, and also seen in 1457 and 1385, possibly 245 AD. As March begins, the comet is ~7

weeks from its April 21 perihelion at 0.78 au. Visually, the comet is getting larger (5' to 8' coma) with a short tail. It is also bright enough to be seen in small binoculars. Images show a much longer (multiple degrees) and dynamic gas tail.

Past returns saw a number of major outbursts from Pons-Brooks, and the current return hasn't disappointed. While the large multi-magnitude outbursts seen last year seem to have ended, three minor ones were reported in February, with the most recent occurring on the 28th-29th.

Even with the outbursts, the comet has been closely following its 1954 lightcurve. If this continues, Pons-Brooks should start the month around magnitude 6.1 and still at 1.21 au from the Sun and 1.69 au from Earth. By the end of the month, it will be closer to magnitude 4.7 and may be within range of naked-eye observers with dark, clear skies. By then, the comet's distance to the Sun will have dropped to 0.87 au and its distance to Earth to 1.61 au.

Located in the evening sky, moving through Andromeda (Mar 1-15), Pisces (15-27), and Aries (27-31), it remains visible only to northern hemisphere observers, though it gets lower with time. By the end of the month for observers at 40 deg north, it will only be at an elevation of 7 degrees at the end of astronomical twilight. Northerners will lose sight of the comet next month, around the same time that southern hemisphere observers will be able to start their observations.

Photo Ops:

Mar 16 - 12P/Pons-Brooks passes within 30' of 11th magnitude galaxy NGC 315

Mar 21 - 12P/Pons-Brooks passes ~3 deg from bright galaxy M33 (will the tail be long enough to reach M33?)

Mar 25-26 - 12P/Pons-Brooks passes ~1.5 deg from 11-12th mag galaxy pair NGC 672 and IC 1727

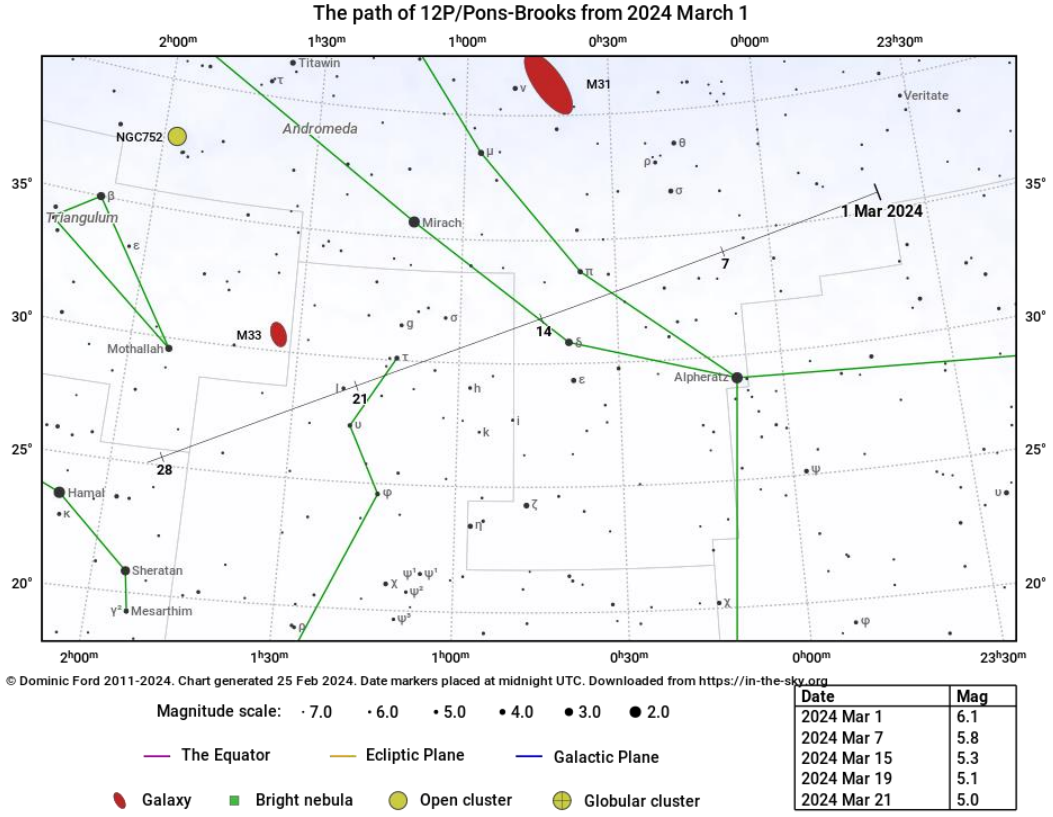


Figure 5 - Finder chart for 12P in March 2024 from in-the-sky.org.

Figure 6 - Wow... 12P/Pons-Brooks showing a long gas structured gas tail and shorter dust tail in this image taken by Michael Jäger on February 15 from Martinsberg, Austria. The image is a 45-minute RGB composite taken with an 11" Celestron RASA and QHY600 camera.

Comets Between Magnitude 6 and 10

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-D126)

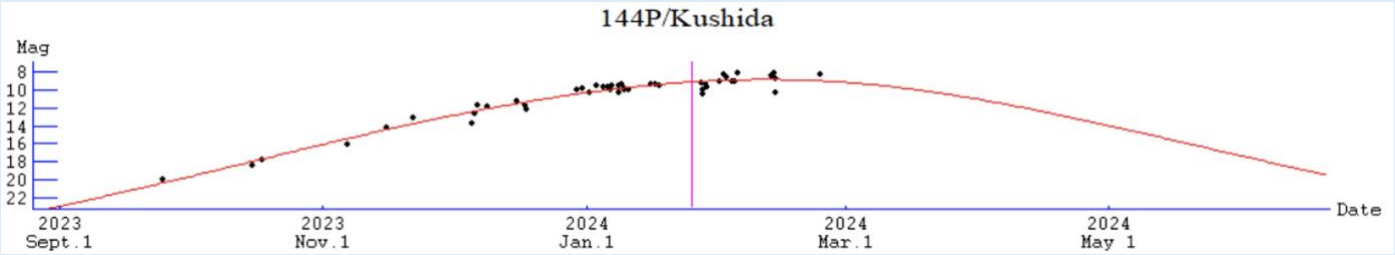
```
144P/Kushida
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Jan. 25.77046 TT                                  Rudenko
q   1.3988585           (2000.0)            P               Q
n   0.13143819     Peri.  216.32129     -0.15944550     -0.98531682
a   3.8310839      Node   242.92547     +0.92113345     -0.12624285
e   0.6348661      Incl.    3.93190     +0.35509197     -0.11494998
P   7.50
From 2434 observations 2016 July 31-2024 Feb. 24, mean residual 0".5.
    Nongravitational parameters A1 = +0.24, A2 = -0.0826.
```

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-Mar-01  05 36  +17 16    1.444   0.841    103E    Tau    9.2   67   30
2024-Mar-06  05 52  +17 23    1.461   0.879    102E    Tau    9.4   67   31
2024-Mar-11  06 08  +17 26    1.481   0.919    101E    Ori    9.7   66   31
2024-Mar-16  06 24  +17 24    1.502   0.963    100E    Gem   10.0   65   31
2024-Mar-21  06 39  +17 18    1.524   1.009     98E    Gem   10.3   64   31
2024-Mar-26  06 55  +17 07    1.549   1.059     97E    Gem   10.6   63   32
2024-Mar-31  07 10  +16 51    1.574   1.111     96E    Gem   11.0   62   32
2024-Apr-05  07 24  +16 32    1.601   1.166     94E    Gem   11.5   60   33
```

Comet Magnitude Formula (from 2023-2024 ALPO photometry)

```
m1 =  1.5 + 5 log d + 56.7 log r (t – 26)
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 02 28.77  S  9.4 TK  7.0B 6  16                          PIL01 Uwe Pilz
144        2024 02 24.20  Z  9.6 GG  0.5R 4       5                      OLAaa Michael Olason
144        2024 02 13.95  M 10.8 AQ 30  L 5  65   2    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
144        2024 02 13.77  S 10.1 TK 12.0R 7  50   3                      PIL01 Uwe Pilz
144        2024 02 13.47 xM  8.9 TK  7.0B    15  12    3           ICQ XX WYA   Christopher Wyatt
144        2024 02 12.88  S  9.0 TI 29.8L 4  65   5.5  2/          ICQ XX HAR11 Christian Harder
144        2024 02 05.20  Z  9.4 GG  0.5R 4       6                      OLAaa Michael Olason
144        2024 02 03.97  S  9.5 TI 29.8L 4  65   5    2           ICQ XX HAR11 Christian Harder
144        2024 02 02.44 xS  9.2 TK  5.0R    10   6.5  2           ICQ XX WYA   Christopher Wyatt
144        2024 02 01.77  S  8.8 TI 29.8L 4  65   7    2           ICQ XX HAR11 Christian Harder
```

The Jupiter-family comet 144P/Kushida is currently in an orbit with a 7.5-year orbital period. The 2024 return is its 5th observed return, with the comet being seen at every return since its discovery in 1994 by Japanese seismologist and amateur astronomer Yoshio Kushida. 144P is one of two comets that Kushida discovered. Both comets were photographic discoveries, and both were discovered only a month apart, in December 1994

and January 1994. The other discovery is also a short-period comet, 147P/Kushida-Muramatsu. 144P was the second of Kushida's finds, having been discovered on the night of 1994 January 8 with a 0.10-m f/4 patrol telescope.

The discovery apparition in 1994 saw the comet brighten to 9th magnitude. The return in 2009 was also a good one, with a peak brightness of 8th magnitude. Kushida has its best returns when its perihelion is in December or January. This year's perihelion is on January 25, which makes this a good return with a perihelion distance of 1.40 au and closest approach to Earth a few weeks earlier at 0.57 au.

The comet threw me a bit of a head fake last month when it appeared like it would underperform and come in fainter than predicted by 2 or more magnitudes. Now, while it didn't brighten to magnitude 7.9 as originally predicted, it still reached between magnitude 8.5 and 9.0. As was the case at past apparitions, peak intrinsic brightness occurred nearly a month after perihelion.

144P is now well past its closest approach to Earth on 2023 December 12 and perihelion on 2024 January 25 at 1.40 AU. As mentioned above, peak intrinsic brightness was a month or so after perihelion, so in late February. As a result, 144P should now fade from around magnitude 9.2 on the 1st to ~ 11.0 at the end of the month. Kushida will be well placed for evening viewers as it moves through the rich winter Milky Way star field of Taurus (Mar 1-7), across the club of Orion (7-15), and into Gemini (15-31).

Photo Ops:
Mar 27 - 144P/Kushida passes ~40' from 10th mag open cluster NGC 2304

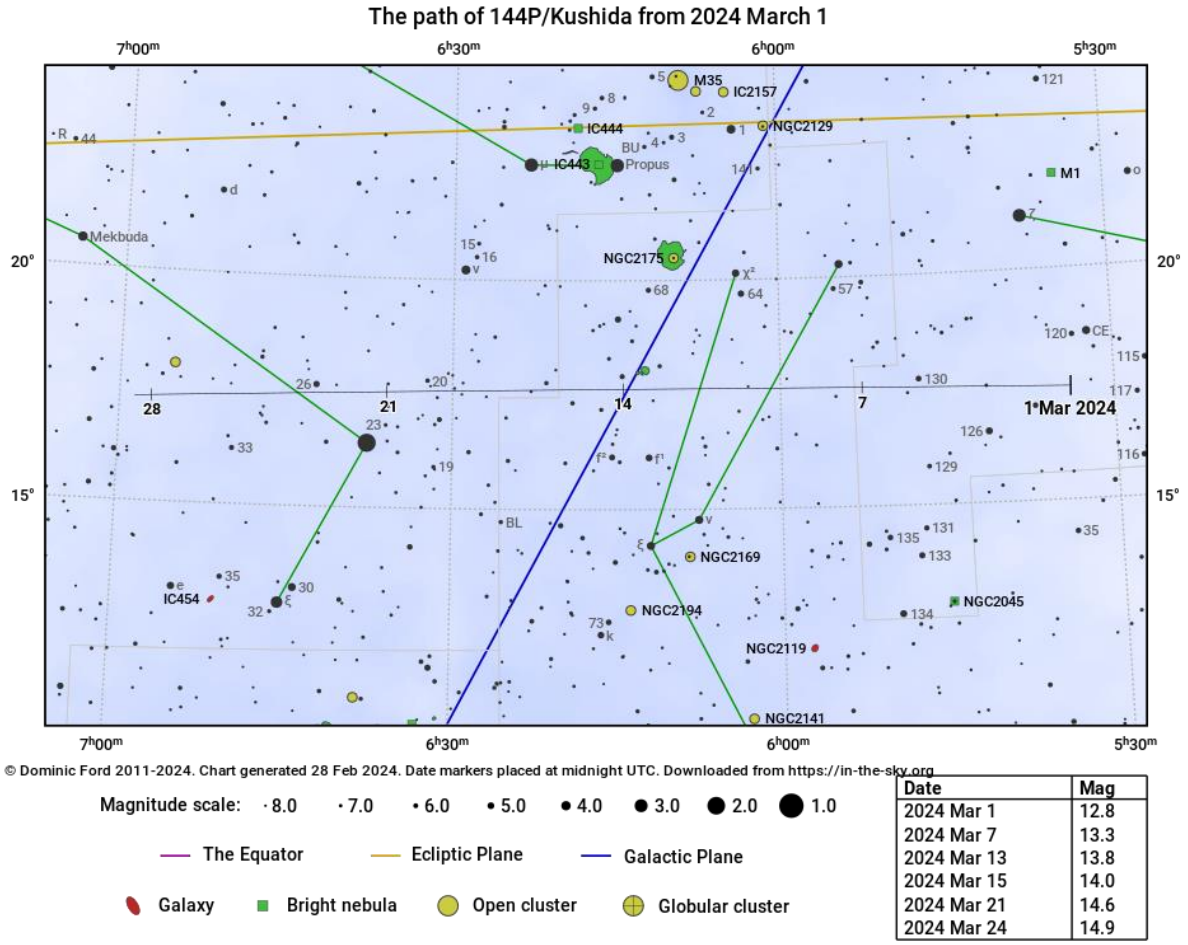


Figure 7 - Finder chart for 144P in March 2024 from in-the-sky.org.

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-D126)

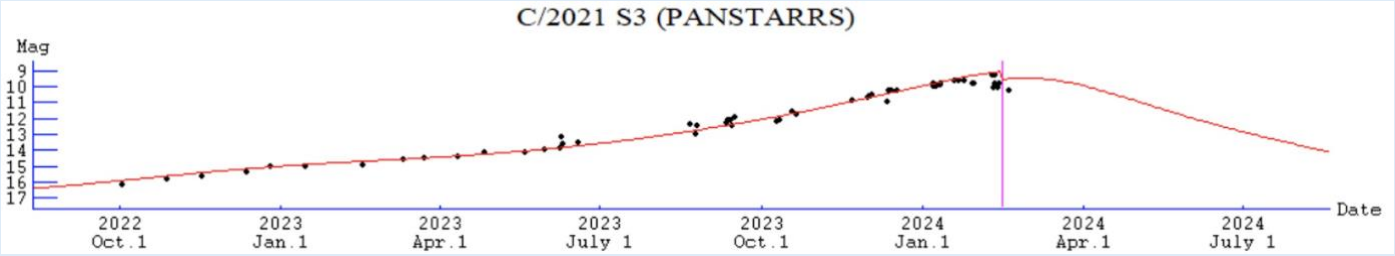
```
   C/2021 S3 (PANSTARRS)
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Feb. 14.71134 TT                                  Rudenko
q   1.3202126           (2000.0)            P               Q
z  -0.0002139      Peri.    6.85495     -0.77078867     +0.39887808
 +/-0.0000015      Node   215.62101     -0.61750378     -0.65961096
e   1.0002823      Incl.   58.53298     -0.15676068     +0.63703191
From 1192 observations 2020 Dec. 6-2024 Feb. 25, mean residual 0".5.
1/a(orig) = +0.000143 AU**-1, 1/a(fut) = +0.000058 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-Mar-01  18 10  -05 37    1.340   1.326     68M    Ser    9.5   33   32
2024-Mar-06  18 24  -01 15    1.354   1.309     70M    Ser    9.5   36   31
2024-Mar-11  18 37  +03 13    1.373   1.300     72M    Ser    9.5   40   30
2024-Mar-16  18 50  +07 45    1.395   1.298     73M    Aql    9.6   43   28
2024-Mar-21  19 03  +12 15    1.421   1.303     75M    Aql    9.7   46   26
2024-Mar-26  19 14  +16 41    1.449   1.315     76M    Sge    9.8   49   24
2024-Mar-31  19 26  +20 58    1.481   1.333     77M    Vul    9.9   52   22
2024-Apr-05  19 36  +25 06    1.515   1.356     78M    Vul   10.1   54   19
```

Comet Magnitude Formula (from ALPO and COBS data)

```
m1 =  7.6 + 5 log d +  5.8 log r [pre-T]
m1 =  7.6 + 5 log d + 10.0 log r [post-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 02 19.29  M 10.2 TK 30  L 5  65   3    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 02 13.30  S 10.0 TK 15.0L 5  37   2    3           ICQ XX SOU01 Willian Souza
   2021S3  2024 02 12.29  M 10.0 TK 30  L 5  65   3    4/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2021S3  2024 02 11.30  S 10.0 TK 15.0L 5  37   2    3           ICQ XX SOU01 Willian Souza
   2021S3  2024 02 10.28  M 10.0 TK 30  L 5  65   4    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
```

C/2021 S3 (PANSTARRS) 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. C/2021 S3 (PANSTARRS) should be at its best this month. Though perihelion was last month on the 14th at 1.32 au, it is at its closest to Earth, though not especially close, at 1.30 au on March 14. How bright this comet is is a bit of a question. Visual observers seem to be reporting a fading throughout February, making the comet closer to magnitude 10.0. CCD/CMOS photometry submitted to the COBS site by Thomas Lehmann disagrees

For the above prediction, I split the difference between the visual and digital magnitudes. As a result, C/2021 S3 should start the month around magnitude 9.5 and remain steady in brightness through the first half of the month.

By the 2nd half, it will begin to fade and could be around magnitude 10.0 by the end of the month. This prediction is very uncertain, and I wouldn't be surprised to see the comet a half magnitude brighter or fainter.

March sees the comet continue to move north as it moves through Serpens (Mar 1-14), Aquila (14-25), Sagitta (25-29), and Vulpecula (29-31), while still providing a number of photo opportunities with several Milky Way open clusters.

Photo Ops:
Mar 12-13 - C/2021 S3 (PANSTARRS) skirts the outer parts of the large 4th mag open cluster IC 4756
Mar 19-20 - C/2021 S3 (PANSTARRS) passes over 8th mag open cluster NGC 6738
Mar 29-30 - C/2021 S3 (PANSTARRS) passes through the large bright asterism Brocchi's Cluster (the Coathanger)

Figure 8 - C/2021 S3 was observed by Gregg Ruppel passing by the bright globular M9 on February 13. The image is a 54-minute LRGB composite.

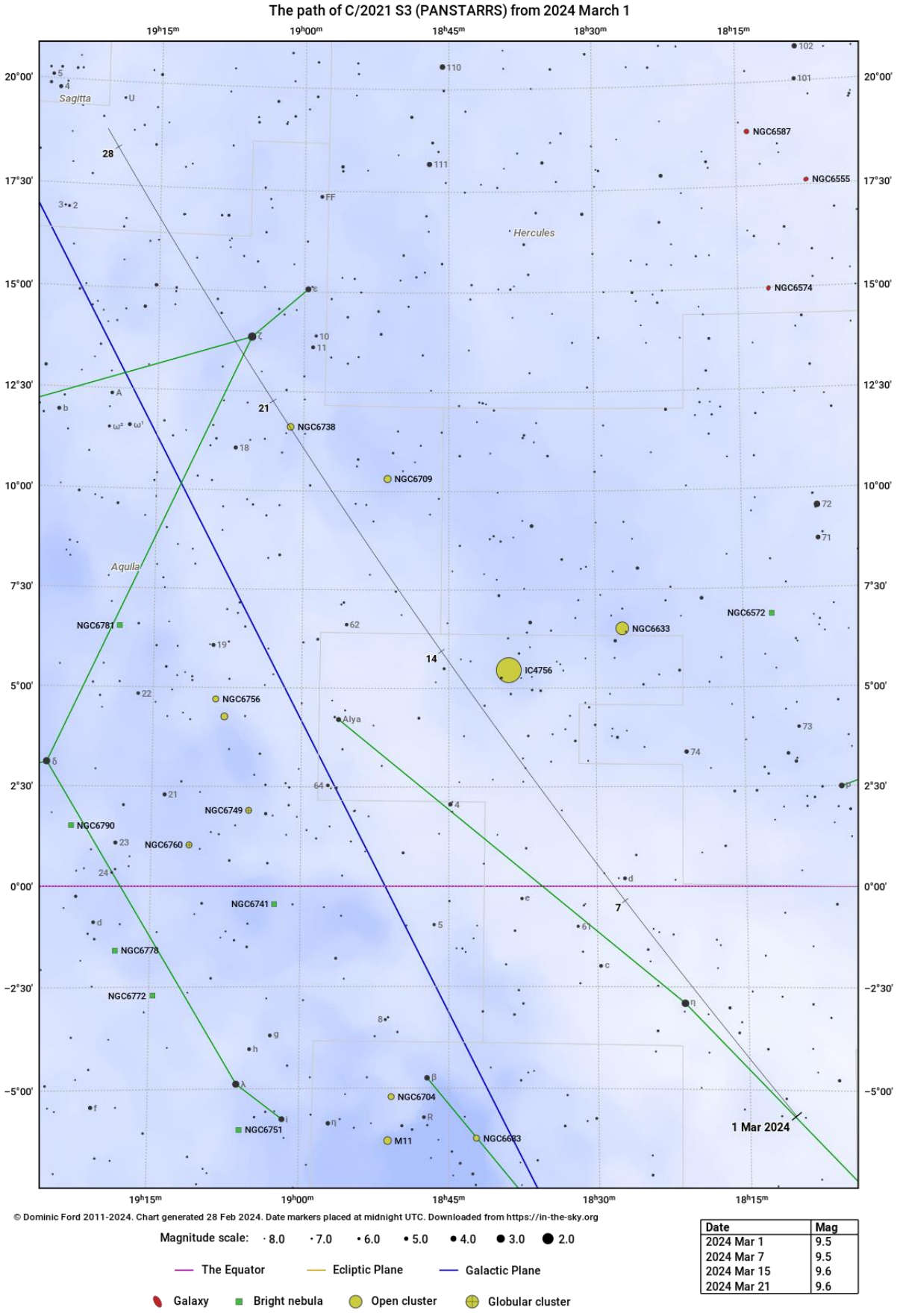


Figure 9 - Star chart for C/2021 S3 (PANSTARRS) for February. Chart made at in-the-sky.org.

Comets Between Magnitude 10 and 12

13P/Olbers

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

Orbit (from Minor Planet Center, MPEC 2024-D126)

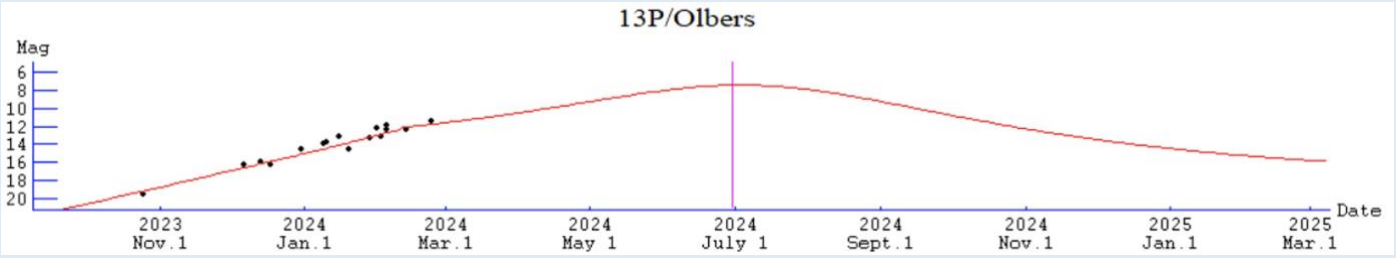
```
13P/Olbers
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 June 30.04559 TT                                  Rudenko
q   1.1754920           (2000.0)            P               Q
n   0.01420764     Peri.   64.41457     -0.60853936     -0.37165102
a  16.8831979      Node    85.84780     +0.18559502     -0.92569492
e   0.9303750      Incl.   44.66458     +0.77151432     -0.07045871
P  69.4
From 1014 observations 1955 Nov. 12-2024 Feb. 24, mean residual 0".9.
    Nongravitational parameters A1 = -0.04, A2 = -0.0641.
```

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-Mar-01  03 04  +04 08   2.087   2.300     65E    Cet  11.6   38   22
2024-Mar-06  03 09  +05 55   2.034   2.309     61E    Cet  11.4   36   20
2024-Mar-11  03 14  +07 43   1.981   2.316     58E    Cet  11.3   33   18
2024-Mar-16  03 19  +09 32   1.929   2.320     54E    Cet  11.1   31   15
2024-Mar-21  03 25  +11 21   1.877   2.322     51E    Tau  10.9   29   13
2024-Mar-26  03 32  +13 11   1.825   2.322     48E    Tau  10.7   26   11
2024-Mar-31  03 39  +15 01   1.774   2.319     45E    Tau  10.6   24    9
2024-Apr-05  03 47  +16 52   1.724   2.313     43E    Tau  10.4   21    7
```

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

```
m1 = -2.8 + 5 log d + 37.1 log r [Up through T-140 days]
m1 =  5.0 + 5 log d + 15.0 log r [After T-140 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 02 24.15  Z 12.5 GG  0.5R 4       2                    OLAaa Michael Olason
 13        2024 02 13.45 xM 13.0 AQ 40.0L 4 108   1.3  4           ICQ XX WYA   Christopher Wyatt
 13        2024 02 05.21  Z 13.4 GG  0.5R 4       2                    OLAaa Michael Olason
 13        2024 02 02.43 xM 13.7 AQ 40.0L 4 108   1.3  4/          ICQ XX WYA   Christopher Wyatt
```

Like 12P/Pons-Brooks, 13P/Olbers is a Halley-type comet, albeit with an orbital period of 69 years vs Pons-Brook's 71 years. 13P was discovered by Heinrich Olbers in 1815 when the comet reached 5th magnitude. A peak of 6-7th magnitude was reached at the next two returns in 1887 and in 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). Olbers will be an evening object low in the western sky when at its best and even then, visible only from the northern hemisphere. This month sees Olbers brightening from magnitude 11.6 to 10.6 as it moves northeastward in the evening constellations of Cetus (Mar 1-18), Aries (18-19), and Taurus (19-31).

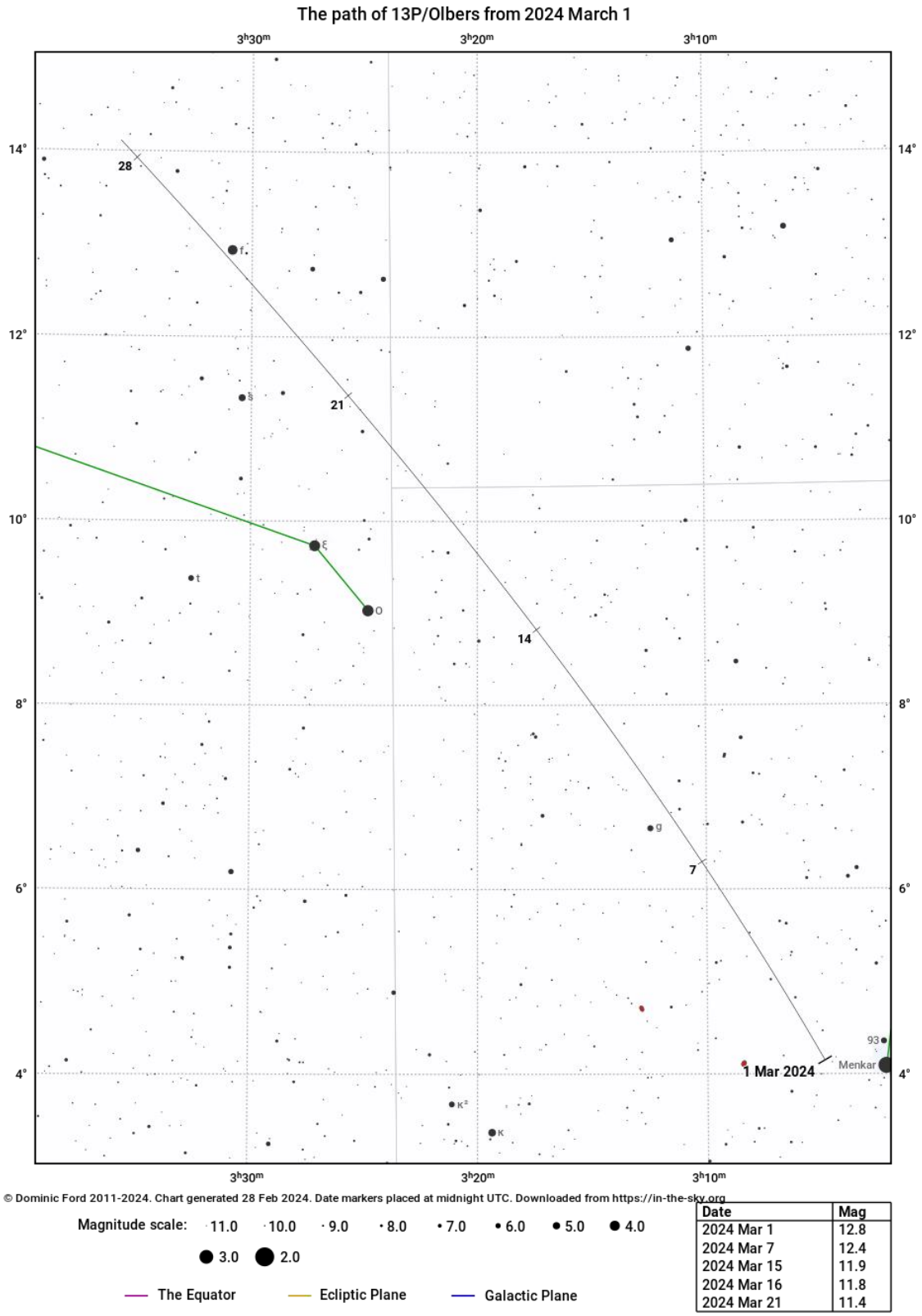


Figure 10 - Finder chart for 13P in March 2024 from in-the-sky.org.

62P/Tsuchinshan

Discovered photographically on 1965 January 1 at the Purple Mountain (Tsuchinshan) Observatory
Short-period comet

Orbit (from Minor Planet Center, MPEC 2023-D126)

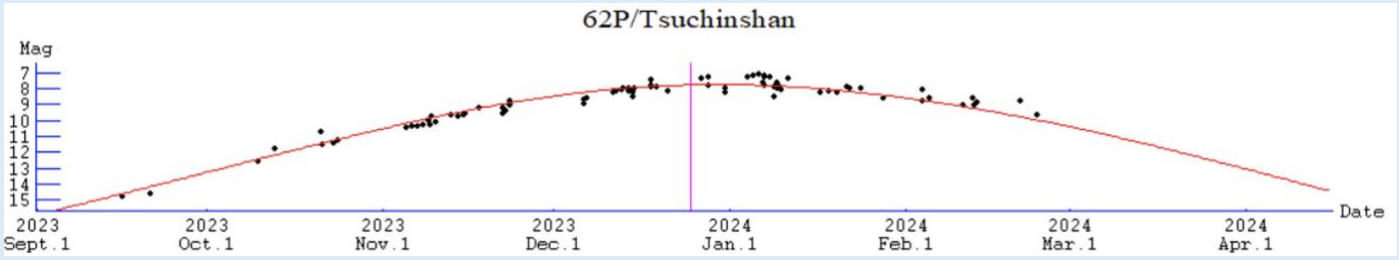
```
62P/Tsuchinshan
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2023 Dec. 25.11629 TT                                  Rudenko
q   1.2649741            (2000.0)            P              Q
n   0.15932620     Peri.   47.30316     -0.43557966     -0.89685625
a   3.3698552      Node    68.66800     +0.79984507     -0.42483526
e   0.6246206      Incl.    4.73776     +0.41293853     -0.12314170
P   6.19
From 1226 observations 2023 Aug. 29-2024 Feb. 24, mean residual 0".5.
    Nongravitational parameters A1 = +0.06, A2 = +0.5968.
```

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

```
62P/Tsuchinshan                                                      Max El
                                                                      (deg)
    Date       R.A.    Decl.      r       d     Elong  Const  Mag  40N  40S
2024-Mar-01  12 36  +10 15    1.491   0.539    153M   Vir  10.4   60   40
2024-Mar-06  12 32  +10 21    1.522   0.555    158M   Vir  10.8   60   40
2024-Mar-11  12 28  +10 23    1.553   0.576    162M   Vir  11.2   60   40
2024-Mar-16  12 24  +10 22    1.586   0.601    166M   Vir  11.6   60   40
2024-Mar-21  12 19  +10 16    1.619   0.631    168M   Vir  12.1   60   40
2024-Mar-26  12 15  +10 05    1.654   0.665    167E   Vir  12.5   60   40
2024-Mar-31  12 11  +09 49    1.688   0.704    164E   Vir  13.0   60   40
2024-Apr-05  12 08  +09 28    1.724   0.748    160E   Vir  13.4   59   41
```

Comet Magnitude Formula (from 2023 ALPO observations)

```
m1 = 5.4 + 5 log d + 36.6 log r
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ CODE Observer Name
                (UT)                    T         Dia  DC  LENG  PA
 62        2024 02 24.22  Z 10.0 GG  0.5R 4       6                      OLAaa Michael Olason
 62        2024 02 13.53 xS  8.9 TK  7.0B    15   12.5 4           ICQ XX WYA   Christopher Wyatt
 62        2024 02 13.17  S  9.8 TK 15.0L 5  37   4    4           ICQ XX SOU01 Willian Souza
 62        2024 02 11.16  S  9.8 TK 15.0L 5  37   4    4           ICQ XX SOU01 Willian Souza
 62        2024 02 05.34  Z  8.9 GG  0.5R 4       9                      OLAaa Michael Olason
 62        2024 02 04.02  S  9.2 TI 29.8L 4  65   8    3           ICQ XX HAR11 Christian Harder
```

Short-period comet 62P/Tsuchinshan is having its best return between 1900 and 2100. Since September, 62P has closely followed a consistent, if rather steep, brightening/fading trend of ~36.6 log r. Surprisingly, that trend has held true even after passing through perihelion on 2023 December 25 perihelion at 1.26 au. If the comet continues following the trend, it will fade from magnitude 10.4 on the 1st to around 11.0 on the 8th, 12.0 on the 20th, and end the month at 13.0. The comet is near opposition this month in Virgo.

Photo Ops:
Mar 10-11 - 62P/Tsuchinshan passes ~35' from 11th mag galaxy NGC 4442
Mar 13 - 62P/Tsuchinshan passes within arc minutes of 13th mag galaxy NGC 4390

Figure 11 - 62P spent a good part of February in close proximity to the galaxies NGC 4596 and 4608. Chris Schur caught the trio on February 12 with a 10" F/2.8 reflector and Atik16200 camera from Payson, AZ. The image is a 2-hour LRGB composite.

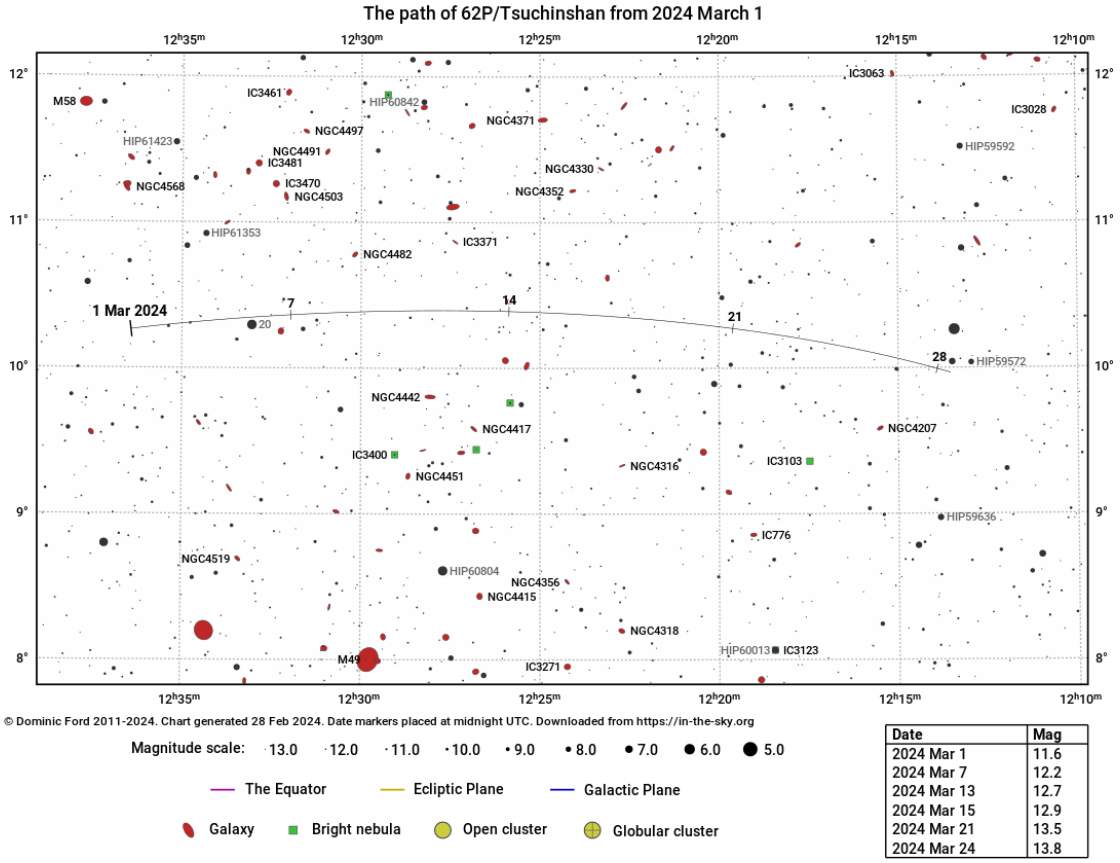


Figure 12 - Finder chart for 62P in March 2024 from in-the-sky.org.

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-D126)

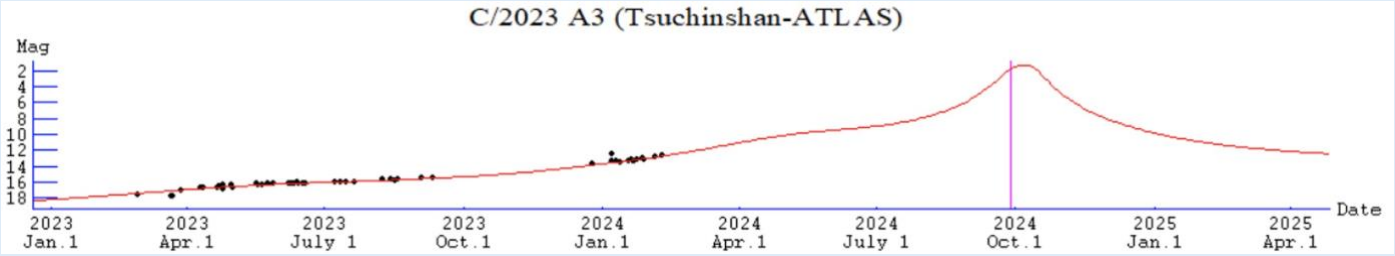
```
   C/2023 A3 (Tsuchinshan-ATLAS)
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2024 Sept. 27.74711 TT                                  Rudenko
q   0.3914505           (2000.0)            P               Q
z  -0.0002732      Peri.  308.49039     +0.36139404     +0.90085188
+/-0.0000079       Node    21.55993     +0.91854987     -0.29964917
e   1.0001069       Incl.  139.11213     -0.16018892     +0.31412779
From 2462 observations 2022 Apr. 9-2024 Feb. 25, mean residual 0".3.
1/a(orig) = -0.000214 AU**-1, 1/a(fut) = -0.000186 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-Mar-01  15 05  -07 20   3.547   3.026    114M   Lib  12.1   43   57
2024-Mar-06  15 02  -07 06   3.486   2.885    119M   Lib  11.9   43   57
2024-Mar-11  14 59  -06 49   3.424   2.749    125M   Lib  11.8   43   57
2024-Mar-16  14 54  -06 28   3.362   2.617    131M   Lib  11.6   43   57
2024-Mar-21  14 48  -06 04   3.299   2.491    137M   Lib  11.4   44   56
2024-Mar-26  14 42  -05 36   3.236   2.372    144M   Vir  11.3   44   56
2024-Mar-31  14 34  -05 05   3.173   2.261    151M   Vir  11.1   45   55
2024-Apr-05  14 25  -04 31   3.108   2.159    157M   Vir  10.9   45   55
```

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

```
m1 = -16.6 + 5 log d + 35.0 log r [Through T-650 days]
m1 =   1.9 + 5 log d + 13.1 log r [Between T-650 and T-382 days]
m1 =   3.1 + 5 log d + 11.5 log r [Between T-382 and T-277 days]
m1 =   5.3 + 5 log d +  8.0 log r [After T-277 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 02 05.39  Z 12.9 GG  0.5R 4       1.4                      OLAaa Michael Olason
```

C/2023 A3 (Tsuchinshan-ATLAS) should break the magnitude 12 barrier this month and remains on track to be a nice comet later this year. Perihelion is still about 7 months out (T = September 27 at 0.39 au), with the comet now between 3.5 and 3.1 au from the Sun.

This month, C/2023 A3 moves from Libra (Mar 1-22) into Virgo (22-31) in the morning sky. Starting the month around magnitude 12.1, it should end the month closer to magnitude 11.1.

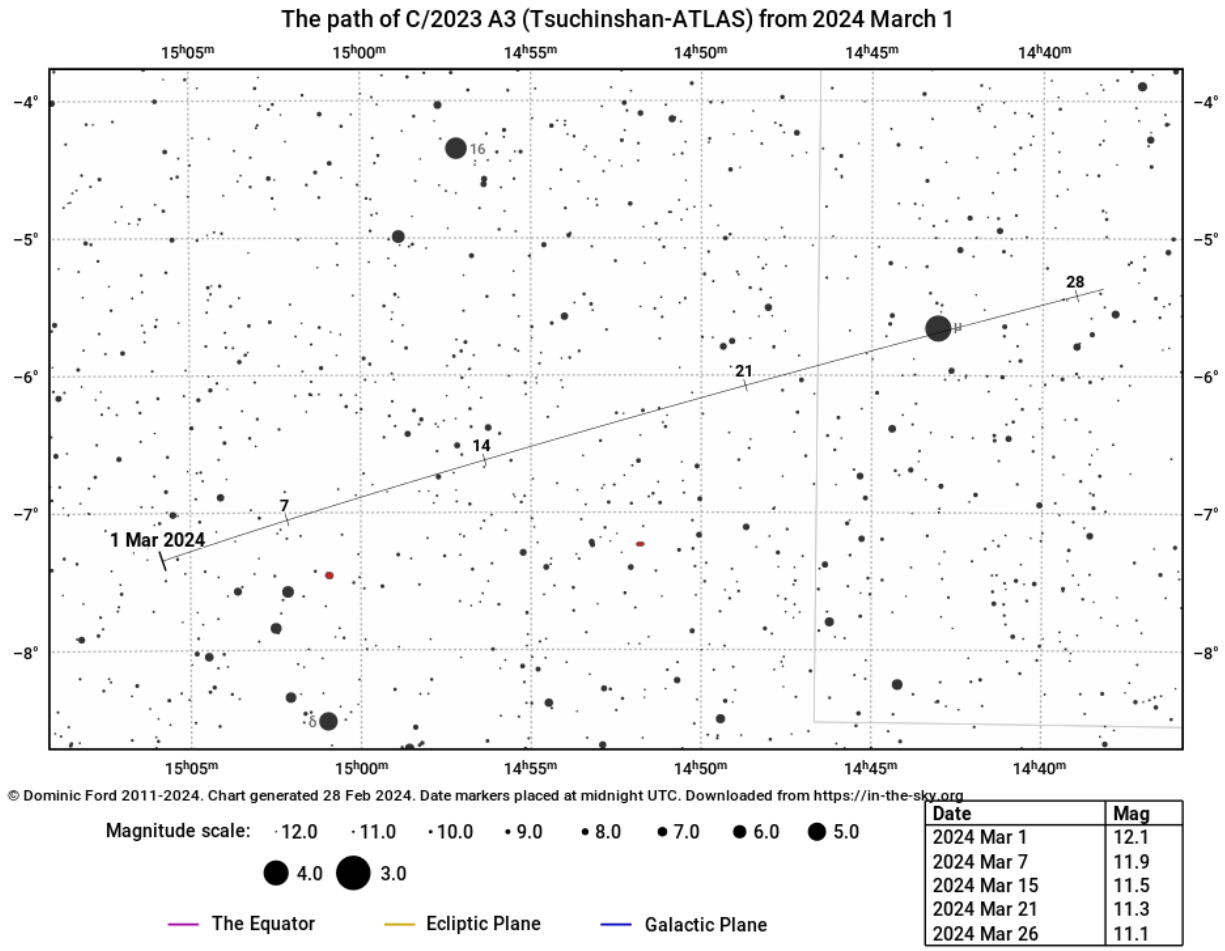


Figure 13 - Star chart for C/2023 A3 in March 2024. Chart produced at in-the-sky.org.

Figure 14 – C/2023 A3 on 2024 February 13, as imaged by Tenho Tuomi with a 0.3-m reflector and Canon T5i/700D dslr. Image is a composite of 16 x 60 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-D126)

```
29P/Schwassmann-Wachmann
Epoch 2024 Mar. 31.0 TT = JDT 2460400.5
T 2019 May 2.75143 TT                                  Rudenko
q   5.7859626            (2000.0)            P             Q
n   0.06618423     Peri.   51.95352     +0.98936630     -0.08207044
a   6.0529399      Node   312.40590     +0.01231203     +0.86988466
e   0.0441070      Incl.    9.35915     +0.14492318     +0.48637960
P  14.9
From 18481 observations 2018 June 18-2024 Feb. 25, 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-Mar-01  08 08  +21 29   6.182   5.400   138E   Cnc  11-14   71   29
2024-Mar-06  08 06  +21 29   6.184   5.457   133E   Cnc  11-14   71   29
2024-Mar-11  08 05  +21 28   6.185   5.519   128E   Cnc  11-14   71   29
2024-Mar-16  08 04  +21 26   6.186   5.585   123E   Cnc  11-14   71   29
2024-Mar-21  08 04  +21 24   6.188   5.655   118E   Cnc  11-14   71   29
2024-Mar-26  08 03  +21 20   6.189   5.729   113E   Cnc  11-14   71   29
2024-Mar-31  08 03  +21 16   6.190   5.805   108E   Cnc  11-14   71   29
2024-Apr-05  08 04  +21 11   6.192   5.883   103E   Cnc  11-14   69   29
```

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 02 13.48 xS 14.7 AQ 40.0L 4 182   0.3  6           ICQ XX WYA   Christopher Wyatt
 29        2024 02 05.31  Z 12.8 GG  0.5R 4       1.7                 OLAaa Michael Olason
 29        2024 02 02.49 xS 12.4 AQ 40.0L 4  59   2    3           ICQ XX WYA   Christopher Wyatt
 29        2024 02 01.80  S 13.5 TI 29.8L 4 170   0.6  3           ICQ XX HAR11 Christian Harder
```

29P/Schwassmann-Wachmann was discovered photographically on 1927 November 15 by the German observing team of Arnold Schwassmann and Arno Arthur Wachmann.

29P experiences outbursts multiple times yearly, with the largest resulting in a peak brightness of 10th magnitude, though the majority are fainter. 29P has been active the past few months, with 8 outbursts since December. Of the eight outbursts, three occurred last month (1 mag outburst on Feb. 5, a 2 mag outburst on Feb 12, and a <1 mag outburst on Feb. 25). The comet should remain in the 11-14th magnitude range in February. The comet is well placed in Cancer for evening observers.

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) and the University of Maryland's 29P Observation campaign (https://wirtanen.astro.umd.edu/29P/29P_obs.shtml).

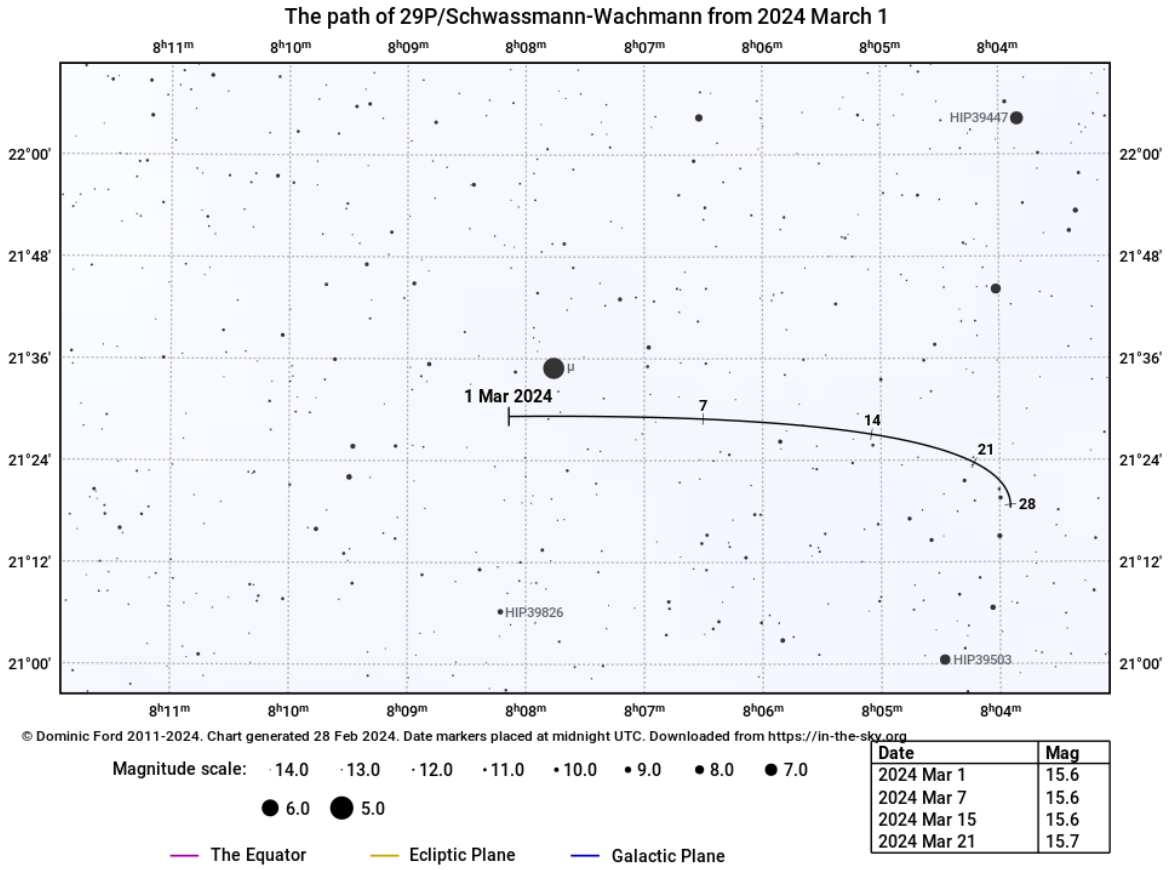


Figure 15 - Finder chart for 29P in March 2024 from in-the-sky.org.

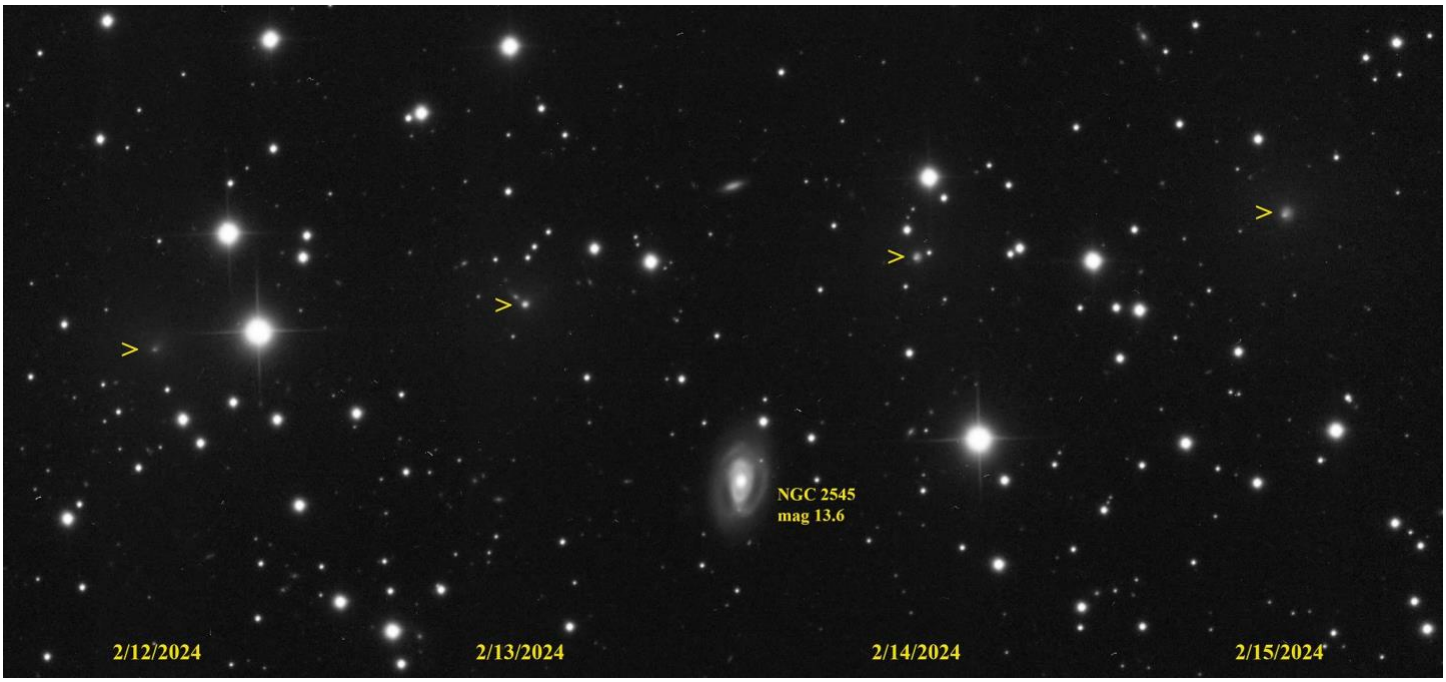


Figure 16 - Eliot Herman caught 29P in yet another of its outbursts. The composite shows images taken on February 13, 14, and 15 and the comet's expanding coma.