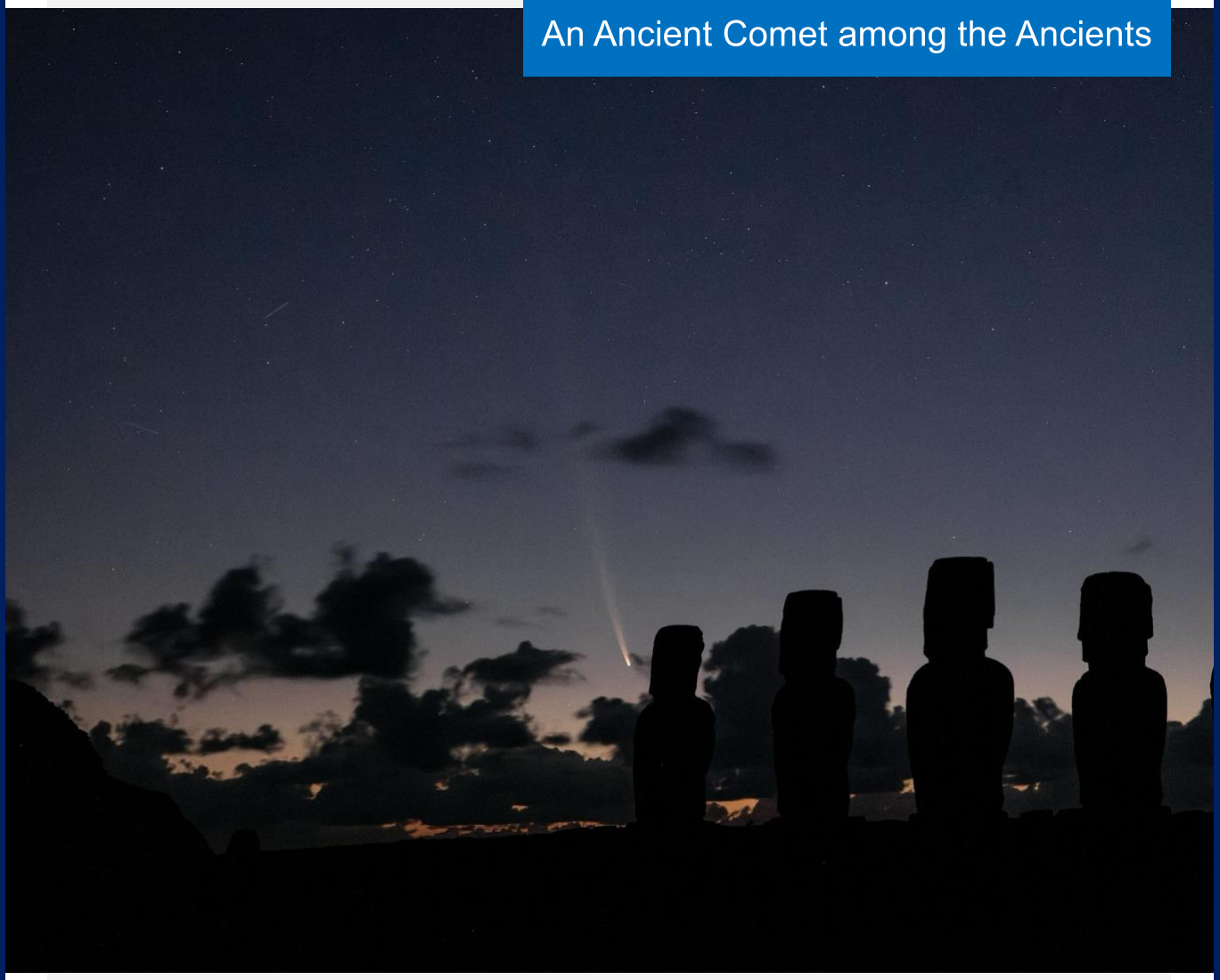
October 2024

ALPO Comet News

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

An Ancient Comet among the Ancients



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On the Front Cover:

The Moai are human figures carved in rock by the Rapa Nui people on Easter Island between 1250 and 1500 CE. Eliot Herman photographed C/2023 A3 (Tsuchinshan-ATLAS) on 2024 October 2 as it rose above some of the Moai. Currently diving back toward the Sun, C/2023 A3 should put on a similar display in the evening sky in mid-October.

The monthly ALPO Comet News PDF can be found on the ALPO Comets Section website (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/939415-alpo-comet-news-for-october-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

Since its discovery in early 2023, we've been waiting to see if C/2023 A3 (Tsuchinshan-ATLAS) would survive its perihelion and become a bright object. Well, so far, so good. Not that it can't still fall apart, but as of October 3, the comet is a 1st magnitude naked eye object in the morning sky with a tail up to 15-20 degrees in length.

But the real show is yet to begin. On October 9, the comet passes within 3 degrees of the Sun, and due to forward scattering by dust and a relatively close approach to Earth, Tsuchinshan-ATLAS may peak at around magnitude -4. That sounds bright, but that's magnitude -4 at only 3 degrees from the Sun. While most of us won't be able to see the comet that close to the Sun, we can watch it in images taken by the SOHO and STEREO-A spacecraft.

After October 9, Tsuchinshan-ATLAS rapidly moves into the evening sky when it should still be a 0th to 2nd magnitude object displaying a strong anti-tail. For several days in mid-October, the comet may greatly resemble C/1956 R1 (Arend-Roland).

As if one naked-eye comet wasn't enough, recently discovered C/2024 S1 (ATLAS) is a Kreutz sungrazer and could also become a naked-eye object in late October near the Sun and in early November in the morning sky. ATLAS is a story that is still developing, and we first need to wait and see if it survives its close brush with the Sun. If so, the northern hemisphere may have its first bright Kreutz sungrazer since C/1965 S1 (Ikeya-Seki) and since C/2011 W3 (Lovejoy) for the southern hemisphere.

Last month, the ALPO Comets Section received 120 images and 139 magnitude estimates of 36 comets: C/2024 S1 (ATLAS), C/2024 Q3 (PANSTARRS), C/2024 G3 (ATLAS), C/2024 B1 (Lemmon), C/2023 V4 (Camarasa-Duszanowicz), C/2023 TD22 (Lemmon), C/2023 R1 (PANSTARRS), C/2023 C2 (ATLAS), C/2023 A3 (Tsuchinshan-ATLAS), C/2022 U1 (Leonard), C/2022 N2 (PANSTARRS), C/2022 E2 (ATLAS), C/2021 S3 (PANSTARRS), C/2020 V2 (ZTF), P/2024 Q2 = P/2005 SB216 (LONEOS), P/2010 WK (LINEAR), 384P/Kowalski, 360P/WISE, 328P/LONEOS-Tucker, 305P/Skiff, 253P/PANSTARRS, 229P/Gibbs, 208P/McMillan, 190P/Mueller, 154P/Brewington, 146P/Shoemaker-Levy, 136P/Mueller, 130P/McNaught-Hughes, 89P/Russell, 54P/de Vico-Swift-NEAT, 50P/Arend, 49P/Arend-Riguax, 43P/Wolf-Harrington, 37P/Forbes, 13P/Olbers, and 12P/Pons-Brooks.

A big thanks to our recent contributors: Dan Bartlett, José J. Chambó, Dan Crowson, Michel Deconinck, Jose Guilherme de Souza Aguiar, Juan Jose Gonzalez Suarez, Christian Harder, Eliot Herman, Rik Hill, Michael

Jäger, John Maikner, Gianluca Masi, Michael Mattiazzo, Martin Mobberley, Mike Olason, Andrew Pearce, Chris Schur, 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 are applied to digital observations. Though we try to keep these lightcurves up to date, observations submitted just 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 the observations submitted directly to the ALPO and those initially submitted to the International Comet Quarterly, Minor Planet Center, and COBS Comet Observation Database. In particular, we have been using observations submitted to the COBS site by Thomas Lehmann for our 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)

Oct 02 - New Moon
Oct 10 - First Quarter Moon
Oct 17 - Full Moon
Oct 24 - Last Quarter Moon

Comets at Perihelion

Oct 01 P/2024 R2 (PANSTARRS) [q = 2.30 au, 5.5-yr period, V ~ 19, new discovery]
Oct 03 360P/WISE [q = 1.85 au, 7.1-yr period, V ~ 18 (though currently running ~1-2 magnitude fainter), discovered in 2010, also seen in 2017 and now 2024]
Oct 07 C/2024 B1 (Lemmon) [q = 1.63 au, V ~ 13]
Oct 11 37P/Forbes [q = 1.62 au, 6.4-yr period, V ~ 13-14, visual discovery in 1929 (q = 1.53 au, peak at 10th mag), missed in 1935, 1955, and 1967, also seen in 1942, 1948, 1961 (peak at 10th mag), 1974, 1980, 1987, 1993, 1999 (peak at 11th mag), 2005 (peak at 11th mag), 2011, 2018 (peak at 10th mag), and 2024]
Oct 12 C/2023 U1 (Fuls) [q = 4.97 au, V ~ 17-18]
Oct 16 476P/PANSTARRS [q = 3.12 au, 10.5-year period, V ~ 19-20, discovered in 2014, 2024 is its 2nd observed return, recovered by ALPO Comets Section contributor John Maikner]
Oct 20 253P/PANSTARRS [q = 2.03 au, 6.4-year period, V = 16, pre-discovery observations from returns in 1998 and 2005, discovered in 2011, also seen in 2018 and now 2024]
Oct 20 487P/Siding Spring [q = 1.81 au, 11.7-year period, V = 14, discovered in 2013, 2024 is 2nd observed return]
Oct 21 C/2024 G1 (Wierzchos) [q = 3.93 au, V ~ 18-19]
Oct 23 234P/LINEAR [q = 2.82 au, 7.4-year period, V ~19-20, discovered in 2002, also seen in 2009, 2017, and now 2024]

Photo Opportunities

Oct 09-10 - 13P/Olbers passes within ~15' of 10-11th mag galaxies NGC 5806 and 5813
Oct 15 - C/2023 A3 (Tsuchinshan-ATLAS) passes ~1 deg from 13P/Olbers
Oct 15 - C/2023 A3 (Tsuchinshan-ATLAS) passes ~1.3 deg from 5th mag globular cluster M5
Oct 15 - 13P/Olbers, C/2023 A3 (Tsuchinshan-ATLAS), and M5 are in a line ~3 degrees in length
Oct 28 - C/2023 A3 (Tsuchinshan-ATLAS) passes from 10th mag globular cluster NGC 6426
Oct 29 - C/2023 A3 (Tsuchinshan-ATLAS) passes ~2 degrees from large open cluster IC 4665

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 S1 (ATLAS)												
2024S1	2024 10 01.74	xS 12.6	AQ	25.0L	5	125	0.8	3/			ICQ XX WYA	Christopher Wyatt
2024S1	2024 10 01.50	Z 13.9	GG	5.0R	4a	750	2				ICQ XX OLAaa	Michael Olason
2024S1	2024 09 30.87	V 12.9	AQ	5.0R	5A	860	4				ICQ XX PEA	Andrew Pearce
2024S1	2024 09 30.75	xM 11.8	AQ	25.0L	5	74	1.3	3/			ICQ XX WYA	Christopher Wyatt
2024S1	2024 09 29.88	V 13.1	AQ	5.0R	5A	630	3.2				ICQ XX PEA	Andrew Pearce
2024S1	2024 09 29.15	C 13.0	AQ	10.6R	5a	120	3				ICQ XX PEA	Andrew Pearce
C/2024 G3 (ATLAS)												
2024G3	2024 09 08.73	C 15.5	AQ	36.0Y	8a	240	0.6		0.4m	133	ICQ XX PEA	Andrew Pearce
C/2023 V4 (Camarasa-Duszanowicz)												
2023V4	2024 09 04.18	Z 14.5	GG	5.0R	4a	300	1.3				ICQ XX OLAaa	Michael Olason
C/2023 R1 (PANSTARRS)												
2023R1	2024 09 03.09	C 17.5	BG	30.5H	4C	600	1	s			ICQ XX MAI01	John Maikner
C/2023 C2 (ATLAS)												
2023C2	2024 09 24.13	Z 13.2	GG	5.0R	4a	500	1.4				ICQ XX OLAaa	Michael Olason
2023C2	2024 08 29.93	M 13.8	AQ	30.0L	5	121	1	5/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2023 A3 (Tsuchinshan-ATLAS)												
2023A3	2024 10 03.52	aM 1.2	TK	5.0B		10	2	7/	1	260	ICQ XX HER02	Carl Hergenrother
2023A3	2024 10 02.79	$M 1.8	TT	4.0B		8	4	7	19	256	ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 10 02.79	$I 1.6	TT	E		1			15	256	ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 10 02.52	aM 1.5	TK	5.0B		10	2	8	2.5	260	ICQ XX HER02	Carl Hergenrother
2023A3	2024 10 02.52	aI 1.2	TK	E		1	3	9	1	260	ICQ XX HER02	Carl Hergenrother
2023A3	2024 10 02.33	M 1.8	TK	8.0B		20	3	8	1.5	260	ICQ XX SOU01	Willian Souza
2023A3	2024 10 02.33	M 1.8	TK	5.0B		10	3	8	1.5	260	ICQ XX SOU01	Willian Souza
2023A3	2024 10 02.33	I 1.5:	TK	0.7E							ICQ XX SOU01	Willian Souza
2023A3	2024 10 01.78	M 2.1	TT	4.0B		8	4	7	15	255	ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 10 01.78	I 1.9	TT	E		1			10	255	ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 10 01.77	xM 2.0	TK	5.0B		7	4	7	3	257	ICQ XX WYA	Christopher Wyatt
2023A3	2024 10 01.77	xM 2.0	TK	E			5	8	13.5	257	ICQ XX WYA	Christopher Wyatt
2023A3	2024 10 01.53	Z 2.4	GG	5.0R	4a	016	5				ICQ XX OLAaa	Michael Olason
2023A3	2024 10 01.33	M 2.1	TK	8.0B		20	3	8	2	260	ICQ XX SOU01	Willian Souza
2023A3	2024 10 01.33	M 2.1	TK	5.0B		10	3	8	1.5	260	ICQ XX SOU01	Willian Souza
2023A3	2024 10 01.33	I 2.0	TK	0.7E							ICQ XX SOU01	Willian Souza
2023A3	2024 09 30.88	aM 2.2	TK	7.0B		15	2.5	8	5	260	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 30.87	aI 2.0	TK	E		1		9	1	260	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 30.76	xM 2.3	TK	E			15	6	9.5	263	ICQ XX WYA	Christopher Wyatt
2023A3	2024 09 30.53	Z 2.8	GG	5.0R	4a	036	5				ICQ XX OLAaa	Michael Olason
2023A3	2024 09 30.51	aM 2.1	TK	5.0B		10	2	7/	2	250	ICQ XX HER02	Carl Hergenrother
2023A3	2024 09 29.87	aM 2.1	TK	7.0B		15	2.5	8	4	257	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 29.87	aI 2.0	TK	0.0E		1		9			ICQ XX PEA	Andrew Pearce
2023A3	2024 09 29.53	Z 3.0	GG	5.0R	4a	003	5				ICQ XX OLAaa	Michael Olason
2023A3	2024 09 29.33	&M 2.7	TK	8.0B		11	5	6/	1.5		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 09 29.19	I 2.2	TK	7.0B		10	5	7	30	m260	ICQ XX DEC	Michel Deconinck
2023A3	2024 09 28.88	aM 2.5	TK	7.0B		15	3	8	4	260	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 28.87	I 2.4	TK	0.0E		1		9			ICQ XX PEA	Andrew Pearce
2023A3	2024 09 28.53	Z 3.4	GG	5.0R	4a	036	5				ICQ XX OLAaa	Michael Olason
2023A3	2024 09 28.51	aM 2.5	TK	5.0B		10	2	7	1	250	ICQ XX HER02	Carl Hergenrother
2023A3	2024 09 28.34	&M 2.8	TK	8.0B		11	5	6	1.3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 09 28.23	I 2.7	TK	5.0B		10	2	8	0.4	260	ICQ XX GON05	Juan Jose Gonzalez Suarez
2023A3	2024 09 28.19	B 2.5	TK	12.0B	5	25	5	7/	20	m250	ICQ XX DEC	Michel Deconinck
2023A3	2024 09 27.53	Z 3.5	GG	5.0R	4a	042	5				ICQ XX OLAaa	Michael Olason
2023A3	2024 09 27.51	aM 2.8	TK	5.0B		10	2	7	1	250	ICQ XX HER02	Carl Hergenrother
2023A3	2024 09 26.51	aM 3.0	TK	5.0B		10	1.5	7	0.5	250	ICQ XX HER02	Carl Hergenrother
2023A3	2024 09 26.33	&M 3.2	TK	8.0B		11	5	6/	0.8		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 09 26.33	M 3.1	TK	6.0R	5	12	3	8	0.5	250	ICQ XX SOU01	Willian Souza
2023A3	2024 09 26.33	M 3.0	TK	8.0B		20	3	8	1	250	ICQ XX SOU01	Willian Souza
2023A3	2024 09 26.33	M 2.9	TK	5.0B		10	3	8	0.8	250	ICQ XX SOU01	Willian Souza
2023A3	2024 09 25.87	aM 3.1	TK	7.0B		15	2.5	8	2	254	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 25.80	M 3.1	TT	7.0B		15	4	8	3	256	ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 09 25.80	I 3.0	TT	0.0E		1					ICQ XX MAT08	Michael Mattiazzo
2023A3	2024 09 25.33	&M 3.4	TK	8.0B		11	5	6/	0.3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 09 25.33	M 3.2	TK	8.0B		20	3	7/	1	250	ICQ XX SOU01	Willian Souza
2023A3	2024 09 25.33	M 3.1	TK	5.0B		10	3	8	1	250	ICQ XX SOU01	Willian Souza
2023A3	2024 09 24.88	aM 3.3	TK	7.0B		15	2.5	8	2.2	253	ICQ XX PEA	Andrew Pearce
2023A3	2024 09 24.51	aS 3.5:	TK	5.0B		10	1.5	7	0.5	250	ICQ XX HER02	Carl Hergenrother
2023A3	2024 09 24.33	&M 3.5	TK	8.0B		11	4	6	0.3		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 09 23.77	xM 3.6	TK	7.0B		15	3	7/	2.5	250	ICQ XX WYA	Christopher Wyatt

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   2023A3  2024 09 23.77 xI  3.3 TK  0.0E         5    8            ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 23.51 aS  3.5:TK  5.0B    10   2    7   0.5  250 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 09 22.88 aM  3.7 TK  7.0B    15   3    7/  1.1  252 ICQ XX PEA   Andrew Pearce
   2023A3  2024 09 22.80 aM  3.6 TK  7.0B    15   4    7   1.3  254 ICQ XX MAT08 Michael Mattiazzo
   2023A3  2024 09 22.78 xM  3.7 TK  7.0B    15   3.1  8   1.7  253 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 22.52 aI  3.9 TK  5.0B    10   1.5  7            ICQ XX HER02 Carl Hergenrother
   2023A3  2024 09 21.88 aM  3.9 TK  7.0B    15   3    7   0.8  250 ICQ XX PEA   Andrew Pearce
   2023A3  2024 09 21.77 xM  3.8 TK  7.0B    15   2    8   1.2  251 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 20.89  M  4.0 TK  7.0B    15   3    7   0.5  253 ICQ XX PEA   Andrew Pearce
   2023A3  2024 09 20.78 xM  4.0 TK  7.0B    15   2.2  7   50  m248 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 19.77 xM  4.2 TK  7.0B    15   2.7  7/  25  m247 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 18.78 xM  4.2 TK  7.0B    15   2.1  6   25  m244 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 18.33 &M  4.4 TK 10.0B    25   5    6/  0.1      ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 09 17.81  S  4.3:TT  7.0B    15   5    8   20  m240 ICQ XX MAT08 Michael Mattiazzo
   2023A3  2024 09 17.78 xM  4.5 TK  7.0B    15   3    6   18  m245 ICQ XX WYA   Christopher Wyatt
   2023A3  2024 09 15.81  S  4.6:TT  7.0B    15   5    8            ICQ XX MAT08 Michael Mattiazzo
C/2022 N2 (PANSTARRS)
   2022N2  2024 09 30.55  C 14.9 AQ 35.0T 5a360   1.3              ICQ XX PEA   Andrew Pearce
   2022N2  2024 09 11.19  Z 14.6 GG  5.0R 4a600   1                ICQ XX OLAaa Michael Olason
   2022N2  2024 09 08.01  S 13.5 TI 53.1L   139   1.5  1/          ICQ XX HAR11 Christian Harder
   2022N2  2024 09 04.20  Z 15.0 GG  5.0R 4a600   1                ICQ XX OLAaa Michael Olason
   2022N2  2024 08 30.12  M 13.9 AQ 30.0L 5 121   1    6           ICQ XX DES01 Jose Guilherme de Souza Aguiar
C/2022 E2 (ATLAS)
   2022E2  2024 09 08.05  S 12.8 TI 53.1L   162   1.5  2/          ICQ XX HAR11 Christian Harder
C/2021 S3 (PANSTARRS)
   2021S3  2024 09 24.17  Z 14.4 GG  5.0R 4a750   1.4              ICQ XX OLAaa Michael Olason
   2021S3  2024 09 11.18  Z 14.1 GG  5.0R 4a600   1.3              ICQ XX OLAaa Michael Olason
   2021S3  2024 09 05.86  S 13.9:TI 53.1L   162   0.8  4           ICQ XX HAR11 Christian Harder
C/2020 V2 (ZTF)
   2020V2  2024 08 30.13  M 13.8 AQ 30.0L 5 121   1    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
384P/Kowalski
384        2024 09 09.35  C 19.0 BG 30.5H 4A250            1.5s265 ICQ XX MAI01 John Maikner
360P/WISE
360        2024 09 09.22  C 20.2 BG 30.5H 4C600                    ICQ XX MAI01 John Maikner
360        2024 09 05.25  C 19.7 BG 30.5H 4C720                    ICQ XX MAI01 John Maikner
305P/Skiff
305        2024 09 06.06  C 18.8 BG 30.5H 4C000                    ICQ XX MAI01 John Maikner
208P/McMillan
208        2024 09 06.25  C 18.8 BG 30.5H 4B880                    ICQ XX MAI01 John Maikner
130P/McNaught-Hughes
130        2024 09 30.63  C 15.5 AQ 35.0T 5a540   1.1       4.6m251 ICQ XX PEA   Andrew Pearce
130        2024 09 24.21  Z 14.8 GG  5.0R 4a750   1.4              ICQ XX OLAaa Michael Olason
130        2024 09 08.03  S 15.2:TI 53.1L   194   0.25 3           ICQ XX HAR11 Christian Harder
130        2024 09 04.30  Z 14.7 GG  5.0R 4A200   1.6              ICQ XX OLAaa Michael Olason
89P/Russell
 89        2024 09 24.15  Z 15.9 GG  5.0R 4a750   1                ICQ XX OLAaa Michael Olason
50P/Arend
 50        2024 09 09.37  C 18.9 BG 30.5H 4A800                    ICQ XX MAI01 John Maikner
49P/Arend-Riguax
 49        2024 09 09.25  C 17.5 BG 30.5H 4A500                    ICQ XX MAI01 John Maikner
43P/Wolf-Harrington
 43        2024 09 30.67  C 17.0 AQ 35.0T 5a540   0.8       0.5m255 ICQ XX PEA   Andrew Pearce
 43        2024 09 12.23  C 17.8 BG 30.5H 4C600  14   s     2  m260 ICQ XX MAI01 John Maikner
37P/Forbes
 37        2024 09 24.14  Z 13.9 GG  5.0R 4a500   1                ICQ XX OLAaa Michael Olason
 37        2024 09 20.11  Z 13.9 GG  5.0R 4a180   1                ICQ XX OLAaa Michael Olason
13P/Olbers
 13        2024 09 30.10  Z  9.6 GG  5.0R 4a180   5                ICQ XX OLAaa Michael Olason
 13        2024 09 28.78  C  9.4 AQ 25.0L 2a120   4         4.5m 52 ICQ XX PEA   Andrew Pearce
 13        2024 09 28.77  S  9.4:TI 29.8L    92   4    3           ICQ XX HAR11 Christian Harder
 13        2024 09 27.82  S  8.6 TK  7.0B    15   4    5/          ICQ XX GON05 Juan Jose Gonzalez Suarez
 13        2024 09 22.79  S  8.8:TI 25.2L    68   4.5  3           ICQ XX HAR11 Christian Harder
 13        2024 09 21.79  S  9.3 TI 25.2L    68   3    3/          ICQ XX HAR11 Christian Harder
 13        2024 09 20.12  Z  9.1 GG  5.0R 4a180   5                ICQ XX OLAaa Michael Olason
 13        2024 09 12.80  C  8.6 AQ 25.0L 2a120   5.3       4.8m 67 ICQ XX PEA   Andrew Pearce
 13        2024 09 11.81  S  8.7 TI 25.2L    68   3.5  3/   9  m 35 ICQ XX HAR11 Christian Harder
 13        2024 09 11.13  Z  8.8 GG  5.0R 4a540   6                ICQ XX OLAaa Michael Olason
 13        2024 09 08.85  S  7.7 TK  5.0B    10   5    5/  0.5   50 ICQ XX GON05 Juan Jose Gonzalez Suarez
 13        2024 09 07.40  S  8.5 TT 10.0B    25   5    6           ICQ XX MAT08 Michael Mattiazzo
 13        2024 09 05.83  S  8.1 TK  7.0B 6  16   4                    PIL01 Uwe Pilz
 13        2024 09 05.82  S  8.7 TI 53.1L   113   4    3/  11  m 30 ICQ XX HAR11 Christian Harder
 13        2024 09 05.15  Z  8.6 GG  5.0R 4a180   6                ICQ XX OLAaa Michael Olason
 13        2024 09 01.83  S  8.5 TI 25.2L    72   4    3/   10 m 45 ICQ XX HAR11 Christian Harder
 13        2024 08 29.89  M  8.5 TK 30.0L 5  65   2    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
12P/Pons-Brooks
 12        2024 09 23.90  M 11.3 AQ 30.0L 5  65   1    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
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 12        2024 09 17.90  M 11.0 AQ 30.0L 5  65   1    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 09 12.75  C 11.0 AQ 10.6R 5a240   6        15.5m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 08.73  C 10.6 AQ 10.6R 5a240   7        18.5m242 ICQ XX PEA   Andrew Pearce
 12        2024 09 06.74  C 10.9 AQ 10.6R 5a240   7        24.2m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 05.73  C 10.7 AQ 10.6R 5a240   7        19.6m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 04.73  C 10.8 AQ 10.6R 5a240   7        24.3m243 ICQ XX PEA   Andrew Pearce
 12        2024 09 03.73  C 10.6 AQ 10.6R 5a240   7        25.5m240 ICQ XX PEA   Andrew Pearce
 12        2024 09 02.73  C 10.7 AQ 10.6R 5a240   7        20.6m244 ICQ XX PEA   Andrew Pearce
 12        2024 09 01.73  C 10.7 AQ 10.6R 5a240   7        18.1m245 ICQ XX PEA   Andrew Pearce
 12        2024 08 31.73  C 10.8 AQ 10.6R 5a240   7        23.9m247 ICQ XX PEA   Andrew Pearce
 12        2024 08 30.90  M 10.5 AQ 30.0L 5  65   1    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 08 29.90  M 10.6 AQ 30.0L 5  65   1    3           ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 08 27.90  M 10.5 AQ 30.0L 5  65   1    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
P/2010 WK (LINEAR)
  P2010WK  2024 09 03.37  C 18.6 BG 30.5H 4A600                   ICQ XX MAI01 John Maikner
P/2024 Q2 = P/2005 SB216 (LONEOS)
  P2005SBL62024 09 03.21  C 19.6 BG 30.5H 4C600                   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 over the next 18 months. 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) and C/2024 G3 (ATLAS), when the comets 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.

Northern Hemisphere	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	01/05/25	01/15/25	01/25/25	02/04/25	02/14/25	02/24/25	03/06/25	03/16/25	03/26/25	04/05/25	04/15/25	04/25/25	05/05/25	05/15/25	05/25/25	06/04/25	06/14/25	06/24/25	07/04/25	07/14/25	07/24/25	08/03/25	08/13/25	08/23/25	09/02/25	09/12/25	09/22/25	10/02/25	10/12/25	10/22/25	11/01/25	11/11/25	11/21/25	12/01/25	12/11/25	12/21/25	12/31/25	01/10/26	01/20/26	01/30/26	02/09/26	02/19/26	03/01/26	03/11/26	03/21/26	03/31/26
C/2023 A3 (Tsuchinshan-ATLAS)	-1	2	5	7	8	9	9																																															
333P/LINEAR							9																																														
C/2024 G3 (ATLAS)																																																						
C/2024 E1 (Wierzchos)																																										9	8	7							8	8	9			
Southern Hemisphere																																																					
C/2023 A3 (Tsuchinshan-ATLAS)	-1	2	5	7	8	9	9																																														
333P/LINEAR							9																																														
C/2024 G3 (ATLAS)								9	7	2	8																																										
C/2024 E1 (Wierzchos)																																																	7	7	7	7	8	8	9		

Figure 1 - Observability and brightness of comets expected to become brighter than magnitude 10 over the next 18 months.

Last 10 Periodic Comet Numberings (from WGSBN Bull. 4, #13)

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486P/2018 L5 = P/2024 H1 (Leonard)                              MPC 174198
485P/2022 U6 = P/2006 AH2 (Sheppard-Tholen)                     MPC 172941
484P/2005 XR132 (Spacewatch)                                    MPC 172941
483P/2016 J1 = P/2010 M9 = P/2020 Y6 = P/2021 K5 (PANSTARRS)    MPC 171409
482P/2014 VF40 (PANSTARRS)                                      MPC 171409
481P/2012 WA_34 = P/2024 C5 (Lemmon-PANSTARRS)                  MPC 171409
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
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New Recoveries & Discoveries

C/2024 S1 (ATLAS) – On September 27, the ATLAS survey's 0.5-m f/2 Schmidt telescope on Haleakala found a new 15th magnitude comet. C/2024 S1 (ATLAS) is a Kreutz sungrazer and has the potential to be a naked-eye object. See more below. [MPEC 2024-T22]

C/2024 R4 (PANSTARRS) – C/2024 R4 is one of 6 new Pan-STARRS comet discoveries that were announced since the last ALPO Comet News. It was found with the Pan-STARRS1 1.8-m reflector on Haleakala on the Hawaiian island of Maui. It was at 20th-21st magnitude at discovery on September 11, though pre-discovery observations were found back to July. Currently, the comet is at 9 au from the Sun. It won't arrive at perihelion until October 2027, when it will be 4.41 au from the Sun and 15-16th magnitude [CBET 5450, MPEC 2024-S12]

P/2024 R3 (PANSTARRS) – This Pan-STARRS2 discovery was found on September 8 at 20th magnitude and is an Activated Asteroid. It has a 5.8-year orbital period, perihelion of 2.34 au, and aphelion of 4.10 au. It is a few months past a 2024 May 6 perihelion. It is likely already at its peak brightness. [CBET 5448, MPEC 2024-S11]

P/2024 R2 (PANSTARRS) – This 20th magnitude Pan-STARRS2 discovery from September 3 is another example of an Activated Asteroid. It has a 5.5-year orbital period, a 2024 October 1 perihelion of 2.30 au, and an aphelion of 3.96 au. Perihelion. It is also likely at its peak brightness. [CBET 5443, MPEC 2024-R202]

P/2024 R1 (PANSTARRS) – A 21st magnitude short-period comet with an orbital period of 6.6-years was found with the Pan-STARRS1 telescope on September 1. Pre-discovery observations were found back to June of this year around the time of its June 15 perihelion at 1.75 au. P/2024 R1 is now fading. [CBET 5441, MPEC 2024-R182]

C/2024 Q4 (PANSTARRS) – Pan-STARRS used their Pan-STARRS2 1.8-m at Haleakala to find this 21st magnitude comet on August 31. C/2024 Q4 is a large q object with perihelion at 5.42 au on 2024 November 8. It should peak at 19th magnitude at the end of 2024. [CBET 5447, MPEC 2024-S10]

C/2024 Q3 (PANSTARRS) – Both Pan-STARRS telescopes (Pan-STARRS1 & 2) at Haleakala discovered this 21st magnitude comet on August 27. Perihelion will be on 2025 March 5 at 2.09 au, when the comet will have brightened to 19th magnitude. [CBET 5440, MPEC 2024-R181]

P/2024 Q2 = P/2005 SB216 (LONEOS) – Martin Masek of the Institute of Physics of the Czech Academy of Sciences recovered this comet at 19th magnitude on August 30, 31, and September 1, 2024. Masek used the 0.25-m f/6.8 reflector ("Fotometric Robotic Atmospheric Monitor") located at La Palma, Spain. Michael Kelley of the University of Maryland reported an independent recovery on several nights between August 2 and 29 with the 1.2-m Schmidt telescope at Palomar and ZTF camera. P/LONEOS was discovered in September 2005. When it arrived at perihelion in 2007, it had brightened to 16th magnitude. The current return sees perihelion on 2026 January 14 at 3.82 au when it should be around 16-17th magnitude. [CBET 5439, MPEC 2024-R78]

Comets Brighter than Magnitude 6

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-P125)

```
    C/2023 A3 (Tsuchinshan-ATLAS)
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Sept. 27.74083 TT                                Rudenko
q   0.3914103           (2000.0)            P               Q
z  -0.0002358      Peri.  308.49352     +0.36145497     +0.90082653
 +/-0.0000004      Node    21.55948     +0.91852494     -0.29970120
e   1.0000923      Incl.  139.11044     -0.16019439     +0.31415084
From 4947 observations 2022 Apr. 9-2024 Aug. 2, mean residual 0".4.
1/a(orig) = +0.000005 AU**-1, 1/a(fut) = -0.000036 AU**-1.
```

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

C/2023 A3 (Tsuchinshan-ATLAS)

									Max El (deg)					
									Ast 40N	Nau 40N	Civ 40N	Ast 40S	Nau 40S	Civ 40S
Date	R.A.	Decl.	r	d	Elong	Ph.A.	Const	Mag	deg	deg	deg	deg	deg	deg
2024-Oct-01	11 04	-05 45	0.401	0.767	21M	114	Leo	2.0	-4	2	8	-1	5	11
2024-Oct-02	11 12	-05 34	0.409	0.721	20M	122	Leo	1.7	-4	2	8	-2	4	10
2024-Oct-03	11 22	-05 22	0.418	0.682	18M	129	Leo	1.4	-5	1	7	-4	3	9
2024-Oct-04	11 32	-05 07	0.428	0.644	17M	136	Leo	1.0	-6	0	6	-6	1	7
2024-Oct-05	11 44	-04 50	0.440	0.609	14M	144	Vir	0.5	-7	-1	5	-8	-2	5
2024-Oct-06	11 57	-04 32	0.451	0.581	12M	151	Vir	-0.2	-9	-3	3	-10	-4	2
2024-Oct-07	12 14	-04 05	0.466	0.549	9M	159	Vir	-1.1	-11	-5	1	-13	-7	-1
2024-Oct-08	12 32	-03 39	0.481	0.525	6M	166	Vir	-2.2	-13	-7	-1	-16	-10	-4
2024-Oct-09	12 51	-03 08	0.497	0.504	3M	172	Vir	-3.5	-15	-9	-3	-20	-14	-8
2024-Oct-10	13 12	-02 35	0.513	0.489	4E	170	Vir	-2.9	-13	-7	-1	-19	-13	-6
2024-Oct-11	13 31	-02 05	0.528	0.479	7E	164	Vir	-1.6	-9	-3	3	-16	-10	-4
2024-Oct-12	13 56	-01 24	0.547	0.473	12E	155	Vir	-0.3	-5	1	7	-13	-7	-1
2024-Oct-13	14 18	-00 47	0.565	0.473	17E	147	Vir	0.7	-1	5	11	-11	-4	2
2024-Oct-14	14 40	-00 12	0.583	0.478	22E	139	Vir	1.5	3	9	15	-8	-1	5
2024-Oct-15	15 01	+00 21	0.601	0.488	26E	132	Vir	2.1	7	13	19	-5	1	8
2024-Oct-16	15 19	+00 48	0.618	0.500	30E	125	Ser	2.7	11	17	23	-3	4	10
2024-Oct-17	15 40	+01 19	0.639	0.519	34E	118	Ser	3.1	14	20	26	0	6	12
2024-Oct-18	15 57	+01 43	0.658	0.540	37E	112	Ser	3.5	17	23	29	2	8	14
2024-Oct-19	16 12	+02 03	0.677	0.564	40E	106	Ser	3.9	20	26	31	3	10	16
2024-Oct-21	16 37	+02 34	0.713	0.614	45E	96	Oph	4.5	24	30	35	6	13	19
2024-Oct-26	17 25	+03 21	0.810	0.771	52E	77	Oph	5.8	31	36	41	9	16	22
2024-Oct-31	17 55	+03 41	0.907	0.943	55E	64	Oph	6.8	34	39	44	9	16	22
2024-Nov-05	18 15	+03 51	1.003	1.117	56E	55	Oph	7.6	35	40	44	8	15	21

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

```
m1 = -16.6 + 5 log d + 35.0 log r + dust phase_function [Through T-650 days]
m1 =   0.2 + 5 log d + 15.7 log r + dust phase_function [Between T-650 and T-309 days]
m1 =   5.3 + 5 log d +  8.4 log r + dust phase_function [Between T-309 and T-70 days]
m1 =   5.7 + 5 log d +  6.7 log r + dust phase_function [Between T-70 days and perihelion]
m1 =   7.1 + 5 log d + 10.0 log r + dust phase_function [After perihelion, 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 10 03.52 aM  1.2 TK  5.0B    10   2    7/  1    260 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 10 02.79 $M  1.8 TT  4.0B     8   4    7  19    256 ICQ XX MAT08 Michael Mattiazzo
   2023A3  2024 10 02.79 $I  1.6 TT     E     1            15    256 ICQ XX MAT08 Michael Mattiazzo
   2023A3  2024 10 02.52 aM  1.5 TK  5.0B    10   2    8   2.5  260 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 10 02.52 aI  1.2 TK     E     1   3    9   1    260 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 10 02.33  M  1.8 TK  8.0B    20   3    8   1.5  260 ICQ XX SOU01 Willian Souza
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2023A3  2024 10 02.33  M  1.8 TK  5.0B    10   3    8   1.5  260 ICQ XX SOU01 Willian Souza
2023A3  2024 10 02.33  I  1.5:TK  0.7E                         ICQ XX SOU01 Willian Souza
2023A3  2024 10 01.78  M  2.1 TT  4.0B     8   4    7  15    255 ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 10 01.78  I  1.9 TT     E     1             10   255 ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 10 01.77 xM  2.0 TK  5.0B     7   4    7   3    257 ICQ XX WYA   Christopher Wyatt
2023A3  2024 10 01.77 xM  2.0 TK     E          5    8  13.5  257 ICQ XX WYA   Christopher Wyatt
2023A3  2024 10 01.53  Z  2.4 GG  5.0R 4a016   5                 ICQ XX OLAaa Michael Olason
2023A3  2024 10 01.33  M  2.1 TK  8.0B    20   3    8   2    260 ICQ XX SOU01 Willian Souza
2023A3  2024 10 01.33  M  2.1 TK  5.0B    10   3    8   1.5  260 ICQ XX SOU01 Willian Souza
2023A3  2024 10 01.33  I  2.0 TK  0.7E                         ICQ XX SOU01 Willian Souza
2023A3  2024 09 30.88 aM  2.2 TK  7.0B    15   2.5  8   5    260 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 30.87 aI  2.0 TK     E     1         9    1   260 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 30.76 xM  2.3 TK     E         15    6   9.5  263 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 30.53  Z  2.8 GG  5.0R 4a036   5                 ICQ XX OLAaa Michael Olason
2023A3  2024 09 30.51 aM  2.1 TK  5.0B    10   2    7/  2    250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 29.87 aM  2.1 TK  7.0B    15   2.5  8   4    257 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 29.87 aI  2.0 TK  0.0E     1         9            ICQ XX PEA   Andrew Pearce
2023A3  2024 09 29.53  Z  3.0 GG  5.0R 4a003   5                 ICQ XX OLAaa Michael Olason
2023A3  2024 09 29.33 &M  2.7 TK  8.0B    11   5    6/  1.5      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 29.19  I  2.2 TK  7.0B    10   5    7   30  m260 ICQ XX DEC   Michel Deconinck
2023A3  2024 09 28.88 aM  2.5 TK  7.0B    15   3    8   4    260 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 28.87  I  2.4 TK  0.0E     1         9            ICQ XX PEA   Andrew Pearce
2023A3  2024 09 28.53  Z  3.4 GG  5.0R 4a036   5                 ICQ XX OLAaa Michael Olason
2023A3  2024 09 28.51 aM  2.5 TK  5.0B    10   2    7   1    250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 28.34 &M  2.8 TK  8.0B    11   5    6   1.3      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 28.23  I  2.7 TK  5.0B    10   2    8   0.4  260 ICQ XX GON05 Juan Jose Gonzalez Suarez
2023A3  2024 09 28.19  B  2.5 TK 12.0B 5  25   5    7/  20  m250 ICQ XX DEC   Michel Deconinck
2023A3  2024 09 27.53  Z  3.5 GG  5.0R 4a042   5                 ICQ XX OLAaa Michael Olason
2023A3  2024 09 27.51 aM  2.8 TK  5.0B    10   2    7   1    250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 26.51 aM  3.0 TK  5.0B    10   1.5  7   0.5  250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 26.33 &M  3.2 TK  8.0B    11   5    6/  0.8      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 26.33  M  3.1 TK  6.0R 5  12   3    8   0.5  250 ICQ XX SOU01 Willian Souza
2023A3  2024 09 26.33  M  3.0 TK  8.0B    20   3    8   1    250 ICQ XX SOU01 Willian Souza
2023A3  2024 09 26.33  M  2.9 TK  5.0B    10   3    8   0.8  250 ICQ XX SOU01 Willian Souza
2023A3  2024 09 25.87 aM  3.1 TK  7.0B    15   2.5  8    2   254 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 25.80  M  3.1 TT  7.0B    15   4    8   3    256 ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 09 25.80  I  3.0 TT  0.0E     1                     ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 09 25.33 &M  3.4 TK  8.0B    11   5    6/  0.3      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 25.33  M  3.2 TK  8.0B    20   3    7/  1    250 ICQ XX SOU01 Willian Souza
2023A3  2024 09 25.33  M  3.1 TK  5.0B    10   3    8   1    250 ICQ XX SOU01 Willian Souza
2023A3  2024 09 24.88 aM  3.3 TK  7.0B    15   2.5  8   2.2  253 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 24.51 aS  3.5:TK  5.0B    10   1.5  7   0.5  250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 24.33 &M  3.5 TK  8.0B    11   4    6   0.3      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 23.77 xM  3.6 TK  7.0B    15   3    7/  2.5  250 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 23.77 xI  3.3 TK  0.0E         5    8            ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 23.51 aS  3.5:TK  5.0B    10   2    7   0.5  250 ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 22.88 aM  3.7 TK  7.0B    15   3    7/  1.1  252 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 22.80 aM  3.6 TK  7.0B    15   4    7   1.3  254 ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 09 22.78 xM  3.7 TK  7.0B    15   3.1  8   1.7  253 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 22.52 aI  3.9 TK  5.0B    10   1.5  7            ICQ XX HER02 Carl Hergenrother
2023A3  2024 09 21.88 aM  3.9 TK  7.0B    15   3    7   0.8  250 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 21.77 xM  3.8 TK  7.0B    15   2    8   1.2  251 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 20.89  M  4.0 TK  7.0B    15   3    7   0.5  253 ICQ XX PEA   Andrew Pearce
2023A3  2024 09 20.78 xM  4.0 TK  7.0B    15   2.2  7   50  m248 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 19.77 xM  4.2 TK  7.0B    15   2.7  7/  25  m247 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 18.78 xM  4.2 TK  7.0B    15   2.1  6   25  m244 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 18.33 &M  4.4 TK 10.0B    25   5    6/  0.1      ICQ XX DES01 Jose Guilherme de Souza Aguiar
2023A3  2024 09 17.81  S  4.3:TT  7.0B    15   5    8   20  m240 ICQ XX MAT08 Michael Mattiazzo
2023A3  2024 09 17.78 xM  4.5 TK  7.0B    15   3    6   18  m245 ICQ XX WYA   Christopher Wyatt
2023A3  2024 09 15.81  S  4.6:TT  7.0B    15   5    8            ICQ XX MAT08 Michael Mattiazzo
```
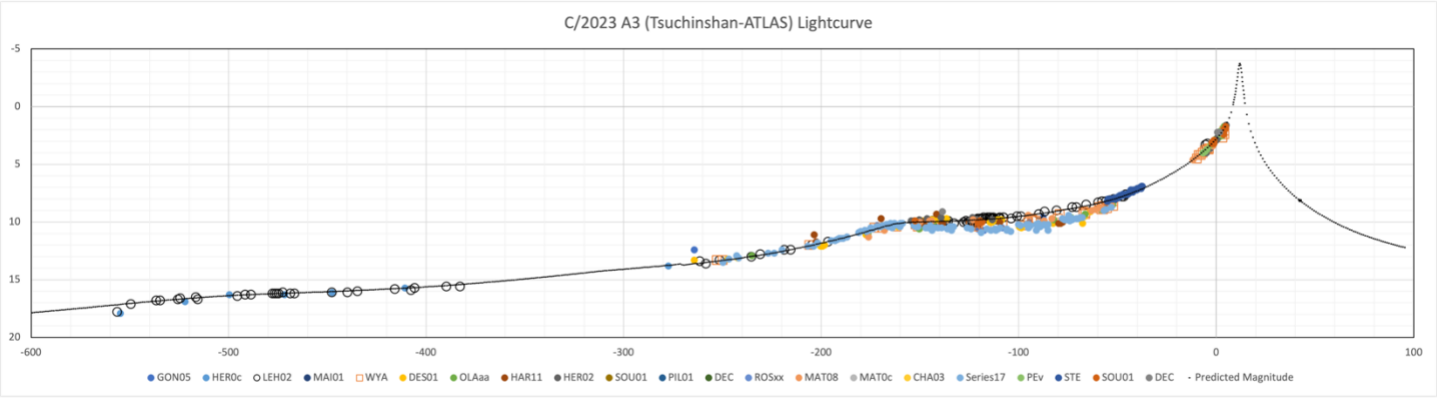

As October begins, C/2023 A3 (Tsuchinshan-ATLAS) is a naked-eye object with a 10-20 degree long tail low in the eastern morning sky. Contrary to some predictions, it has not disintegrated (at least not yet), and due to a shrinking Earth-comet distance and dust forward scattering at high angles, it continues to brighten for us observers on Earth. Assuming the comet doesn't fall apart or rapidly fade intrinsically, the stage is set for an even better show in the next week or two, featuring the possibility of more spacecraft observations, daylight observations, a strong anti-tail, and a naked-eye object in the evening sky. Now, if only the bright Moon weren't also in the evening sky to spoil some of the view.

After correcting for aperture and phase function, the comet possesses a well-behaved lightcurve. A big question mark is how quickly the comet will intrinsically fade after perihelion. For the 70 days leading up to perihelion, the comet brightened at a 6.7 log r rate. Rather than assume it will fade at the same rate, the ALPO predictions assume a 10 log r fading rate. If it fades faster, the comet will be fainter than predicted and perhaps a lot fainter

if the nucleus disrupts. The second big unknown is whether we are accurately modeling its phase function. For this work, I'm using the Marcus-Lowell phase function and using a dynamic d90 value (d90 is a parameter for how dusty a comet is) that changes with the Sun-comet distance [specifically $d90 = \frac{r^{-1}+r^2}{2}$].



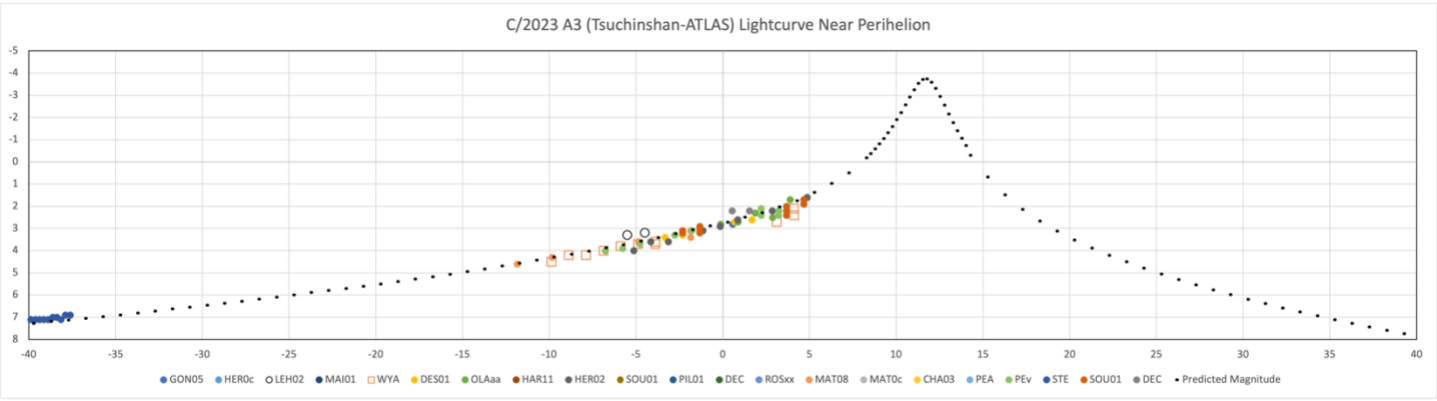
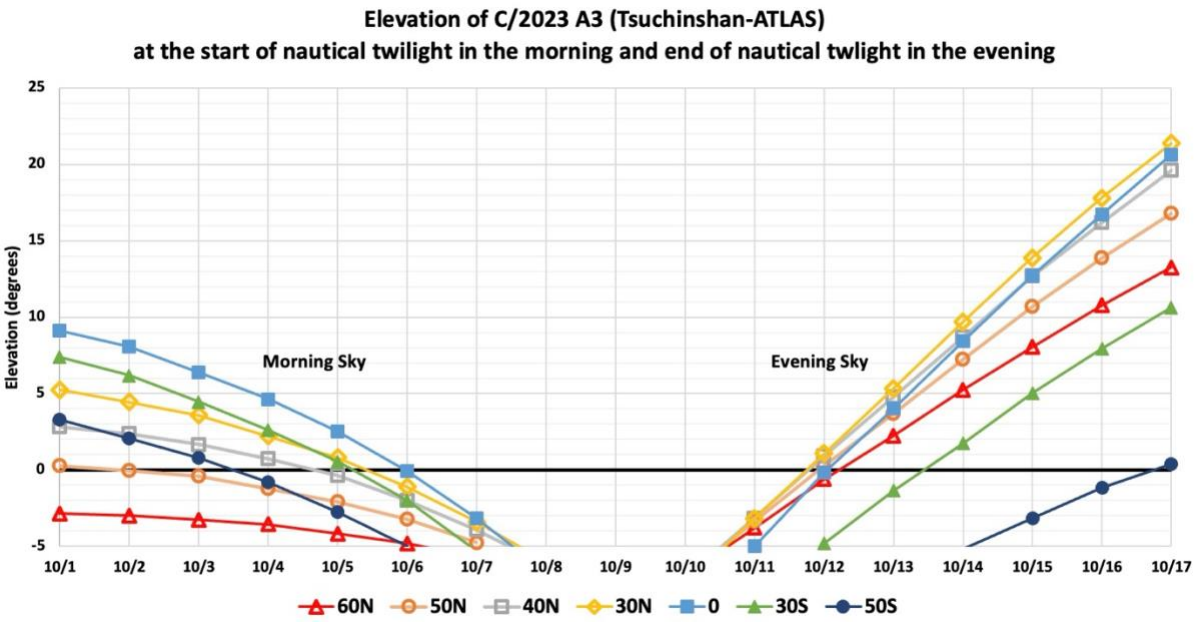


Figure 2 - Lightcurve of C/2023 A3 from data submitted to the ALPO Comets Section as well as photometry from the STEREO spacecraft and Thomas Lehmann.

The following table expands on the one above and shows the comet's altitude at the start of astronomical and nautical twilight in the morning sky from +40 and -40 latitude. It highlights how difficult it will be to observe Tsuchinshan-ATLAS in early October. The magnitude predictions include enhanced brightness due to the forward scattering of dust at large-phase angles.

	Max El (deg)										
Date	40N Ast deg	40N Nau deg	40N Civ deg	40S Ast deg	40S Nau deg	40S Civ deg	r	delta	Ph.A.	Elong	Mag
2024-Oct-01	-4	2	8	-1	5	11	0.402	0.762	115	21M	2.0
2024-Oct-02	-4	2	8	-2	4	10	0.409	0.721	122	20M	1.7
2024-Oct-03	-5	1	7	-4	3	9	0.418	0.682	129	18M	1.4
2024-Oct-04	-6	0	6	-6	1	7	0.428	0.644	136	17M	1.0
2024-Oct-05	-7	-1	5	-8	-2	5	0.440	0.609	144	14M	0.5
2024-Oct-06	-9	-3	3	-10	-4	2	0.453	0.578	151	12M	-0.2
2024-Oct-07	-11	-5	1	-13	-7	-1	0.466	0.549	159	9M	-1.1
2024-Oct-08	-13	-7	-1	-16	-10	-4	0.481	0.525	166	6M	-2.2
2024-Oct-09	-15	-9	-3	-20	-14	-8	0.497	0.504	172	3M	-3.5
2024-Oct-10	-13	-7	-1	-19	-13	-6	0.513	0.489	170	4E	-2.9
2024-Oct-11	-9	-3	3	-16	-10	-4	0.530	0.478	163	8E	-1.6
2024-Oct-12	-5	1	7	-13	-7	-1	0.547	0.473	155	12E	-0.3
2024-Oct-13	-1	5	11	-11	-4	2	0.565	0.473	147	17E	0.7
2024-Oct-14	3	9	15	-8	-1	5	0.583	0.478	139	22E	1.5
2024-Oct-15	7	13	19	-5	1	8	0.601	0.488	132	26E	2.1
2024-Oct-16	11	17	23	-3	4	10	0.620	0.501	125	30E	2.7
2024-Oct-17	14	20	26	0	6	12	0.639	0.519	118	34E	3.1
2024-Oct-18	17	23	29	2	8	14	0.658	0.540	112	37E	3.5

The following figure shows the elevation of the comet at the start of nautical twilight in the morning and the end of nautical twilight in the evening for several latitudes.



Looking ahead to October, here are some key dates and predictions for the comet's appearance. Dates are in UTC.

October 5 [0.44 au from the Sun, 0.61 au from Earth, 14 deg solar elongation, 144 deg phase angle]
On this date, the comet may be as bright as magnitude 0.5. It is best placed for observers on the Equator, with northern and southern low-latitude observers seeing it rise around the start of nautical twilight and more and more after the start of nautical twilight for observers at northern and southern high latitudes.

By this date, the comet will once again be observable in images taken with the STEREO HI-A camera. The STEREO spacecraft is located ~26 degrees ahead of the Earth along the Earth's orbit. As a result, the spacecraft will see the comet from a slightly different vantage point. On October 5 from STEREO, the comet will be at a distance of 0.54 au and a phase angle of 160 degrees, resulting in a brighter magnitude of -1.6.

The comet will enter the STEREO-A HI1 field of view at the end of October 4. Very low-resolution images will be downlinked and made publicly available rather quickly at https://stereo.gsfc.nasa.gov/browse/2024/09/30/ahead/hi1/1024/. High-resolution images will take several days to come down from the spacecraft. You can access those images in FITS format at https://stereo-ssc.nascom.nasa.gov/pub/ins_data/secchi/L0/a/img/hi_1.

October 7 [0.47 au from the Sun, 0.55 au from Earth, 9 deg solar elongation, 159 deg phase angle]
The comet continues to brighten as it approaches Earth and is viewed at larger phase angles, resulting in more forward scattering by dust. Though the comet will only rise at the start of civil twilight in the morning, it might still be visible to some due to its brightness of magnitude -1.1. At 40N, the comet rises ~29 minutes before the Sun. At 40S, it rises ~13 minutes before the Sun. On the spacecraft front, the comet will be visible in the SOHO C3 coronagraph field of view from October 7 to 11 at https://soho.nascom.nasa.gov/data/realtime/c3/512/.

October 8 [0.48 au from the Sun, 0.53 au from Earth, 6 deg solar elongation, 166 deg phase angle]
At 40N, the comet at magnitude -2.2 to -3.5 rises ~16 minutes before the Sun. At 40S, it rises after the Sun.

October 9 [0.50 au from the Sun, 0.50 au from Earth, 3.5 deg solar elongation, 173 deg phase angle]
The comet is now closest to the Sun on the sky (3.5 deg), at a maximum phase angle of 173 deg, and its brightest, which may be as bright as magnitude -3.7. While -3 sounds bright, remember this is still -3 during the day within 3 deg of the Sun. Assuming the comet really is that bright or brighter, I wouldn't be surprised to see images of the comet at that time. At 40N, the comet rises and sets within minutes of the Sun. At 40S, it rises after the Sun and sets before the Sun. Tsuchinshan-ATLAS exits the STEREO-A HI1 field of view late in the day at magnitude 1.7.

October 10 [0.51 au from the Sun, 0.49 au from Earth, 4 deg solar elongation, 170 deg phase angle]
At 40N, the comet at magnitude -2.9 to -1.6 sets ~35 minutes after the Sun. At 40S, it sets minutes after the Sun.

October 12 [0.55 au from the Sun, 0.47 au from Earth, 12 deg solar elongation, 155 deg phase angle]
Tsuchinshan-ATLAS is closest to Earth at 0.47 au. At northern mid-latitudes, the comet is almost as high as Venus in the evening sky. The comet sets ~80 minutes after the Sun at 40N and ~34 minutes after the Sun at 40S. At magnitude -0.3 and 2 days away from an orbit plane crossing, the comet may look very similar to C/1956 R1 (Arend-Roland). The Moon is in the sky at ~70% illumination.

October 14 [0.58 au from the Sun, 0.48 au from Earth, 22 deg solar elongation, 139 deg phase angle]
Orbit plane crossing! Tsuchinshan-ATLAS' anti-tail will be at its narrowest and brightest on this date, though it will be observable for several nights before and after the 14th. The comet sets ~2 hours after the Sun at 40N and ~1 hour after the Sun at 40S. Though fading fast, it may still be as bright as magnitude 1.5 as it continues its C/1956 R1 (Arend-Roland) impression. If there is one downside to this apparition, it is that the Moon is in the evening sky and ~90% illuminated.

October 15 [0.60 au from the Sun, 0.49 au from Earth, 26 deg solar elongation, 132 deg phase angle]
As if the comet won't be photogenic enough, it will pass ~1 deg from 10th mag 13P/Olbers and 5th mag globular cluster M5.

October 20 [0.55 au from the Sun, 0.47 au from Earth, 12 deg solar elongation, 155 deg phase angle]
The comet has faded to magnitude 4.2, but at least the Moon is finally out of the way in the northern hemisphere. South of the equator, some amount of dark Moon-less time started a night or two earlier.

<u>Photo Opportunities</u>

Oct 15	- C/2023 A3 (Tsuchinshan-ATLAS) passes ~1 deg from 13P/Olbers
Oct 15	- C/2023 A3 (Tsuchinshan-ATLAS) passes ~1.3 deg from 5th mag globular cluster M5
Oct 15	- 13P/Olbers, C/2023 A3 (Tsuchinshan-ATLAS), and M5 are in a line ~3 degrees in length
Oct 28	- C/2023 A3 (Tsuchinshan-ATLAS) passes from 10th mag globular cluster NGC 6426
Oct 29	- C/2023 A3 (Tsuchinshan-ATLAS) passes ~2 degrees from large open cluster IC 4665

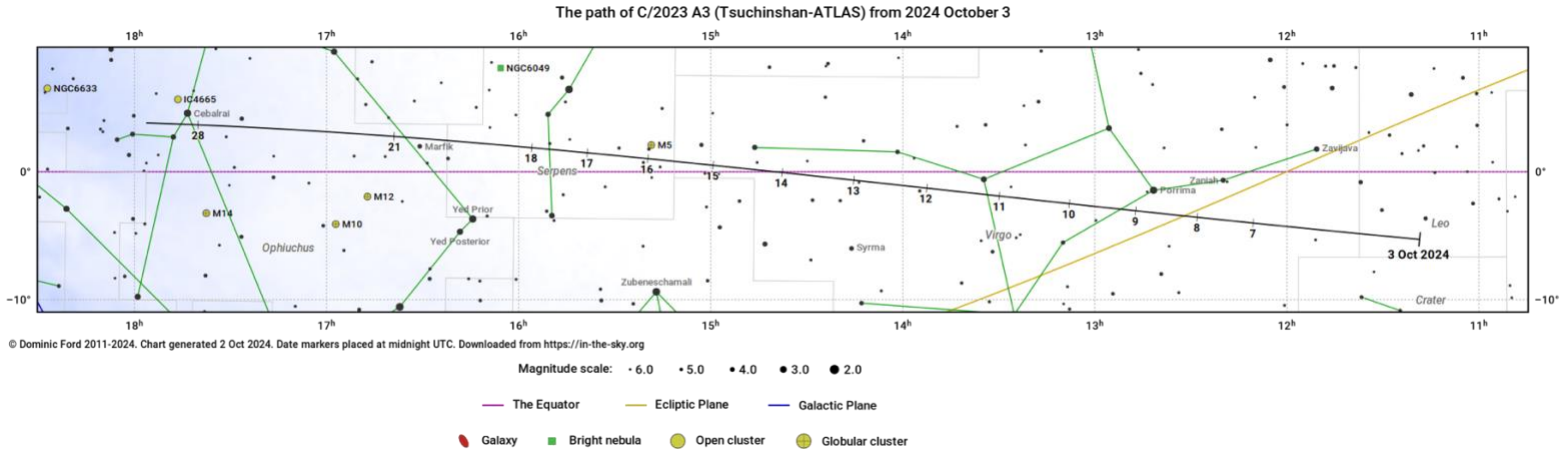


Figure 3 - Star chart for C/2023 A3 in October 2024. Chart produced at in-the-sky.org.

Figure 4 - C/2023 A3 as imaged by Mike Olason from Tucson, Arizona on 2024 September 29 with a 50mm f/5.6 lens. The inset image gives a good impression of the comet's appearance in small binoculars from the northern hemisphere.

Figure 5 - In the southern hemisphere, the comet's tail extends away from the horizon as seen in this image taken on 2024 September 29 by Michael Mattizzo from Swan Hill, Victoria, Australia. Michael used a Canon 60Da + Canon 50mm lens to obtain this 2x30-sec exposure.

Figure 6 - The imaging team of Gerald Rhemann, Michael Jäger, & Denis Möller caught this exquisite image of C/2023 A3 on September 30, 2024, with a ASA 12" f/3.6 Astrograph and ZWO ASI 6200 MM Pro camera from Farm Tivoli, Namibia,

C/2024 S1 (ATLAS)

Discovered on 2024 September 27 by the ATLAS survey
Kreutz sungrazer

Orbit (from Minor Planet Center, MPEC 2024-T22)

```
    C/2024 S1 (ATLAS)
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Oct. 28.45981 TT                                  Rudenko
q   0.0083130           (2000.0)            P               Q
z  -0.0075234      Peri.   68.81055     +0.18872878     -0.97233155
 +/-0.3144432      Node   347.11231     -0.95898405     -0.15228787
e   1.0000625      Incl.  141.88528     +0.21149714     +0.17714334
From 126 observations 2024 Sept. 27-Oct. 1, mean residual 0".8.
```

Ephemerides (produced with Seiichi Yoshida's Comets for Windows program, ***assumed brightness and highly uncertain***)

C/2024 S1 (ATLAS)

									Max El					
									Ast	Nau	Civ	Ast	Nau	Civ
									40N	40N	40N	40S	40S	40S
Date	R.A.	Decl.	r	d	Ph.A.	Elong	Const	Mag	deg	deg	deg	deg	deg	deg
2024-Oct-01.0	09 20	-12 42	0.994	1.337	48	47M	Hya	11.4	11	16	21	24	30	36
2024-Oct-02.0	09 25	-13 02	0.970	1.309	49	47M	Hya	11.3	11	16	21	23	30	36
2024-Oct-03.0	09 30	-13 22	0.945	1.281	50	46M	Hya	11.2	10	16	20	23	29	35
2024-Oct-04.0	09 35	-13 43	0.920	1.253	52	46M	Hya	11.1	10	15	20	23	29	35
2024-Oct-05.0	09 41	-14 04	0.894	1.226	53	45M	Hya	10.9	10	15	20	22	28	35
2024-Oct-06.0	09 47	-14 26	0.868	1.199	55	45M	Hya	10.8	9	14	19	22	28	34
2024-Oct-07.0	09 53	-14 48	0.842	1.173	56	44M	Hya	10.6	9	14	19	21	27	34
2024-Oct-08.0	09 59	-15 10	0.815	1.147	58	44M	Hya	10.5	8	13	18	20	27	33
2024-Oct-09.0	10 06	-15 32	0.788	1.121	60	43M	Hya	10.3	8	13	18	20	26	32
2024-Oct-10.0	10 14	-15 55	0.761	1.096	62	42M	Hya	10.2	7	12	17	19	25	32
2024-Oct-11.0	10 21	-16 17	0.733	1.072	63	41M	Hya	10.0	6	11	16	18	24	31
2024-Oct-12.0	10 29	-16 40	0.704	1.048	66	40M	Hya	9.8	5	10	15	17	24	30
2024-Oct-13.0	10 38	-17 01	0.675	1.025	68	38M	Hya	9.7	4	10	14	16	22	29
2024-Oct-14.0	10 47	-17 23	0.645	1.003	70	37M	Hya	9.5	3	9	14	15	21	28
2024-Oct-15.0	10 57	-17 43	0.615	0.983	73	36M	Crt	9.3	2	8	12	14	20	26
2024-Oct-16.0	11 07	-18 01	0.584	0.963	75	34M	Crt	9.0	1	6	11	12	19	25
2024-Oct-17.0	11 18	-18 18	0.551	0.945	78	32M	Crt	8.8	0	5	10	11	17	23
2024-Oct-18.0	11 29	-18 32	0.518	0.929	81	30M	Crt	8.5	-1	4	9	9	16	22
2024-Oct-19.0	11 41	-18 43	0.484	0.914	84	28M	Crt	8.3	-3	2	8	7	14	20
2024-Oct-20.0	11 54	-18 51	0.449	0.902	88	26M	Crt	8.0	-4	1	6	5	12	18
2024-Oct-21.0	12 08	-18 53	0.412	0.891	92	24M	Crv	7.6	-6	-1	5	3	10	16
2024-Oct-22.0	12 22	-18 50	0.374	0.884	96	21M	Crv	7.3	-8	-2	3	1	7	14
2024-Oct-23.0	12 37	-18 41	0.333	0.880	100	19M	Crv	6.8	-9	-4	2	-1	5	11
2024-Oct-24.0	12 52	-18 23	0.290	0.879	105	16M	Crv	6.3	-11	-6	0	-4	2	8
2024-Oct-25.0	13 09	-17 55	0.244	0.883	110	13M	Vir	5.6	-13	-7	-2	-7	-1	5
2024-Oct-26.0	13 26	-17 16	0.193	0.893	116	9M	Vir	4.6	-15	-9	-3	-10	-4	2
2024-Oct-27.0	13 44	-16 18	0.134	0.911	124	6M	Vir	3.2	-17	-11	-5	-13	-7	-1
2024-Oct-28.0	14 04	-14 45	0.059	0.947	140	2E	Vir	-0.4	-17	-11	-5	-17	-11	-5
2024-Oct-28.46			0.008	0.995	78	0E	Vir	-4.7						
2024-Oct-29.0	13 59	-13 16	0.065	1.016	67	3M	Vir	2.7	-14	-8	-2	-14	-8	-2
2024-Oct-30.0	13 46	-14 15	0.139	1.017	76	7M	Vir	4.9	-11	-5	1	-11	-5	1
2024-Oct-31.0	13 36	-15 10	0.197	1.016	77	11M	Vir	5.9	-9	-3	3	-9	-2	4
2024-Nov-01.0	13 27	-16 02	0.247	1.014	78	14M	Vir	6.6	-7	-1	4	-7	0	7
2024-Nov-02.0	13 20	-16 51	0.293	1.012	77	16M	Vir	7.1	-6	0	6	-4	2	9
2024-Nov-03.0	13 13	-17 39	0.336	1.010	77	19M	Vir	7.5	-4	2	7	-2	4	11
2024-Nov-04.0	13 07	-18 26	0.377	1.009	76	21M	Vir	7.8	-3	3	8	0	6	13
2024-Nov-05.0	13 02	-19 12	0.415	1.007	75	23M	Vir	8.1	-1	4	9	1	8	15

Comet Magnitude Formula (from ALPO data)

m1 = 10.8 + 5 log d + 7.0 log r + dust phase_function [***assumed, and highly uncertain***]
where "t" is the date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au

Recent Magnitude Measurements Contributed to the ALPO Comets Section

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA T	COMA Dia	COMA DC	TAIL LENG	TAIL PA	ICQ	CODE	Observer Name
2024S1	2024 10 01.74	xS 12.6	AQ	25.0L	5	125	0.8	3/				ICQ	XX WYA	Christopher Wyatt
2024S1	2024 10 01.50	Z 13.9	GG	5.0R	4	a750	2					ICQ	XX OLAaa	Michael Olason
2024S1	2024 09 30.87	V 12.9	AQ	5.0R	5	A860	4					ICQ	XX PEA	Andrew Pearce
2024S1	2024 09 30.75	xM 11.8	AQ	25.0L	5	74	1.3	3/				ICQ	XX WYA	Christopher Wyatt
2024S1	2024 09 29.88	V 13.1	AQ	5.0R	5	A630	3.2					ICQ	XX PEA	Andrew Pearce
2024S1	2024 09 29.15	C 13.0	AQ	10.6R	5	a120	3					ICQ	XX PEA	Andrew Pearce

On 2024 September 27, Robert Siverd discovered C/2024 S1 (ATLAS) on images taken with the "Asteroid Terrestrial-Impact Last Alert System" (ATLAS) 0.5-m f/2 Schmidt telescope at Haleakala, Hawaii. ATLAS reported the comet at 15th magnitude, though others reported it as bright as 11-12th magnitude soon after discovery. C/2024 S1 is a member of the Kreutz family with a perihelion on 2024 October 28.5 UT at an extremely small perihelion distance of 0.0075 au.

Some of the greatest comets of all time were Kreutz sungrazers. And we really mean sungrazing, with perihelia that come within 1 or 2 solar radii of the Sun's surface. Some have even crashed into the Sun. This family of comets numbers in the thousands, with the earliest known example likely being the Comet of 371 BC. Recent studies suggest that most, if not all, of the Kreutz comets result from a cascading series of break-up events that started with the comet of 371 BC.

Though there are thousands of known Kreutz sungrazers, most were small objects only several meters in diameter that were only observed by sun-watching spacecraft, like SOHO, and didn't survive their close approach to the Sun. Even for the few sungrazers observed as significant naked-eye objects, few were observed before perihelion.

Now, the big **DISCLAIMER**! *The brightness prediction above and anything I say below may turn out to be a complete work of fiction. The comet may not get as bright as predicted and may even disintegrate at any time.*

While significantly brighter than the majority of known Kreutz comets, which were only seen in spacecraft data within several solar radii of the Sun, C/2024 S1 is still a faint object. Assuming its current brightness is not due to a short-term outburst, ATLAS is ~5-6 magnitude fainter than C/1965 S1 (Ikeya-Seki), the last "great" Kreutz sungrazer, at a similar distance from the Sun. On the other hand, it may be a magnitude or two brighter than the last sungrazer to be observed from the ground as a bright object, C/2011 W3 (Lovejoy). I say "may" because Lovejoy wasn't discovered until it was closer to the Sun, so we can't do an apples-to-apples comparison yet. In mid-October, ATLAS will reach the same distance from the Sun that Lovejoy was first observed at.

Observers in the northern hemisphere should be able to observe ATLAS until mid-October, when it may be a 9th-magnitude object in the eastern morning sky. Southern hemisphere observers should be able to follow it for another week when it may be a 5-6th magnitude object.

If the comet is still going strong, it should be bright enough to be seen in SOHO coronagraphic image data and might even be bright enough to be imaged from Earth near the Sun.

If ATLAS can survive at least a few hours to days after perihelion, then it should become a conspicuous naked-eye object after perihelion. The bright, long tails displayed by Kreutz sungrazers are made of dust released by the comet AFTER perihelion. In the case of C/2011 W3 (Lovejoy), the nucleus disintegrated 1.5 days after perihelion, but that was long enough to create a visually impressive dust tail. In the case of the "Headless Comet" C/1887 B1, the tail was produced from dust released only 6 hours after perihelion, presumably when the nucleus disrupted. Hopefully C/2024 S1 is large enough to survive perihelion, at least for a few hours.

After perihelion, the comet will move back into the eastern morning sky. If it survives, the tail may be the first thing observers notice rising well before the much fainter coma. This is definitely a comet to keep an eye on, and we will know more in the coming weeks.

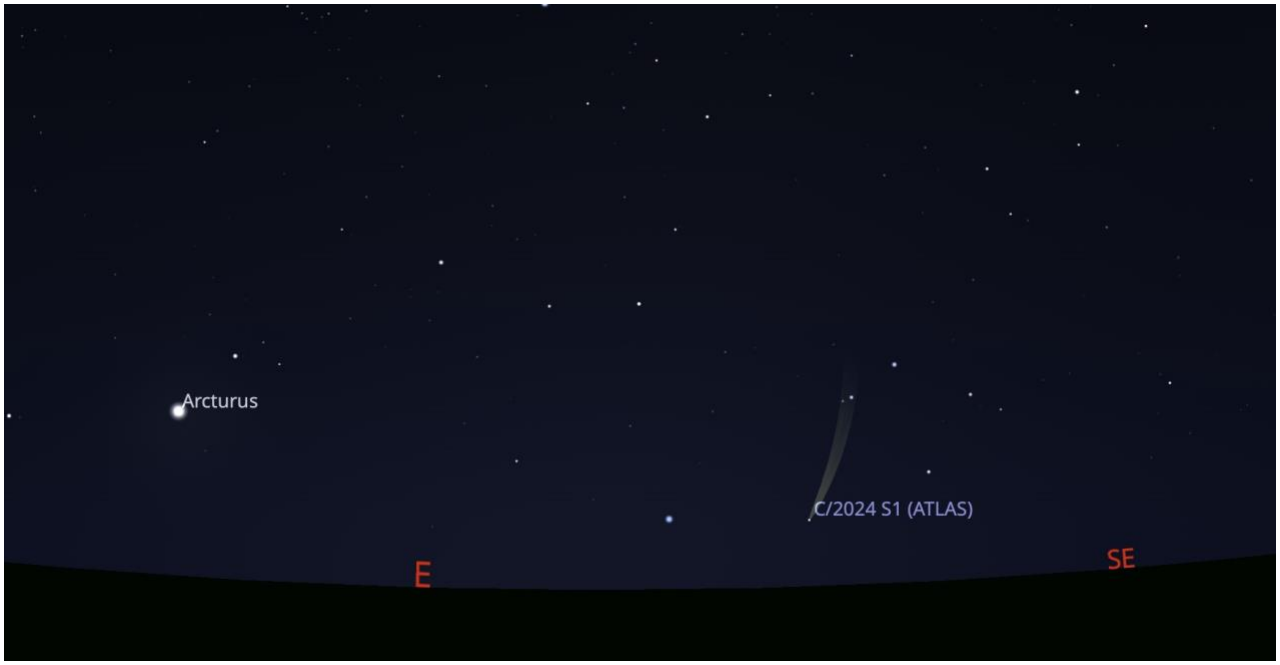


Figure 7 – An attempt to use Stellarium to predict what Comet ATLAS may look like on the morning of November 4 from Tucson, AZ. While Stellarium doesn't exactly model comet tails, I tweaked the tail parameters to match what was seen with Comet Lovejoy in length and brightness.

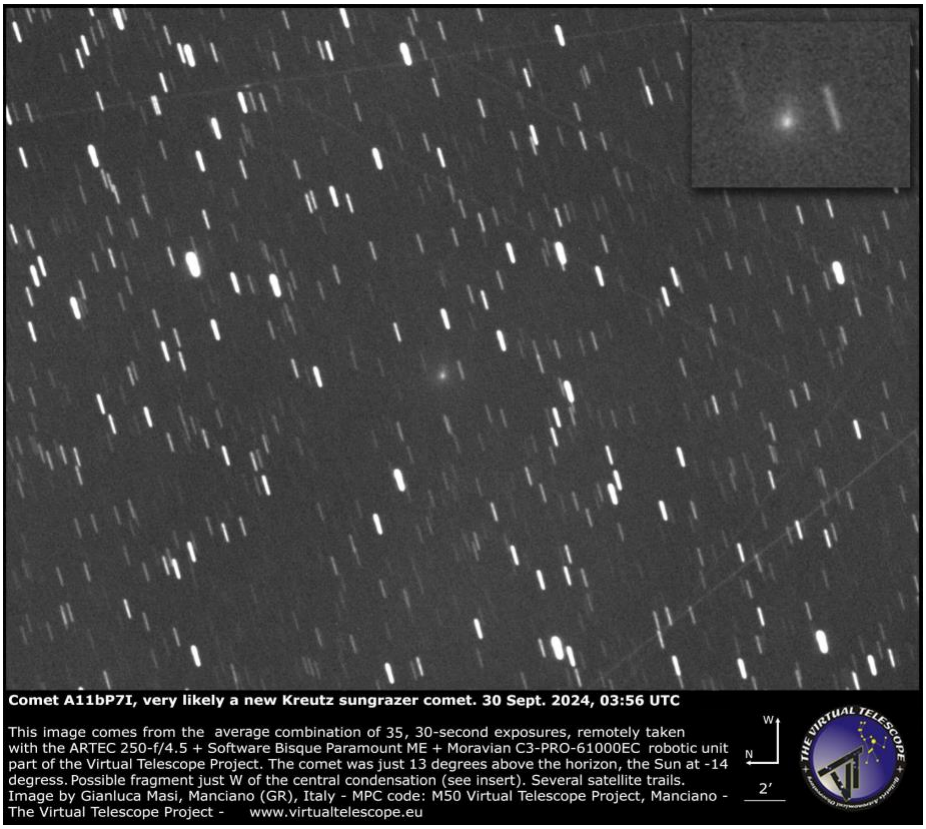


Figure 8 - C/2024 S1 (ATLAS) seen only days after discovery by Gianluca Masi with a ARTEC 250 f/4.5 telescope and Moravian C3-PRO-61000EC camera.

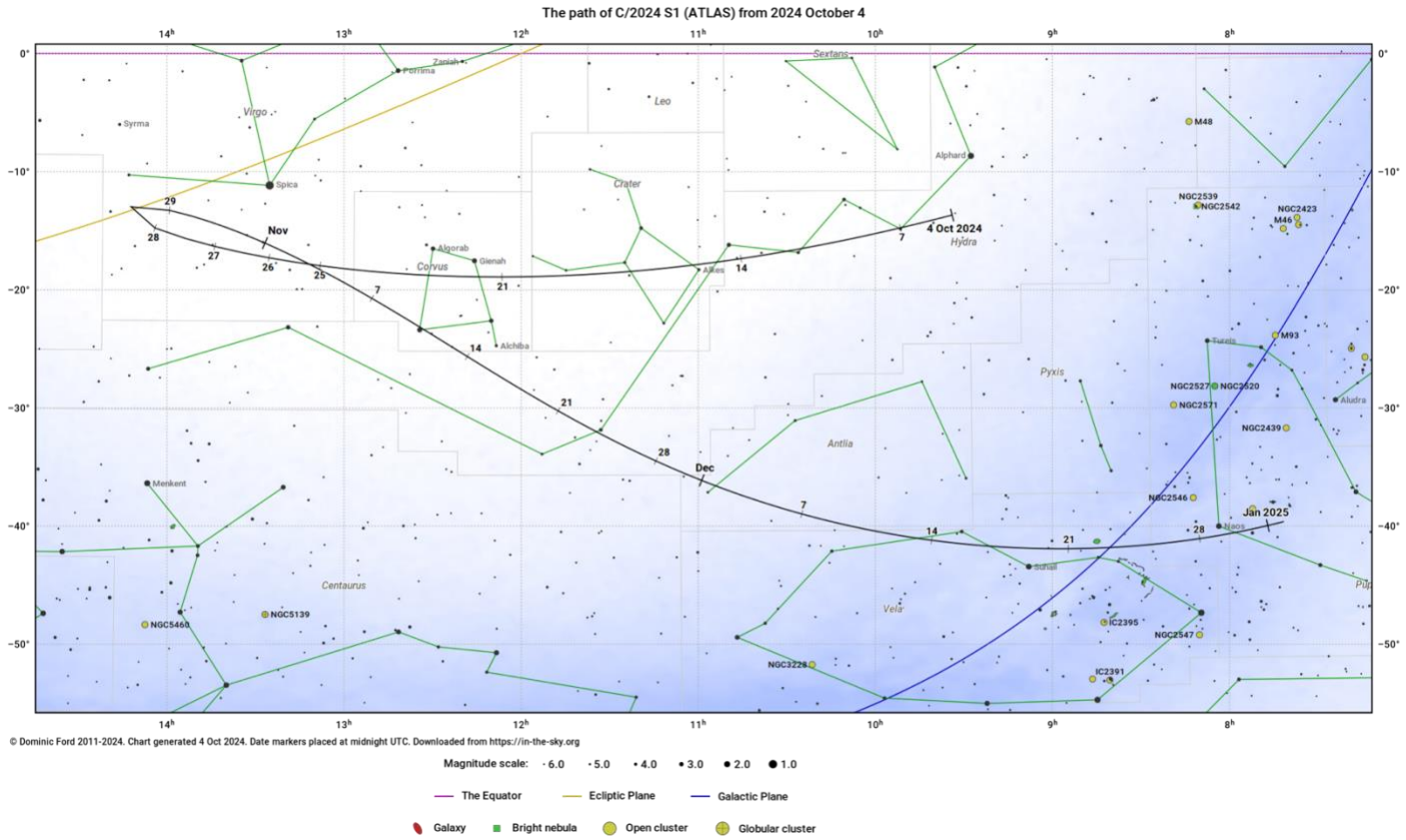


Figure 9 - Star chart for C/2024 S1 from October through December 2024. Chart produced at in-the-sky.org.

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-R266)

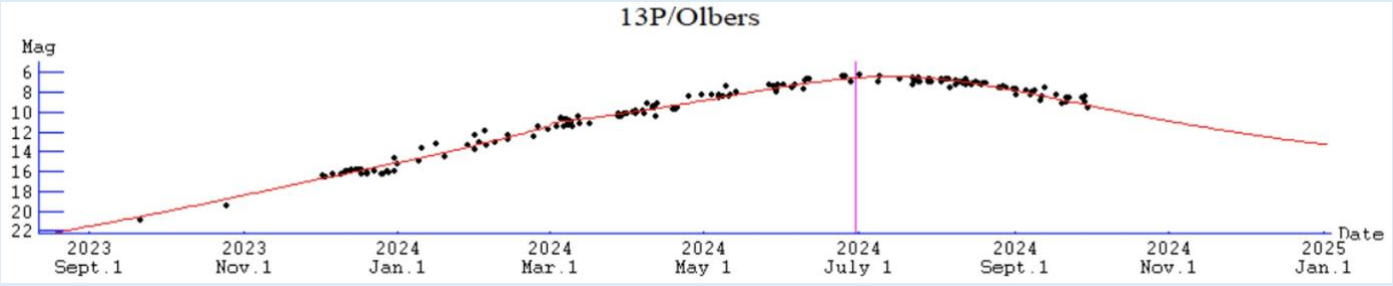
```
13P/Olbers
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 June 30.04992 TT                                  Rudenko
q   1.1754716            (2000.0)            P              Q
n   0.01423377     Peri.   64.41661     -0.60853162     -0.37163262
a  16.8625268      Node    85.84711     +0.18556161     -0.92570085
e   0.9302909      Incl.   44.66596     +0.77152845     -0.07047784
P  69.2
From 1970 observations 2023 Oct. 8-2024 Sept. 9, mean residual 0".5.
    Nongravitational parameters A1 = +0.68, A2 = -0.2475.
```

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-Oct-01  14 40   +04 54    1.794   2.541     33E   Vir    9.4   13    2
2024-Oct-06  14 51   +02 59    1.845   2.616     31E   Vir    9.6   12    1
2024-Oct-11  15 02   +01 12    1.897   2.692     30E   Vir    9.9   10    0
2024-Oct-16  15 13   -00 29    1.949   2.768     28E   Ser   10.1    9    0
2024-Oct-21  15 24   -02 04    2.002   2.844     26E   Ser   10.4    7    0
2024-Oct-26  15 34   -03 32    2.054   2.919     24E   Ser   10.6    6    0
2024-Oct-31  15 44   -04 54    2.107   2.992     22E   Lib   10.8    4    0
2024-Nov-05  15 53   -06 10    2.160   3.065     20E   Lib   11.1    2    0
```

Comet Magnitude Formula (from 2023-2024 ALPO data)

```
m1 = -0.9 + 5 log d + 32.9 log r [Up through T-120 days]
m1 =  3.9 + 5 log d + 15.5 log r (T - 13)[After T-120 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 09 30.10  Z  9.6 GG  5.0R 4a180   5                 ICQ XX OLAaa Michael Olason
 13        2024 09 28.78  C  9.4 AQ 25.0L 2a120   4          4.5m 52 ICQ XX PEA   Andrew Pearce
 13        2024 09 28.77  S  9.4:TI 29.8L    92   4    3            ICQ XX HAR11 Christian Harder
 13        2024 09 27.82  S  8.6 TK  7.0B    15   4    5/           ICQ XX GON05 Juan Jose Gonzalez Suarez
 13        2024 09 22.79  S  8.8:TI 25.2L    68   4.5  3            ICQ XX HAR11 Christian Harder
 13        2024 09 21.79  S  9.3 TI 25.2L    68   3    3/           ICQ XX HAR11 Christian Harder
 13        2024 09 20.12  Z  9.1 GG  5.0R 4a180   5                 ICQ XX OLAaa Michael Olason
 13        2024 09 12.80  C  8.6 AQ 25.0L 2a120   5.3        4.8m 67 ICQ XX PEA   Andrew Pearce
 13        2024 09 11.81  S  8.7 TI 25.2L    68   3.5  3/   9  m 35 ICQ XX HAR11 Christian Harder
 13        2024 09 11.13  Z  8.8 GG  5.0R 4a540   6                 ICQ XX OLAaa Michael Olason
 13        2024 09 08.85  S  7.7 TK  5.0B    10   5    5/  0.5   50 ICQ XX GON05 Juan Jose Gonzalez Suarez
 13        2024 09 07.40  S  8.5 TT 10.0B    25   5    6            ICQ XX MAT08 Michael Mattiazzo
 13        2024 09 05.83  S  8.1 TK  7.0B 6  16   4                      PIL01 Uwe Pilz
 13        2024 09 05.82  S  8.7 TI 53.1L   113   4    3/  11  m 30 ICQ XX HAR11 Christian Harder
 13        2024 09 05.15  Z  8.6 GG  5.0R 4a180   6                 ICQ XX OLAaa Michael Olason
 13        2024 09 01.83  S  8.5 TI 25.2L    72   4    3/   10 m 45 ICQ XX HAR11 Christian Harder
```

Halley-type comet 13P/Olbers is now 3 months past its late June perihelion at 1.18 au. The comet has been slow to fade, with a lightcurve showing a maximum intrinsic brightness about 2 weeks after perihelion. September saw 13P fade from around magnitude 8.5 to 9.5. That fading should continue in October to as faint as magnitude 11 by the end of the month.

Still, Olbers is the brightest comet in the evening sky, at least for northern hemisphere observers, as it will cease to be visible from the southern hemisphere very early in the month. Even for northern observers, October may be the last month to observe Olbers visually as it will sink too far into the bright dusk twilight by the end of the month.

While moving through Virgo (Oct 1-15), Serpens (15-26), and Libra (26-31), Olbers will have a few photo ops. The big one will be sharing the stage with a much brighter C/2023 A3 (Tsuchinshan-ATLAS) on October 15.

<u>Photo Opportunities</u>

Oct 09-10 - 13P/Olbers passes within ~15' of 10-11th mag galaxies NGC 5806 and 5813
Oct 15 - C/2023 A3 (Tsuchinshan-ATLAS) passes ~1 deg from 13P/Olbers
Oct 15 - 13P/Olbers, C/2023 A3 (Tsuchinshan-ATLAS), and M5 are in a line ~3 degrees in length

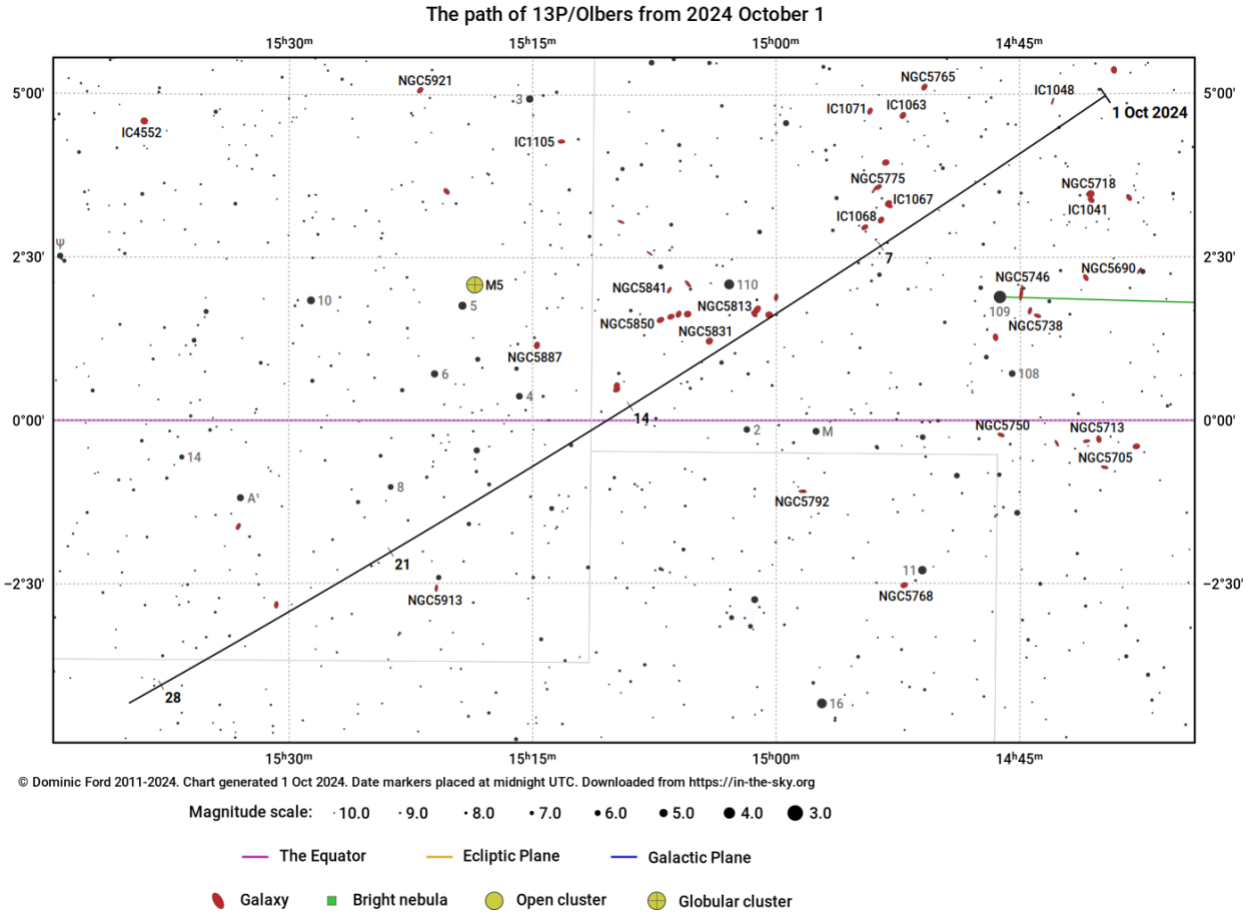


Figure 10 - Finder chart for 13P/Olbers in October 2024 from in-the-sky.org.

Comets Between Magnitude 10 and 12

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-R266)

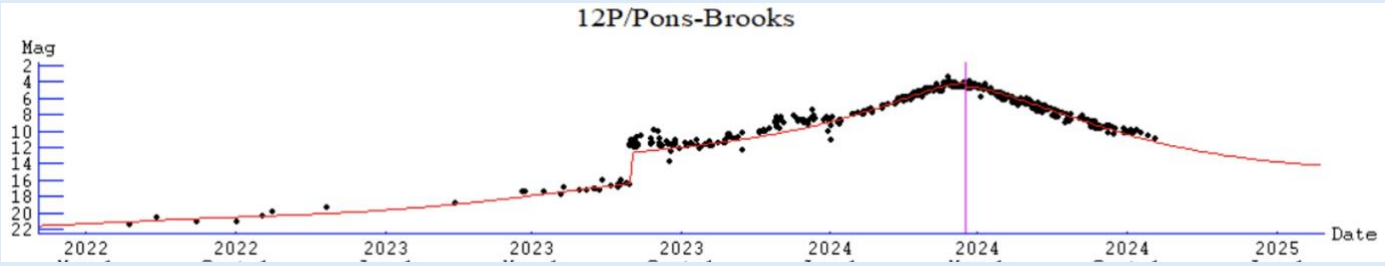
```
12P/Pons-Brooks
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Apr. 21.12545 TT                                  Rudenko
q   0.7808137            (2000.0)            P              Q
n   0.01382996     Peri.  198.99025     +0.14511003     -0.32929539
a  17.1891936      Node   255.85555     +0.98566415     +0.13015039
e   0.9545753      Incl.   74.19215     +0.08607710     -0.93521410
P  71.3
From 4471 observations 2023 Oct. 1-2024 Sept. 1, mean residual 0".6.
    Nongravitational parameters A1 = +0.74, A2 = -0.2277.
```

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-Oct-01  13 46   -47 32    2.640    3.214     47E    Cen   11.6    0   24
2024-Oct-06  13 58   -47 32    2.700    3.311     45E    Cen   11.7    0   23
2024-Oct-11  14 10   -47 32    2.759    3.407     42E    Cen   11.9    0   21
2024-Oct-16  14 21   -47 31    2.817    3.500     40E    Lup   12.1    0   19
2024-Oct-21  14 32   -47 32    2.875    3.590     38E    Lup   12.2    0   17
2024-Oct-26  14 42   -47 32    2.933    3.677     36E    Lup   12.3    0   14
2024-Oct-31  14 52   -47 33    2.990    3.760     34E    Lup   12.5    0   12
2024-Nov-05  15 02   -47 34    3.047    3.840     32E    Lup   12.6    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 +  9.7 log r [between T-275 days and perihelion]
m1 =  4.7 + 5 log d + 10.3 log r [after perihelion]
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Measurements 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 09 23.90  M 11.3 AQ 30.0L 5  65   1    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 09 17.90  M 11.0 AQ 30.0L 5  65   1    5           ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 09 12.75  C 11.0 AQ 10.6R 5a240   6        15.5m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 08.73  C 10.6 AQ 10.6R 5a240   7        18.5m242 ICQ XX PEA   Andrew Pearce
 12        2024 09 06.74  C 10.9 AQ 10.6R 5a240   7        24.2m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 05.73  C 10.7 AQ 10.6R 5a240   7        19.6m239 ICQ XX PEA   Andrew Pearce
 12        2024 09 04.73  C 10.8 AQ 10.6R 5a240   7        24.3m243 ICQ XX PEA   Andrew Pearce
 12        2024 09 03.73  C 10.6 AQ 10.6R 5a240   7        25.5m240 ICQ XX PEA   Andrew Pearce
 12        2024 09 02.73  C 10.7 AQ 10.6R 5a240   7        20.6m244 ICQ XX PEA   Andrew Pearce
 12        2024 09 01.73  C 10.7 AQ 10.6R 5a240   7        18.1m245 ICQ XX PEA   Andrew Pearce
 12        2024 08 31.73  C 10.8 AQ 10.6R 5a240   7        23.9m247 ICQ XX PEA   Andrew Pearce
 12        2024 08 30.90  M 10.5 AQ 30.0L 5  65   1    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 08 29.90  M 10.6 AQ 30.0L 5  65   1    3           ICQ XX DES01 Jose Guilherme de Souza Aguiar
 12        2024 08 27.90  M 10.5 AQ 30.0L 5  65   1    3/          ICQ XX DES01 Jose Guilherme de Souza Aguiar
```

This month, the other bright Halley-type comet, 12P/Pons-Brooks, fades from around magnitude 11.6 to 12.5. Now past its April perihelion at 0.78 au, Pons-Brooks is receding back into the outer solar system not to return for 71 years in 2095. The comet is a southern-hemisphere-only object in Centaurus (Oct 1-14) and Lupus (14-31).

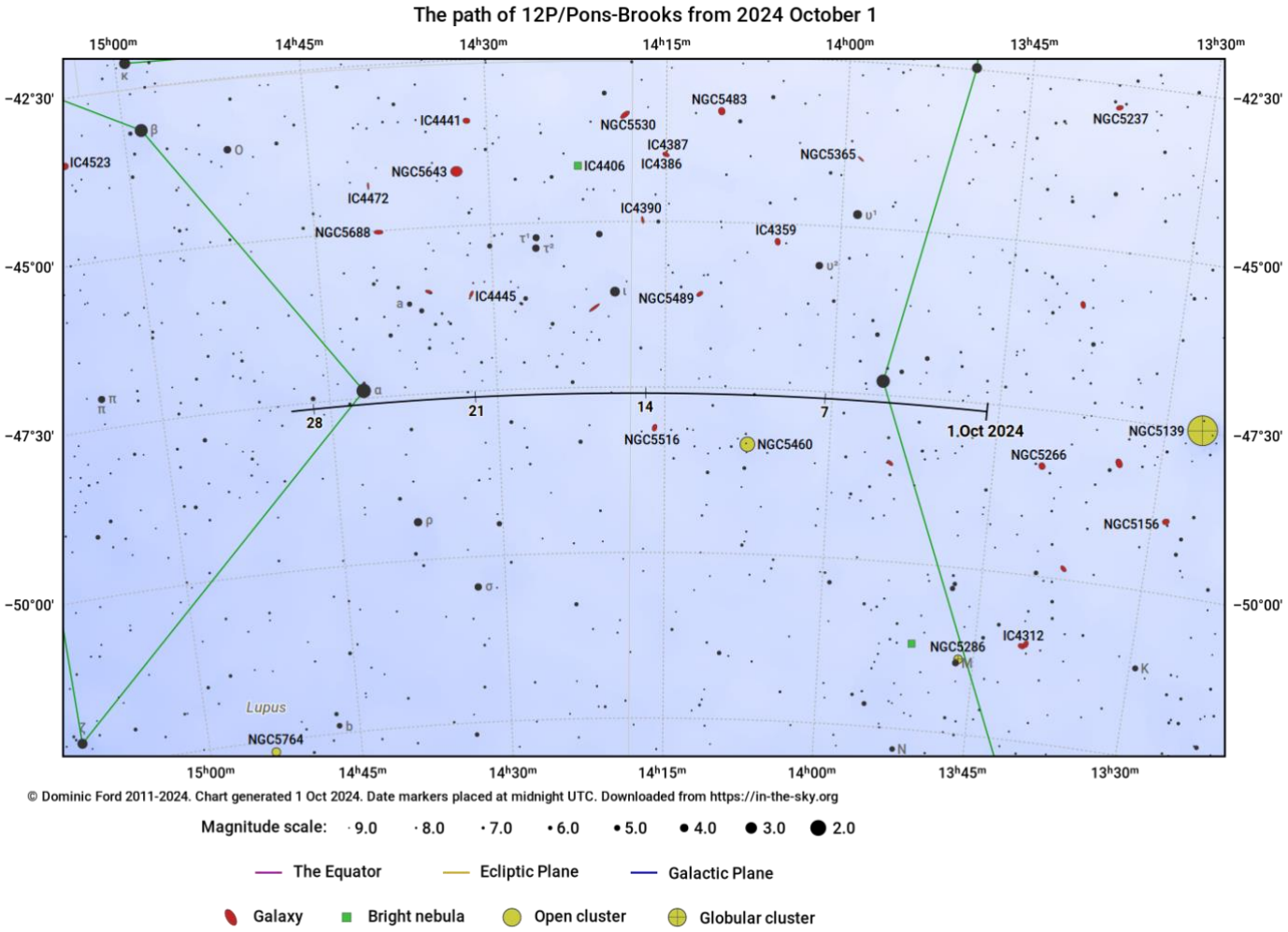


Figure 11 - Finder chart for 12P/Pons-Brooks in October 2024 from in-the-sky.org.