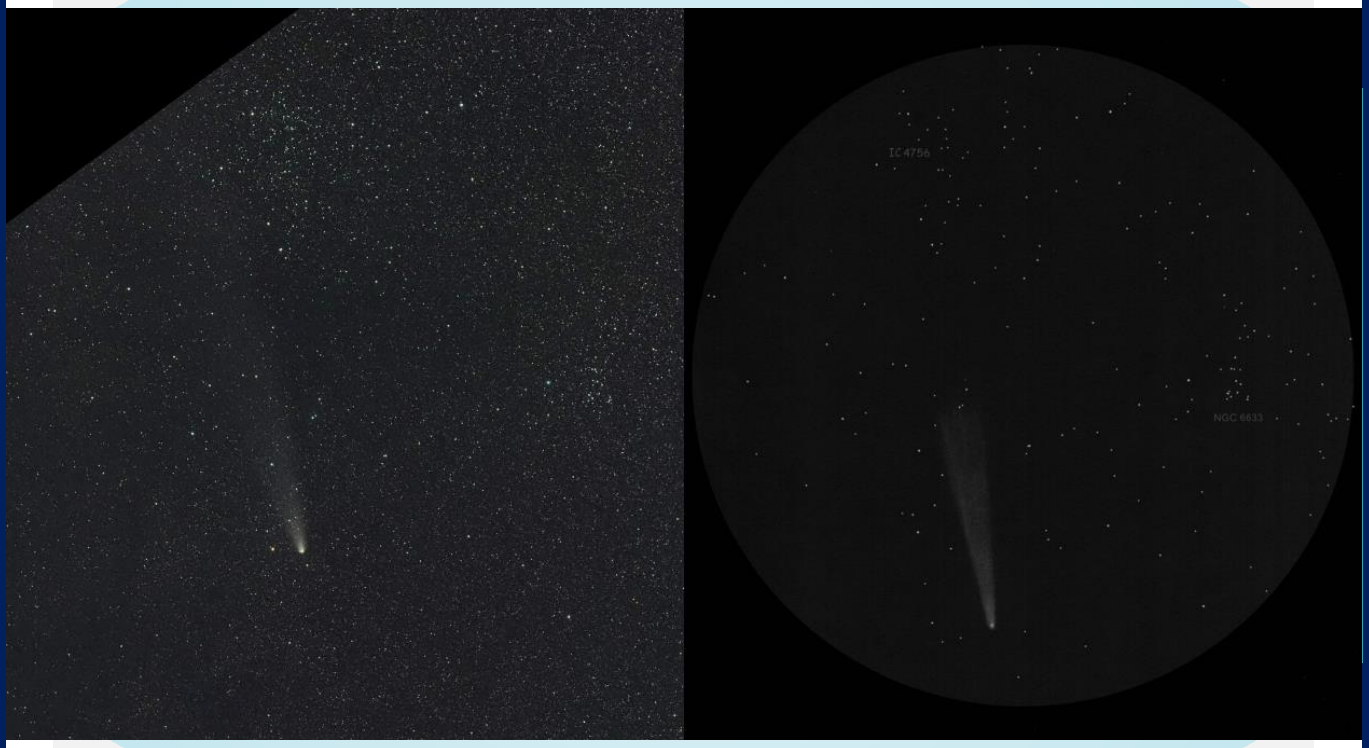
December 2024

ALPO Comet News

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

C/2023 A3 (Tsuchinshan-ATLAS)
Meets the Jewels of the Milky Way



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On the Front Cover:

As C/2023 A3 (Tsuchinshan-ATLAS) receded from the Sun and Earth in November, it held on to its impressive dust tail, which was easily visible to both visual and digital observers. This month's front cover images compare two different views of the comet taken only hours apart. On the right is a visual sketch by Christian Harder on 2024 November 7 at 20:30 UT with 10x50 binoculars from the island of La Palma. The image on the left was taken by Eliot Herman a few hours later early on November 8 UT with the iTelescopes T70 135mm f/3.5 Samyang lens and ZWO ASI2600MM camera.

Also sharing the field are two large, bright open star clusters NGC 6633 and IC 4756. NGC 6633 has a comet connection in that it was discovered in 1745-46 by Philippe Loys de Chéseaux, the discoverer of the Great Comet of 1744 (C/1743 X1) and C/1746 P1.

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/946351-alpo-comet-news-for-december-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

As C/2023 A3 (Tsuchinshan-ATLAS) fades from 9th to 11th magnitude in the evening sky, three other comets are expected to be brighter than magnitude 12 as 2024 comes to a close. Like Tsuchinshan-ATLAS, two are also limited to northern hemisphere observers, while the other is only for southern hemisphere observers.

333P/LINEAR is a short-period comet with an 8.7-year orbital period and should peak a little brighter than magnitude 10 as it races across the northern sky. The comet won't stay bright for long and will have faded to around magnitude 12 by the end of the month. The other northern comet, C/2022 E2 (ATLAS), will barely break the 12th magnitude barrier this month before also fading by the end of the month.

In the southern hemisphere, C/2024 G3 (ATLAS) should rapidly brighten from around magnitude 9th to 5th magnitude. Unfortunately, it will be a horizon hugger this month. ATLAS is still brightening at a pace that suggests it will become a negative magnitude object at perihelion in January, though it will be too close to the Sun to be seen by most observers at that time. By the time G3 climbs back into a dark sky, it will be much fainter, though possibly still a naked-eye object.

Last month, the ALPO Comets Section received 140 magnitude estimates and 216 images of 44 comets: C/2024 T5(ATLAS), C/2024 M1 (ATLAS), C/2024 G3 (ATLAS), C/2024 B1 (Lemmon), C/2023 X2 (Lemmon), C/2023 X2 (Lemmon), C/2023 TD22 (Lemmon), C/2023 R1 (PANSTARRS), C/2023 C2 (ATLAS), C/2023 A3 (Tsuchinshan-ATLAS), C/2022 QE78 (ATLAS), C/2022 N2 (PANSTARRS), C/2022 E2 (ATLAS), C/2020 V2 (ZTF), C/2020 K1 (PANSTARRS), C/2017 K2 (PANSTARRS), C/2014 UN271 (Bernardinelli-Bernstein), P/2024 O2 (PANSTARRS), P/2023 S1, 496P/Hill, 487P/Siding Spring, 472P/NEAT-LINEAR, 338P/McNaught, 333P/LINEAR, 328P/LONEOS-Tucker, 305P/Skiff, 276P/Vorobjov, 253P/PANSTARRS, 242P/Spahr, 208P/McMillian, 146P/Shoemaker-LINEAR, 130P/McNaught-Hughes, 117P/Helin-Roman-Alu, 95P/Chiron, 89P/Russell, 74P/Smirnova-Chernykh, 54P/de Vico-Swift-NEAT, 50P/Arend, 49P/Arend-Rigaux, 43P/Wolf-Harrington, 37P/Forbes, 33P/Daniel, 29P/Schwassmann-Wachmann, and 13P/Olbers.

A big thanks to our recent contributors: Dan Bartlett, Michel Besson, Manon Bouchard, Denis Buczynski, José J. Chambó, Michel Deconinck, Jose Guilherme de Souza Aguiar, Juan Jose Gonzalez Suarez, Christian Harder, Carl Hergenrother, Eliot Herman, Rik Hill, Michael Jäger, Patrice Lapointe, John Maikner, Gianluca Masi, Michael Mattiazzo, Frank J. Melillo, Martin Mobberley, Mike Olason, Andrew Pearce, Olivier Planchon, Ludovic Perbet, Nicolas Peyrus, Uwe Pilz, Michael Rosolina, Gregg Ruppel, Chris Schur, Clement Violette, and Christopher Wyatt.

Request for Observations

We welcome all comet observations, whether textual descriptions, images, drawings, magnitude estimates, or spectra. We'd love to hear from you! Please share your observations via email with the Comets Section Coordinator Carl Hergenrother and Assistant Coordinator Michel Deconinck at comets@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)

Dec 01 - New Moon
Dec 08 - First Quarter Moon
Dec 15 - Full Moon
Dec 22 - Last Quarter Moon
Dec 30 - New Moon

Comets at Perihelion

Dec 01 - C/2023 Q1 (PANSTARRS) [q = 2.58 au, V ~ 14-15]
Dec 06 - 2024 PN7 (PANSTARRS) [q = 1.52 au, 552-year period, V ~ 19-20, cometary activity has been reported, though the object is yet to be reclassified as a comet]
Dec 08 - P/2024 T2 (Rankin) [q = 1.97 au, 15.5-year period, V ~ 18, this is its only observed return]
Dec 10 - 276P/Vorobjov [q = 3.90 au, 12.4-year period, V ~ 16, discovered in 2012; there were also pre-discovery observations from a return in 2001, the comet was abnormally bright near aphelion in 2019-2020]
Dec 15 - P/2015 R2 (PANSTARRS) [q = 2.45 au, 9.5-year period, V ~ 21, discovered in 2015, this is its first return since discovery, no observations have been made yet this apparition]
Dec 18 - 268P/Bernardi (q = 2.41 au, 9.8-year period, V ~ 18-19, discovered in 2005, also seen in 2015, yet to be observed at this return]
Dec 20 - C/2024 Q4 (PANSTARRS) [q = 5.33 au, V ~ 19-20]
Dec 23 - 242P/Spahr [q = 3.97 au, 13.0-year period, V ~ 17, discovered in 1998, also seen in 2012, this is its 3rd observed return]
Dec 24 - 190P/Mueller [q = 2.02 au, 8.7-year period, V ~ 19, peaked at V ~ 17 at opposition earlier in year, discovered in 1998, also seen at returns in 2007 and 2016, 2024 is its 4th observed return, this comet is a very low activity object]
Dec 29 - 2017 MB1 [q = 0.59 au, 3.7-year period, V ~ 19-20, possible connection to alpha Capricornid meteor shower and comets 169P/NEAT, P/2003 T12 (SOHO), and P/2024 OC2 (PANSTARRS), cometary activity reported by Peter Birtwhistle in 2017]
Dec 30 - P/2023 JN16 (Lemmon) [q = 2.30 au, 4.4-year period, main belt comet, peaked at V ~ 19 in 2023, also observed in 2018 at V = 24]

Photo Opportunities

Dec 01 - C/2023 (Tsuchinshan-ATLAS) passes between 7th and 10th mag open clusters NGC 6755 & 6756
Dec 06 - C/2023 (Tsuchinshan-ATLAS) passes within 10' of open cluster NGC 6773
Dec 10/11 - C/2024 G3 (ATLAS) passes 2 deg from 5th mag open cluster NGC 6124
Dec 10/11 - C/2022 E2 (ATLAS) passes over the heavily dust-extincted galaxy IC 342
Dec 12/13 - C/2024 G3 (ATLAS) passes 40' from 9th mag globular cluster NGC 6139
Dec 24 - C/2023 (Tsuchinshan-ATLAS) passes within 5' of 12th mag planetary nebula NGC 6807

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 T5(ATLAS)												
2024T5	2024 11 11.53	C 18.8	AV	35.0T	5A	440	0.3				ICQ XX PEA	Andrew Pearce
2024T5	2024 11 10.59	C 18.6	AV	35.0T	5A	260	0.3				ICQ XX PEA	Andrew Pearce
2024T5	2024 11 09.56	C 18.4	AV	35.0T	5A	260	0.3				ICQ XX PEA	Andrew Pearce
C/2024 M1 (ATLAS)												
2024M1	2024 11 30.00	S 14.9	TI	53.1L		242		9			ICQ XX HAR11	Christian Harder
2024M1	2024 11 12.63	C 15.6	AV	35.0T	5A	080	0.4				ICQ XX PEA	Andrew Pearce
2024M1	2024 11 11.64	C 15.7	AV	35.0T	5A	080	0.4				ICQ XX PEA	Andrew Pearce
2024M1	2024 11 10.64	C 15.9	AV	35.0T	5A	080	0.4				ICQ XX PEA	Andrew Pearce
2024M1	2024 11 06.70	C 16.0	AV	35.0T	5A	080	0.4				ICQ XX PEA	Andrew Pearce
C/2024 G3 (ATLAS)												
2024G3	2024 11 28.35	C 10.0	AV	3.8A	4a	150	0.5				ICQ XX MAT08	Michael Mattiazzo
2024G3	2024 11 04.43	Z 11.8	U4	28.0D	2a	300	1	6	2	m170	ICQ XX MAT08	Michael Mattiazzo
2024G3	2024 11 01.43	Z 12.0	U4	28.0D	2a	300	0.7	6	1	m167	ICQ XX MAT08	Michael Mattiazzo
C/2023 TD22 (Lemmon)												
2023TD22	2024 11 03.51	C 16.9	AV	35.0T	5A	080	0.3				ICQ XX PEA	Andrew Pearce
C/2023 A3 (Tsuchinshan-ATLAS)												
2023A3	2024 11 29.71	S 8.8	TI	25.2L		56	1.7	4/	17	m 65	ICQ XX HAR11	Christian Harder
2023A3	2024 11 28.77	C 8.9	AV	10.6R	5a	180	4		0.6	76	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 27.77	C 8.9	AV	10.6R	5a	180	4		0.6	75	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 26.91	M 8.8	TK	10 B		25	1	5/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 26.77	C 8.8	AV	10.6R	5a	180	5		0.8	72	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 25.91	M 8.7	TK	10 B		25	2	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 25.80	B 8.1	TK	5.0B		10	2	7	0.4	70	ICQ XX GON05	Juan Jose Gonzalez Suarez
2023A3	2024 11 24.91	M 8.7	TK	10 B		25	2	5/			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 23.77	C 8.8	AV	10.6R	5a	180	5		0.7	72	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 22.78	S 8.6	TI	25.2L		56	2.1	4/	8	m 70	ICQ XX HAR11	Christian Harder
2023A3	2024 11 22.77	C 8.9	AV	10.6R	5a	180	5		1	74	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 21.77	C 8.6	AV	10.6R	5a	180	6		0.9	73	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 21.08	M 8.3	TK	12.5B		30	2	6/	4	m 70	ICQ XX HER02	Carl Hergenrother
2023A3	2024 11 21.08	M 8.2	TK	12.5B		30	2	6/	4m	55	ICQ XX HER02	Carl Hergenrother
2023A3	2024 11 18.92	M 8.5	TK	10 B		25	2	5			ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 18.77	C 8.6	AV	10.6R	5a	180	6		1.2	75	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 18.74	S 8.6	TI	25.2L		56	2.5		10	m 72	ICQ XX HAR11	Christian Harder
2023A3	2024 11 18.74	I 8.9	S	12.0B	5	25		5	5	m 70	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 17.74	I 8.8	S	12.0B	5	25		5	6	m 70	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 17.70	S 8.3	TK	12.0R	7	50		6			PIL01	Uwe Pilz
2023A3	2024 11 16.77	C 8.4	AV	10.6R	5a	300	6		1.1	76	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 11.91	M 8.1	TK	10 B		25	3	5/	0.5		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 11.74	E 9.0	S	25.0C	10	192	3	6	18	m 68	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 10.92	M 8.0	TK	10 B		25	3	6	0.5		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 11 10.80	C 8.6	AB	10.6R	5a	90	6		1.3	73	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 10.74	E 8.3	S	12.0B	5	25	3	5	22	m 75	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 07.75	I 7.3	S	7.0B		10		3	15	m 75	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 06.84	B 7.0	TK	5.0B		10	3	7	1.4	70	ICQ XX GON05	Juan Jose Gonzalez Suarez
2023A3	2024 11 06.77	C 8.3	AB	10.6R	5a	90	7		1.3	75	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 05.76	C 7.8	AV	10.6R	5a	90	6		1.1	74	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 05.12	M 6.8	TK	5.0B		10	5	4	0.2		ICQ XX HER02	Carl Hergenrother
2023A3	2024 11 04.76	I 7.0	S	7.0B		10		4	30	m 75	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 04.76	C 7.6	AV	10.6R	5a	90	6		1.3	75	ICQ XX PEA	Andrew Pearce
2023A3	2024 11 03.81	B 6.9	TK	5.0B		10	3	7	1.8	80	ICQ XX GON05	Juan Jose Gonzalez Suarez
2023A3	2024 11 03.74	I 6.8	S	7.0B		10			45	m 75	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 03.72	S 5.5	TK	2.5B	4	8	4	6/	0.3	51	PIL01	Uwe Pilz
2023A3	2024 11 02.74	E 6.7	S	7.0B		10		4/	1	75	ICQ XX DEC	Michel Deconinck
2023A3	2024 11 01.74	I 6.7	S	7.0B		10		5	1.5	75	ICQ XX DEC	Michel Deconinck
2023A3	2024 10 31.91	M 6.2	TK	10 B		25	3	5	1.4		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 10 30.91	M 6.2	TK	10 B		25	3	5/	1.5		ICQ XX DES01	Jose Guilherme de Souza Aguiar
2023A3	2024 10 29.91	M 6.1	TK	10 B		25	3	6	1.5		ICQ XX DES01	Jose Guilherme de Souza Aguiar
C/2022 QE78 (ATLAS)												
2022QE78	2024 11 22.81	C 15.6	AV	35.0T	5a	360	0.5				ICQ XX PEA	Andrew Pearce
2022QE78	2024 11 12.67	C 15.8	AV	35.0T	5A	080	0.5				ICQ XX PEA	Andrew Pearce
2022QE78	2024 11 09.75	C 15.9	AV	35.0T	5A	080	0.4				ICQ XX PEA	Andrew Pearce
2022QE78	2024 11 06.74	C 15.8	AV	35.0T	5A	080	0.5				ICQ XX PEA	Andrew Pearce
C/2022 N2 (PANSTARRS)												
2022N2	2024 11 22.53	C 16.0	AV	35.0T	5a	480	0.6				ICQ XX PEA	Andrew Pearce
2022N2	2024 11 17.52	C 15.2	AV	35.0T	5a	480	0.8				ICQ XX PEA	Andrew Pearce
2022N2	2024 11 08.58	C 15.3	AV	35.0T	5a	360	1		2.1m	240	ICQ XX PEA	Andrew Pearce

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   2022N2  2024 11 06.90  S 13.8 AQ 20.3T10 133   0.4  5           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022N2  2024 11 06.53  C 15.3 AV 35.0T 5a360   0.8       1.3m244 ICQ XX PEA   Andrew Pearce
   2022N2  2024 11 03.85  S 13.7 AQ 20.3T10 166   0.4  5           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022N2  2024 11 03.54  C 15.3 AV 35.0T 5a360   0.9       1.4m238 ICQ XX PEA   Andrew Pearce
C/2022 E2 (ATLAS)
   2022E2  2024 11 29.86  S 12.8 TI 53.1L   162   1.2  3           ICQ XX HAR11 Christian Harder
   2022E2  2024 11 28.04  S 11.8 AQ 20.3T10  77   1.5  4           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022E2  2024 11 26.90  S 12.6 TI 25.2L   145   1    3           ICQ XX HAR11 Christian Harder
   2022E2  2024 11 22.78  S 12.2 TI 25.2L   145   1    3           ICQ XX HAR11 Christian Harder
   2022E2  2024 11 06.80  S 11.7 AQ 20.3T10 133   1.3  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022E2  2024 11 03.96  S 11.7 AQ 20.3T10 133   1.3  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
C/2020 V2 (ZTF)
   2020V2  2024 11 22.57  C 15.6 AV 35.0T 5a480   0.7              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 17.53  C 15.3 AV 35.0T 5a480   0.8              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 11.52  C 15.2 AV 35.0T 5a360   0.8              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 10.58  C 15.3 AV 35.0T 5a360   0.6              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 09.52  C 15.2 AV 35.0T 5a360   0.8              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 08.57  C 15.2 AV 35.0T 5a360   0.8              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 06.60  C 14.8 AV 35.0T 5a360   0.4              ICQ XX PEA   Andrew Pearce
   2020V2  2024 11 03.58  C 15.3 AV 35.0T 5a360   0.8              ICQ XX PEA   Andrew Pearce
C/2020 K1 (PANSTARRS)
   2020K1  2024 11 10.63  C 16.9 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
   2020K1  2024 11 09.78  C 16.4 AV 35.0T 5A080   0.6              ICQ XX PEA   Andrew Pearce
   2020K1  2024 11 06.69  C 16.8 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
C/2017 K2 (PANSTARRS)
   2017K2  2024 11 10.70  C 15.4 AV 35.0T 5A080   0.7              ICQ XX PEA   Andrew Pearce
   2017K2  2024 11 09.72  C 15.4 AV 35.0T 5A080   0.7              ICQ XX PEA   Andrew Pearce
   2017K2  2024 11 06.71  C 15.9 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
C/2014 UN271 (Bernardinelli-Bernstein)
   2014UNR12024 11 22.75  C 16.8 AV 35.0T 5A080   0.6              ICQ XX PEA   Andrew Pearce
   2014UNR12024 11 17.62  C 16.5 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
   2014UNR12024 11 11.56  C 16.5 AV 35.0T 5A080   0.6              ICQ XX PEA   Andrew Pearce
   2014UNR12024 11 10.62  C 16.3 AV 35.0T 5A080   0.6              ICQ XX PEA   Andrew Pearce
   2014UNR12024 11 09.82  C 16.1 AV 35.0T 5a360   0.7              ICQ XX PEA   Andrew Pearce
487P/Siding Spring
487        2024 11 29.80  S 14.6 TI 53.1L   242   0.3  3/          ICQ XX HAR11 Christian Harder
472P/NEAT-LINEAR
472        2024 11 10.70  C 16.0 AV 35.0T 5A260   0.5              ICQ XX PEA   Andrew Pearce
472        2024 11 06.73  C 15.9 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
333P/LINEAR
333        2024 11 30.08  S 11.1 TI 25.2L    78   2.4  3           ICQ XX HAR11 Christian Harder
333        2024 11 30.02  S 12.4:TI 53.1L   139   1.8  3           ICQ XX HAR11 Christian Harder
333        2024 11 28.23  I 12.0 S  25.0C10 250         3           ICQ XX DEC   Michel Deconinck
333        2024 11 28.16  S 10.9 TK 20.3T10  77   2.2  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
333        2024 11 12.29  M 13.1 AQ  30 L 5 100   1    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
333        2024 11 11.29  M 13.3 AQ  30 L 5 100   1    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
333        2024 11 04.18  S 12.2 AQ 20.3T10 133   2    2/          ICQ XX GON05 Juan Jose Gonzalez Suarez
305P/Skiff
305        2024 11 06.52  C 18.0 AV 35.0T 5A080   0.3              ICQ XX PEA   Andrew Pearce
305        2024 11 03.53  C 18.0 AV 35.0T 5A080   0.3       0.4m 82 ICQ XX PEA   Andrew Pearce
276P/Vorobjov
276        2024 11 11.58  C 17.1 AV 35.0T 5A080   0.4       0.9m274 ICQ XX PEA   Andrew Pearce
276        2024 11 10.56  C 17.2 AV 35.0T 5A080   0.4       0.4m264 ICQ XX PEA   Andrew Pearce
276        2024 11 06.64  C 17.6 AV 35.0T 5A080   0.3               ICQ XX PEA   Andrew Pearce
276        2024 11 03.63  C 17.0 AV 35.0T 5a720   0.4       0.5m263 ICQ XX PEA   Andrew Pearce
253P/PANSTARRS
253        2024 11 22.66  C 17.4 AV 35.0T 5A260   0.5              ICQ XX PEA   Andrew Pearce
253        2024 11 17.58  C 16.9 AV 35.0T 5A260   0.4              ICQ XX PEA   Andrew Pearce
253        2024 11 10.59  C 17.0 AV 35.0T 5A260   0.5              ICQ XX PEA   Andrew Pearce
253        2024 11 08.71  C 17.2 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
253        2024 11 06.61  C 16.8 AV 35.0T 5A080   0.4              ICQ XX PEA   Andrew Pearce
253        2024 11 03.59  C 17.1 AV 35.0T 5A080   0.5              ICQ XX PEA   Andrew Pearce
242P/Spahr
242        2024 11 09.76  C 17.1 AV 35.0T 5A080   0.4       0.2m285 ICQ XX PEA   Andrew Pearce
242        2024 11 06.65  C 17.9 AV 35.0T 5A080   0.5               ICQ XX PEA   Andrew Pearce
208P/McMillian
208        2024 11 08.62  C 18.1 AV 35.0T 5a900   0.5              ICQ XX PEA   Andrew Pearce
208        2024 11 06.55  C 18.9 AV 35.0T 5A080   0.4              ICQ XX PEA   Andrew Pearce
208        2024 11 03.56  C 18.9 AV 35.0T 5A080   0.4              ICQ XX PEA   Andrew Pearce
130P/McNaught-Hughes
130        2024 11 22.69  C 15.9 AV 35.0T 5A260   0.7              ICQ XX PEA   Andrew Pearce
130        2024 11 11.56  C 15.5 AV 35.0T 5A080   1        3.7m247 ICQ XX PEA   Andrew Pearce
130        2024 11 10.55  C 15.8 AV 35.0T 5A080   0.8      4.2m248 ICQ XX PEA   Andrew Pearce
130        2024 11 09.60  C 15.7 AV 35.0T 5a720   1        5.2m248 ICQ XX PEA   Andrew Pearce
130        2024 11 06.65  C 15.8 AV 35.0T 5a900   0.8      3.2m250 ICQ XX PEA   Andrew Pearce
130        2024 11 03.62  C 15.7 AV 35.0T 5a900   0.8      4  m251 ICQ XX PEA   Andrew Pearce
```

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89P/Russell
 89        2024 11 06.54  C 18.2 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
 89        2024 11 05.98  C 18.7 BG 30.5H 4C600                     ICQ XX MAI01 John Maikner
 89        2024 11 03.55  C 18.1 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
49P/Arend-Rigaux
 49        2024 11 17.56  C 17.2 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
 49        2024 11 06.58  C 17.6 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
 49        2024 11 03.57  C 17.6 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
43P/Wolf-Harrington
 43        2024 11 11.55  C 16.2 AV 35.0T 5A080   0.6               ICQ XX PEA   Andrew Pearce
 43        2024 11 10.54  C 16.4 AV 35.0T 5A080   0.4               ICQ XX PEA   Andrew Pearce
 43        2024 11 09.59  C 16.2 AV 35.0T 5a900   0.7       0.4m262 ICQ XX PEA   Andrew Pearce
 43        2024 11 06.62  C 16.2 AV 35.0T 5a900   0.7               ICQ XX PEA   Andrew Pearce
37P/Forbes
 37        2024 11 28.77  C 13.8 AV 10.6R 5a180   1.1               ICQ XX PEA   Andrew Pearce
 37        2024 11 27.77  C 13.6 AV 10.6R 5a360   0.9               ICQ XX PEA   Andrew Pearce
 37        2024 11 24.92  M 13.6 AQ  30 L 5 121   0.5  6            ICQ XX DES01 Jose Guilherme de Souza Aguiar
29P/Schwassmann-Wachmann
 29        2024 11 30.09  S 11.4 TI 25.2L    78   1.8  3            ICQ XX HAR11 Christian Harder
 29        2024 11 30.01  S 12.2:TI 53.1L   113   1.2  3            ICQ XX HAR11 Christian Harder
 29        2024 11 28.11  S 11.6 AQ 20.3T10 100   2    4/           ICQ XX GON05 Juan Jose Gonzalez Suarez
 29        2024 11 07.12  S 11.9 AQ 20.3T10 166   0.6  7            ICQ XX GON05 Juan Jose Gonzalez Suarez
 29        2024 11 04.14  I 12.3 AQ 20.3T10 133        9            ICQ XX GON05 Juan Jose Gonzalez Suarez
P/2024 O2 (PANSTARRS)
  P2024O2  2024 11 06.02  C 19.6 BG 30.5H 4B520                     ICQ XX MAI01 John Maikner
```

Comets News

Looking Ahead to the Year or So of Comets

The chart below shows those comets expected to become brighter than magnitude 10 over the next 12 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/2024 G3 (ATLAS) when the comet will only be above the horizon in bright twilight but may still be bright enough to be observed.

All brightness predictions are just that—predictions and may be off by many magnitudes.

Northern Hemisphere	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
C/2023 A3 (Tsuchinshan-ATLAS)	9																																			
333P/LINEAR	9																																			
C/2024 G3 (ATLAS)																																				
Southern Hemisphere																																				
C/2023 A3 (Tsuchinshan-ATLAS)	9																																			
333P/LINEAR	9																																			
C/2024 G3 (ATLAS)	9	8	6	4	0	5	7	8	9																											

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

Last 10 Periodic Comet Numberings (from WGSBN Bull. 4, #16)

```
493P/2005 SB216 = P/2004 Q2 (LONEOS)
492P/2010 WK    = P/2010 PB57 = P/2024 O3 (LINEAR)
491P/2014 MG4   = P/2024 K2 (Spacewatch-PANSTARRS)
490P/2019 M2    = P/2024 C6 (ATLAS)
489P/1894 F1    = P/2007 HE4 (Denning)
488P/2024 N6    = P/2002 QU151 (NEAT-PANSTARRS)
487P/2012 US27  = P/2024 N5 (Siding Spring)
486P/2018 L5    = P/2024 H1 (Leonard)
485P/2022 U6    = P/2006 AH2 (Sheppard-Tholen)
484P/2005 XR132 (Spacewatch)
```

New Recoveries & Discoveries

C/2024 V2 (Sarneczky) – Krisztian Sarneczky of the Konkoly Observatory in Hungary discovered C/2024 V2 on 2024 November 10 at 19th magnitude with a 0.60-m Schmidt telescope at the Piszkesteto Observatory, which is also in Hungary. This is the 4th comet to be named after Sarneczky. His other discoveries have been found over the past few years, with two found earlier this year: C/2022 A1 (Sarneczky), C/2024 N3 (Sarneczky), and C/2024 N4 (Sarneczky).

C/2024 V2 is an intrinsically faint long-period comet with a perihelion on 2024 November 4 at 1.25 au and closest approach to Earth on November 25 at 0.97 au. The comet has likely already peaked in brightness at 19th magnitude and should fade this month. [CBET 5475, MPEC 2024-W9)

C/2024 V1 (Borisov) – Gennadii Vladimirovich Borisov of the MARGO observatory near Nauchnij, Crimea, found a 19th magnitude long-period comet on 2024 November 8 with a 0.50-m f/1.9 astrograph. C/2024 V1 arrives at perihelion on 2025 April 2 at 2.35 au. It should peak at 17th magnitude in late February and early March between opposition (and closest approach to Earth on February 16 at 1.58 au) and perihelion. This is Borisov's 13th discovery, all since 2013. [CBET 5474, MPEC 2024-V184]

P/2024 OC2 (PANSTARRS) – The Pan-STARRS survey found this comet as an asteroid at 22nd magnitude on 2024 July 28. Follow-up observations by David Tholen from November 6 found 2024 OC2 to possess a 1' tail. It was also found to show a tail in images taken by the STEREO-A spacecraft a month earlier. Perihelion was on 2024 October 9 at 0.59 au. Since the object is probably only active when close to the Sun, it will likely be inactive in December and fainter than 20th magnitude. With an orbital period of 4.3-years, it will return to perihelion in January 2029. [CBET 5473, MPEC 2024-V174]

P/2024 OC2 appears to be another member of a complex of related objects that also includes comets 169P/NEAT and P/2003 T12 (SOHO), asteroid 2017 MB1(which is also at perihelion this month), and the alpha Capricornids meteor shower.

C/2024 T5 (ATLAS) – The newest Comet ATLAS is similar to this month's 12th magnitude Comet ATLAS (C/2022 E2) in that it was discovered around 8 au from the Sun (8.43 au to be exact) but has a perihelion around 3 au (3.85 au on 2027 March 7). The comet was discovered on 2024 October 2 at 19th magnitude with an ATLAS 0.5-m f/2 Schmidt reflector at Sutherland, South Africa. It should peak at 13th magnitude in early 2027. [CBET 5472, MPEC 2024-V97]

C/2024 U1 (PANSTARRS) – On 2024 October 30, the Pan-STARRS survey found a new 20th magnitude long-period comet with the Pan-STARRS1 1.8-m Ritchey-Chretien reflector at Haleakala, Hawaii. At discovery, C/2024 U1 was 4 months past its 2024 June 30 perihelion at 4.84 au. Though it appears that this comet is brighter after perihelion than before, based on a number of pre-discovery observations going back to November 23, it is likely as bright as it will get. [CBET 5471, MPEC 2024-V81]

Comets Brighter Than Magnitude 6

C/2024 G3 (ATLAS)

Discovered visually on 1812 July 12 by Jean-Louis Pons and rediscovered visually on 1883 September 2 by William R. Brooks
Dynamically old long-period comet

Orbit (from Minor Planet Center, MPEC 2024-U268)

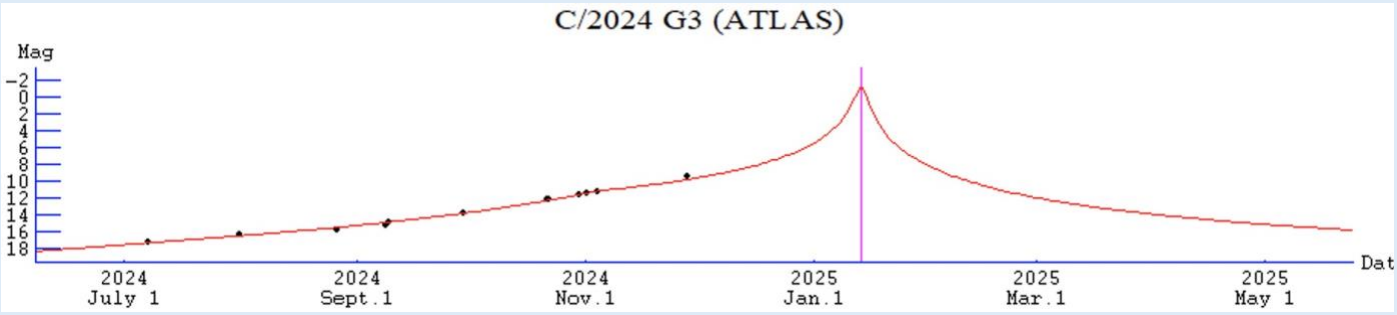
```
    C/2024 G3 (ATLAS)
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2025 Jan. 13.42898 TT                                  Rudenko
q   0.0935252           (2000.0)            P               Q
z  -0.0000952      Peri.  108.12535     -0.04069055     +0.81534820
 +/-0.0000034      Node   220.33878     +0.14761168     +0.57658088
e   1.0000089      Incl.  116.84643     +0.98820801     -0.05255281
From 271 observations 2024 Apr. 5-Oct. 28, mean residual 0".4.
1/a(orig) = +0.000337 AU**-1, 1/a(fut) = +0.000164 AU**-1.
```

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

```
C/2024 G3 (ATLAS)                                                    Max El
                                                                      (deg)
                                                                  Astro Twi Nau Twi
    Date      R.A.    Decl.     r       d     Elong  Const  Mag  40N  40S   40S
2024-Dec-01  15 54  -40 46   1.273   2.150    20M   Lup    9.6    0    2     7
2024-Dec-06  16 06  -39 54   1.167   2.045    19M   Lup    9.2    0    2     7
2024-Dec-11  16 19  -38 51   1.056   1.932    19M   Sco    8.7    0    1     7
2024-Dec-16  16 34  -37 35   0.941   1.811    19M   Sco    8.2    0    1     7
2024-Dec-21  16 50  -35 59   0.818   1.680    19M   Sco    7.5    0    0     7
2024-Dec-26  17 08  -33 54   0.687   1.540    18M   Sco    6.7    0    0     6
2024-Dec-31  17 29  -31 04   0.544   1.389    17M   Sco    5.7    0    0     4
2025-Jan-05  17 57  -26 58   0.384   1.226    15M   Sgr    4.2    0    0     1
```

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

```
m1 =  4.2 + 5 log d + 19.5 log r [until T-70 days]
m1 =  7.8 + 5 log d +  8.0 log r [between T-70 days and perihelion, assumed]
m1 =  9.2 + 5 log d + 10.0 log r [after perihelion, assumed]
where "t" is date of perihelion, "d" is Comet-Earth distance in au, and "r" is Comet-Sun distance in au
```



Recent Magnitude Measurements Contributed to the ALPO Comets Section

```
Recent Magnitude Measurements in ICQ format:
Comet Des  YYYY MM DD.DD     Mag SC APER FL POW    COMA     TAIL    ICQ CODE Observer Name
              (UT)                    T         Dia  DC  LENG  PA
   2024G3  2024 11 28.35  C 10.0 AV  3.8A 4a150   0.5                ICQ XX MAT08 Michael Mattiazzo
   2024G3  2024 11 04.43  Z 11.8 U4 28.0D 2a300   1    6    2  m170 ICQ XX MAT08 Michael Mattiazzo
   2024G3  2024 11 01.43  Z 12.0 U4 28.0D 2a300   0.7  6    1  m167 ICQ XX MAT08 Michael Mattiazzo
```

C/2024 G3 (ATLAS) was discovered on 2024 April 5 by the "Asteroid Terrestrial-Impact Last Alert System" (ATLAS) search program with their 0.5-m f/2 Schmidt reflector stationed at Rio Hurtado, Chile. The comet was 4.6 au from the Sun at discovery and 18th magnitude. ATLAS could become a negative magnitude object at perihelion on 2025 January 13 at a small distance of 0.09 au from the Sun. Unfortunately, it will also be located close to the Sun on the sky when bright, and like Tsuchinshan-ATLAS, it won't be easily observable until it is much fainter. And from the northern hemisphere, it may not be visible at all.

Though currently visible from the southern hemisphere, it is a difficult object hugging the eastern morning horizon. As a result, there were only three magnitude estimates made for C/2024 G3 (ATLAS) last month, and all were made by Michael Mattiazzo. He measured the comet to have brightened from magnitude 12.0 on November 1 to 10.0 on the 28th. In his images, the comet possessed a small moderately condensed sub-1' coma and short 1-2' tail.

Observations made between July and early November found the comet brightening at a rapid 19.5 log r rate. However, Michael Mattiazzo's most recent observation from November 28 and a Terry Lovejoy submission to COBS from December 1 (V = 9.8) suggest a slowdown in the brightening rate. At the risk of reading too much into only two measurements, the prediction above assumes a slower 8 log r rate until perihelion.

As mentioned above, C/2024 G3 will not be visible from the northern hemisphere. Even from the southern hemisphere, it will be a very low object in the morning sky as its solar elongation starts the month at a small 20 degrees and falls to 16 degrees by New Year's. As a result, the comet will only be at an elevation of 1-2 degrees before the start of astronomical twilight until mid-month, when it won't rise until twilight has started. If the 8 log r trend is correct, the comet should start the month around magnitude 9.6, brightening to 8.2 by mid-month and ending the month at 5.4.

<u>Photo Opportunities</u>
Dec 10/11 - C/2024 G3 (ATLAS) passes 2 deg from 5th mag open cluster NGC 6124
Dec 12/13 - C/2024 G3 (ATLAS) passes 40' from 9th mag globular cluster NGC 6139

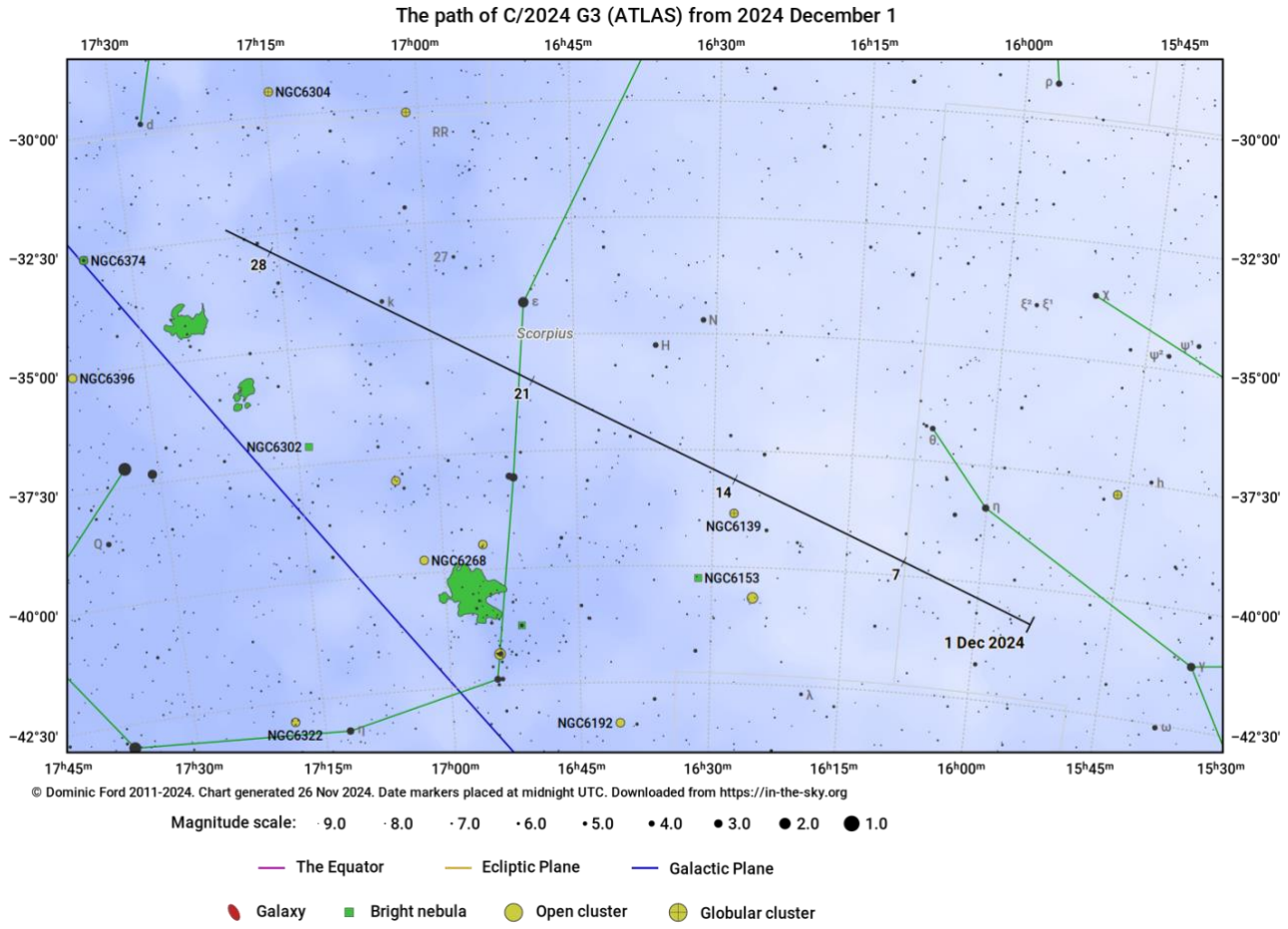


Figure 2 - Finder chart for C/2024 G3 (ATLAS) in December 2024 from in-the-sky.org.

Comets Between Magnitude 6 and 10

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-V192)

```
    C/2023 A3 (Tsuchinshan-ATLAS)
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Sept. 27.74203 TT                                  Rudenko
q   0.3914332           (2000.0)            P                Q
z  -0.0002588      Peri.  308.49169     +0.36142734     +0.90083841
 +/-0.0000002      Node    21.55932     +0.91853458     -0.29967476
e   1.0001013      Incl.  139.11071     -0.16020145     +0.31414200
From 7020 observations 2022 Apr. 9-2024 Nov. 14, mean residual 0".6.
1/a(orig) = -0.000251 AU**-1, 1/a(fut) = -0.000223 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-Dec-01  19 08  +04 29   1.472   1.958    46E   Aql   9.5   29    0
2024-Dec-06  19 14  +04 41   1.557   2.101    44E   Aql   9.8   27    0
2024-Dec-11  19 20  +04 56   1.641   2.238    41E   Aql  10.0   25    0
2024-Dec-16  19 26  +05 13   1.723   2.367    39E   Aql  10.3   22    0
2024-Dec-21  19 31  +05 31   1.804   2.490    36E   Aql  10.5   19    0
2024-Dec-26  19 36  +05 52   1.883   2.606    34E   Aql  10.8   16    0
2024-Dec-31  19 41  +06 15   1.962   2.715    32E   Aql  11.0   13    0
2025-Jan-05  19 45  +06 40   2.039   2.817    31E   Aql  11.2    9    0
```

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 =   6.4 + 5 log d +  8.4 log r + dust phase_function [After perihelion]
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 11 29.71  S  8.8 TI 25.2L    56   1.7  4/  17  m 65 ICQ XX HAR11 Christian Harder
   2023A3  2024 11 28.77  C  8.9 AV 10.6R 5a180   4        0.6   76 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 27.77  C  8.9 AV 10.6R 5a180   4        0.6   75 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 26.91  M  8.8 TK  10 B    25   1    5/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 26.77  C  8.8 AV 10.6R 5a180   5        0.8   72 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 25.91  M  8.7 TK  10 B    25   2    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 25.80  B  8.1 TK  5.0B    10   2    7   0.4   70 ICQ XX GON05 Juan Jose Gonzalez Suarez
   2023A3  2024 11 24.91  M  8.7 TK  10 B    25   2    5/           ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 23.77  C  8.8 AV 10.6R 5a180   5        0.7   72 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 22.78  S  8.6 TI 25.2L    56   2.1  4/   8  m 70 ICQ XX HAR11 Christian Harder
   2023A3  2024 11 22.77  C  8.9 AV 10.6R 5a180   5        1     74 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 21.77  C  8.6 AV 10.6R 5a180   6        0.9   73 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 21.08  M  8.3 TK 12.5B    30   2    6/   4  m 70 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 11 21.08  M  8.2 TK 12.5B    30   2    6/     4m 55 ICQ XX HER02 Carl Hergenrother
   2023A3  2024 11 18.92  M  8.5 TK  10 B    25   2    5            ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 18.77  C  8.6 AV 10.6R 5a180   6        1.2   75 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 18.74  S  8.6 TI 25.2L    56   2.5       10 m 72 ICQ XX HAR11 Christian Harder
   2023A3  2024 11 18.74  I  8.9 S  12.0B 5  25        5    5  m 70 ICQ XX DEC   Michel Deconinck
   2023A3  2024 11 17.74  I  8.8 S  12.0B 5  25        5    6  m 70 ICQ XX DEC   Michel Deconinck
   2023A3  2024 11 17.70  S  8.3 TK 12.0R 7  50        6                 PIL01 Uwe Pilz
   2023A3  2024 11 16.77  C  8.4 AV 10.6R 5a300   6        1.1   76 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 11.91  M  8.1 TK  10 B    25   3    5/  0.5       ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 11.74  E  9.0 S  25.0C10 192   3    6   18  m 68 ICQ XX DEC   Michel Deconinck
   2023A3  2024 11 10.92  M  8.0 TK  10 B    25   3    6   0.5       ICQ XX DES01 Jose Guilherme de Souza Aguiar
   2023A3  2024 11 10.80  C  8.6 AB 10.6R 5a 90   6        1.3   73 ICQ XX PEA   Andrew Pearce
   2023A3  2024 11 10.74  E  8.3 S  12.0B 5  25   3    5   22  m 75 ICQ XX DEC   Michel Deconinck
   2023A3  2024 11 07.75  I  7.3 S   7.0B    10        3   15  m 75 ICQ XX DEC   Michel Deconinck
```

2023A3	2024	11	06.84	B	7.0	TK	5.0B		10	3	7	1.4		70	ICQ	XX	GON05 Juan Jose Gonzalez Suarez
2023A3	2024	11	06.77	C	8.3	AB	10.6R	5a	90	7		1.3		75	ICQ	XX	PEA Andrew Pearce
2023A3	2024	11	05.76	C	7.8	AV	10.6R	5a	90	6		1.1		74	ICQ	XX	PEA Andrew Pearce
2023A3	2024	11	05.12	M	6.8	TK	5.0B		10	5	4	0.2			ICQ	XX	HER02 Carl Hergenrother
2023A3	2024	11	04.76	I	7.0	S	7.0B		10		4	30	m	75	ICQ	XX	DEC Michel Deconinck
2023A3	2024	11	04.76	C	7.6	AV	10.6R	5a	90	6		1.3		75	ICQ	XX	PEA Andrew Pearce
2023A3	2024	11	03.81	B	6.9	TK	5.0B		10	3	7	1.8		80	ICQ	XX	GON05 Juan Jose Gonzalez Suarez
2023A3	2024	11	03.74	I	6.8	S	7.0B		10			45	m	75	ICQ	XX	DEC Michel Deconinck
2023A3	2024	11	03.72	S	5.5	TK	2.5B	4	8	4	6/	0.3		51			PIL01 Uwe Pilz
2023A3	2024	11	02.74	E	6.7	S	7.0B		10		4/	1		75	ICQ	XX	DEC Michel Deconinck
2023A3	2024	11	01.74	I	6.7	S	7.0B		10		5	1.5		75	ICQ	XX	DEC Michel Deconinck
2023A3	2024	10	31.91	M	6.2	TK	10	B	25	3	5	1.4			ICQ	XX	DES01 Jose Guilherme de Souza Aguiar
2023A3	2024	10	30.91	M	6.2	TK	10	B	25	3	5/	1.5			ICQ	XX	DES01 Jose Guilherme de Souza Aguiar
2023A3	2024	10	29.91	M	6.1	TK	10	B	25	3	6	1.5			ICQ	XX	DES01 Jose Guilherme de Souza Aguiar

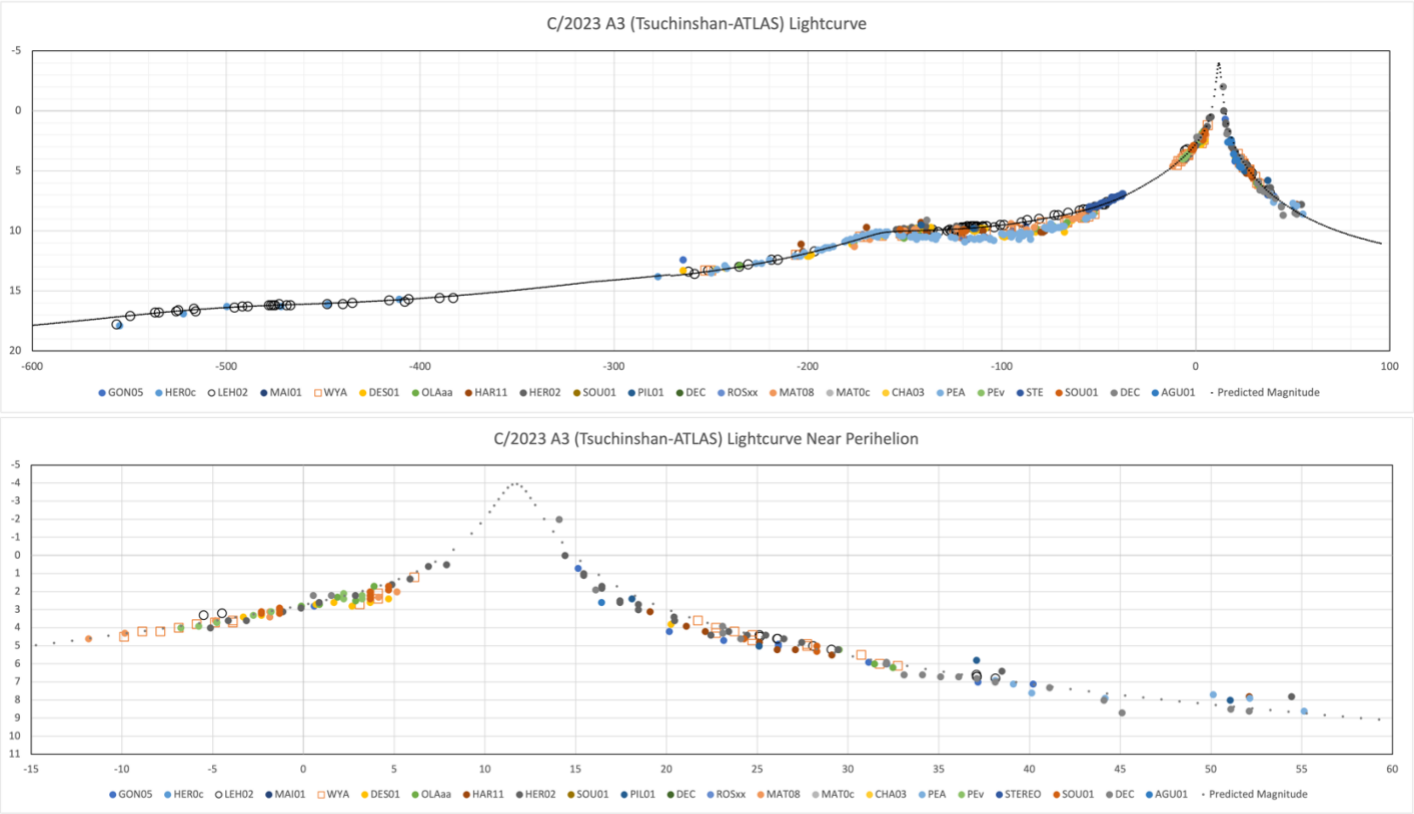


Figure 3 - Lightcurves of C/2023 A3 from data submitted to the ALPO Comets Section and photometry from Thomas Lehmann & the STEREO spacecraft.

It has been two months since C/2023 A3 (Tsuchinshan-ATLAS) was at perihelion and about a month and a half since it graced the sky as a bright naked-eye object. Now, as the comet retreats into the expanses of the outer solar system, it has dimmed considerably, starting December at a modest 9th magnitude. By month's end, further fading is expected, with the comet slipping to around 11th magnitude as its heliocentric and geocentric distances increase from 1.47 to 1.98 AU and 1.96 to 2.74 AU, respectively.

Despite its diminishing brightness, C/2023 A3 remains a rewarding target for both visual and photographic observers. Recent images reveal a striking bifurcated dust tail, while visual reports describe a faint, yet discernible tail stretching between 10 and 20 arcminutes.

Throughout December, northern hemisphere observers can follow the comet in the evening skies as it traverses the constellation of Aquila. However, its visibility will gradually worsen as it sinks lower toward the horizon night by night. Fortunately, Aquila's wealth of deep-sky wonders provides several intriguing conjunction opportunities as Tsuchinshan-ATLAS glides past a few notable open clusters and planetary nebulae.

<u>Photo Opportunities</u>

Dec 01 - C/2023 (Tsuchinshan-ATLAS) passes between 7th & 10th mag open clusters NGC 6755 & 6756

Dec 06 - C/2023 (Tsuchinshan-ATLAS) passes within 10’ of open cluster NGC 6773
Dec 24 - C/2023 (Tsuchinshan-ATLAS) passes within 5’ of 12th mag planetary nebula NGC 6807

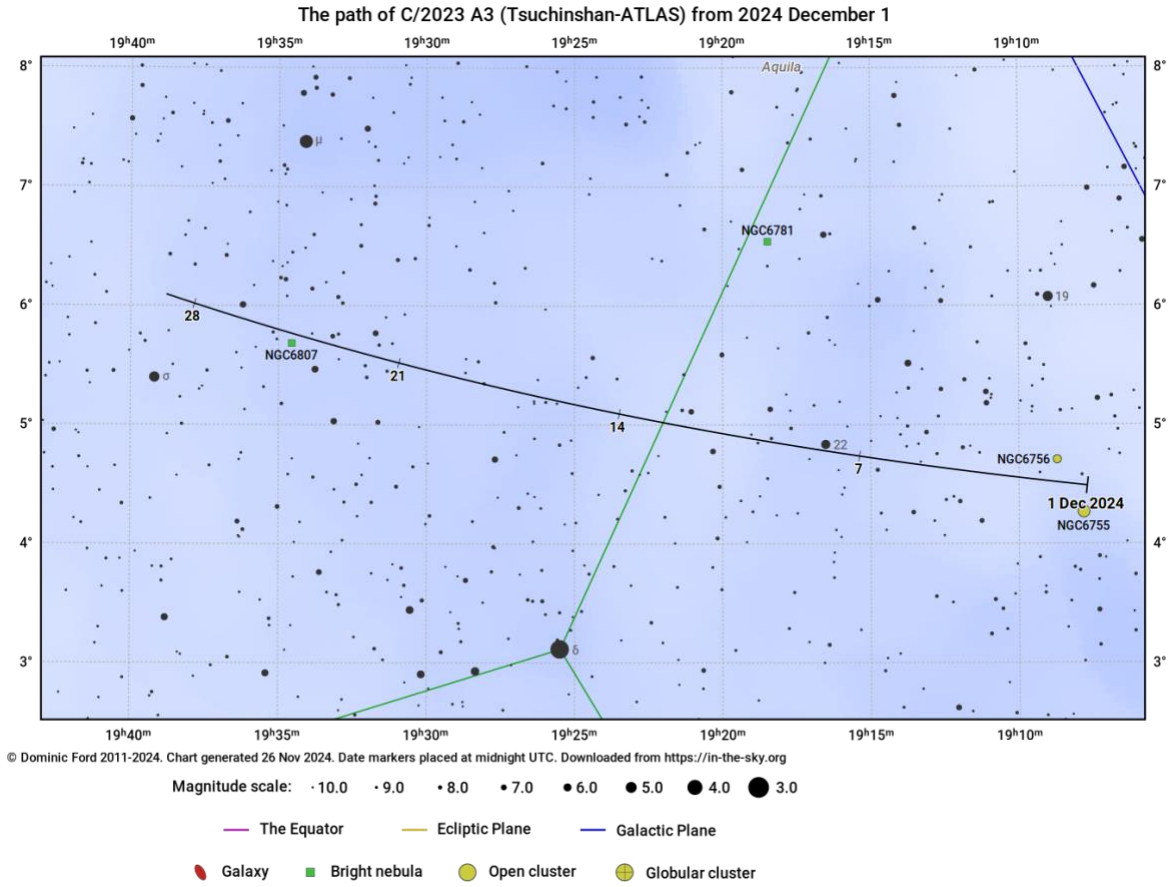


Figure 4 - Star chart for C/2023 A3 in December 2024. Chart produced at in-the-sky.org.

Figure 5 - This image of C/2023 A3 (Tsuchinshan-ATLAS) from 2024 November 18 by Dan Bartlett shows the bifurcated dust tail and a faint gas tail (just above the dust tail). The image is a co-add of 68 x 30-sec exposures with a Celestron C14 and ZWO ASI6200mcP.

333P/LINEAR

Discovered on 2007 November 4 by the Lincoln Laboratory Near-Earth Asteroid Research program
Jupiter-family comet

Orbit (from Minor Planet Center, MPEC 2024-V192)

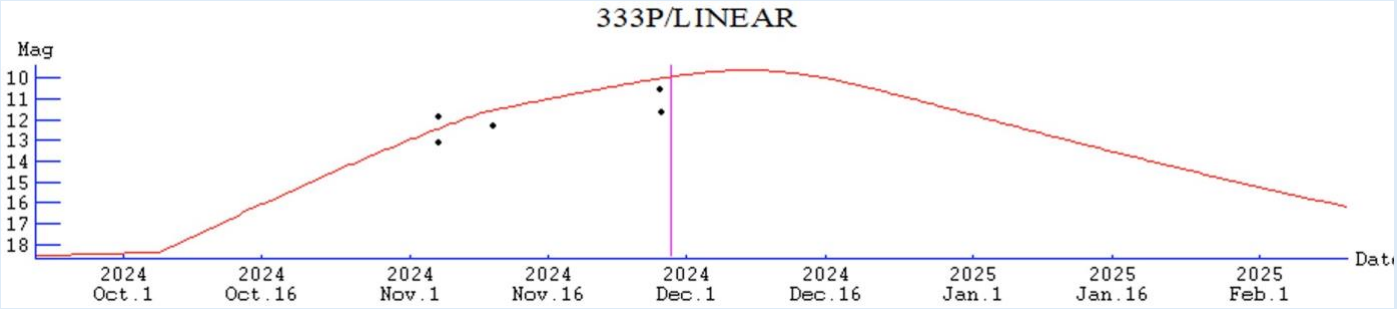
```
333P/LINEAR
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Nov. 29.29920 TT                                  Rudenko
q   1.1129402           (2000.0)            P              Q
n   0.11366829      Peri.   26.01798     -0.12521079     +0.73230094
a   4.2206224       Node   115.70563     +0.73013507     -0.38878629
e   0.7363090       Incl.  132.02167     +0.67173286     +0.55908905
P   8.67
From 647 observations 2016 Jan. 1-2024 Nov. 12, mean residual 0".6.
```

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

```
333P/LINEAR                                                        Max El
                                                                    (deg)
    Date       R.A.    Decl.      r        d     Elong  Const  Mag  40N  40S
2024-Dec-01  12 23  +40 34    1.113    0.618     84M    CVn    9.9   64    0
2024-Dec-06  13 24  +53 55    1.117    0.554     88M    UMa    9.7   57    0
2024-Dec-11  15 30  +64 50    1.125    0.544     90M    Dra    9.7   43    0
2024-Dec-16  18 23  +65 02    1.137    0.590     88E    Dra   10.0   39    0
2024-Dec-21  20 07  +57 49    1.153    0.681     85E    Cyg   10.5   48    0
2024-Dec-26  20 57  +50 24    1.173    0.799     81E    Cyg   11.1   51    0
2024-Dec-31  21 25  +44 30    1.197    0.932     77E    Cyg   11.7   51    0
2025-Jan-05  21 43  +40 01    1.223    1.073     72E    Cyg   12.3   49    0
```

Comet Magnitude Formula (from Seiichi Yoshida)

```
H  = 15.0, G = 0.15 [Before T-55 days]
m1 =  6.5 + 5 log d + 80.0 log r [Between T-55 days and T-20 days]
m1 =  9.5 + 5 log d + 30.0 log r [Between T-20 days and T+108 days]
H  = 15.0, G = 0.15 [After T+108 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
333        2024 11 30.08  S 11.1 TI 25.2L    78   2.4  3           ICQ XX HAR11 Christian Harder
333        2024 11 30.02  S 12.4:TI 53.1L   139   1.8  3           ICQ XX HAR11 Christian Harder
333        2024 11 28.23  I 12.0 S  25.0C10 250        3           ICQ XX DEC   Michel Deconinck
333        2024 11 28.16  S 10.9 TK 20.3T10  77   2.2  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
333        2024 11 12.29  M 13.1 AQ  30 L 5 100   1    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
333        2024 11 11.29  M 13.3 AQ  30 L 5 100   1    4           ICQ XX DES01 Jose Guilherme de Souza Aguiar
333        2024 11 04.18  S 12.2 AQ 20.3T10 133   2    2/          ICQ XX GON05 Juan Jose Gonzalez Suarez
```

The enigmatic short-period comet 333P/LINEAR is set to grace our December skies at its brightest early in the month. Distinguished as the retrograde comet with the shortest known orbital period—just 8.7 years—333P is a fascinating oddity in the periodic comet family. Initially discovered in November 2007 by the LINEAR survey, this comet reached 11th magnitude during its 2016 return. This year, perihelion occurred on November 29 at a distance of 1.11 AU, with Earth's closest approach to the comet following shortly on December 9 at 0.54 AU.

In November, visual observers, including Michel Deconinck, Jose Guilherme de Souza Aguiar, and Juan Joe Gonzalez, reported magnitudes ranging from 10.9 to 13.3, with a diffuse coma spanning 1' to 2.4' and a moderate degree of condensation (DC = 2.5-4). Such variability in brightness is characteristic of comets exhibiting a gassy, diffuse coma, whose apparent luminosity fluctuates significantly with observing conditions, equipment, and magnification. A striking image captured by Michael Jäger on November 4 revealed a distinct, compact inner coma enveloped by a more tenuous outer halo.

Throughout December, 333P will race across the northern celestial sphere, remaining exclusively visible to northern hemisphere observers. Beginning the month in Canes Venatici (Dec 1-5), it will dash through Ursa Major (Dec 5-8), Draco (Dec 8-19), and conclude the year in Cygnus (Dec 19-31). If its current behavior mirrors that of its 2016 return, observers can anticipate a peak magnitude of 9.7 in early December, followed by a swift fade to approximately magnitude 11.8 by the end of the month.

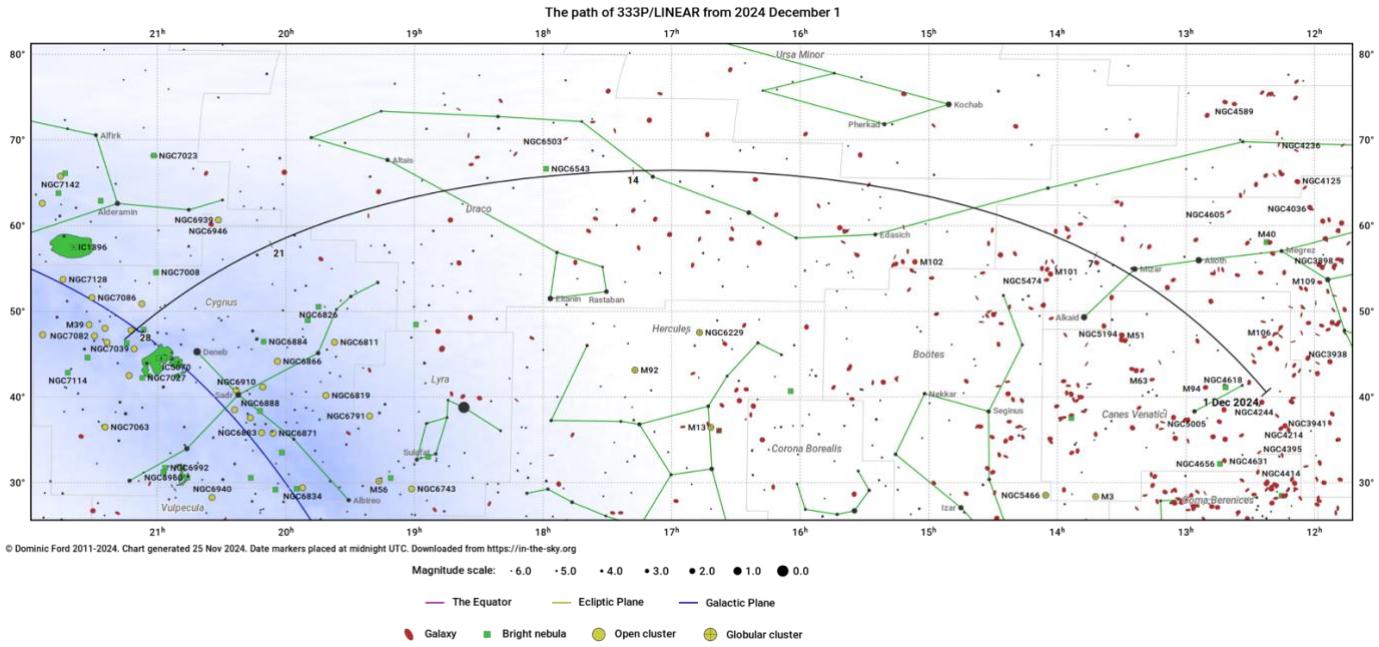


Figure 6 - Finder chart for 333P/LINEAR in December 2024 from in-the-sky.org.

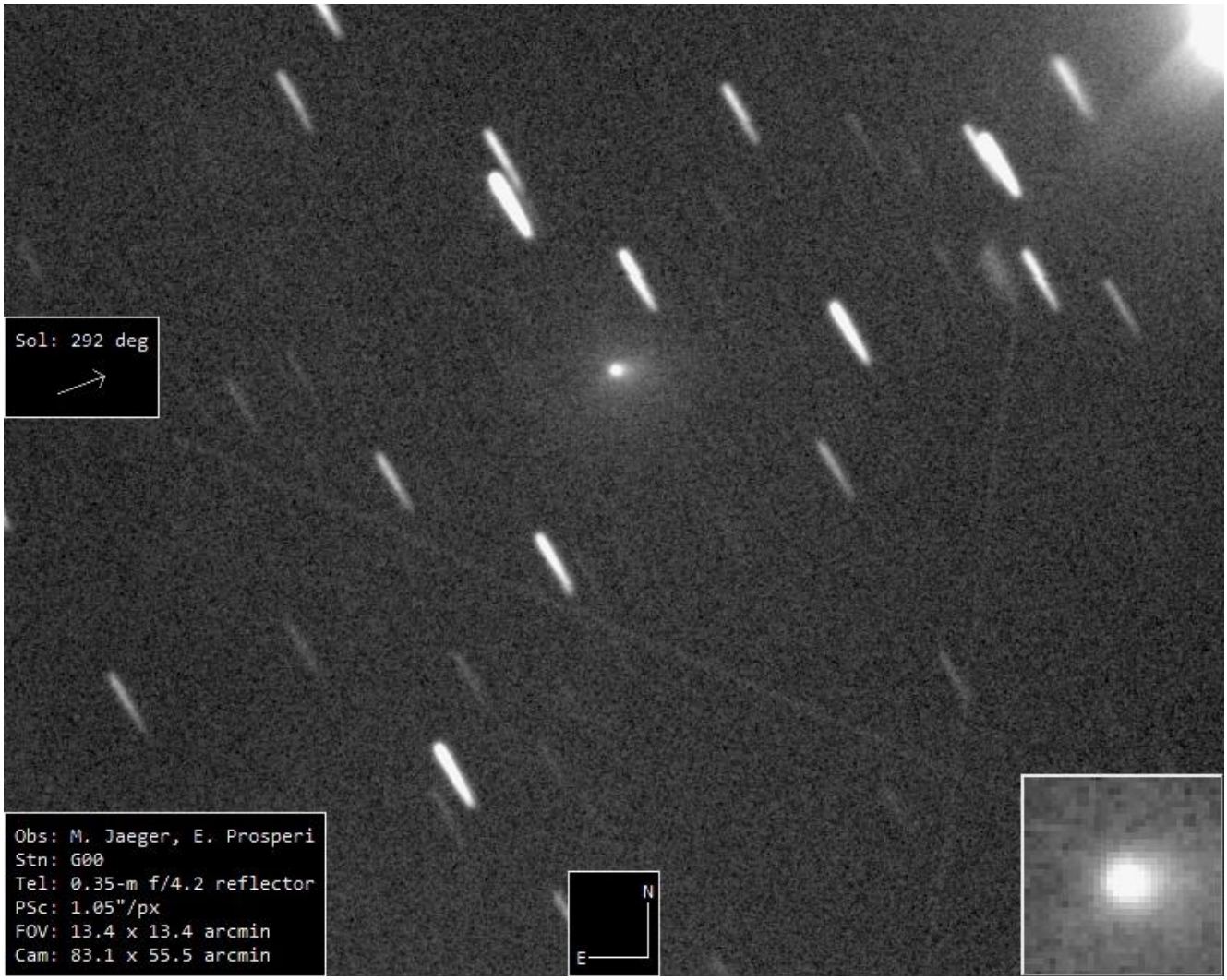


Figure 7 - Michael Jäger imaged 333P/LINEAR on 2024 November 04 at 4:15 UT. The image is a co-add of 17x90 sec exposures taken with a 14"/4.2 reflector and QHY600 camera.

Comets Between Magnitude 10 and 12

C/2022 E2 (ATLAS)

Discovered on 2022 March 7 by the "Asteroid Terrestrial-Impact Last Alert System" (ATLAS) program with a 0.5-m f/2 Schmidt reflector at Rio Hurtado, Chile
Long-period comet

Orbit (from Minor Planet Center, MPEC 2024-V192)

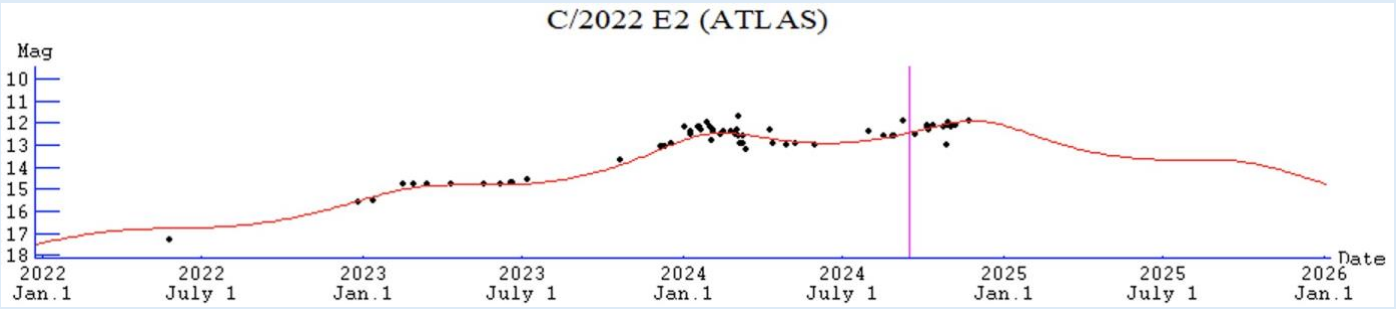
```
    C/2022 E2 (ATLAS)
Epoch 2024 Oct. 17.0 TT = JDT 2460600.5
T 2024 Sept. 14.14192 TT                                  Rudenko
q   3.6662775            (2000.0)            P               Q
z  -0.0002844      Peri.   41.73051     -0.03432528     +0.83137960
 +/-0.0000004      Node   125.38065     +0.63730978     -0.40928367
e   1.0010427      Incl.  137.13490     +0.76984286     +0.37589206
From 3102 observations 2022 Feb. 23-2024 Nov. 14, mean residual 0".6.
1/a(orig) = +0.000086 AU**-1, 1/a(fut) = -0.000078 AU**-1.
```

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

```
C/2022 E2 (ATLAS)                                                    Max El
                                                                      (deg)
    Date      R.A.   Decl.     r       d    Elong  Const  Mag   40N   40S
2024-Dec-01  04 48  +68 21   3.732   2.986   133M   Cam  11.9    62     0
2024-Dec-06  04 18  +68 26   3.741   2.991   133E   Cam  11.9    62     0
2024-Dec-11  03 48  +68 04   3.750   3.008   133E   Cam  11.9    62     0
2024-Dec-16  03 21  +67 18   3.760   3.036   131E   Cam  12.0    63     0
2024-Dec-21  02 57  +66 14   3.770   3.076   128E   Cas  12.0    64     0
2024-Dec-26  02 36  +64 56   3.780   3.125   125E   Cas  12.1    65     0
2024-Dec-31  02 19  +63 29   3.792   3.185   121E   Cas  12.1    66     0
2025-Jan-05  02 06  +61 59   3.803   3.252   117E   Cas  12.2    68     0
```

Comet Magnitude Formula (from ALPO and Lehman data)

```
m1 =  4.5 + 5 log d +  8.8 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
   2022E2  2024 11 28.04  S 11.8 AQ 20.3T10  77   1.5  4           ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022E2  2024 11 26.90  S 12.6 TI 25.2L   145   1    3           ICQ XX HAR11 Christian Harder
   2022E2  2024 11 22.78  S 12.2 TI 25.2L   145   1    3           ICQ XX HAR11 Christian Harder
   2022E2  2024 11 06.80  S 11.7 AQ 20.3T10 133   1.3  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
   2022E2  2024 11 03.96  S 11.7 AQ 20.3T10 133   1.3  3/          ICQ XX GON05 Juan Jose Gonzalez Suarez
```

Typically, comets highlighted in these pages are brighter than magnitude 12.0. Though C/2022 E2 (ATLAS) was first discovered back in March 2022 at a faint 18th magnitude, it has only now reached 12th magnitude. However, this comet's time in the ALPO Comet News spotlight will likely be fleeting, as it is expected to dim below 12th magnitude by mid-December.

C/2022 E2 was discovered by the ATLAS survey with their 0.5-m f/2 Schmidt reflector stationed in Rio Hurtado, Chile. A pre-discovery image from February 2022 was found from when the comet was at a distance

of 8.4 AU from the Sun. Perihelion was on September 14, 2024, at 3.67 AU. This month, the comet reaches peak brightness thanks to its relatively closest approach to Earth at 2.99 AU.

Throughout December, C/2022 E2 will linger around magnitude 12.0, slowly drifting through the northern Milky Way constellations of Camelopardalis (Dec 1-16) and Cassiopeia (Dec 16-31). With a high northern declination, the comet remains visible exclusively to northern hemisphere observers, offering favorable views throughout the night as opposition occurs at the beginning of the month.

Visual reports describe a small 1' to 1.5' coma with weak to moderate condensation (DC = 3-4), while photographs highlight a slender, slightly curved dust tail.

A notable observing opportunity arrives on December 10-11, when the comet will pass in front of the faint yet striking galaxy IC 342. This face-on spiral galaxy, located roughly 7-11 million light-years away, is heavily obscured by Milky Way dust. If not for its unfortunate position, IC 342 would rank among the brightest galaxies, rivalling the top five in the sky. Currently, it appears as a challenging 9th-magnitude object, but the juxtaposition with C/2022 E2 promises a unique spectacle for astrophotographers and visual observers alike.

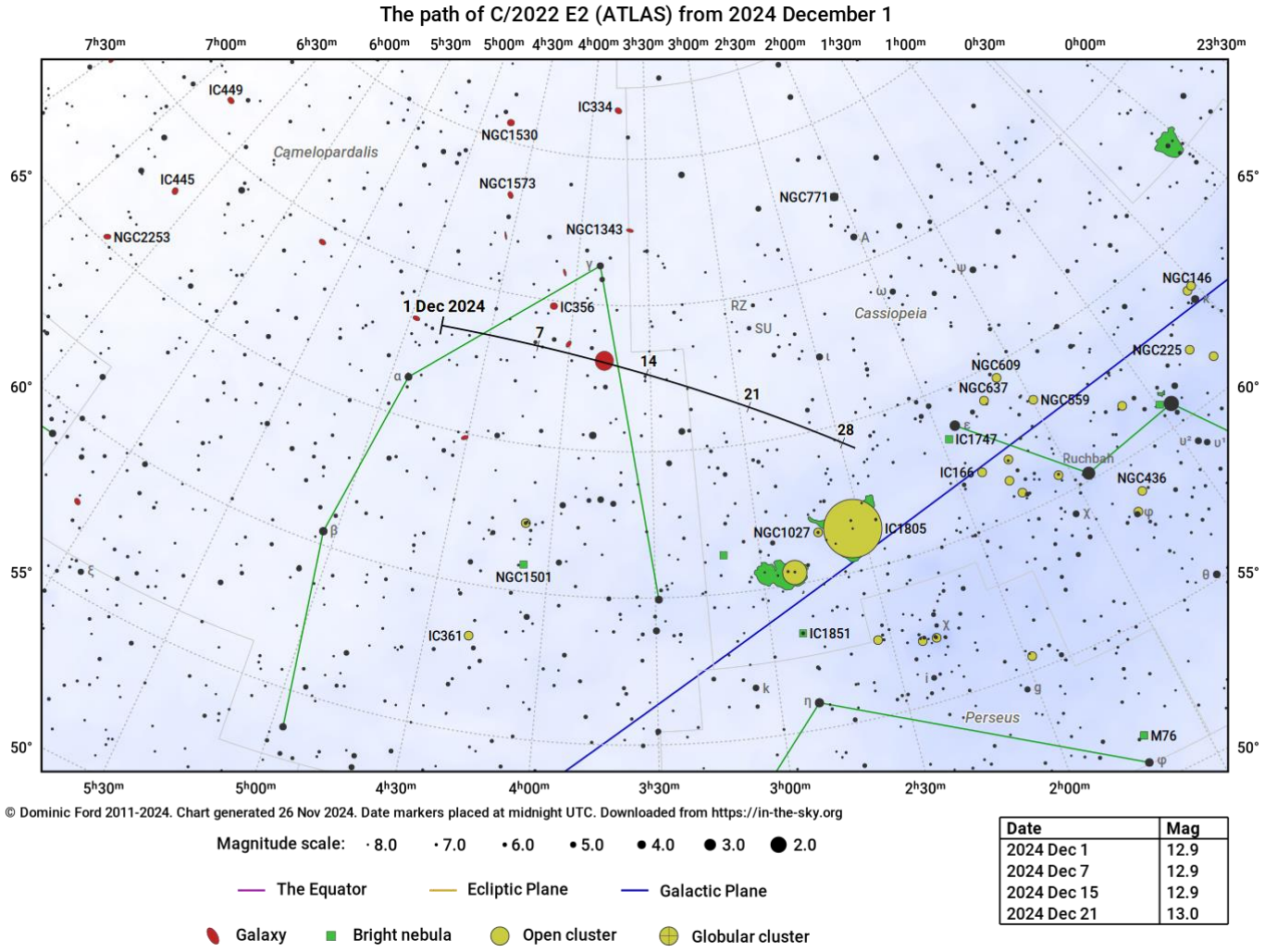


Figure 8 - Finder chart for C/2022 E2 (ATLAS) in December 2024 from in-the-sky.org.

Figure 9 - C/2022 E2 (ATLAS) and its gently curved dust tail were captured in this image taken on 2024 November 26 by Denis Buczynski. The image is a composite of 24 x 60 second exposures with a 0.3-m f/4 reflector and ZWO ASI1600MM camera.