

ALPO COMET NEWS

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

August 2021

alpo-astronomy.org

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The ALPO will be holding its Annual Conference on August 13-14. The Comets Section will be presenting two talks, one on recent comet observations, and the other on Solar System objects portrayed on coins and medals. Here are a few comet-related coins and medals.

Top Left: Reverse of a gold 2.5 Ducati of Pope Leo X (1513-1521) showing the Three Wise men following a comet. Top Center: Reverse of a silver Denarius of Roman emperor Augustus commemorating the Great Comet of 44 B.C. Top Right: Reverse of a medal (from around the time of the Great Comet of 1881) commemorating a Dutch Jeton which showed the Great Comet of 1578. Center: Obverse and reverse of a Donohoe Medal for the discovery of C/1907 G1 (Grigg-Mellish) awarded to John Grigg. Bottom Left: Obverse of Ducat of Hamburg with de Cheseaux's Comet of 1744. Bottom Center: Obverse of silver Klippe Medal of Frankfurt displaying the Great Comet of 1618. Bottom Right: Another silver medal of Frankfurt, but this time with the Great Comet of 1680.

Image Credit: Comet of 1744 – Numismatik Naumann GmbH, Papal gold coin – Heritage Auctions, Donohoe Medal – Kolner Munzkabinett, all others – Classical Numismatics Group.

Table of Contents

SUMMARY -----	3
COMETS SECTION NEWS -----	3
COMETS CALENDAR FOR AUGUST 2021 -----	4
COMETS BRIGHTER THAN MAGNITUDE 10 -----	5
C/2021 O1 (NISHIMURA) -----	5
COMETS BETWEEN MAGNITUDE 10 AND 13 -----	7
C/2020 T2 (PALOMAR)-----	7
4P/FAYE-----	9
6P/D'ARREST-----	11
7P/PONS-WINNECKE-----	12
8P/TUTTLE-----	14
15P/FINLAY-----	15
67P/CHURYUMOV-GERASIMENKO-----	16
C/2017 K2 (PANSTARRS)-----	17
C/2019 L3 (ATLAS)-----	18
FAINTER COMETS OF INTEREST (FAINTER THAN 13.0) -----	19
C/2021 A1 (LEONARD)-----	19
C/2021 O3 (PANSTARRS)-----	20
NEW DISCOVERIES, RECOVERIES AND OTHER COMETS IN THE NEWS -----	22
RECENT MAGNITUDES CONTRIBUTED TO THE ALPO COMETS SECTION -----	23

The monthly ALPO Comet News PDF can be found on the ALPO Comets Section website (<http://www.alpo-astronomy.org/cometblog/>). A shorter version of this report is posted on a dedicated Cloudy Nights forum (<https://www.cloudynights.com/topic/782993-alpo-comet-news-for-august-2021/>). All are encouraged to join the discussion over at Cloudy Nights. The ALPO Comet 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 encouraged.

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

July saw the discovery of 9th magnitude C/2021 O1 (Nishimura), though the comet was located so close to the Sun that few have been able to observe it. While we are still waiting for a comet to brighten into an easy-to-observe object for small apertures, a number of fainter comets are visible in the magnitude 10-13 range for imagers and large aperture visual observers. A recent discovery, C/2021 O3 (PANSTARRS), is currently around 18-19th magnitude but may brighten into a nice binocular object early next year.

Comets Section News

The ALPO's Annual Conference will be held virtually on Friday and Saturday, August 13-14. Each day is packed with talks about various aspects of Solar System observing. The Comets Section will be presenting two talks. One will be an overview of the past year's comet observations. The second talk will be on a slightly different topic, Solar System numismatics (i.e., Solar System objects, including comets, on coins and medals). The meeting is free and more information on the conference and how to watch can be found on the ALPO web site at <http://alpo-astronomy.org/>.

During July, the ALPO Comets Section received 27 images and/or sketches from Michel Deconinck, Carl Hergenrother, Martin Mobberley, and Mike Olason of the following comets: 4P/Faye, 7P/Pons-Winnecke, 10P/Tempel, 15P/Finlay, 19P/Borrelly, 47P/Ashbrook-Jackson, 106P/Schuster, C/2017 K2 (PANSTARRS), C/2017 Y2 (PANSTARRS), C/2018 U1 (Lemmon), C/2019 K7 (Smith), C/2019 T3 (ATLAS), C/2019 T4 (ATLAS), C/2019 U5 (PANSTARRS), C/2020 F2 (ATLAS), C/2020 H5 (Robinson), C/2020 K1 (PANSTARRS), C/2020 M5 (ATLAS), C/2020 O2 (Amaral), C/2020 PV6 (PANSTARRS), C/2020 T2 (Palomar), C/2021 A1 (Leonard), C/2021 O1 (Nishimura).

The Section also received 82 visual and CCD magnitude measurements from Michel Deconinck, J. J. Gonzalez, Carl Hergenrother, Mike Olason, and Chris Wyatt of comets 4P/Faye, 7P/Pons-Winnecke, 10P/Tempel, 15P/Finlay, 19P/Borrelly, 67P/Churyumov-Gerasimenko, 106P/Schuster, 246P/NEAT, C/2017 K2 (PANSTARRS), C/2018 U1 (Lemmon), C/2019 F1 (ATLAS-Africano), C/2019 L3 (ATLAS), C/2019 T4 (ATLAS), C/2020 F5 (MASTER), C/2020 J1 (SONEAR), C/2020 PV6 (PANSTARRS), C/2020 T2 (Palomar), C/2021 A1 (Leonard), and C/2021 O1 (Nishimura).

In addition to observations submitted to the ALPO, we also occasionally use data from other sources to augment our analysis. We acknowledge with thanks comet observations submitted to the International Comet Quarterly, Minor Planet Center, COBS Comet Observation Database, and our own ALPO contributors used in this report.

Comets Calendar for August 2021

- Aug 01 – 7P/Pons-Winnecke (Mag 10) and 19P/Borrelly (Mag 16) within 1.5 deg of each other
- Aug 01 – 15P/Finlay within 0.25 deg of open cluster NGC 1746
- Aug 02 – 67P/Churyumov-Gerasimenko within 0.15 deg of 13th mag galaxy NGC 645
- Aug 05-06 – 67P/Churyumov-Gerasimenko within 0.5 deg of 12th mag galaxies NGC 676, 693, & 706
- Aug 08 – New Moon
- Aug 08 – 67P/Churyumov-Gerasimenko within 0.15 deg of 13th mag galaxy NGC 645
- Aug 09-10 – 67P/Churyumov-Gerasimenko within 0.1 deg of 14th mag galaxy IC 182
- Aug 11 – 15P/Finlay within 0.75 deg of southern edge of supernova remnant Simeis 147
- Aug 15 – First Quarter Moon
- Aug 18 – 332P/Ikeya-Murakami at perihelion ($q = 1.58$ au, 5.4-year orbit, $V \sim 20$, poor apparition, comet currently unobservable due to proximity to Sun)
- Aug 18 – 106P/Schuster at perihelion ($q = 1.53$ au, 7.3-year orbit, $V \sim 15$)
- Aug 19 – C/2020 M5 (ATLAS) at perihelion ($q = 3.00$ au, $V \sim 15$)
- Aug 21 – 4P/Faye within ~ 0.5 deg of NGC 1555 (Hind's Variable Nebula)
- Aug 22 – Full Moon
- Aug 24 – 67P/Churyumov-Gerasimenko within 0.25 deg of 13th mag galaxies NGC 1024, 1028 & 1029
- Aug 25 – 193P/LINEAR-NEAT at perihelion ($q = 2.17$ au, 6.8-year orbit, $V \sim 16$)
- Aug 26 – P/2008 WZ96 (LINEAR) at perihelion ($q = 1.85$ au, 6.2-year orbit, $V \sim 20$, not yet recovered)
- Aug 27 – 8P/Tuttle at perihelion ($q = 1.03$ au, 13.6-year orbit, $V \sim 8$)
- Aug 28 – C/2021 K2 (MASTER) at perihelion ($q = 5.47$ au, $V \sim 18$)
- Aug 28 – C/2020 O2 (Amaral) at perihelion ($q = 4.86$ au, $V \sim 15$)
- Aug 28 – 15P/Finlay within 0.1 deg of open cluster NGC 2266
- Aug 28 – C/2020 T2 (PANSTARRS) within 0.4 deg of 12th mag galaxy NGC 5878
- Aug 30 – Last Quarter Moon
- Aug 30 – 4P/Faye within 0.25 deg of open cluster NGC 1647
- Aug 31 – C/2019 L3 (ATLAS) within 0.05 deg of 13th mag galaxy NGC 2303

Comets Brighter Than Magnitude 10

C/2021 O1 (Nishimura)

Discovered 2021 July 21 at 9-10th magnitude by amateur Hideo Nishimura with a DLSR + 200mm lens
 Discovery Telescope: 1.2-m Samuel Oschin Schmidt on Mount Palomar
 Perihelion on 2021 August 13 at 0.79 au, inclination = 27.6 deg, eccentricity = 1.0

C/2021 O1 (Nishimura)									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	07 37	+31 29	0.829	1.705	20M	Gem	9.5	2	0	
2021-Aug-06	08 11	+31 02	0.808	1.702	18M	Cnc	9.4	0	0	
2021-Aug-11	08 44	+30 00	0.797	1.709	17M	Cnc	9.4	0	0	
2021-Aug-16	09 16	+28 25	0.799	1.725	15M	Cnc	9.4	0	0	
2021-Aug-21	09 47	+26 22	0.812	1.750	14M	Leo	9.5	0	0	
2021-Aug-26	10 15	+23 58	0.835	1.784	13M	Leo	9.7	0	0	
2021-Aug-31	10 41	+21 20	0.868	1.825	12E	Leo	9.9	0	0	
2021-Sep-05	11 05	+18 34	0.910	1.872	11E	Leo	10.1	0	0	

Comet Magnitude Parameters --- H = 9.2, 2.5n = 10.0

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
202101	2021 07 26.47	C 9.2	GG	27.9T	6A270	1.3			ICQ xx OLaxx	Mike Olason

Amateur astronomer Hideo Nishimura of Gansho-ji, Kakegawa, Japan, discovered a 9-10th magnitude comet at an amazingly small solar elongation of 23 degrees. Nishimura found the comet on July 21 with a Canon EOS 6D digital camera and 200-mm f/3.2 lens. At discovery, the new comet was located ~2 degrees from 8P/Tuttle. This is Nishimura's 2nd discovery, his first was the visual discovery C/1994 N1 (Nakamura-Nishimura-Machholz). [Ref: MPEC 2021-O47, CBET 5004, 5008]

C/2021 O1 (Nishimura) is a long-period comet with perihelion on August 13 at 0.79 au. The comet is unfortunately poorly placed on the other side of the Sun for the perihelic part of its apparition.

It might have been observable from the southern hemisphere in June but was at a low elevation of ~7 deg at the start of astronomical twilight and around 12th magnitude. Nishimura discovered the comet in the morning during a short window of opportunity for northern observers when it was

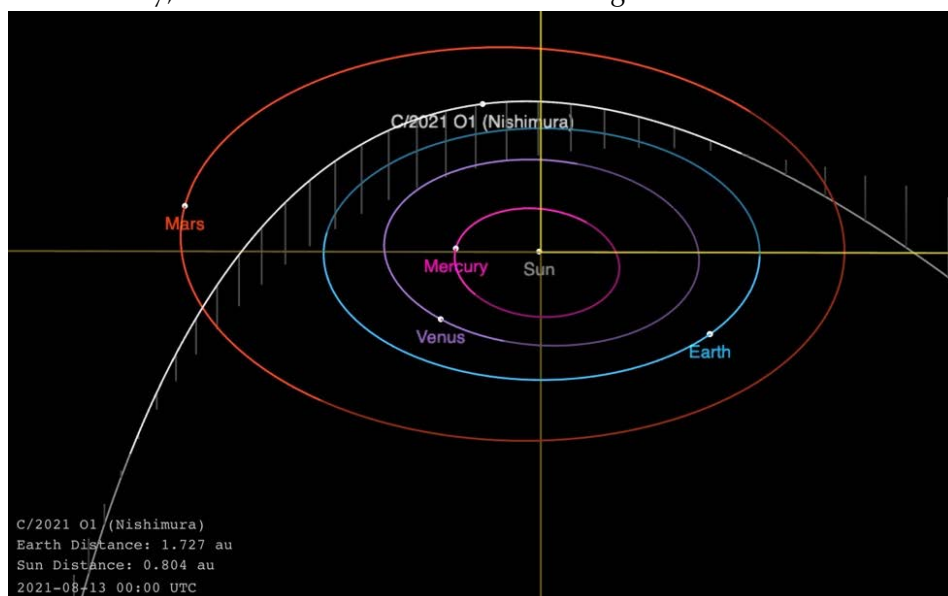


Figure 1 - Orbit of C/2021 O1 (Nishimura) and the inner planets for the time of Nishimura's perihelion (2021 August 13). Image produced with the JPL Small-Body Database Browser.

visible at only a degree or three above the horizon before the start of astronomical twilight.

The comet will be even more difficult to observe in August. Perhaps observers with a flat eastern horizon will be able to observe the comet at the start of the month deep in nautical twilight. But after a few days to a week, the comet should be too close to the Sun for most, if not all, observers. Solar elongation is slowly shrinking to a minimum of 6 degrees in mid-October. It will once again become visible to northern observers in December though the comet will likely be very faint by then. Southern observers will have to wait till January 2022.

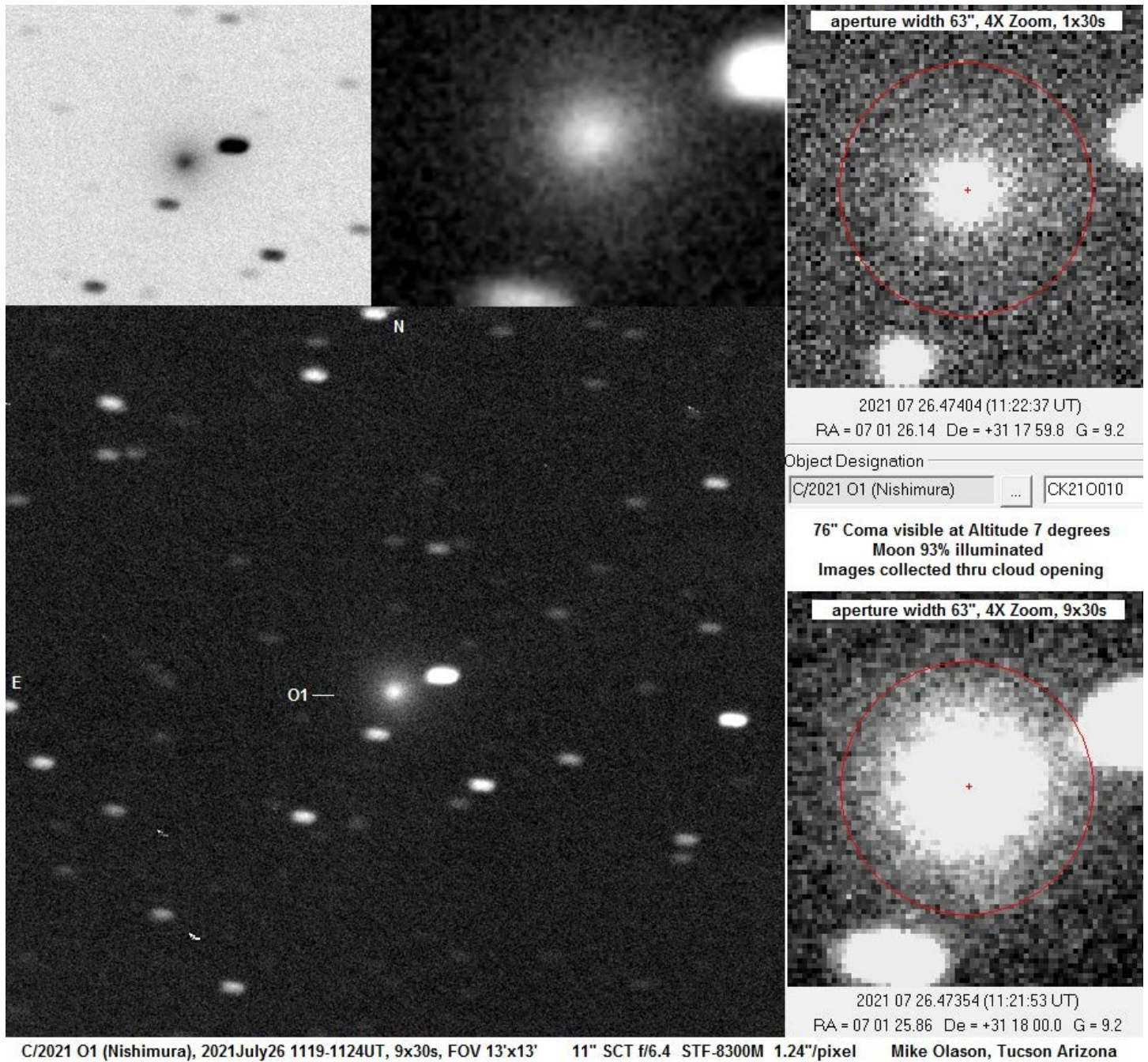


Figure 2 - C/2021 O1 (Nishimura) as imaged by Mike Olason on July 26.

Comets Between Magnitude 10 and 13

C/2020 T2 (Palomar)

Discovered 2020 October 7 at 19th magnitude by the Zwicky Transient Facility (ZTF)
 Discovery Telescope: 1.2-m Samuel Oschin Schmidt on Mount Palomar
 Perihelion on 2021 July 11 at 2.05 au, inclination = 27.9 deg, eccentricity = 0.9935
 Dynamically old long-period comet with orbital period of ~5600 years

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2021-Aug-01	14 26	-03 47	2.070	1.858	87E	Vir	10.1	28	52
2021-Aug-06	14 34	-05 51	2.078	1.910	84E	Vir	10.2	26	53
2021-Aug-11	14 41	-07 52	2.088	1.965	82E	Vir	10.3	24	53
2021-Aug-16	14 50	-09 48	2.099	2.022	80E	Lib	10.3	22	53
2021-Aug-21	14 58	-11 40	2.112	2.081	77E	Lib	10.4	20	53
2021-Aug-26	15 07	-13 27	2.126	2.142	75E	Lib	10.5	18	52
2021-Aug-31	15 16	-15 10	2.142	2.204	73E	Lib	10.6	17	50
2021-Sep-05	15 25	-16 48	2.160	2.269	70E	Lib	10.7	15	49

Comet Magnitude Parameters --- H = 5.6, 2.5n = 10.0

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia	DC	TAIL LENG	PA	ICQ CODE	Observer Name
2020T2	2021 07 31.48 xM	10.4	AQ	40.0L	4	59	4.0	6			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 30.44 xM	10.6	AQ	40.0L	4	59	4.0	6			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 29.39 xM	10.4	AQ	40.0L	4	59	6.0	5			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 27.91 S	9.9	TK	20.3T10	77		6	3/			ICQ XX GON05	J J Gonzalez Suarez
2020T2	2021 07 27.40 xM	10.4	TK	25.0L	5	40	5.0	5			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 13.94 S	9.8	TK	20.3T10	77		6	3/			ICQ XX GON05	J J Gonzalez Suarez
2020T2	2021 07 12.40 xM	10.5	AQ	40.0L	4	59	4.5	6			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 08.94 S	9.7	TK	20.3T10	77		7	3/			ICQ XX GON05	J J Gonzalez Suarez
2020T2	2021 07 05.91 E	10.5	TK	25.0C10	62		5	3			ICQ XX DECa	Michel Deconinck
2020T2	2021 07 05.43 xM	10.5	AQ	40.0L	4	59	4.2	5/			ICQ XX WYA	Christopher Wyatt
2020T2	2021 07 04.96 S	9.8	TK	20.3T10	77		6	3/			ICQ XX GON05	J J Gonzalez Suarez
2020T2	2021 07 04.36 xM	10.4	AO	25.0L	5	40	3.8	5			ICO XX WYA	Christopher Wvatt

C/2020 T2 (PANSTARRS) has spent the past 2 months around magnitude 10. Now post its July 11 perihelion and moving away from the Earth, the comet should begin to slowly fade this month. Michel Deconinck, J. J. Gonzalez and Chris Wyatt made a dozen magnitude measurements in July and found the comet to be between magnitude 9.7 and 10.6. There does seem to be an aperture effect at work as the fainter visual measurements correspond to larger apertures. Michel, J. J., and Chris reported the comet to be tailless with a coma diameter between 3.8 and 7' and a degree of condensation between 3.5 and 6.

August should see the comet fade from around magnitude 10.1 to 10.6 as it moves through the evening constellations of Virgo (Aug 1-12) and Libra

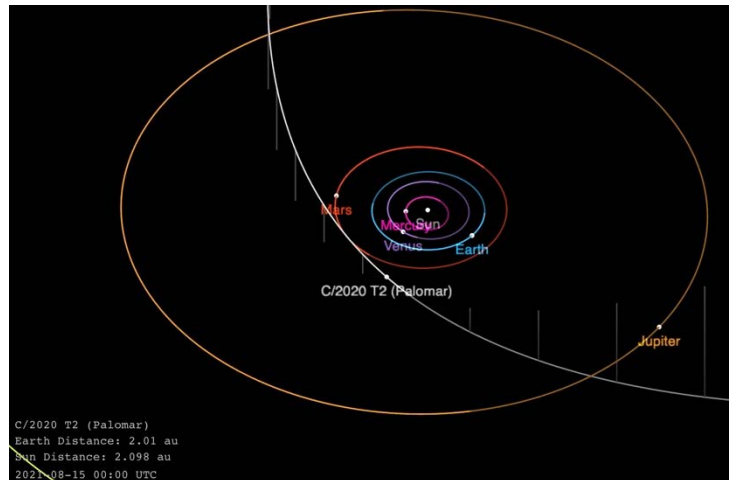
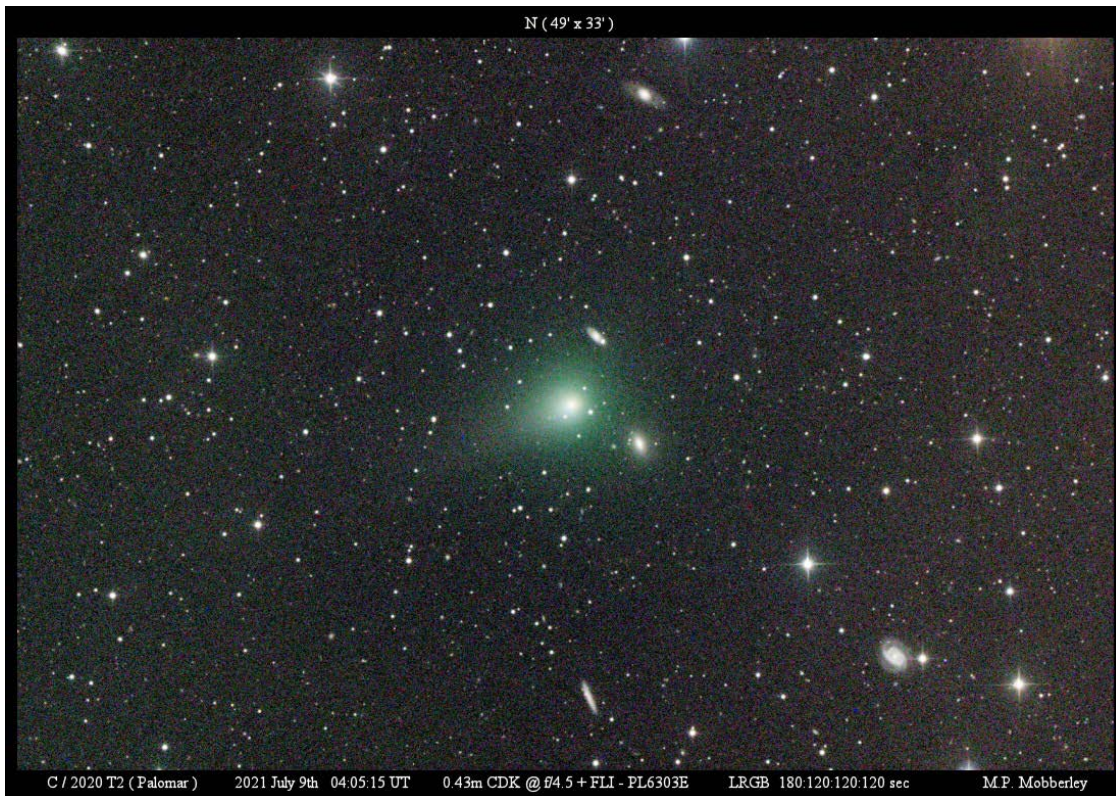


Figure 3 - Orbit of C/2020 T2 (PANSTARRS) and the planets from the JPL Small-Body Browser.

(12-31). Towards the end of the month on August 28, there may be a photo op with C/2020 T2 passing within 0.4 deg of 12th mag galaxy NGC 5878.



C/2020 T2 (Palomar)

2021/07/05 - 21h46 UTC

Takahashi Mewlon 250mm f10 - 62x

F.O.S.: 35'

Magn.: +10.5 - Tail: N/A - Coma: 5' - DC: 3

Aquarellia Observatory

Figure 4 – Image and sketch of C/2020 T2 (PANSTARRS). Top – Image taken on July 9 by Martin Mobberley. Bottom – Sketch made on July 5 by Michel Deconinck.

4P/Faye

Discovered on 1843 November 23 by the Herve Faye
 Perihelion on 2021 September 9 at 1.62 au, inclination = 8.0 deg, eccentricity = 0.58
 Short-period comet with orbital period of ~7.48 years

4P/Faye										Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S		
2021-Aug-01	03 22	+17 57	1.668	1.595	75M	Ari	11.3	39	30		
2021-Aug-06	03 36	+18 20	1.657	1.552	77M	Tau	11.1	42	29		
2021-Aug-11	03 50	+18 38	1.647	1.510	78M	Tau	11.0	44	29		
2021-Aug-16	04 04	+18 50	1.638	1.470	80M	Tau	10.9	47	29		
2021-Aug-21	04 18	+18 56	1.631	1.432	81M	Tau	10.7	49	29		
2021-Aug-26	04 32	+18 56	1.626	1.395	83M	Tau	10.6	52	29		
2021-Aug-31	04 45	+18 51	1.622	1.359	85M	Tau	10.6	54	29		
2021-Sep-05	04 59	+18 39	1.620	1.325	86M	Tau	10.5	56	29		

Comet Magnitude Parameters --- H = 3.7, 2.5n = 29.5

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
4	2021 07 26.38	C 12.3	GG	27.9T	6A540	1.3	8 m256	ICQ xx OLaxx	Mike Olason	
4	2021 07 22.08	I 11.0:TK	12.6B	5	62	1	6	ICQ XX DECaa	Michel Deconinck	
4	2021 07 14.09	S 10.8	TK	20.3T10	77	4	2/	ICQ XX GON05	J J Gonzalez Suarez	
4	2021 07 09.08	S 11.1	TK	20.3T10	100	4	2/	ICQ XX GON05	J J Gonzalez Suarez	

Comet 4P/Faye was discovered visually by Herve Faye on 1843 November 23 at 5th-6th magnitude. This year's apparition is its 22nd observed return. At its best returns in 1991 and 2006, Faye reached 9th magnitude. 2021 is a moderately good but not great return and should see Faye reach magnitude 10.3 at the end of September.

Three visual observations from Michel Deconinck and J. J. Gonzalez found Faye between 10.8 and 11.1 with a coma ranging from 1' to 4'. A CCD measurement by Mike Olason came in a little fainter at magnitude 12.3 with a 1.3' coma. The image showed the development of a long dust tail and a hint of asymmetry in the coma.

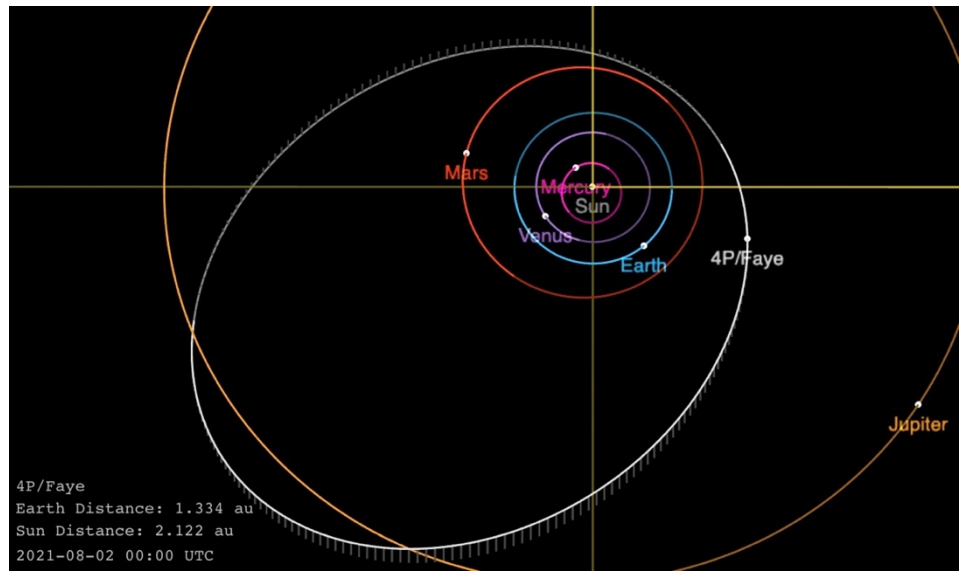


Figure 5 - Orbit of 4P/Faye and the inner planets and Jupiter for mid-August. Image produced with the JPL Small-Body Database Browser.

Perihelion occurs on September 8 at 1.62 au followed by a minimum distance to Earth a few months later on December 5 at 0.94 au. Faye is currently a morning object observable from both hemispheres and should brighten from around magnitude 12.4 to 11.2 as its moves through Aries (Aug 1) and Taurus (2-30).



4P-Faye

2021/07/22 - 02h00 UTC

Binocular Vixen 2x126mm f5 EP 25, 18 & 10mm

F.O.S: 120'

Magn.: +11.0 - coma: 1' - DC: 6

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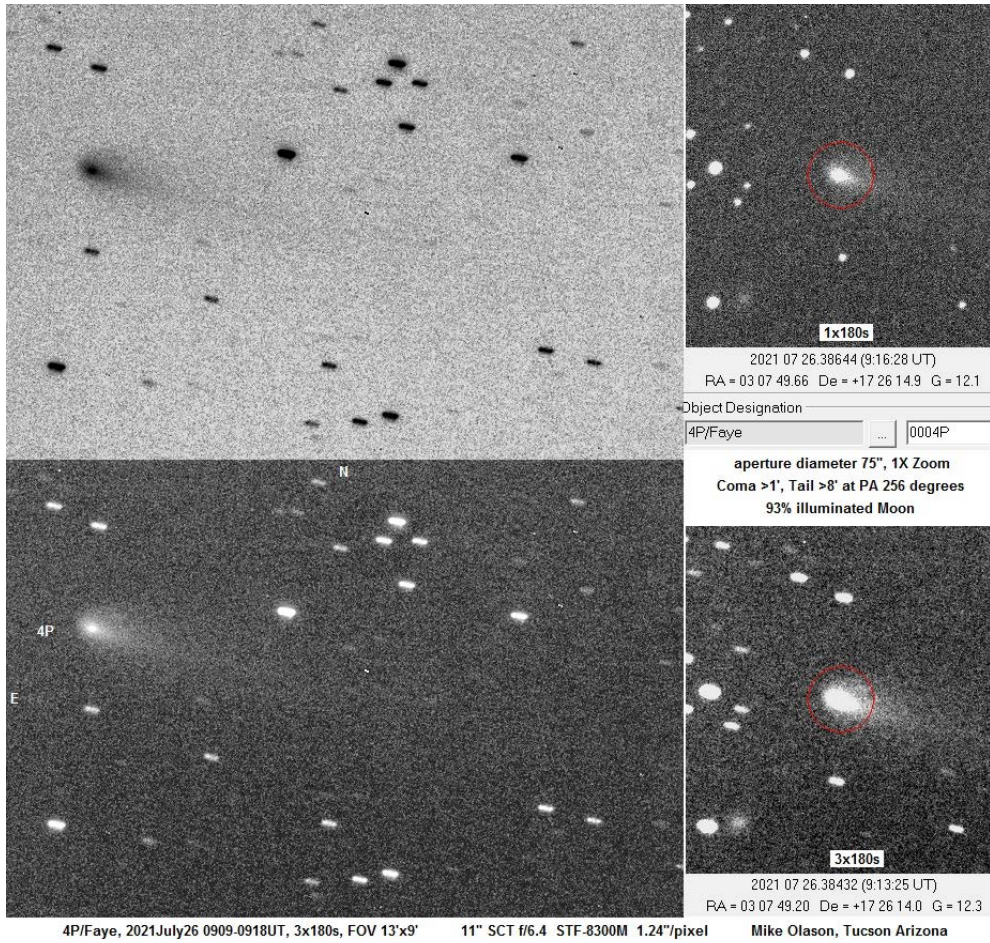


Figure 6 - Image and sketch of 4P/Faye. Top – Sketch made on July 22 by Michel Deconinck. Bottom - Image taken on July 26 by Mike Olason.

6P/d'Arrest

Discovered on 1851 June 28 by the Heinrich Ludwig d'Arrest
 Perihelion on 2021 September 17 at 1.35 au, inclination = 19.5 deg, eccentricity = 0.61
 Short-period comet with orbital period of ~6.54 years

6P/d'Arrest									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	16 17	+02 43	1.461	0.746	111E	Ser	14.4	48	47	
2021-Aug-06	16 22	+00 08	1.441	0.747	108E	Oph	14.0	45	50	
2021-Aug-11	16 29	-02 32	1.423	0.749	106E	Oph	13.7	43	53	
2021-Aug-16	16 36	-05 16	1.406	0.753	104E	Oph	13.3	40	55	
2021-Aug-21	16 45	-08 03	1.392	0.759	102E	Oph	13.0	37	58	
2021-Aug-26	16 55	-10 49	1.380	0.766	101E	Oph	12.6	34	61	
2021-Aug-31	17 07	-13 33	1.370	0.776	99E	Oph	12.3	32	63	
2021-Sep-05	17 20	-16 12	1.363	0.788	97E	Oph	12.0	30	65	
Comet Magnitude Parameters			---	H = 3.5,	2.5n = 45.0,	offset = +60 days				

Heinrich Louis d'Arrest discovered 6P visually in June 1851 though we now know that it had been previously observed by another astronomer, Phillipe la Hire, in 1678. Long-time comet watchers may remember this comet's excellent apparition in 1976 when it passed 0.15 au from Earth and reached 5th magnitude. d'Arrest's perihelion distance is larger now at 1.35 au so such close approaches are not currently possible. This year closest approach to Earth will be on August 2 at 0.75 au and perihelion on September 17 at 1.35 au.

No visual observations of d'Arrest have been submitted to the ALPO or COBS yet for the current apparition. Several CCD observations have been submitted to the COBS site. In July, most observers reported d'Arrest at ~17th magnitude with a small sub-arc minute coma. Michael Lehmann observed the comet on the 28th and 29th and found it to be much brighter (12.7-13.4) and larger (5.6-7.1'). His measurements are brighter than the prediction above which is based on photometric parameters by Seiichi Yoshida (<http://www.aerith.net/comet/catalog/0006P/2021.html>). According to the prediction, d'Arrest should rapidly brighten in August from around magnitude 14.4 to 12.3 as it moves through the evening constellations of Serpens (Aug 1-5), Ophiuchus (5-30).

Most comets fade as they move away from the Sun and Earth, but d'Arrest experiences a seasonal effect resulting in a peak brightness up to 60 days after perihelion. As a result, a maximum brightness around magnitude 9.8 should occur in the late October / early November time frame.

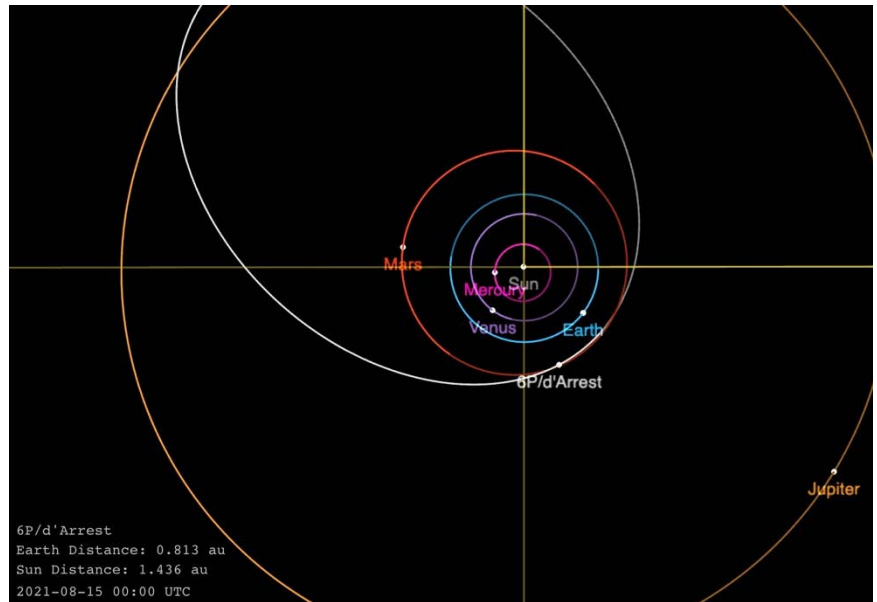


Figure 7 – Orbit of 6P/d'Arrest and the inner planets and Jupiter for mid-August. Image produced with the JPL Small-Body Database Browser.

7P/Pons-Winnecke

Discovered on 1819 June 12 by the Jean-Luis Pons
 Rediscovered on 1858 March 9 by Friedrich August Theodor Winnecke
 Perihelion on 2021 May 27 at 1.23 au, inclination = 22.4 deg, eccentricity = 0.64
 Short-period comet with orbital period of ~6.31 years

7P/Pons-Winnecke									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag		40N	40S
2021-Aug-01	00 06	-46 59	1.468	0.595	129M	Phe	11.2		3	83
2021-Aug-06	00 07	-48 33	1.500	0.623	131M	Phe	11.4		1	81
2021-Aug-11	00 05	-49 50	1.533	0.654	132M	Phe	11.7		0	80
2021-Aug-16	00 02	-50 49	1.567	0.688	133M	Phe	11.9		0	79
2021-Aug-21	23 58	-51 31	1.601	0.724	134M	Phe	12.2		0	79
2021-Aug-26	23 52	-51 54	1.637	0.762	134M	Phe	12.5		0	78
2021-Aug-31	23 46	-52 01	1.673	0.803	134M	Phe	12.8		0	78
2021-Sep-05	23 40	-51 51	1.710	0.847	134M	Phe	13.1		0	78

Comet Magnitude Parameters --- H = 10.1, 2.5n = 19.7, offset = +34 days

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
7	2021	07	31.51	xM 11.8	AQ	40.0L	4	59	6.0	3/		ICQ XX WYA Christopher Wyatt
7	2021	07	30.50	xM 13.0	AQ	40.0L	4	108	1.9	6		ICQ XX WYA Christopher Wyatt
7	2021	07	29.47	xM 12.4	AQ	40.0L	4	108	1.8	5/		ICQ XX WYA Christopher Wyatt
7	2021	07	26.43	C 12.2	GG	27.9T	6A300		1.3		288	ICQ xx OLAxx Mike Olason
7	2021	07	12.74	xM 11.2	AQ	40.0L	4	59	3.1	5		ICQ XX WYA Christopher Wyatt
7	2021	07	09.11	S 10.5	TK	20.3T10	100		5	2/		ICQ XX GON05 J J Gonzalez Suarez
7	2021	07	06.71	xM 11.8	AQ	40.0L	4	59	4.8	6		ICQ XX WYA Christopher Wyatt

Comet 7P/Pons-Winnecke was an 8th magnitude object when visually discovered by Jean-Luis Pons on 1819 June 12. It was re-discovered thirty-nine years later on 1858 March 9 by Friedrich August Theodor Winnecke. Throughout the 19th and early 20th century, Pons-Winnecke was routinely a bright object and often reached 6th magnitude during its better placed apparitions. Its best apparition occurred in 1927 when it reached 3rd magnitude during an especially close approach to Earth (0.04 au).

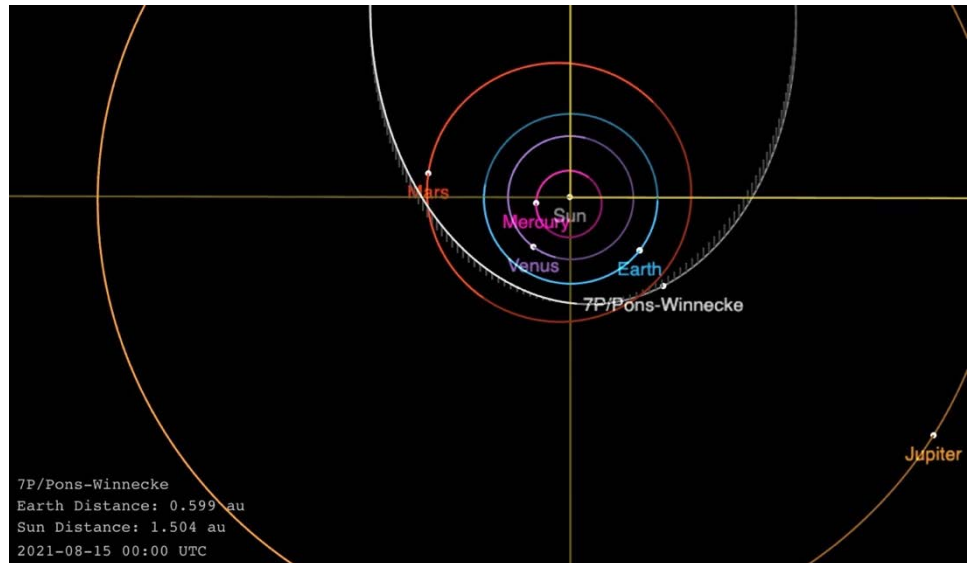


Figure 8 - Orbit of 7P/Pons-Winnecke and the inner planets and Jupiter for mid-August. Image produced with the JPL Small-Body Database Browser.

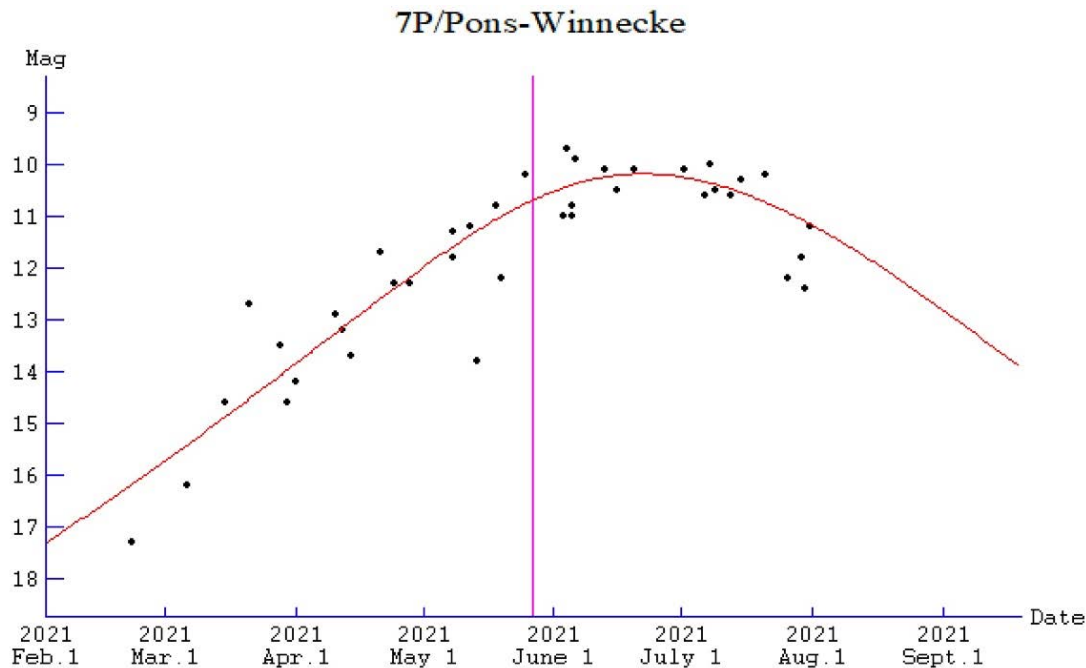


Figure 9 – Visual magnitude estimates submitted to the ALPO Comets Sections and CCD measurements submitted by Michael Lehmann to the COBS website (<https://cobs.si>) are plotted. The lightcurve (red curve) can be modeled with the following photometric parameters: $H = 10.1$, $2.5n = 19.7$, time offset = +34 days). Lightcurve solution and plot produced with Seiichi Yoshida's Comet for Windows program.

Gravitational perturbations have increased its perihelion distance from a 0.76 au in 1841 to a maximum of 1.26 au in 1989. As a result, it hasn't had a bright return since 1939 (6th magnitude) and nowadays usually gets no brighter than ~10-11th magnitude. Over the coming decades, Pons-Winnecke's perihelion distance will decrease from this year's 1.23 au to 1.13 au in 2027, 0.98 au in 2039, 0.87 au in 2051, and a minimum near 0.84 au for perihelia between 2062 through the end of the 21st century. The smaller distances will result in close approaches to Earth in 2045 (0.21 au), 2062 (0.17 au), 2073 (0.19 au), and 2084 (0.31 au). Check out Kazuo Kinoshita's Comet Orbit Page entry for 7P for more details on 7P's past and future orbital evolution at <http://jcometobs.web.fc2.com/pcmtn/0007p.htm>.

Six visual and a CCD magnitude estimate were submitted to the Comets Section by J. J. Gonzalez, Mike Olason, and Chris Wyatt. The observations found a large range of coma diameters (1.3' to 6'), DC values (2.5 to 6), and magnitudes (10.5 to 13.0). The scatter in coma parameters and brightness suggests a low surface brightness coma sensitive to telescope aperture and observing technique. Confirming this point, CCD measurements submitted by Michel Lehmann (ICQ code LEHaa) to the COBS site, found a larger coma in July (between 15' and 20') resulting in brighter object (between 10.0 and 10.5).

In the past, Pons-Winnecke has reached peak brightness in the weeks after perihelion. This year was no different. Perihelion was back on May 27, but the comet appeared at its brightest roughly a month later in late June/early July. Observations at the end of July show the beginning of a fading trend which should continue as the comet moves away from both the Sun and Earth. August should see the comet fade from around magnitude 11 to 13 as it moves through the southern constellation of Phoenix (14-31). Its location at southern declinations of -47 to -52 makes it an invisible object from northern mid-latitudes but well placed for southern hemisphere observers.

Photo Ops: At the beginning of August, 7P/Pons-Winnecke and 16th magnitude 19P/Borrelly will be located within a few degrees of each other. While Pons-Winnecke is fading, Borrelly is brightening and should peak around 9th magnitude in January/February 2022.

8P/Tuttle

Discovered on 1790 January 9 by Pierre F. A. Mechain
 Rediscovered on 1858 January 5 by Horace Tuttle
 Perihelion on 2021 August 27 at 1.03 au, inclination = 54.9 deg, eccentricity = 0.82
 Short-period comet with orbital period of ~13.6 years

8P/Tuttle									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	07 15	+24 38	1.104	1.982	21M	Gem	10.7	0	0	
2021-Aug-06	07 31	+21 29	1.079	1.948	22M	Gem	10.3	0	0	
2021-Aug-11	07 48	+18 08	1.058	1.917	22M	Gem	10.0	0	0	
2021-Aug-16	08 04	+14 35	1.042	1.888	23M	Cnc	9.7	0	0	
2021-Aug-21	08 20	+10 52	1.031	1.863	24M	Cnc	9.4	0	2	
2021-Aug-26	08 36	+07 00	1.026	1.842	25M	Cnc	9.2	0	4	
2021-Aug-31	08 52	+03 01	1.027	1.825	26M	Hya	9.0	0	6	
2021-Sep-05	09 08	-01 01	1.034	1.814	27M	Hya	8.8	0	8	

Comet Magnitude Parameters --- H = 7.0, 2.5n = 20.0, offset = +25 days [Ref: Seiichi Yoshida]

Similar to the discovery story of Pons-Winnecke, 8P/Tuttle was discovered during two widely separated apparitions. Pierre François André Méchain made the first discovery in January 1790. Sixty-eight years later, 8P was re-discovered by Horace Parnell Tuttle in January 1858. With a 13.6-year period, 8P/Tuttle is making its 13th observed return. Tuttle's relatively large semi-major axis of 5.7 au and inclination of 54.9° makes it a Halley-type rather than a Jupiter-family comet.

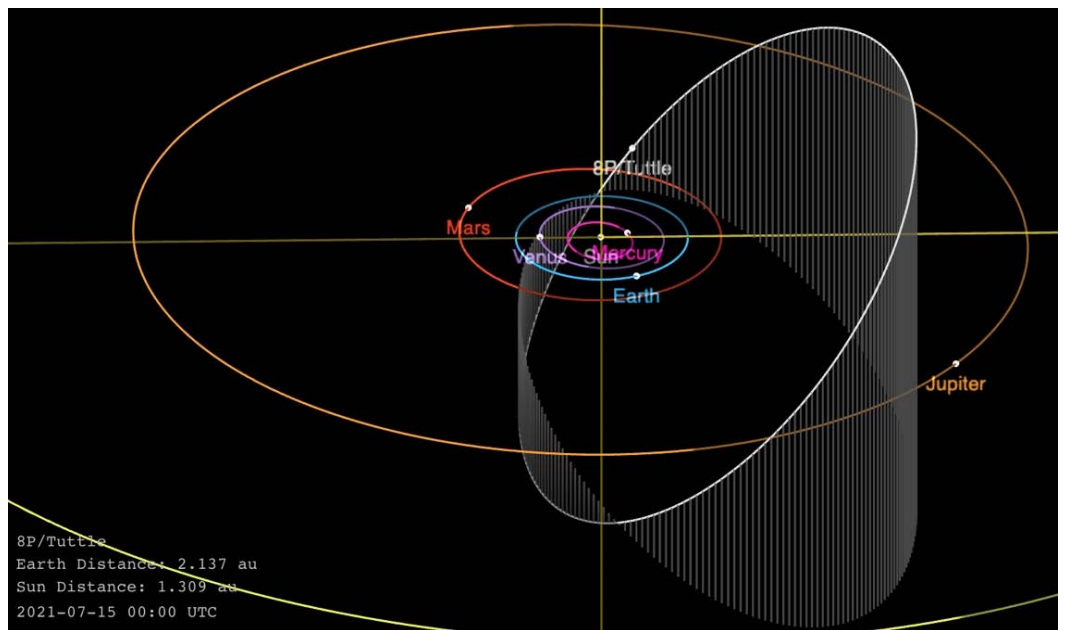


Figure 10 - Orbit of 8P/Tuttle and the inner planets and Jupiter for mid-July. Image produced with the JPL Small-Body Database Browser.

The current return is poor with Tuttle arriving at perihelion nearly on the opposite side of the Sun from Earth. Even with such poor placement and a minimum distance to Earth on September 12 of 1.81 au, Tuttle is expected to brighten to magnitude 8.5 in September.

For yet another month, Tuttle is located at a very low solar elongation (21-26 deg) and will be difficult to observe. This should improve by the end of the month as the comet will start to move out of the glow of the dawn as a 9th magnitude object for southern observers. Tuttle's large inclination results in it spending most of its time post-perihelion far south of the ecliptic, as a result the comet won't be visible to northern observers until it has faded beyond the reach of visual observers.

15P/Finlay

Discovered 1886 September 26 by the William Henry Finlay
 Perihelion on 2021 July 13 at 0.99 au, inclination = 6.8 deg, eccentricity = 0.72
 Short-period comet with orbital period of ~6.56 years

15P/Finlay									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	05 00	+23 49	1.028	1.262	52M	Tau	11.1	24	15	
2021-Aug-06	05 20	+24 46	1.049	1.291	52M	Tau	11.3	26	13	
2021-Aug-11	05 39	+25 31	1.074	1.320	52M	Tau	11.5	28	12	
2021-Aug-16	05 58	+26 05	1.103	1.347	53M	Tau	11.7	29	11	
2021-Aug-21	06 16	+26 29	1.135	1.374	54M	Gem	12.0	31	10	
2021-Aug-26	06 33	+26 45	1.171	1.398	55M	Gem	12.2	33	9	
2021-Aug-31	06 49	+26 54	1.208	1.420	56M	Gem	12.5	35	9	
2021-Sep-05	07 04	+26 58	1.248	1.439	58M	Gem	12.7	37	8	

Comet Magnitude Parameters --- H = 10.4, 2.5n = 16.0

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
15	2021 07 26.48	C 12.8	GG	27.9T	6A300	1.3			ICQ xx OLAXx	Mike Olason
15	2021 07 14.11	S 10.2	TK	20.3T10	100	5	3		ICQ XX GON05	J J Gonzalez Suarez
15	2021 07 12.77	xM 11.3	AQ	40.0L	4 59	2.6	4		ICQ XX WYA	Christopher Wyatt
15	2021 07 06.76	xM 11.1	AQ	40.0L	4 59	2.9	4		ICQ XX WYA	Christopher Wyatt

15P/Finlay was discovered in 1886 by William Henry Finlay at the Royal Observatory at Cape of Good Hope in South Africa. This apparition marks the 16th observed return of 15P. Its best return was in 1906 when it passed 0.27 au from Earth and reached 6th magnitude. During its previous return in 2014/2015, 15P experienced two outbursts of 2-3 mag outburst with the brightest reaching 7th magnitude.

Chris Wyatt visually observed 15P at magnitude 11.1 and 11.3 on July 6 and 12 with his 0.40-m f/4 reflector. J. J. Gonzalez found the comet to be brighter (10.2) and larger (~5' vs Chris' 2.6-2.9'). Aperture correcting Chris's measurements do make them 0.9 magnitudes brighter and more in line with J. J.'s observations.

Perihelion was last month on July 13th at 0.99 au, Finlay should now be fading from ~11th to 12th magnitude as it moves away from the Earth and Sun. The comet is a morning object in Taurus (Aug 1-16) and Gemini (16-30).

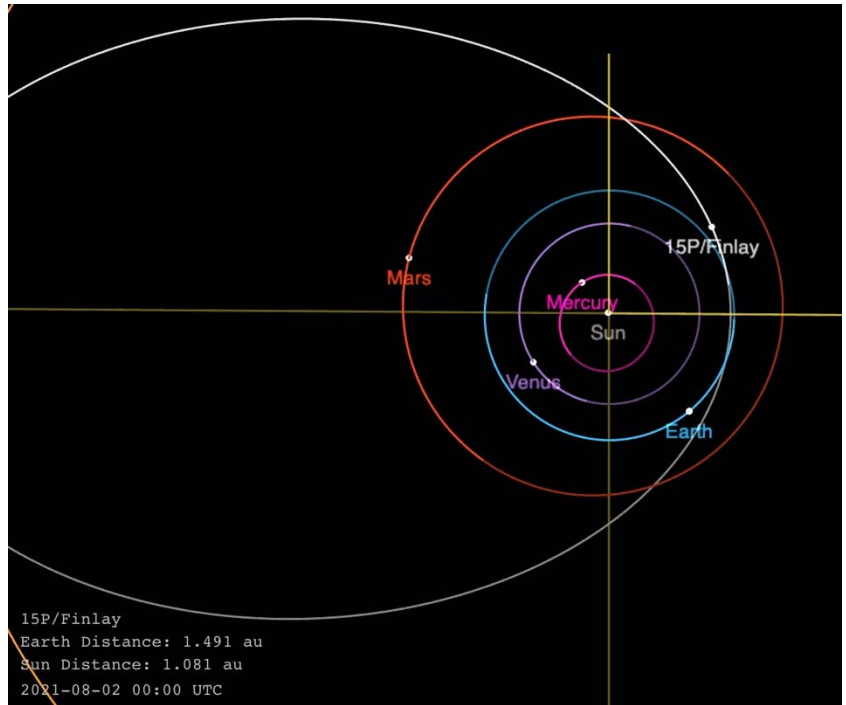


Figure 11 - Orbit of 15P/Finlay and the inner planets and Jupiter for early August. Image produced with the JPL Small-Body Database Browser.

67P/Churyumov-Gerasimenko

Discovered 1969 September 11 by the Klim Ivanovic Churyumov and Svetlana Ivanovna Gerasimenko
 Perihelion on 2021 November 2 at 1.21 au, inclination = 3.9 deg, eccentricity = 0.65
 Short-period comet with orbital period of ~6.43 years

67P/Churyumov-Gerasimenko

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2021-Aug-01	01 36	+05 16	1.646	1.070	104M	Psc	13.7	48	45
2021-Aug-06	01 49	+06 27	1.609	1.004	105M	Psc	13.5	51	43
2021-Aug-11	02 02	+07 40	1.573	0.940	107M	Psc	13.2	53	42
2021-Aug-16	02 15	+08 55	1.537	0.880	108M	Cet	12.9	56	41
2021-Aug-21	02 29	+10 12	1.502	0.824	109M	Cet	12.7	58	40
2021-Aug-26	02 44	+11 32	1.469	0.770	110M	Ari	12.4	60	38
2021-Aug-31	03 00	+12 54	1.436	0.721	111M	Ari	12.1	62	37
2021-Sep-05	03 16	+14 18	1.405	0.675	111M	Ari	11.8	64	35

Comet Magnitude Parameters --- H = 9.5, 2.5n = 14.0, offset = +40 days [Ref: Seiichi Yoshida]

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
67	2021 07 12.76 xM	15.0	AQ	40.0L	4	182	0.4 5/		ICQ XX WYA	Chris Wyatt
67	2021 07 06.73 xM	15.1	AQ	40.0L	4	261	0.3 6		ICQ XX WYA	Chris Wyatt

67P was discovered on plates taken on 1969 September 11 by Kiev University Astronomical Observatory astronomers Klim Ivanovic Churyumov and Svetlana Ivanovna Gerasimenko working with a 50-cm Maksutov astrograph at the Alma-Ata Astrophysical Institute in current day Kazakhstan. This apparition is 67P's 9th observed return with perihelion occurring on 2021 November 2 at 1.21 au. A close approach to Earth at 0.42 au on November 12 results in the comet's best return since 1982 when it came marginally closer to Earth at 0.39 au. At that return, a peak brightness of 9th magnitude was reached. A similar brightness should occur this November and December when it will be a morning object visible from both hemispheres. Like 19P, 67P was also the target of a spacecraft mission. The ESA Rosetta and Philae crafts are the only spacecraft to have orbited and landed on a comet. This will be 67P's first return since Rosetta ended its mission by soft landing onto the comet's surface.

Chris Wyatt spied 67P twice in July and found the comet to be magnitude 15.0 and 15.1. Aperture correction suggests the comet is closer to 14.0 which is in line with the prediction for the comet to brighten from magnitude 13.7 to 12.1 this month as it moves through Pisces (Aug 1-12), Cetus (12-22) and Aries (22-30) in the morning sky.

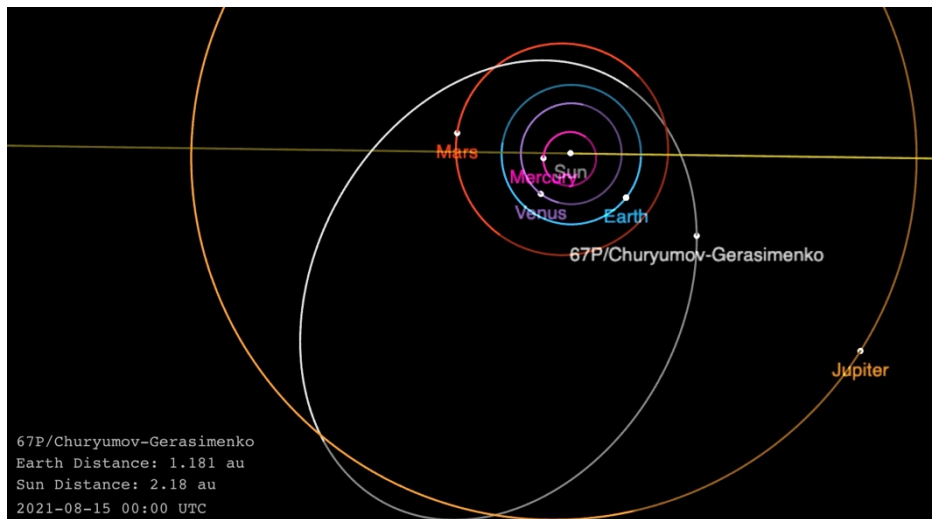


Figure 12 - Orbit of 67P/Churyumov-Gerasimenko and the planets for mid-August. From the JPL Small-Body Browser.

C/2017 K2 (PANSTARRS)

Discovered 2017 May 21 by the Pan-STARRS survey with the Pan-STARRS1 1.8-m on Haleakala
 Perihelion on 2022 December 19 at 1.80 au, inclination = 87.6 deg, eccentricity = 1.00008
 Dynamically old long-period comet

C/2017 K2 (PANSTARRS)

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2021-Aug-01	17 08	+38 35	5.724	5.391	104E	Her	13.0	84	11
2021-Aug-06	17 05	+37 43	5.682	5.383	102E	Her	13.0	81	12
2021-Aug-11	17 03	+36 48	5.639	5.378	99E	Her	13.0	78	13
2021-Aug-16	17 01	+35 51	5.597	5.376	97E	Her	12.9	76	14
2021-Aug-21	16 59	+34 52	5.555	5.377	94E	Her	12.9	73	15
2021-Aug-26	16 58	+33 51	5.512	5.379	92E	Her	12.9	70	16
2021-Aug-31	16 57	+32 50	5.470	5.384	89E	Her	12.9	68	17
2021-Sep-05	16 56	+31 48	5.427	5.390	86E	Her	12.8	65	17

Comet Magnitude Parameters --- H = 3.6, 2.5n = 7.6

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
2017K2	2021 07 31.48 xM	13.2	AQ	40.0L	4	108	1.0 3/	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 30.45 xM	13.3	AQ	40.0L	4	182	1.0 5/	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 29.40 xM	13.2	AQ	40.0L	4	108	1.5 4	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 27.92 S	12.2	AQ	20.3T10	133		1.0 4/	ICQ XX GON05	Juan Jose Gonzalez Suarez	
2017K2	2021 07 27.41 xM	13.5	AQ	25.0L	5	179	0.8 3	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 13.96 S	12.1	AQ	20.3T10	77		1.5 4	ICQ XX GON05	Juan Jose Gonzalez Suarez	
2017K2	2021 07 12.42 xM	13.5	AQ	40.0L	4	108	1 5/	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 08.96 S	12.2	AQ	20.3T10	100		1.5 4	ICQ XX GON05	Juan Jose Gonzalez Suarez	
2017K2	2021 07 05.88 I	13.0:TK	25.0C10	192			7	ICQ XX DECa	Michel Deconinck	
2017K2	2021 07 05.49 xM	13.5	AQ	40.0L	4	182	1 5/	ICQ XX WYA	Christopher Wyatt	
2017K2	2021 07 04.98 S	12.3	AQ	20.3T10	133		1.5 4	ICQ XX GON05	Juan Jose Gonzalez Suarez	

C/2017 K2 (PANSTARRS) was discovered on 2017 May 21 by the Pan-STARRS1 1.8-m telescope at Haleakala on the Hawaiian island of Maui. At discovery the comet was around 21st magnitude and located at 16.1 au from the Sun. Pre-discovery observations were found back to May of 2013 when the comet was 23.7 au from the Sun. For comparison Uranus has a semi-major axis of 19.2 au.

C/2017 K2 (PANSTARRS) is still 16 months from a 2022 December 19 perihelion at 1.80 au when it should reach 7th magnitude (if its current 2.5n ~ 7.6 brightening trend continues). A large number of visual observations were made in July by Michel Deconinck, J. J. Gonzalez and Chris Wyatt. They found a small comet with a coma diameter between 0.8' and 1.5'. Chris placed the comet between magnitude 13.2 and 13.5.

Michel's sole observation was a little brighter at 13.0 while J. J. was the brightest at magnitude 12.1 to 12.3.

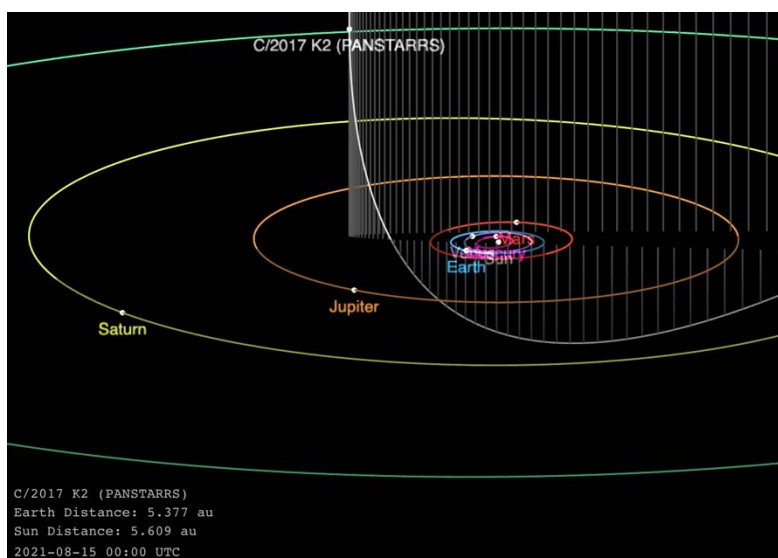


Figure 13 - Orbit of C/2017 K2 (PANSTARRS) from the JPL Small-Body Browser.

C/2017 K2 remains a northern object in Hercules though still observable from the southern hemisphere as shown by Chris Wyatt's observations from Australia. The comet will continue to slowly brighten throughout the remainder of 2021 and all of 2022.



C/2017 K2 (PanSTARRS) 2021/07/05 - 21h14 UTC
 Takahashi Mewlon 250mm f10 - 192x F.O.S.: 18'
 Magn.: +13.0 - Tail: N/A - Coma: ? - DC: 7
 Aquarellia Observatory

Figure 14 - A sketch of C/2017 K2 (PANSTARRS) by Michel Deconinck made on July 5.

C/2019 L3 (ATLAS)

Discovered 2017 May 21 by the Pan-STARRS survey with the Pan-STARRS1 1.8-m on Haleakala
 Perihelion on 2022 January 9 at 3.55 au, inclination = 48.4 deg, eccentricity = 1.0016
 Dynamically new long-period comet

C/2019 L3 (ATLAS)									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	06 09	+47 40	3.845	4.522	43M	Aur	11.5	25	0	
2021-Aug-06	06 18	+47 21	3.828	4.467	45M	Aur	11.4	28	0	
2021-Aug-11	06 26	+47 02	3.812	4.410	48M	Aur	11.4	30	0	
2021-Aug-16	06 33	+46 41	3.796	4.350	51M	Aur	11.3	33	0	
2021-Aug-21	06 41	+46 20	3.780	4.287	53M	Aur	11.3	36	0	
2021-Aug-26	06 48	+45 58	3.765	4.222	56M	Aur	11.2	39	0	
2021-Aug-31	06 55	+45 35	3.750	4.154	59M	Aur	11.2	42	0	
2021-Sep-05	07 01	+45 12	3.736	4.084	63M	Aur	11.1	45	0	

Comet Magnitude Parameters --- H = 3.5, 2.5n = 8.0

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
2019L3	2021 07 14.12	S 11.2	TK	20.3	T10	100	2.5 3/	ICQ XX GON05	Juan Jose Gonzalez Suarez	
2019L3	2021 07 09.09	S 11.4	TK	20.3	T10	133	2.5 3/	ICQ XX GON05	Juan Jose Gonzalez Suarez	

C/2019 L3 passed north of the Sun a few weeks ago and is now a morning object for northern hemisphere observers as it moves through Auriga.

J. J. Gonzalez made two observations of L3 in July finding the comet at magnitude 11.4 on the 9th and 11.2 on the 14th with a 2.5' coma on both nights.

C/2019 L3 is still 5 months from a 2022 January 9 perihelion at 3.57 au. The large perihelion distance means C/2019 L3 should remain a visual object well into 2022 and possibly even 2023. If the comet brightens at a conservative 2.5n

= 8 rate, it could reach magnitude 10.0 at the end of 2021 when it will be well placed in the opposition sky.

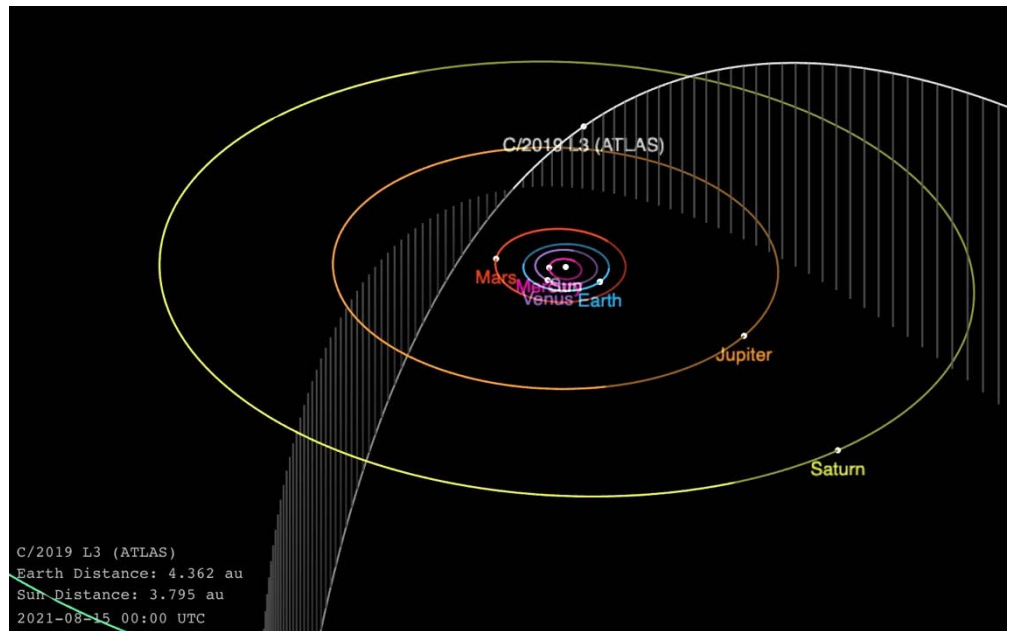


Figure 15 - Orbit diagram of C/2019 L3 (ATLAS) from the JPL Small-body Database Browser.

Fainter Comets of Interest (Fainter than 13.0)

C/2021 A1 (Leonard)

Discovered 2021 January 3 by Greg Leonard of the Catalina Sky Survey with the 1.5-m on Mount Lemmon
 Perihelion on 2022 January 3 at 0.61 au, inclination = 132.7 deg, eccentricity = 1.00002
 Dynamically old long-period comet

C/2021 A1 (Leonard)									Max El (deg)	
Date	R.A.	Decl.	r	d	Elong	Const	Mag	40N	40S	
2021-Aug-01	10 35	+46 07	2.698	3.449	36E	UMa	16.3	19	0	
2021-Aug-06	10 38	+45 18	2.632	3.402	34E	UMa	16.2	17	0	
2021-Aug-11	10 40	+44 31	2.566	3.350	33E	UMa	16.0	15	0	
2021-Aug-16	10 43	+43 44	2.500	3.291	32E	UMa	15.9	14	0	
2021-Aug-21	10 46	+42 59	2.433	3.226	32E	UMa	15.8	12	0	
2021-Aug-26	10 50	+42 16	2.365	3.154	32E	UMa	15.6	11	0	
2021-Aug-31	10 53	+41 33	2.297	3.076	33E	UMa	15.5	9	0	
2021-Sep-05	10 57	+40 52	2.228	2.992	33M	UMa	15.3	8	0	

Comet Magnitude Parameters --- H = 10.3, 2.5n = 7.6

Recent Magnitude Measurements in ICQ format:

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia	TAIL DC LENG PA	ICQ CODE	Observer Name
2021A1	2021 07 05.23	V 17.3	U4	61.0Y	7A200	0.5	0.6m 85	ICQ xx HER02	Carl Hergenrother	

C/2021 A1 (Leonard) was found on 2021 January 3 by Greg Leonard with the Mount Lemmon 1.5-m reflector. At discovery, it was around 19th magnitude and located 5.1 au from the Sun.

C/2021 A1 has the potential to become a nice object at the end of the year due to a relatively small perihelion of 0.62 au on 2022 January 3, a close approach to within 0.233 au from Earth on December 12, and a phase angle that reaches a maximum of 160 degrees at the time of close approach which may result in a few magnitudes of enhanced brightness due to forward scattering of light by cometary dust. Working against are a small solar elongation at the time of maximum brightness (a minimum elongation of 15 deg) and the comet's slow rate of brightening.

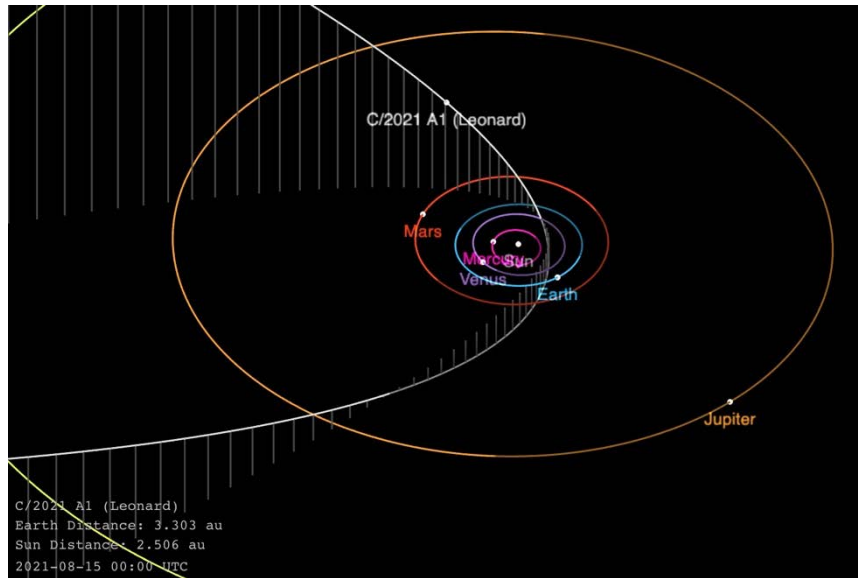


Figure 16 - Orbit of C/2021 A1 (Leonard) from the JPL Small-body Database Browser.

I was able to observe the comet with one of the iTelescopes.net 0.6-m telescopes at magnitude 17.3 on July 5. Only one a single observation has been submitted to COBS since then (Michael Lehmann found Leonard at magnitude 16.2 on July 30). The new data confirms that Leonard is still brightening at a rate of $2.5n \sim 7.6$ which would result in a peak brightness around magnitude 6.3. Even with 2-3 magnitudes of dust forward scattering enhancement, Leonard may be a very difficult object to observe when at its best.

C/Leonard is an evening object near 15-16th magnitude located in Ursa Major. The comet is far enough north of the Sun that it will be observed through its upcoming solar conjunction in early September though it will be a very low object in August and September (and below the horizon for southern hemisphere observers). Imagers and large aperture visual observers are strongly encouraged to monitor C/2021 A1 over the coming months.

C/2021 O3 (PANSTARRS)

Discovered 2021 July 26 by Pan-STARRS with the 1.8-m Pan-STARRS1 1.8-m on Haleakala
 Perihelion on 2022 April 21 at 0.29 au, inclination = 56.7 deg, eccentricity = 1.0

Date	R.A.	Decl.	r	d	Elong	Const	Mag	Max El	
								40N	40S
2021-Aug-01	23 24	+27 58	4.251	3.655	119M	Peg	18.9	78	22
2021-Aug-06	23 21	+28 04	4.194	3.541	124M	Peg	18.8	78	22
2021-Aug-11	23 18	+28 06	4.137	3.431	128M	Peg	18.7	78	22
2021-Aug-16	23 14	+28 02	4.079	3.326	132M	Peg	18.6	78	22
2021-Aug-21	23 10	+27 53	4.021	3.226	136M	Peg	18.5	78	22
2021-Aug-26	23 05	+27 39	3.962	3.132	140M	Peg	18.4	78	22
2021-Aug-31	23 00	+27 18	3.903	3.045	143M	Peg	18.2	77	23
2021-Sep-05	22 54	+26 50	3.843	2.964	146E	Peg	18.1	77	23

Comet Magnitude Parameters --- H = 11.1, 2.5n = 8.0

MPEC 2021-P05 and CBET 5009 reported the discovery of a new comet by the Pan-STARRS survey. C/2021 O3 (PANSTARRS) was first seen on July 26 at 19th magnitude by the Pan-STARRS1 1.8-m Ritchey-Chretien on Haleakala. Though currently 4.2 au from the Sun, C/2021 O3 will get a lot closer to the Sun at perihelion. With an observational arc of only 6-days, the comet appears to be a long-period comet though it will be some weeks (unless pre-discovery observations are found) before we know whether it is dynamically old or new.

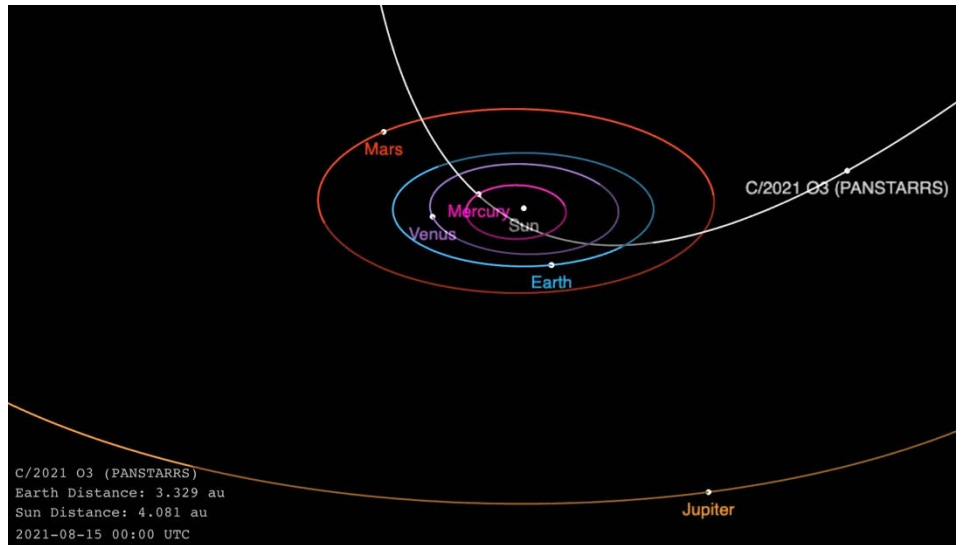


Figure 17 – Orbit of C/2021 O3 (PANSTARRS) from the JPL Small-Body Browser.

The current orbit by Syuichi Nakano has perihelion occurring on 2022 April 21 at 0.29 au [CBET 5009]. At the present, we don't have any information on this comet's brightening rate. Any prediction of C/2021 O3's brightness near perihelion will be very uncertain. Not to mention, whether the comet will even survive to reach perihelion.

C/2021 O3 will experience some of the same observational issues as C/2021 A1 (Leonard). On the plus side, PANSTARRS will reach a relatively large phase angle though not as large as Leonard (only ~136 vs 160 deg). PANSTARRS will also be located at very small solar elongation near perihelion which will make it a VERY difficult object to observe until a few weeks after perihelion and then only for northern observers.

This month, the comet is riding high in Pegasus near opposition for northern observers, but not too far north so southern observers will also be able to observe it. Though by observe, we mean imaging as the comet is expected to be around 18-19th magnitude this month.

Southern hemisphere observers should be able to follow PANSTARRS will near the end of the year when the comet could be around 15-16th magnitude. Northern hemisphere observers will be able to follow it for another month or two till mid-February when it could be as bright as 13-14th magnitude. The comet will then spend the next two and a half months within 20 deg of the Sun.

The comet's orbit will be refined over the coming weeks so we may still see its date of perihelion shift by a day or two. The analysis the follows is based on the current orbit with perihelion on 2022 April 21.26 UT at 0.297 au from the Sun and assumes the comet will not disintegrate. If it turns out to be dynamically new, its current brightness suggests an intrinsically faint object that may be prone to disintegration.

The comet's orbit is aligned in such a way that the comet will be mainly a northern hemisphere object except for a week or so centered on perihelion. On the date of perihelion C/2021 O3 will be an evening object located only 16 deg from the Sun. Northern hemisphere observers (for +40N) will not be able to observe it at that time as it will still be 7 deg below the horizon at the start of nautical twilight. It will be observable from the southern hemisphere (-40S) when it will be at an elevation of 5 deg at the start of nautical twilight and only 1 deg below the horizon at the start of astronomical twilight. If the comet brightens at a $10\log(r)$ from now till perihelion, it could be a magnitude 4.3 object. If its rate of brightening is $8\log(r)$, it will be fainter at magnitude 6.6. Either way this will be a difficult observation.

The comet becomes observable in a dark sky (after the end of astronomical twilight) by the first few nights of May. This is around the time of maximum phase angle (135 deg) which may provide a 1-2 magnitude boost in brightness. Still, we are talking about an object that may only be around 3rd-6th magnitude and still located ~20 deg from the Sun. Though it will be fading fast, the comet will quickly move north and circumpolar by mid-May.

Like Leonard, we still have some time to watch and wait. Imagers are highly encouraged to observe PANSTARRS over the coming months.

New Discoveries, Recoveries and Other Comets in the News

C/2021 O3 (PANSTARRS) – See above.

P/2021 O2 = P/2005 W3 (Kowalski) – This returning comet was a Catalina Sky Survey discovery by Richard Kowalski. At its 2005 apparition it peaked at 18th magnitude. The Pan-STARRS survey serendipitously recovered the comet on July 20th of this year at 20th magnitude. Rob Weryk (University of Western Ontario) then found Pan-STARRS observations 6 nights in 2020 going back to 2020 August 19. This year perihelion occurs on 2021 September 20 at 2.89 au. If the comet follows the same brightness trend as it did in 2005, it should peak at 17th magnitude. [Ref: CBET 5006]

C/2021 O1 (Nishimura) – See above.

C/2021 N3 (PANSTARRS) – The Pan-STARRS survey discovered this new long-period comet at 20th magnitude on July 13 with the Pan-STARRS1 1.8-m on Haleakala. The comet has already passed perihelion (T = 2020 August 19, q = 5.72 au) and will likely slowly fade from here on out. [Ref: MPEC 2021-O39, CBET 5003]

P/2021 N2 (Fuls) – David Carson Fuls found this 18th magnitude comet on July 9 with the 0.68-m Catalina Schmidt. *P/2021 N2* is a short-period comet with an orbital period of 19.58-years. Perihelion is on 2021 October 29 at 3.82 au. A peak brightness around 17th magnitude is expected in November when the comet will be at opposition and still within weeks of perihelion. [Ref: MPEC 2021-N137, CBET 5000!]

P/2021 N1 (ZTF) – The Palomar 1.2-m Schmidt was used by the Zwicky Transient Facility survey to find this comet on July 2 at 19th magnitude. Pre-discovery observations from June 17th show the comet to have been brighter at 17th magnitude. *P/2021 N1* is a short-period comet with a 5.12-year orbital period and small perihelion distance of 0.96 au. The comet is now fading as perihelion was back on 2021 June 6. [Ref: MPEC 2021-N115, CBET 4999]

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 >.

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

Stay safe and enjoy the sky!
- Carl Hergenrother

Recent Magnitudes Contributed to the ALPO Comets Section

Comet Des	YYYY MM DD.DD (UT)	Mag	SC	APER	FL	POW	COMA Dia DC	TAIL LENG PA	ICQ CODE	Observer Name
C/2021 O1 (Nishimura)	2021 07 26.47	C 9.2	GG	27.9T	6A	270	1.3		ICQ xx OLaxx	Mike Olason
C/2021 A1 (Leonard)	2021 07 05.23	V 17.3	U4	61.0Y	7A	200	0.5	0.6m 85	ICQ xx HER02	Carl Hergenrother
C/2020 T2 (Palomar)	2021 07 31.48	xM 10.4	AQ	40.0L	4	59	4.0 6		ICQ XX WYA	Christopher Wyatt
	2021 07 30.44	xM 10.6	AQ	40.0L	4	59	4.0 6		ICQ XX WYA	Christopher Wyatt
	2021 07 29.39	xM 10.4	AQ	40.0L	4	59	6.0 5		ICQ XX WYA	Christopher Wyatt
	2021 07 27.91	S 9.9	TK	20.3T10		77	6 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 27.40	xM 10.4	TK	25.0L	5	40	5.0 5		ICQ XX WYA	Christopher Wyatt
	2021 07 13.94	S 9.8	TK	20.3T10		77	6 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 12.40	xM 10.5	AQ	40.0L	4	59	4.5 6		ICQ XX WYA	Christopher Wyatt
	2021 07 08.94	S 9.7	TK	20.3T10		77	7 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 05.91	E 10.5	TK	25.0C10		62	5 3		ICQ XX DECa	Michel Deconinck
	2021 07 05.43	xM 10.5	AQ	40.0L	4	59	4.2 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 04.96	S 9.8	TK	20.3T10		77	6 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 04.36	xM 10.4	AQ	25.0L	5	40	3.8 5		ICQ XX WYA	Christopher Wyatt
C/2020 PV6 (PANSTARRS)	2021 07 30.46	xM 14.7	AQ	40.0L	4	261	0.5 4		ICQ XX WYA	Christopher Wyatt
	2021 07 29.41	xM 14.6	AQ	40.0L	4	182	0.5 4		ICQ XX WYA	Christopher Wyatt
C/2020 J1 (SONEAR)	2021 07 30.45	xM 13.8	AQ	40.0L	4	108	0.9 6		ICQ XX WYA	Christopher Wyatt
	2021 07 29.40	xM 13.8	AQ	40.0L	4	108	1.0 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 27.90	S 11.3	TK	20.3T10		77	4 1/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 13.93	S 11.1	TK	20.3T10		100	4 2		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 12.41	xM 13.4	AQ	40.0L	4	108	1 6		ICQ XX WYA	Christopher Wyatt
	2021 07 08.92	S 11.2	TK	20.3T10		100	4 2/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 05.50	xM 13.9	AQ	40.0L	4	182	0.6 6		ICQ XX WYA	Christopher Wyatt
	2021 07 04.95	S 11.2	TK	20.3T10		77	5 2/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 04.37	xM 13.9	AQ	25.0L	5	125	1.3 4		ICQ XX WYA	Christopher Wyatt
C/2020 F5 (MASTER)	2021 07 31.50	xM 14.7	AQ	40.0L	4	182	0.5 6		ICQ XX WYA	Christopher Wyatt
	2021 07 30.50	xM 14.9	AQ	40.0L	4	182	0.6 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 29.46	xM 15.1	AQ	40.0L	4	182	0.6 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 12.75	xM 14.9	AQ	40.0L	4	261	0.5 6		ICQ XX WYA	Christopher Wyatt
	2021 07 06.72	xM 14.9	AQ	40.0L	4	182	0.5 6		ICQ XX WYA	Christopher Wyatt
C/2019 T4 (ATLAS)	2021 07 12.39	xM 14.6	AQ	40.0L	4	182	0.4 4/		ICQ XX WYA	Christopher Wyatt
	2021 07 05.42	xM 14.4	AQ	40.0L	4	182	0.5 4/		ICQ XX WYA	Christopher Wyatt
C/2019 L3 (ATLAS)	2021 07 14.12	S 11.2	TK	20.3T10		100	2.5 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 09.09	S 11.4	TK	20.3T10		133	2.5 3/		ICQ XX GON05	Juan Jose Gonzalez Suarez
C/2019 F1 (ATLAS-Africano)	2021 07 31.51	xM 14.7	AQ	40.0L	4	261	0.5 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 30.49	xM 14.8	AQ	40.0L	4	261	0.6 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 29.45	xM 14.9	AQ	40.0L	4	261	0.5 3/		ICQ XX WYA	Christopher Wyatt
	2021 07 12.78	xM 14.8	AQ	40.0L	4	261	0.5 6		ICQ XX WYA	Christopher Wyatt
	2021 07 06.70	xM 14.8	AQ	40.0L	4	261	0.5 4		ICQ XX WYA	Christopher Wyatt
	2021 07 05.47	xM 14.9	AQ	40.0L	4	261	0.3 4		ICQ XX WYA	Christopher Wyatt
C/2018 U1 (Lemmon)	2021 07 31.50	xM 15.0	AQ	40.0L	4	261	0.5 3/		ICQ XX WYA	Christopher Wyatt
	2021 07 30.48	xM 15.0	AQ	40.0L	4	261	0.5 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 29.44	xM 15.0	AQ	40.0L	4	261	0.5 5		ICQ XX WYA	Christopher Wyatt
	2021 07 05.48	xM 15.0	AQ	40.0L	4	261	0.3 5/		ICQ XX WYA	Christopher Wyatt
C/2017 K2 (PANSTARRS)	2021 07 31.48	xM 13.2	AQ	40.0L	4	108	1.0 3/		ICQ XX WYA	Christopher Wyatt
	2021 07 30.45	xM 13.3	AQ	40.0L	4	182	1.0 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 29.40	xM 13.2	AQ	40.0L	4	108	1.5 4		ICQ XX WYA	Christopher Wyatt
	2021 07 27.92	S 12.2	AQ	20.3T10		133	1.0 4/		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 27.41	xM 13.5	AQ	25.0L	5	179	0.8 3		ICQ XX WYA	Christopher Wyatt
	2021 07 13.96	S 12.1	AQ	20.3T10		77	1.5 4		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 12.42	xM 13.5	AQ	40.0L	4	108	1 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 08.96	S 12.2	AQ	20.3T10		100	1.5 4		ICQ XX GON05	Juan Jose Gonzalez Suarez
	2021 07 05.88	I 13.0:TK	25.0C10			192	7		ICQ XX DECa	Michel Deconinck
	2021 07 05.49	xM 13.5	AQ	40.0L	4	182	1 5/		ICQ XX WYA	Christopher Wyatt
	2021 07 04.98	S 12.3	AQ	20.3T10		133	1.5 4		ICQ XX GON05	Juan Jose Gonzalez Suarez
246P/NEAT	2021 07 30.43	xM 14.3	AQ	40.0L	4	182	0.6 4/		ICQ XX WYA	Christopher Wyatt
246	2021 07 29.43	xM 14.1	AQ	40.0L	4	182	0.7 5/		ICQ XX WYA	Christopher Wyatt
246	2021 07 12.73	xM 14.5	AQ	40.0L	4	261	0.6 5/		ICQ XX WYA	Christopher Wyatt
246	2021 07 06.70	xM 13.8	AQ	40.0L	4	182	0.8 4/		ICQ XX WYA	Christopher Wyatt

246	2021 07 05.46	xM	14.0	AQ	40.0L	4	182	0.6	5		ICQ XX WYA	Christopher Wyatt
106P/Schuster												
106	2021 07 26.45	C	15.2	GG	27.9T	6A	540	0.4		> 1.4m245	ICQ xx OLAXx	Mike Olason
67P/Churyumov-Gerasimenko												
67	2021 07 12.76	xM	15.0	AQ	40.0L	4	182	0.4	5/		ICQ XX WYA	Chris Wyatt
67	2021 07 06.73	xM	15.1	AQ	40.0L	4	261	0.3	6		ICQ XX WYA	Chris Wyatt
19P/Borrelly												
19	2021 07 11.64	C	18.1	U4	43.0Y	7A	200	0.4		0.3m240	ICQ xx HER02	Carl Hergenrother
15P/Finlay												
15	2021 07 26.48	C	12.8	GG	27.9T	6A	300	1.3			ICQ xx OLAXx	Mike Olason
15	2021 07 14.11	S	10.2	TK	20.3T	10	100	5	3		ICQ XX GON05	Juan Jose Gonzalez Suarez
15	2021 07 12.77	xM	11.3	AQ	40.0L	4	59	2.6	4		ICQ XX WYA	Christopher Wyatt
15	2021 07 06.76	xM	11.1	AQ	40.0L	4	59	2.9	4		ICQ XX WYA	Christopher Wyatt
10P/Tempel												
10	2021 07 26.40	C	13.4	GG	27.9T	6A	600	1.3			ICQ xx OLAXx	Mike Olason
10	2021 07 12.76	xS	13.6	AQ	40.0L	4	182	1.1	3		ICQ XX WYA	Christopher Wyatt
10	2021 07 06.75	xM	13.5	AQ	40.0L	4	182	1	3/		ICQ XX WYA	Christopher Wyatt
7P/Pons-Winnecke												
7	2021 07 31.51	xM	11.8	AQ	40.0L	4	59	6.0	3/		ICQ XX WYA	Christopher Wyatt
7	2021 07 30.50	xM	13.0	AQ	40.0L	4	108	1.9	6		ICQ XX WYA	Christopher Wyatt
7	2021 07 29.47	xM	12.4	AQ	40.0L	4	108	1.8	5/		ICQ XX WYA	Christopher Wyatt
7	2021 07 26.43	C	12.2	GG	27.9T	6A	300	1.3		288	ICQ xx OLAXx	Mike Olason
7	2021 07 12.74	xM	11.2	AQ	40.0L	4	59	3.1	5		ICQ XX WYA	Christopher Wyatt
7	2021 07 09.11	S	10.5	TK	20.3T	10	100	5	2/		ICQ XX GON05	Juan Jose Gonzalez Suarez
7	2021 07 06.71	xM	11.8	AQ	40.0L	4	59	4.8	6		ICQ XX WYA	Christopher Wyatt
4P/Faye												
4	2021 07 26.38	C	12.3	GG	27.9T	6A	540	1.3		8 m256	ICQ xx OLAXx	Mike Olason
4	2021 07 22.08	I	11.0	TK	12.6B	5	62	& 1	6		ICQ XX DECaa	Michel Deconinck
4	2021 07 14.09	S	10.8	TK	20.3T	10	77	4	2/		ICQ XX GON05	Juan Jose Gonzalez Suarez
4	2021 07 09.08	S	11.1	TK	20.3T	10	100	4	2/		ICQ XX GON05	Juan Jose Gonzalez Suarez