

MINOR PLANETS AT UNUSUALLY FAVORABLE ELONGATIONS IN 2022

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A list is presented of minor planets which are much brighter than usual at their 2022 apparitions.

The minor planets in the lists which follow will be much brighter at their 2022 apparitions than at their average distances at maximum elongation. Many years may pass before these planets will be again as bright as in 2022. Observers are encouraged to give special attention to those which lie near the limit of their equipment.

These lists have been prepared by an examination of the maximum elongation circumstances of minor planets computed by the author for all years through 2060 with a full perturbation program written by Dr. John Reed, and to whom he expresses his thanks. Elements are from EMP 1992, except that for all planets for which new or improved elements have been published subsequently in the Minor Planet Circulars or in electronic form, the newer elements have been used. Planetary positions are from the JPL DE-200 ephemeris, courtesy of Dr. E. Myles Standish.

Any planets whose brightest magnitudes near the time of maximum elongation vary by at least 2.0 in this interval and in 2022 will be within 0.3 of the brightest occurring, or vary by at least 3.0 and in 2022 will be within 0.5 of the brightest occurring; and which are visual magnitude 14.5 or brighter, are included. For planets brighter than visual magnitude 13.5, which are within the range of a large number of observers, these standards have been relaxed somewhat to include a larger number of planets. Magnitudes have been computed from the updated magnitude parameters published in MPC28104-28116, on 1996 Nov. 25, or more recently in the Minor Planet Circulars.

Oppositions may be in right ascension or in celestial longitude. Here we use still a third representation, maximum elongation from the Sun, instead of opposition. Though unconventional, it has the advantage that many close approaches do not involve actual opposition to the Sun near the time of minimum distance and greatest brightness and are missed by an opposition-based program. Other data are also provided according to the following tabular listings: Minor planet number, date of maximum elongation from the Sun in format yyyy/mm/dd, maximum elongation in degrees, right ascension on date of maximum elongation, declination on date of maximum elongation, both in J2000 coordinates, date of brightest magnitude in format yyyy/mm/dd, brightest magnitude, date of minimum distance in format yyyy/mm/dd, and minimum distance in AU.

Users should note that when the maximum elongation is about 177° or greater, the brightest magnitude is sharply peaked due to enhanced brightening near zero phase angle. Even as near as 10 days before or after minimum magnitude the magnitude is generally about 0.4 greater. This effect takes place in greater time interval for smaller maximum elongations. There is some interest in very small minimum phase angles. For maximum elongations E near 180° at Earth distance Δ, an approximate formula for the minimum phase angle φ is

$$\phi = (180^\circ - E) / (\Delta + 1)$$

A special list of asteroids approaching the Earth more closely than 0.3 AU is provided following the list of temporal sequence of favorable elongations.

Table I. Numerical Sequence of Favorable Elongations

Planet	Max	Elon	D	Max	E	RA	Dec	Br	Mag	D	Br	Mag	Min	Dist	D	Min	Dist
10	2022/04/29	174.6°	14h16m	-19°				2022/04/29	9.2	2022/05/01	1.799						
13	2022/05/04	179.5°	14h46m	-16°				2022/05/04	9.9	2022/05/02	1.590						
20	2022/02/05	178.7°	9h12m	+14°				2022/02/05	8.5	2022/02/02	1.119						
26	2022/05/21	178.4°	15h51m	-21°				2022/05/21	10.3	2022/05/22	1.406						
27	2022/11/12	177.8°	3h12m	+15°				2022/11/12	8.7	2022/11/16	1.026						
30	2022/11/29	176.5°	4h16m	+24°				2022/11/29	9.6	2022/11/25	1.114						
34	2022/02/21	175.0°	10h 9m	+ 6°				2022/02/21	11.4	2022/02/22	1.414						
46	2022/10/25	177.7°	2h 3m	+10°				2022/10/25	10.5	2022/10/20	1.146						
70	2022/06/23	164.8°	18h12m	-38°				2022/06/24	10.7	2022/06/27	1.190						
90	2022/07/31	176.9°	20h46m	-21°				2022/07/31	11.6	2022/08/01	1.610						
93	2022/07/15	165.9°	19h49m	-35°				2022/07/15	10.8	2022/07/14	1.381						
98	2022/02/16	166.8°	10h13m	+25°				2022/02/16	11.4	2022/02/18	1.212						
115	2022/11/19	157.7°	3h 5m	+40°				2022/11/18	9.6	2022/11/16	0.974						
128	2022/09/17	169.5°	23h56m	-11°				2022/09/17	10.6	2022/09/18	1.429						
156	2022/05/07	175.0°	14h49m	-21°				2022/05/07	10.7	2022/05/07	1.106						
164	2022/12/01	171.9°	4h25m	+13°				2022/11/29	10.8	2022/11/17	1.023						
166	2022/12/24	167.1°	6h 3m	+10°				2022/12/22	12.8	2022/12/16	1.330						
181	2022/02/21	174.7°	10h27m	+15°				2022/02/21	11.3	2022/02/16	1.660						
190	2022/01/19	172.7°	7h57m	+13°				2022/01/19	12.4	2022/01/16	2.418						
198	2022/08/04	166.8°	20h47m	- 4°				2022/08/06	10.3	2022/08/12	0.998						
204	2022/05/28	169.8°	16h28m	-11°				2022/05/28	11.4	2022/05/30	1.210						
222	2022/06/27	179.0°	18h21m	-24°				2022/06/27	12.6	2022/06/26	1.722						
232	2022/04/08	171.7°	13h19m	+ 0°				2022/04/08	12.5	2022/04/10	1.113						
264	2022/11/19	177.7°	3h35m	+21°				2022/11/19	11.3	2022/11/16	1.461						
269	2022/07/04	171.2°	18h49m	-14°				2022/07/04	11.6	2022/07/03	1.050						
275	2022/04/23	172.0°	14h14m	- 5°				2022/04/23	11.8	2022/04/20	1.395						
290	2022/01/31	136.9°	9h29m	+60°				2022/01/29	13.5	2022/01/28	0.885						
351	2022/01/12	176.5°	7h35m	+25°				2022/01/12	11.7	2022/01/14	1.369						
358	2022/08/04	176.5°	20h52m	-13°				2022/08/04	13.1	2022/08/09	1.971						
365	2022/10/23	170.5°	2h 7m	+ 2°				2022/10/23	12.1	2022/10/23	1.382						
382	2022/06/17	171.2°	17h38m	+32°				2022/06/16	12.4	2022/06/13	1.675						
384	2022/11/15	178.9°	3h23m	+19°				2022/11/16	12.1	2022/11/18	1.314						
394	2022/07/30	170.0°	20h50m	-28°				2022/07/31	12.1	2022/08/04	1.182						
397	2022/10/09	165.6°	0h26m	+18°				2022/10/08	11.3	2022/10/06	0.999						
416	2022/06/04	173.2°	16h49m	-29°				2022/06/04	10.2	2022/06/05	1.174						
455	2022/10/15	159.6°	1h41m	-11°				2022/10/11	10.9	2022/10/05	0.956						
465	2022/07/05	177.8°	18h58m	-24°				2022/07/05	13.1	2022/06/29	1.654						
479	2022/10/02	167.2°	0h56m	- 7°				2022/10/03	12.2	2022/10/07	1.210						
539	2022/09/04	168.4°	22h36m	+ 3°				2022/09/05	12.3	2022/09/08	1.203						
543	2022/10/26	166.5°	1h40m	+24°				2022/10/26	13.0	2022/10/26	1.625						
554	2022/01/02	178.6°	6h54m	+24°				2022/01/02	10.9	2021/12/29	1.090						
596	2022/05/28	178.4°	16h22m	-19°				2022/05/28	11.8	2022/05/29	1.439						
645	2022/12/15	169.1°	5h25m	+34°				2022/12/15	13.8	2022/12/15	1.795						
672	2022/07/25	166.1°	20h26m	-33°				2022/07/24	13.7	2022/07/23	1.215						
696	2022/10/06	159.1°	0h14m	+24°				2022/10/08	12.4	2022/10/10	1.483						
704	2022/08/17	160.4°	21h25m	+ 5°				2022/08/18	9.9	2022/08/21	1.728						
711	2022/06/13	166.7°	17h23m	-36°				2022/06/15	13.4	2022/06/20	0.848						
726	2022/11/19	177.2°	3h34m	+22°				2022/11/19	12.5	2022/11/08	1.068						
778	2022/01/15	169.2°	7h50m	+31°				2022/01/14	12.7	2022/01/12	1.413						
786	2022/06/28	177.3°	18h27m	-25°				2022/06/28	12.3	2022/06/23	1.805						
795	2022/04/09	178.9°	13h 8m	- 8°				2022/04/09	12.6	2022/04/10	1.470						
804	2022/09/21	174.9°	23h47m	+ 4°				2022/09/21	10.9	2022/09/18	1.467						
809	2022/09/01	178.8°	22h41m	- 9°				2022/09/01	12.9	2022/09/02	0.841						
852	2022/10/14	174.0°	1h21m	+ 2°				2022/10/13	11.7	2022/10/02	0.983						
854	2022/06/05	168.8°	16h58m	-11°				2022/06/05	14.0	2022/06/09	0.969						
925	2022/01/11	174.0°	7h29m	+27°				2022/01/11	11.5	2022/01/12	1.529						
941	2022/09/17	170.0°	23h54m	-11°				2022/09/18	14.3	2022/09/21	1.298						
956	2022/08/20	170.5°	21h43m	- 3°				2022/08/20	13.9	2022/08/18	0.824						
960	2022/09/09	173.5°	23h 1m	+ 0°				2022/09/09	14.3	2022/09/07	0.874						
972	2022/09/17	166.1°	23h19m	+10°				2022/09/18	12.5	2022/09/20	1.374						
986	2022/09/23	155.7°	0h39m	-22°				2022/09/22	13.0	2022/09/21	1.547						
987	2022/08/23	178.0°	22h 4m	- 9°				2022/08/23	12.1	2022/08/23	1.388						
990	2022/10/10	173.4°	0h51m	+12°				2022/10/09	13.6	2022/10/06	1.100						
1021	2022/12/28	170.0°	6h22m	+13°				2022/12/27	11.4	2022/12/19	1.164						
1052	2022/12/01	175.2°	4h32m	+17°				2022/12/01	13.6	2022/11/27	0.965						
1060	2022/07/26	166.5°	20h 9m	- 6°				2022/07/26	14.0	2022/07/26	0.782						
1077	2022/08/27	177.5°	22h24m	-12°				2022/08/27	13.7	2022/08/30	0.942						
1115	2022/01/06	165.7°	7h22m	+36°				2022/01/07	12.9	2022/01/08	1.621						
1116	2022/12/28	152.1°	6h34m	+51°				2022/12/27	12.9	2022/12/25	1.371						
1130	2022/07/27	175.1°	20h19m	-14°				2022/07/27	13.2	2022/07/31	0.802						
1131	2022/07/25	177.1°	20h21m	-22°				2022/07/25	13.6	2022/08/06	0.679						
1192	2022/03/19	176.6°	11h54m	+ 3°				2022/03/18	14.2	2022/03/12	0.862						
1239	2022/12/25	178.8°	6h16m	+24°				2022/12/25	13.7	2022/12/28	1.080						
1240	2022/10/08	166.4°	0h34m	+18°				2022/10/07	12.8	2022/10/03	1.419						
1277	2022/06/17	175.4°	17h46m	-18°				2022/06/18	13.1	2022/06/23	1.087						
1299	2022/12/20	166.6°	5h50m	+10°				2022/12/19	14.3	2022/12/17	1.340						
1319	2022/05/02	177.2°	14h31m	-17°				2022/05/02	13.8	2022/05/01	1.372						
1431	2022/08/28	163.5°	23h 0m	-24°				2022/08/28	14.0	2022/08/28	1.151						
1438	2022/10/14	177.8°	1h15m	+10°				2022/10/14	14.2	2022/10/11	1.423						
1448	2022/01/15	168.9°	7h56m	+32°				2022/01/15	14.4	2022/01/16	0.959						

Planet	Max	Elon	D	Max	E	RA	Dec	Br	Mag	D	Br	Mag	Min	Dist	D	Min	Dist
1476	2022/08/03	175.3°		20h59m	-21°			2022/08/04	14.1	2022/08/05			0.838				
1500	2022/11/13	171.5°		3h 6m	+26°			2022/11/13	14.4	2022/11/10			0.839				
1527	2022/10/04	179.0°		0h41m	+ 3°			2022/10/04	13.5	2022/09/25			0.888				
1543	2022/08/10	166.7°		21h13m	- 3°			2022/08/10	13.4	2022/08/08			0.778				
1565	2022/12/07	173.8°		4h45m	+28°			2022/12/06	13.3	2022/11/23			0.755				
1573	2022/10/27	166.6°		2h37m	+ 1°			2022/10/26	13.8	2022/10/23			0.859				
1638	2022/08/02	179.5°		20h48m	-17°			2022/08/02	13.8	2022/07/29			1.244				
1657	2022/01/09	176.6°		7h25m	+25°			2022/01/09	14.3	2022/01/16			0.933				
1660	2022/12/06	148.6°		5h30m	- 7°			2022/12/13	13.9	2022/12/19			0.901				
1664	2022/02/24	167.5°		10h45m	+21°			2022/02/24	13.5	2022/02/24			0.832				
1683	2022/08/12	176.9°		21h29m	-18°			2022/08/12	14.0	2022/08/10			1.241				
1689	2022/09/03	172.3°		23h 1m	-14°			2022/09/04	13.8	2022/09/09			1.047				
1710	2022/07/24	163.6°		20h28m	-35°			2022/07/27	14.5	2022/08/02			0.749				
1718	2022/09/04	167.5°		22h28m	+ 3°			2022/09/03	14.5	2022/09/01			0.711				
1756	2022/10/09	169.7°		0h44m	+15°			2022/10/10	14.1	2022/10/11			0.979				
1792	2022/10/18	166.7°		1h48m	- 2°			2022/10/19	14.1	2022/10/20			1.030				
1836	2022/07/20	174.6°		19h55m	-15°			2022/07/20	13.8	2022/07/18			1.246				
1884	2022/01/10	138.1°		7h29m	+63°			2022/01/10	13.9	2022/01/10			0.934				
1994	2022/07/26	163.7°		20h 8m	- 3°			2022/07/27	14.2	2022/07/30			1.181				
2034	2022/11/30	166.2°		4h45m	+35°			2022/11/30	14.5	2022/12/01			0.879				
2100	2022/09/05	161.1°		21h58m	+ 5°			2022/09/03	13.7	2022/08/31			0.187				
2199	2022/08/25	178.4°		22h17m	-12°			2022/08/25	14.3	2022/08/17			0.854				
2212	2022/12/22	119.5°		10h42m	+39°			2023/01/11	13.5	2023/01/18			0.233				
2231	2022/09/08	179.1°		23h 4m	- 4°			2022/09/08	14.2	2022/09/11			1.057				
2235	2022/02/24	156.4°		9h47m	-11°			2022/02/22	14.5	2022/02/20			1.652				
2237	2022/09/18	176.6°		23h46m	- 5°			2022/09/18	14.4	2022/09/21			1.512				
2243	2022/10/23	178.1°		1h50m	+13°			2022/10/23	14.4	2022/10/14			0.985				
2316	2022/07/03	177.3°		18h49m	-20°			2022/07/03	14.5	2022/07/05			1.037				
2337	2022/10/22	176.1°		1h51m	+ 7°			2022/10/22	14.4	2022/10/25			1.225				
2341	2022/12/03	178.6°		4h36m	+23°			2022/12/03	13.8	2022/11/30			0.907				
2343	2022/09/11	176.9°		23h14m	- 1°			2022/09/12	14.3	2022/09/16			0.763				
2375	2022/07/13	179.9°		19h30m	-21°			2022/07/13	14.4	2022/07/06			1.895				
2583	2022/09/07	166.1°		23h23m	-19°			2022/09/08	14.3	2022/09/09			0.793				
2606	2022/04/19	174.6°		13h59m	- 6°			2022/04/19	13.3	2022/04/17			1.054				
2717	2022/08/04	175.7°		20h50m	-13°			2022/08/04	13.4	2022/08/07			0.730				
2751	2022/11/10	178.9°		3h 2m	+18°			2022/11/11	14.5	2022/11/14			1.071				
2757	2022/10/30	179.5°		2h16m	+14°			2022/10/30	14.4	2022/11/01			1.601				
2820	2022/10/10	177.8°		0h59m	+ 8°			2022/10/10	14.1	2022/10/09			0.870				
2870	2022/09/20	171.2°		0h 4m	- 9°			2022/09/20	14.3	2022/09/21			0.893				
3224	2022/04/16	177.2°		13h32m	-12°			2022/04/16	14.2	2022/04/20			1.347				
3284	2022/06/30	173.7°		18h43m	-29°			2022/07/02	14.5	2022/07/17			0.897				
3345	2022/01/09	171.1°		7h23m	+31°			2022/01/10	13.7	2022/01/14			1.067				
3382	2022/10/11	175.6°		0h58m	+10°			2022/10/10	14.5	2022/10/04			0.875				
3388	2022/01/04	173.9°		7h12m	+28°			2022/01/05	14.3	2022/01/06			0.914				
3728	2022/12/17	140.0°		5h40m	-16°			2022/12/17	14.5	2022/12/17			1.246				
3773	2022/10/16	178.1°		1h27m	+ 7°			2022/10/16	14.3	2022/10/10			0.810				
3901	2022/05/29	156.3°		16h15m	-45°			2022/05/28	14.4	2022/05/27			0.917				
3920	2022/07/12	177.7°		19h24m	-19°			2022/07/12	14.4	2022/07/25			0.832				
3925	2022/10/18	162.9°		1h59m	- 6°			2022/10/17	14.4	2022/10/15			1.589				
4080	2022/08/15	171.0°		21h27m	- 5°			2022/08/15	14.2	2022/08/13			0.724				
4135	2022/09/21	174.5°		23h44m	+ 4°			2022/09/21	14.4	2022/09/23			1.151				
4384	2022/08/11	179.0°		21h23m	-14°			2022/08/11	14.4	2022/08/16			1.219				
4451	2022/10/15	151.4°		23h49m	+27°			2022/10/08	13.7	2022/09/30			0.774				
4460	2022/08/09	170.6°		21h20m	-25°			2022/08/09	14.2	2022/08/13			1.478				
4512	2022/02/07	173.9°		9h31m	+21°			2022/02/06	14.4	2022/02/04			1.233				
4577	2022/12/02	176.0°		4h32m	+25°			2022/12/03	14.1	2022/12/11			1.052				
4724	2022/06/22	178.7°		18h 2m	-22°			2022/06/22	14.1	2022/06/26			0.792				
4768	2022/08/13	179.6°		21h30m	-14°			2022/08/13	14.1	2022/08/16			1.452				
4869	2022/08/08	175.0°		21h17m	-20°			2022/08/08	14.5	2022/08/07			0.833				
5216	2022/08/09	179.1°		21h15m	-14°			2022/08/09	13.8	2022/08/10			1.188				
5352	2022/11/25	177.7°		4h 0m	+22°			2022/11/25	14.5	2022/11/24			1.017				
5693	2022/05/08	136.6°		17h53m	- 6°			2022/05/24	14.0	2022/05/28			0.069				
6027	2022/07/04	179.0°		18h51m	-21°			2022/07/04	14.0	2022/07/03			0.845				
6146	2022/06/19	174.2°		17h53m	-29°			2022/06/20	13.9	2022/06/27			0.725				
6794	2022/10/23	174.3°		1h56m	+ 5°			2022/10/23	14.0	2022/10/22			1.438				
6906	2022/12/08	177.1°		4h59m	+25°			2022/12/08	14.5	2022/12/03			1.041				
7335	2022/05/20	152.0°		14h36m	+ 1°			2022/05/25	11.1	2022/05/27			0.027				
7482	2022/01/13	108.9°		6h26m	-47°			2022/01/18	10.4	2022/01/18			0.013				
7559	2022/07/03	173.6°		18h53m	-29°			2022/07/04	14.4	2022/07/09			0.871				
9117	2022/12/30	177.3°		6h38m	+25°			2022/12/30	14.4	2023/01/03			1.100				
9900	2022/06/02	172.1°		16h43m	-14°			2022/06/02	14.2	2022/06/04			0.680				
10449	2022/09/14	179.2°		23h29m	- 4°			2022/09/14	14.5	2022/09/11			1.042				
11650	2022/10/27	167.2°		1h45m	+24°			2022/10/25	14.4	2022/10/17			0.958				
13918	2022/08/06	178.8°		21h 2m	-15°			2022/08/06	14.4	2022/08/04			1.045				
23606	2022/07/19	179.6°		19h53m	-21°			2022/07/19	13.9	2022/07/18			0.102				
28017	2022/12/28	178.1°		6h26m	+21°			2022/12/27	14.3	2022/12/10			0.813				
52800	2022/01/10	170.4°		7h20m	+31°			2022/01/09	14.2	2022/12/31			0.728				
66875	2022/12/02	178.1°		4h32m	+23°			2022/12/02	14.0	2022/12/05			0.750				
85713	2022/10/29	134.4°		5h20m	+27°			2022/11/16	14.0	2022/11/21			0.141				
138971	2022/02/11	134.9°		12h45m	+25°			2022/02/28	14.0	2022/03/04			0.033				
153591	2022/04/09	142.7°		10h45m	-20°			2022/03/05	13.5	2022/02/28			0.101				
161989	2022/10/10	121.2°		2h49m	-37°			2022/09/03	13.3	2022/09/01			0.058				
217628	2022/10/26	138.0°		4h53m	+10°			2022/11/14	14.4	2022/11/20			0.135				

Table II. Temporal Sequence of Favorable Elongations

Planet	Max	Elon	D	Max	E	RA	Dec	Br	Mag	D	Br	Mag	Min	Dist	D	Min	Dist
554	2022/01/02	178.6°		6h54m	+24°			2022/01/02	10.9	2021/12/29			1.090				
3388	2022/01/04	173.9°		7h12m	+28°			2022/01/05	14.3	2022/01/06			0.914				
1115	2022/01/06	165.7°		7h22m	+36°			2022/01/07	12.9	2022/01/08			1.621				
1657	2022/01/09	176.6°		7h25m	+25°			2022/01/09	14.3	2022/01/16			0.933				
3345	2022/01/09	171.1°		7h22m	+31°			2022/01/10	13.7	2022/01/14			1.067				
1884	2022/01/10	138.1°		7h29m	+63°			2022/01/10	13.9	2022/01/10			0.934				
52800	2022/01/10	170.4°		7h20m	+31°			2022/01/09	14.2	2022/12/31			0.728				
925	2022/01/11	174.0°		7h29m	+27°			2022/01/11	11.5	2022/01/12			1.529				
351	2022/01/12	176.5°		7h35m	+25°			2022/01/12	11.7	2022/01/14			1.369				
7482	2022/01/13	108.9°		6h26m	-47°			2022/01/18	10.4	2022/01/18			0.013				
778	2022/01/15	169.2°		7h50m	+31°			2022/01/14	12.7	2022/01/12			1.413				
1448	2022/01/15	168.9°		7h56m	+32°			2022/01/15	14.4	2022/01/16			0.959				
190	2022/01/19	172.7°		7h57m	+13°			2022/01/19	12.4	2022/01/16			2.418				
290	2022/01/31	136.9°		9h29m	+60°			2022/01/29	13.5	2022/01/28			0.885				
20	2022/02/05	178.7°		9h12m	+14°			2022/02/05	8.5	2022/02/02			1.119				
4512	2022/02/07	173.9°		9h31m	+21°			2022/02/06	14.4	2022/02/04			1.233				
138971	2022/02/11	134.9°		12h45m	+25°			2022/02/28	14.0	2022/03/04			0.033				
98	2022/02/16	166.8°		10h31m	+25°			2022/02/16	11.4	2022/02/18			1.212				
34	2022/02/21	175.0°		10h 9m	+ 6°			2022/02/21	11.4	2022/02/22			1.414				
181	2022/02/21	174.7°		9h12m	+15°			2022/02/21	11.3	2022/02/16			1.660				
1664	2022/02/24	167.5°		10h45m	+21°			2022/02/24	13.5	2022/02/24			0.832				
2235	2022/02/24	156.4°		9h47m	-11°			2022/02/22	14.5	2022/02/20			1.652				
1192	2022/03/19	176.6°		11h54m	+ 3°			2022/03/18	14.2	2022/03/12			0.862				
232	2022/04/08	171.7°		13h19m	+ 0°			2022/04/08	12.5	2022/04/10			1.113				
795	2022/04/09	178.9°		13h 8m	- 8°			2022/04/09	10.6	2022/04/10			1.470				
153591	2022/04/09	142.7°		10h45m	-20°			2022/03/05	13.5	2022/03/06			0.147				
3224	2022/04/16	177.2°		13h32m	-12°			2022/04/16	14.2	2022/04/20			1.347				
2606	2022/04/19	174.6°		13h59m	- 6°			2022/04/19	13.3	2022/04/17			1.054				
275	2022/04/23	172.0°		14h14m	- 5°			2022/04/23	11.8	2022/04/20			1.395				
10	2022/04/29	174.6°		14h16m	-19°			2022/04/29	9.8	2022/05/01			1.799				
1319	2022/05/02	177.2°		14h31m	-17°			2022/05/02	13.2	2022/05/01			1.372				
13	2022/05/04	179.5°		14h46m	-16°			2022/05/04	9.9	2022/05/02			1.590				
156	2022/05/07	175.0°		14h49m	-21°			2022/05/07	10.7	2022/05/07			1.106				
5693	2022/05/08	136.6°		17h53m	- 6°			2022/05/24	14.0	2022/05/28			0.069				
7335	2022/05/20	152.0°		14h36m	+ 1°			2022/05/25	11.1	2022/05/27			0.027				
26	2022/05/21	178.4°		15h51m	-21°			2022/05/21	10.3	2022/05/22			1.406				
204	2022/05/28	169.8°		16h28m	-11°			2022/05/28	11.4	2022/05/30			1.210				
596	2022/05/28	178.4°		16h22m	-19°			2022/05/28	11.8	2022/05/29			1.439				
3901	2022/05/29	156.3°		16h15m	-45°			2022/05/28	14.4	2022/05/27			0.917				
9900	2022/06/02	172.1°		16h43m	-14°			2022/06/02	14.2	2022/06/04			0.680				
416	2022/06/04	173.2°		16h49m	-29°			2022/06/04	10.2	2022/06/05			1.174				
854	2022/06/05	168.8°		16h58m	-11°			2022/06/05	14.0	2022/06/09			0.969				
711	2022/06/13	166.7°		17h23m	-36°			2022/06/15	13.4	2022/06/20			0.848				
382	2022/06/17	171.2°		17h38m	-32°			2022/06/16	12.4	2022/06/13			1.675				
1277	2022/06/17	175.4°		17h46m	-18°			2022/06/18	13.1	2022/06/23			1.087				
6146	2022/06/19	174.2°		17h53m	-29°			2022/06/20	13.9	2022/06/27			0.725				
4724	2022/06/22	178.7°		18h 2m	-22°			2022/06/22	14.1	2022/06/26			0.792				
70	2022/06/23	164.8°		18h12m	-38°			2022/06/24	10.7	2022/06/27			1.190				
222	2022/06/27	179.0°		18h21m	-24°			2022/06/27	12.6	2022/06/26			1.722				
786	2022/06/28	177.3°		18h27m	-25°			2022/06/28	12.3	2022/06/23			1.805				
3284	2022/06/30	173.7°		18h43m	-29°			2022/07/02	14.5	2022/07/17			0.897				
2316	2022/07/03	177.3°		18h49m	-20°			2022/07/03	14.5	2022/07/05			1.037				
7559	2022/07/03	173.6°		18h53m	-29°			2022/07/04	14.4	2022/07/09			0.871				
269	2022/07/04	171.2°		18h49m	-14°			2022/07/04	11.6	2022/07/03			1.050				
6027	2022/07/04	179.0°		18h51m	-21°			2022/07/04	14.0	2022/07/03			0.845				
465	2022/07/05	177.8°		18h58m	-24°			2022/07/05	13.1	2022/06/29			1.654				
3920	2022/07/12	177.7°		19h24m	-19°			2022/07/12	14.4	2022/07/25			0.832				
2375	2022/07/13	179.9°		19h30m	-21°			2022/07/13	14.4	2022/07/06			1.895				
93	2022/07/15	165.9°		19h49m	-35°			2022/07/15	10.8	2022/07/14			1.381				
23606	2022/07/19	179.6°		19h53m	-21°			2022/07/19	13.9	2022/07/18			0.102				
1836	2022/07/20	174.6°		19h55m	-15°			2022/07/20	13.8	2022/07/18			1.246				
1710	2022/07/24	163.6°		20h28m	-35°			2022/07/27	14.5	2022/08/02			0.749				
672	2022/07/25	166.1°		20h26m	-33°			2022/07/24	13.7	2022/07/23			1.215				
1131	2022/07/25	177.1°		20h21m	-22°			2022/07/25	13.6	2022/08/06			0.679				
1060	2022/07/26	166.5°		20h 9m	- 6°			2022/07/26	14.0	2022/07/26			0.782				
1994	2022/07/26	163.7°		20h 8m	- 3°			2022/07/27	14.2	2022/07/30			1.181				
1130	2022/07/27	175.1°		20h19m	-14°			2022/07/27	13.2	2022/07/31			0.802				
394	2022/07/30	170.0°		20h50m	-28°			2022/07/31	12.1	2022/08/04			1.182				
90	2022/07/31	176.9°		20h46m	-21°			2022/07/31	11.6	2022/08/01			1.610				
1638	2022/08/02	179.5°		20h48m	-17°			2022/08/02	13.8	2022/07/29			1.244				
1476	2022/08/03	175.3°		20h59m	-21°			2022/08/04	14.1	2022/08/05			0.838				
198	2022/08/04	166.8°		20h47m	- 4°			2022/08/06	10.3	2022/08/12			0.998				
158	2022/08/04	176.5°		20h22m	-13°			2022/08/04	13.1	2022/08/09			1.971				
2717	2022/08/04	175.5°		20h50m	-13°			2022/08/04	13.4	2022/08/07			0.730				
13918	2022/08/06	178.7°		21h 2m	-15°			2022/08/06	14.4	2022/08/04			1.045				
4869	2022/08/08	175.0°		21h17m	-20°			2022/08/08	14.5	2022/08/07			0.833				
4460	2022/08/09	170.6°		21h20m	-25°			2022/08/09	14.2	2022/08/13			1.478				
5216	2022/08/09	179.1°		21h15m	-14°			2022/08/09	13.8	2022/08/10			1.188				
1543	2022/08/10	166.7°		21h13m	- 2°			2022/08/10	13.4	2022/08/08			0.778				
4384	2022/08/11	179.0°		21h23m	-14°			2022/08/11	14.4	2022/08/16			1.219				

Planet	Max	Elon	D	Max	E	RA	Dec	Br	Mag	D	Br	Mag	Min	Dist	D	Min	Dist
1683	2022/08/12	176.9°	21h29m	-18°				2022/08/12	14.0	2022/08/10	1.241						
4768	2022/08/13	179.6°	21h30m	-14°				2022/08/13	14.1	2022/08/16	1.452						
4080	2022/08/15	171.0°	21h27m	-5°				2022/08/15	14.2	2022/08/13	0.724						
704	2022/08/17	160.4°	21h25m	+5°				2022/08/18	9.9	2022/08/21	1.728						
956	2022/08/20	170.5°	21h43m	-3°				2022/08/20	13.9	2022/08/18	0.824						
987	2022/08/23	178.0°	22h 4m	-9°				2022/08/23	12.1	2022/08/23	1.388						
2199	2022/08/25	178.4°	22h17m	-12°				2022/08/25	14.3	2022/08/17	0.854						
1077	2022/08/27	177.5°	22h24m	-12°				2022/08/27	13.7	2022/08/30	0.942						
1431	2022/08/28	163.5°	23h 0m	-24°				2022/08/28	14.0	2022/08/28	1.151						
809	2022/09/01	178.8°	22h41m	-9°				2022/09/01	12.9	2022/09/02	0.841						
1689	2022/09/03	172.3°	23h 1m	-14°				2022/09/04	13.8	2022/09/09	1.047						
539	2022/09/04	168.4°	22h36m	+3°				2022/09/05	12.3	2022/09/08	1.203						
1718	2022/09/04	167.5°	22h28m	+3°				2022/09/03	14.5	2022/09/01	0.711						
2100	2022/09/05	161.1°	21h58m	+5°				2022/09/03	13.7	2022/08/31	0.187						
2583	2022/09/07	166.1°	23h23m	-19°				2022/09/08	14.3	2022/09/09	0.793						
2231	2022/09/08	179.1°	23h 4m	-4°				2022/09/08	14.2	2022/09/11	1.057						
960	2022/09/09	173.5°	23h 1m	+0°				2022/09/09	14.3	2022/09/07	0.874						
161989	2022/09/10	121.2°	2h49m	-37°				2022/09/03	13.3	2022/09/01	0.058						
2343	2022/09/11	176.9°	23h14m	-1°				2022/09/12	14.3	2022/09/16	0.763						
10449	2022/09/14	179.2°	23h29m	-9°				2022/09/14	14.5	2022/09/11	1.042						
128	2022/09/17	169.5°	23h56m	-11°				2022/09/17	10.6	2022/09/18	1.429						
941	2022/09/17	170.0°	23h54m	-11°				2022/09/18	14.3	2022/09/21	1.298						
972	2022/09/17	166.1°	23h19m	+10°				2022/09/18	12.5	2022/09/20	1.374						
2237	2022/09/18	176.6°	23h46m	-5°				2022/09/18	14.4	2022/09/21	1.512						
2870	2022/09/20	171.2°	0h 4m	-9°				2022/09/20	14.3	2022/09/21	0.893						
804	2022/09/21	174.9°	23h47m	+4°				2022/09/21	10.9	2022/09/18	1.467						
4135	2022/09/21	174.5°	23h44m	+4°				2022/09/21	14.4	2022/09/23	1.151						
986	2022/09/23	155.7°	0h39m	-22°				2022/09/22	13.0	2022/09/21	1.547						
479	2022/10/02	167.2°	0h56m	-7°				2022/10/03	12.2	2022/10/07	1.210						
1527	2022/10/04	179.0°	0h41m	+3°				2022/10/04	13.5	2022/09/25	0.888						
696	2022/10/06	159.1°	0h14m	+24°				2022/10/08	12.4	2022/10/10	1.483						
1240	2022/10/08	166.4°	0h34m	+18°				2022/10/07	12.8	2022/10/03	1.419						
397	2022/10/09	165.6°	0h26m	+18°				2022/10/08	11.3	2022/10/06	0.999						
1756	2022/10/09	169.7°	0h44m	+15°				2022/10/10	14.1	2022/10/11	0.979						
990	2022/10/10	173.4°	0h51m	+12°				2022/10/09	13.6	2022/10/06	1.100						
2820	2022/10/10	177.8°	0h59m	+8°				2022/10/10	14.1	2022/10/09	0.870						
3382	2022/10/11	175.6°	0h58m	+10°				2022/10/10	14.5	2022/10/04	0.875						
852	2022/10/14	174.0°	1h21m	+2°				2022/10/13	11.7	2022/10/02	0.983						
1438	2022/10/14	177.8°	1h15m	+10°				2022/10/14	14.2	2022/10/11	1.423						
455	2022/10/15	159.6°	1h41m	-11°				2022/10/11	10.9	2022/10/05	0.956						
4451	2022/10/15	151.4°	23h49m	+27°				2022/10/08	13.7	2022/09/30	0.774						
3773	2022/10/16	178.1°	1h27m	+7°				2022/10/16	14.3	2022/10/10	0.810						
1792	2022/10/18	166.7°	1h48m	-2°				2022/10/19	14.1	2022/10/20	1.030						
3925	2022/10/18	162.9°	1h59m	-6°				2022/10/17	14.4	2022/10/15	1.589						
2337	2022/10/22	176.1°	1h51m	+7°				2022/10/22	14.4	2022/10/25	1.225						
365	2022/10/23	170.5°	2h 7m	+2°				2022/10/23	12.1	2022/10/23	1.382						
2243	2022/10/23	178.1°	1h50m	+13°				2022/10/23	14.4	2022/10/14	0.985						
6794	2022/10/23	174.3°	1h56m	+5°				2022/10/23	14.0	2022/10/22	1.438						
46	2022/10/25	177.7°	2h 3m	+10°				2022/10/25	10.5	2022/10/20	1.146						
543	2022/10/26	166.5°	1h40m	+24°				2022/10/26	13.0	2022/10/26	1.625						

Table III. Numerical list of approaches closer than 0.3 AU

Planet	Max	Elon	D	Max	E	RA	Dec	Br	Mag	D	Br	Mag	Min	Dist	D	Min	Dist
2212	2022/12/22	119.5°	10h42m	+39°				2023/01/11	13.5	2023/01/18	0.233						
7335	2022/05/20	152.0°	14h36m	+1°				2022/05/25	11.1	2022/05/27	0.027						
7482	2022/01/13	108.9°	6h26m	-47°				2022/01/18	10.4	2022/01/18	0.013						
23606	2022/07/19	179.6°	19h53m	-21°				2022/07/19	13.9	2022/07/18	0.102						
85713	2022/10/29	134.4°	5h20m	+27°				2022/11/16	14.0	2022/11/21	0.141						
138971	2022/02/11	134.9°	12h45m	+25°				2022/02/28	14.0	2022/03/04	0.033						
153591	2022/04/09	142.7°	10h45m	-20°				2022/03/05	13.5	2022/02/28	0.101						
161989	2022/09/10	121.2°	2h49m	-37°				2022/09/03	13.3	2022/09/01	0.058						
217628	2022/10/26	138.0°	4h53m	+10°				2022/11/14	14.4	2022/11/20	0.135						

COMET C/2017 T2 (PANSTARRS): NUCLEUS LIGHTCURVE AND PERIOD

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We present the results of the CCD photometry of the comet C/2017 T2 (PanSTARRS). From more than 1800 images we have constructed the lightcurve of the (presumed) nucleus and estimate the rotational period to be 5.6759 ± 0.0046 h.

Comet C/2017 T2 (PanSTARRS) was discovered on 2017 October 2 by the PanSTARRS project at a distance near the orbit of Saturn (Yoshida, 2020). Since then, it has been the focus of professional and nonprofessional (amateur) astronomers. The results which allow us to create the “long time” lightcurve of this comet are concentrated in the COBS database (Zakajsek, 2020) or in specialized pages, e.g., Yoshida (2020).

For our observations, we used a Schmidt-Cassegrain Celestron telescope with 9.25-inch aperture (f/10). We have this telescope at our disposal at our “Júlia” observatory. The mount is an NEQ6/Pro and we use an MI G2-1600 camera as the light detector, cooled to -20°C (Moravian Instruments, 2020). Our devices, and especially the camera, are the same as professional instruments used in many observatories worldwide. The SNR value we have in all cases is greater than 50. The field of view is 20×13.4 arcmin. We have treated all our measurements, “fits” frames, using the *AstroImageJ* software package (Collins et al., 2017). No filters were used in our imaging. Basic data for our observations is given in the Table I.