

ESA's NEO Coordination Centre

Current NEO statistics

With the start of the annual monsoon season in the South West of the United States, we expect a reduction in the number of monthly discoveries for the next couple of months.

- Known NEOs: 29 293 asteroids and 117 comets
- NEOs in risk list*: 1382
- NEOs designated during last month: 131
- NEOs discovered since 1 January 2022: 1494

Focus on

The upcoming 10 August marks the 50th anniversary of a well-known astronomical event, the 1972 Great Daylight Fireball, also known as the Grand Teton meteor. The event became famous thanks to photographs and a video that showed the bright object streaking across the daylight skies of the Northwestern United States. What makes this fireball scientifically peculiar is the fact that the object survived its very close encounter with the Earth: the body entered our atmosphere at a very shallow angle, and did not lose sufficient energy to fall to the ground. It is thought that, after reaching a minimum altitude of about 50 km above the surface, the object headed out of the atmosphere and continued its travel through space. The asteroid probably had a diameter of about 10 metres, and has not been seen since the event. But since it survived the encounter, it is not unreasonable to think that it might be discovered again by future asteroid surveys. As of today, the closest approacher ever discovered while still in space that did not fall on Earth is 2020 VT4. It reached a minimum altitude of about 400 km on 13 November 2020, roughly the altitude of the International Space Station. It was a very close approach, but not close enough to significantly interact with our atmosphere during the short timespan of the fly-by.

Upcoming interesting close approaches

None of the asteroids known at the beginning of the month will have significant close approaches with our planet during the month of August. As usual, it is likely that many additional close approachers will be discovered during the month itself.

Recent interesting close approaches

No known object came extremely close to the Earth in July.

- 2022 NF is a small object, 5 to 10 metres in diameter, which had a close approach at about 80 000 km from the Earth on 7 July. It is the closest among the known approachers of the month.

News from the risk list

A new object took the first spot in the ranking.

- 2022 OT1 is a 30-metre asteroid discovered by Pan-STARRS at the end of July. It currently has an impact probability of about 1 in 1000 for February 2039.
- 2014 EK67 entered our list due to predisccovery observations from Pan-STARRS. Its orbit was poorly determined, and compatible with non-NEO solutions. Additional archival data found by our team proves that the object is not a NEO.

*The risk list of all known objects with a non-zero (although usually very low) impact probability can be found at <https://neo.ssa.esa.int/risk-list>

In other news

- The announcement of full operations for the James Webb Space Telescope will offer new observational opportunities for Solar System science too. However, the telescope may not be ideal for NEO observations, due to its limited tracking speed. It has been designed with a tracking speed capability up to 1.8"/min (the typical angular motion of Mars), but commissioning tests showed it should be capable to reach speeds up to 4"/min.

Upcoming events

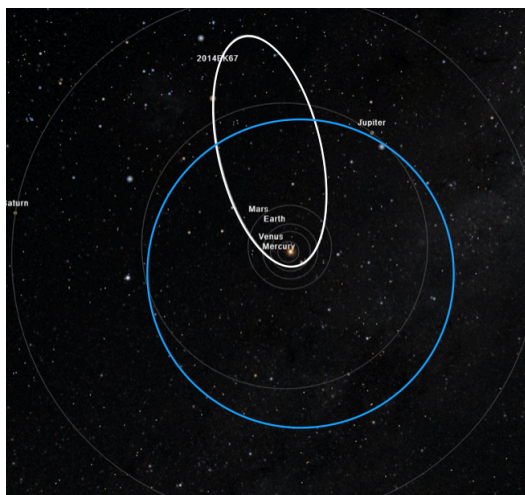
A fireball meeting will happen in summer, and the usual EPSC and DPS meetings will be held in the fall.

- Workshop #3 on Fireballs and their Detection, 13-14 August 2022, Glasgow, UK
<https://www.europlanet-society.org/workshop-3-on-fireballs-and-their-detection/>
- Europlanet Science Congress (EPSC) 2022, 18-23 September 2022, Granada, Spain
<https://www.epsc2022.eu>
- 54th Annual Meeting of the AAS Division for Planetary Sciences, 2-7 October 2022, London, Canada
<https://aas.org/meetings/dps54>

Current risk list

The table shows the top ten objects currently in our risk list. The new object 2022 OT1 is visible at the top of the list, while 2014 EK67, originally ranked fourth, has already been removed from it.

Designator	Size range in m	Date of possible impact	Impact probability	Palermo scale	Torino scale	Impact velocity in km/s
2022 OT1	25–60	2039-02-04 14:15	1 / 2100	-3.05	0	12.96
2010 RF12	6–13	2095-09-05 23:49	1 / 14	-3.07	0	12.29
1979 XB	500–1200	2056-12-12 21:39	1 / 3 500 000	-3.22	0	27.54
2000 SG344	29–70	2071-09-16 00:57	1 / 1100	-3.37	0	11.27
2008 JL3	23–50	2027-05-01 09:06	1 / 7000	-3.66	0	14.01
2021 GX9	22–50	2032-04-16 21:51	1 / 20 000	-3.67	0	20.17
2020 FA5	160–400	2110-10-29 06:46	1 / 600 000	-3.74	0	29.34
2018 JD	12–27	2067-05-08 13:22	1 / 800	-3.82	0	13.76
2011 DU9	12–27	2046-02-23 20:45	1 / 1400	-3.90	0	14.21
2012 QD8	60–140	2047-03-08 23:18	1 / 170 000	-3.90	0	23.58



The plot shows the nominal orbit of 2014 EK67, the object mentioned in the previous page, before and after the addition of the new observations found by our team.

The nominal orbit before the new observations (white) is a typical high-eccentricity NEO orbit, crossing that of the Earth. Once the new data is added, the orbit is now clearly distant (blue), and the object turns out to be a Jupiter Trojan. Of course, this means that the original orbit had an extremely large uncertainty, compatible with very different regions of the inner solar system.

[Credit: ESA / PDO]

Links for more information

Website: <https://neo.ssa.esa.int>

Close approaches page: <https://neo.ssa.esa.int/close-approaches>

Risk List: <https://neo.ssa.esa.int/risk-list>

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