

→ NEWSLETTER MARCH 2023

ESA's NEO Coordination Centre

Current NEO statistics

An additional near-Earth comet is now included in our total of known NEOs.

- Known NEOs: 31 351 asteroids and 119 comets
- NEOs in risk list*: 1447
- NEOs designated during last month: 144
- NEOs discovered since 1 January 2023: 336

Focus on

The new year started pretty early with a new imminent impactor discovery. On 12 February Krisztián Sárneczky, the Hungarian astronomer who discovered 2022 EB5 in March 2022, reported the discovery of a new possible impactor. Now known as 2023 CX1, it was quickly confirmed to be a metre-sized asteroid on a collision course with Earth, with an impact point in Normandy, France. Thanks to an advance warning of almost 7 hours, the entire approach and atmospheric entry was observed extraordinarily well, and the trajectory could be determined with the precision of just a few tens of metres. This in turn led to an accurate determination of the location where possible fragments could have reached the ground, and indeed meteorites were recovered shortly after. In light of the now more frequent occurrence of these predicted impacts (three in less than 12 months), our Centre has now developed a dedicated [webpage](#) presenting summary information on all seven impactors discovered so far, with a history page dedicated to each of them. It will be updated in the future with similar information for new impact events.

Upcoming interesting close approaches

A moderately large new discovery is flying-by in March.

- 2023 DQ is a newly discovered object, almost 200 metres in size, that will fly-by on 8 March at about 6 lunar distances.

Recent interesting close approaches

One known large object had a distant fly-by, and a smaller new one came much closer (in addition to the impactor).

- (199145) 2005 YU128 is a large km-sized asteroid that had a moderately close approach on 16 February, at about 12 lunar distances.
- 2023 DR reached one fifth of the distance of the Moon on 25 February.

News from the risk list

A new Torino Scale 1 object entered the risk list.

- 2023 DW is a new entry at the top of our risk list, rated at a Torino Scale level of 1 at the beginning of the month. It's a Tunguska-sized newly discovered asteroid with a probability of about 1 in 700 to impact the Earth in 2046. Further observations over the next few weeks should clarify the situation.
- 2023 AJ1, the asteroid that reached Torino Scale 1 in January, has been removed from the risk list thanks to additional observations collected in early February.

*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

- In the few days after the fall of 2023 CX1, a total of three separate and uncorrelated fireballs produced meteorites that were collected on the ground. In addition to the fragments of 2023 CX1, collected in Normandy, meteorites were found also from an event in Basilicata, Italy, and a separate one in Texas, USA.
- The Asteroid Framing Cameras for the upcoming ESA Hera mission to Didymos are now **complete and fully tested**.

Upcoming events

- 8th IAA Planetary Defense Conference, 3-7 April 2023, Vienna, Austria
<https://iaaspace.org/event/8th-iaa-planetary-defense-conference-2023/>
- Asteroids, Comets, Meteors Conference, 18-23 June 2023, Flagstaff, USA
<https://www.hou.usra.edu/meetings/acm2023/>
- 55th Annual Meeting of the AAS Division for Planetary Sciences (joint meeting with the Europlanet Science Congress (EPSC) 2023), 1-6 October 2023, San Antonio, USA
<https://dps.aas.org/meetings/future>

List of past impactors

The table below contains the updated list of known asteroids detected in space before impact. It now includes 2023 CX1, the third one discovered in less than 12 months.

Object name	Impact time in UT	Time between discovery and impact in hours	Impact latitude in deg	Impact longitude in deg	Size range in m	H magnitude	Expected energy in kt of TNT equivalent	Discovery site
2023 CX1	2023-02-13 02:59	7	50 N	1 E	1–2	32.7	0.034	GINOP-KHK, Piszkesteto
2022 WJ1	2022-11-19 08:27	4	43 N	79 W	0.5–1	33.6	0.009	Mt. Lemmon Survey
2022 EB5	2022-03-11 21:22	2	70 N	8 W	1–3	31.4	0.3	GINOP-KHK, Piszkesteto
2019 MO	~ 2019-06-22 21:30	~ 13	~ 15 N	~ 70 W	4–8	29.3	3.8	ATLAS-MLO, Mauna Loa
2018 LA	2018-06-02 16:44	8	21 S	24 E	2–5	30.5	0.9	Mt. Lemmon Survey
2014 AA	~ 2014-01-02 02:30	~ 22	~ 13 N	~ 30 W	2–4	30.9	0.2	Mt. Lemmon Survey
2008 TC3	2008-10-07 02:45	20	21 N	31 E	4	30.3	0.7	Mt. Lemmon Survey



Incoming trajectory of 2023 CX1 towards its impact with Normandy. It shows that the object approached the impact point from a western direction relative to the Earth's surface. The red dot marks the impact point, over Normandy, France.

The asteroid size and shape are just for representation purposes, and they do not match the actual properties of the object.

[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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