

ESA's NEO Coordination Centre

Current NEO statistics

Despite a December rich of discoveries, 2023 closed with less than 2900 new NEOs, the lowest of the last 4 years. This relative reduction of discovery rates is likely due to a few unforeseen shutdowns of major US surveys during the year.

- Known NEOs: 33 948 asteroids and 122 comets
- NEOs in risk list*: 1574
- NEOs designated during last month: 293
- NEOs discovered since 1 January 2023: 2878

Focus on

This January marks the 10th anniversary of the first meeting of the International Asteroid Warning Network (IAWN), held at the MPC on 13-14 January 2014. Since its establishment a decade ago, following a recommendation by the UN Committee on the Peaceful Uses of Outer Space (COPUOS), IAWN has played an increasingly important role in the NEO community, becoming a reference point for observers around the world. Of particular importance are the various observing campaigns organized by the network, each addressing specific observing needs of the community: thanks to these coordinated events, dozens of observers have been able to test their capabilities to observe challenging NEOs, improving their techniques and skills in preparation for a possible future need for a quick-reaction observational effort for an upcoming threatening NEO.

Upcoming interesting close approaches

None of the objects known at the beginning of the year will approach closer than the Moon during the month of January.

Recent interesting close approaches

Ten asteroids came closer than the Moon in December, all but one were discovered during the month.

- 2020 YO₃ is the most interesting of the close approaches of the month of December. It's a 40-metre, Tunguska-sized object, which flew by the Earth on 23 December, at roughly half the distance of the Moon. It almost reached magnitude 12 at its closest approach.

News from the risk list

A new object reached a high rating in our list, but was subsequently downgraded thanks to our observations.

- 2023 XC₁₄ reached the third position of our risk list in December, for a series of possible impacts starting in the 2060s. Subsequent observations obtained by our team with the Calar Alto Schmidt telescope in Spain led to a reduction of the overall impact probability by roughly a factor of 10.
- 2023 TL₄, which had reached a Torino Scale level of 1 during the month of November, was entirely removed from our risk list in early December, thanks to high-precision astrometry extracted by our team in collaboration with ESO, using ESO's Very Large Telescope (VLT).

*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

- ESA's Hera spacecraft has almost completed its final tests at ESA's ESTEC facilities in Noordwijk.

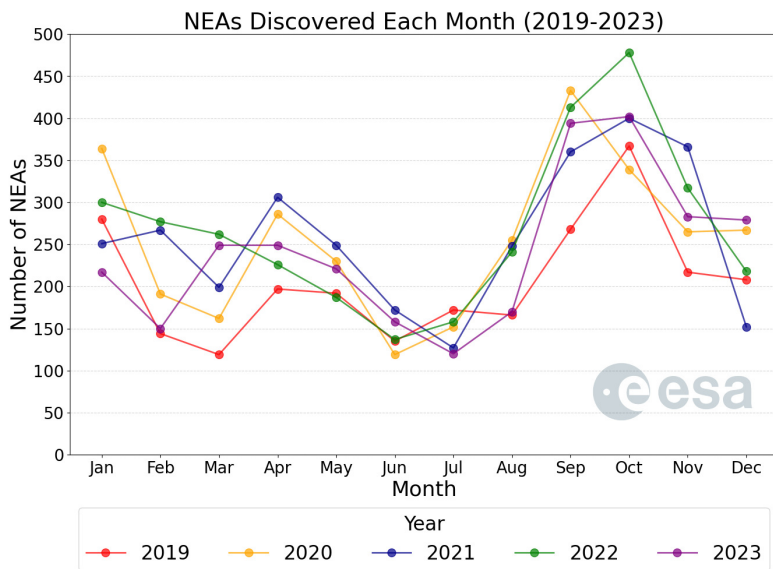
Upcoming events

- 55th Lunar and Planetary Science Conference (LPSC 2024), 11-15 March 2024, The Woodlands, USA
<https://www.hou.usra.edu/meetings/lpsc2024/>
- Apophis T-5 Years, 22-23 April 2024, Noordwijk, The Netherlands
<https://www.hou.usra.edu/meetings/apophis2024/>
- Follow-up Observations of Small Bodies in the Solar System in the Era of Large Discovery Surveys, 6 and 8 August 2024, Cape Town, South Africa
<https://sbss2024.saa0.ac.za/>

Highest-rated objects added to the risk list in 2023

The table shows the top 10 objects entering the risk list in 2023 and still present, ranked by current Palermo Scale.

Designator	Size range in m	Date of possible impact	Impact probability	Palermo scale	Torino scale	Impact velocity in km/s
2023 VD3	11-24	2034-11-08 17:09	1/400	-2.65	0	21.01
2023 VH6	21-50	2112-11-28 22:36	1/400	-3.24	0	13.12
2023 D0	21-50	2057-03-23 19:43	1/2 000	-3.53	0	13.18
2023 XC14	50-120	2066-12-31 17:00	1/26 000	-3.66	0	14.28
2023 Y01	17-40	2078-01-08 06:32	1/1 300	-3.81	0	11.51
2023 AC2	30-70	2051-12-31 02:32	1/50 000	-4.37	0	15.01
2023 SE2	19-40	2049-09-25 23:42	1/90 000	-4.55	0	27.12
2023 XE3	9-20	2053-11-04 05:32	1/2 800	-4.56	0	11.36
2023 XY10	150-300	2091-12-14 16:43	1/5 000 000	-4.67	0	25.15
2023 TB2	50-110	2098-08-31 20:16	1/120 000	-4.75	0	13.12



The plot presents the monthly NEO discovery rate for the last 5 years.

It shows that year 2023 was nicely in line with most of the recent years, except for some drops in February and August, which resulted in an overall lower total for the year.

It also shows the well-known periodicity of discovery rates, with a minimum during summer months and a maximum in the fall.

[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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