

ESA's NEO Coordination Centre

Current NEO statistics

The number of discoveries in 2022 surpassed the record of 2021 by almost 100 objects. By the end of the year, the total number of known NEOs surpassed 31 000.

- Known NEOs: 31 002 asteroids and 118 comets
- NEOs in risk list*: 1440
- NEOs designated during last month: 258
- NEOs discovered since 1 January 2022: 3181

Focus on

The beginning of a year is traditionally the time for new resolutions. We would like to take advantage of the occasion to remind all observers of the importance of an often neglected element of their observational settings, the timing accuracy. At the end of November, IAWN organized an observing campaign designed to test the accuracy of the timetags observers report together with their astrometric observations. For those who participated in the event, the final results of the campaign will soon be published. We would nevertheless like to encourage all observers to dedicate some time to ensure that the astrometry they produce is as accurate as it can be: ESA's Gaia catalogue has dramatically improved how well we can measure sky coordinates, and nowadays timing biases are often the most critical issue of the data we use for our orbital and impact prediction work. Time checks can be done at any time observing GNSS satellites, always visible at any given time and location.

Upcoming interesting close approaches

No objects known at the beginning of the year will have any significant close approach during the month of January.

Recent interesting close approaches

Three objects, one small and two large ones, reached a similar magnitude during the month of December.

- 2022 YO1, a newly discovered object of about 4 m, came to less than 30 000 km from the Earth on 17 December. It reached magnitude 13 at its closest approach.
- 2015 RN35 and 2010 XC15, two well-known objects, approached the Earth at about 2 lunar distances, but their larger sizes compensated for the distance and led to a comparable observable brightness.

News from the risk list

The new highest-rated object of our risk list is actually an old object that got a boost due to a revised definition of the ranking parameter.

- 2001 VB is the new highest-ranked object of our risk list. However, it is neither a new object, nor a particularly important one. Discovered back in 2001, and never reobserved since, its appearance at the top of the list is the consequence of a slight revision of the adopted [definition](#) of Palermo Scale. The scale now weighs more heavily how close in time a possible impact is. This object has a negligible chance of impact (less than 1 in 100 million) in July this year, but the closeness of the date pushed the ranking of the object towards the top of the list.

*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 orbit determination and impact monitoring software being run at our Centre has been upgraded to a new version. It also received a new name, and it is now called “Aegis”, the mythological name of the shield of Zeus.

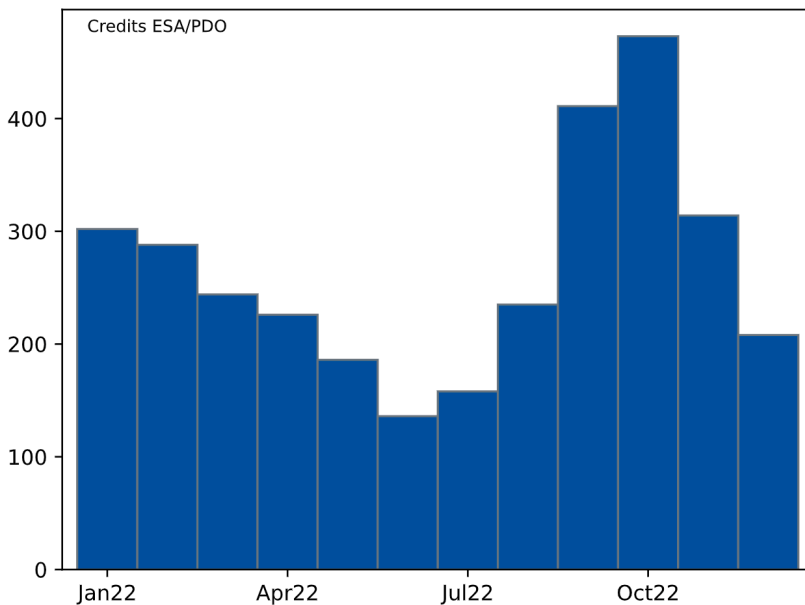
Upcoming events

- 2nd ESA NEO and Debris Detection Conference, 24-26 January 2023, Darmstadt, Germany
<https://neo-sst-conference.sdo.esoc.esa.int/>
- 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/>

Highest-rated objects added to the risk list in 2022

The table shows the top 10 objects entering the risk list in 2022 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
2019 VB37	30–70	2049-04-26 01:30	1 / 18 000	-3.69	0	18.34
2022 UY14	25–60	2043-04-28 22:24	1 / 33 000	-3.96	0	23.23
2022 VE1	25–80	2053-10-26 06:39	1 / 43 000	-4.02	0	19.25
2022 NX1	6–14	2075-12-04 19:06	1 / 270	-4.22	0	11.18
2022 Y01	2–5	2024-12-17 06:20	1 / 2 400	-4.30	0	18.25
2022 SX55	2–5	2035-09-17 19:56	1 / 240	-4.31	0	16.44
2022 AT2	2–11	2080-01-14 08:33	1 / 1 400	-4.31	0	12.90
2022 UE3	30–70	2093-10-13 23:51	1 / 25 000	-4.44	0	15.31
2022 YS6	10–25	2066-01-03 06:26	1 / 4 600	-4.56	0	15.03
2022 WW11	85–200	2050-11-29 04:37	1 / 10 000	-4.62	0	17.46



This histogram shows the number of NEOs discovered during each of the months of the past year.

The usual periodicity of the discover rates is evident. Discoveries are at their lowest during the summer months, when many currently operating surveys are inactive due to seasonal weather conditions. The highest rate is then reached in the fall months, when good weather conditions are combined with already moderately long nights in the Northern hemisphere, where most surveys are located.

[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>

neo.ssa.esa.int

To subscribe to this newsletter fill the form at <https://neo.ssa.esa.int/subscribe-to-services>

To unsubscribe or for any further information please send an email to neocc@esa.int

