

ESA's NEO Coordination Centre

Current NEO statistics

Our risk list now contains almost 1500 objects, but they still represent less than 5% of the known NEOs.

- Known NEOs: 32 378 asteroids and 121 comets
- NEOs in risk list*: 1495
- NEOs designated during last month: 111
- NEOs discovered since 1 January 2023: 1342

Focus on

Given two orbits with a common focus, the minimum distance between a point on the first orbit and one on the second is known as Minimum Orbital Intersection Distance (MOID). Computing reliable values of the MOID between the Earth and an NEO is important for planetary defence, because only if the MOID is smaller than a certain threshold, then there may be a chance that such NEO may impact the Earth. For this reason, the MOID value is also used to classify an NEO as a Potentially Hazardous Object. Note that a low Earth MOID is a necessary but not sufficient condition for an impact: the Earth and the NEO must also reach the position on their orbits realising the MOID at the same time.

Upcoming interesting close approaches

No known NEOs will come closer than the Moon in August.

Recent interesting close approaches

A close fly-by that approached the Earth from the Sun's direction exemplifies the importance of space-based asteroid discovery.

- 2023 NT1, discovered by the ATLAS station in South Africa on the morning of 15 July, was at the time of discovery on its way out from a close approach with Earth. The object, a 30-metre body, had passed by our planet two days earlier, at just 100 000 km from the Earth centre. This fly-by is the perfect example of why an infrared space-based mission, like ESA's NEOMIR, is needed for planetary defence purposes: the object approached our planet from a solar elongation of just 35°, making it undiscoverable optically from the ground before its closest approach. Had it been an impactor instead of a close approacher, only a space mission could have alerted us in time to mitigate the damage: NEOMIR, currently under study by ESA, would have been capable of discovering the object 2 weeks before the close approach.
- 2023 HO6 is a newly-discovered moderately large 200 m asteroid that had a fly-by at 5 lunar distances in early July.

News from the risk list

The very-low-probability possible impact at the top of our risk list did not happen.

- 2001 VB, the large asteroid that led our list for the last few months, has now dropped to much lower rankings. No new observations were obtained, but the date of the single high-rated impact solution passed without any actual impact, and could therefore be removed from the list. This behavior was entirely expected, since the probability of impact for this object was completely negligible.

*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

- A new asteroid detection algorithm, called Heliolinc3D and developed by the [Rubin Observatory](#) team, has been successfully demonstrated on data from the ATLAS survey, identifying an unknown NEO.

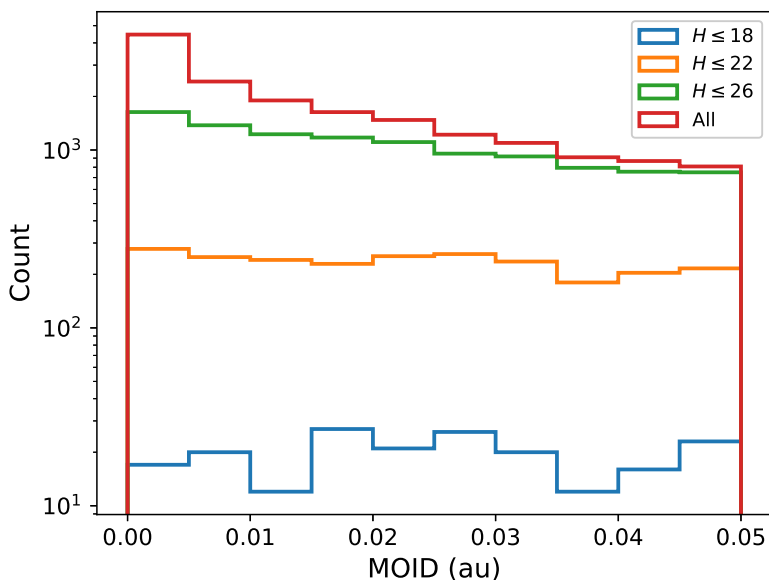
Upcoming events

- 42nd International Meteor Conference, 31 August-3 September 2023, Redu, Belgium
<https://imc2023.imo.net/>
- 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>

Known large NEAs with the smallest MOID

The table lists all currently known NEAs with an absolute magnitude larger than 25 that have a nominal orbit with a MOID with Earth smaller than 10 000 km, at the current reference epoch. It also lists their next close approach, the distance they will reach, and the U parameter (discussed in the July 2022 issue of this newsletter). It shows that, in many cases, the next approach is far from the minimum value, and thus the close approach distance is much larger than what the MOID would allow.

Asteroid	MOID in au	MOID in km	Diameter in m	U parameter	Next Close Approach	Nominal Distance in au
2014 DA	0.000013	1900	80–170	7.2	2039-10-17	0.169060
2010 VB1	0.000022	3200	60–130	0.0	2026-03-24	0.016586
2016 FG60	0.000022	3200	140–300	3.4	2062-08-17	0.020027
2018 LK	0.000031	4600	120–270	1.8	2029-06-22	0.178656
2014 PW59	0.000031	4700	170–400	1.2	2044-06-07	0.042939
(367943) Duende	0.000036	5400	20–40	2.6	2026-02-11	0.159440
2023 DZ2	0.000048	7100	40–90	0.9	2026-04-04	0.006767
2012 HB25	0.000065	9800	28–60	7.2	2046-07-16	0.036985



Histogram showing the number of known NEOs per bin of MOID, in different size classes.

The distribution appears to be fairly uniform at large sizes, while low-MOID objects are more abundant at low values because small objects are typically only discoverable during very close approaches.

[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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