

## ESA's NEO Coordination Centre

### Current NEO statistics

Despite the poor weather at many survey sites, more than 250 new NEOs were discovered in March.

- Known NEOs: 31 603 asteroids and 120 comets
- NEOs in risk list\*: 1463
- NEOs designated during last month: 252
- NEOs discovered since 1 January 2023: 586

### Focus on

In recent times, and on many occasions, the NEO community has seen how news about asteroid close approaches to Earth have broken out in the media without a clear criterion as to why these particular approaches deserved news coverage while others did not. ESA's NEOCC provides a list of asteroid recent and upcoming close approaches on its web portal. We recently added a colour-coded "close approach index" to that list, which should allow the press, media and public to easily evaluate the importance of each event. The close approach index takes into account the object size and the distance of the asteroid's approach to Earth. Approaches are classified into five categories: very rare (occurring typically once per decade), rare (every few years), infrequent (roughly once every few months), frequent (once every few weeks) and very frequent (more than once per week). For example, the very recent case of 2023 DZ2 was initially classified as a rare event, but has since been downgraded to infrequent after a refinement in the estimation of its size.

### Upcoming interesting close approaches

None of the currently known NEOs are expected to come closer than the Moon in April.

- 2006 HV5 is probably the most noticeable known close approach for the month of April. It's a 300-metre asteroid coming to about 6 lunar distances on 26 April.

### Recent interesting close approaches

The fly-by of a large newly discovered object was prominently discussed in the news at the end of March.

- 2023 DZ2 is a newly-discovered objects of 30-50 metres that had a noticeable close approach on 25 March, coming to less than half a lunar distance. As mentioned above, approaches of objects of this size at such a close distance are not a common occurrence.

### News from the risk list

Two objects took the top spot of our risk list in March, but they have both been removed by now.

- 2023 DW, which topped the list with a Torino Scale rating of 1 during the first half of March, had all its impact chances excluded during the second half of the month.
- 2023 DZ2, the close approacher described above, also reached a Torino Scale rating of 1 a few days after discovery, for a possible impact in year 2026. Subsequent observations just before close approach removed all possible collisions.

\*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 International Asteroid Warning Network (IAWN) organised a fast-response campaign targeting the fly-by of 2023 DZ2. The goal of the campaign was to test the capabilities of the worldwide community to collect physical characterisation information on a target within a time-span of less than a week, and with no advance warning. The results will be presented soon.

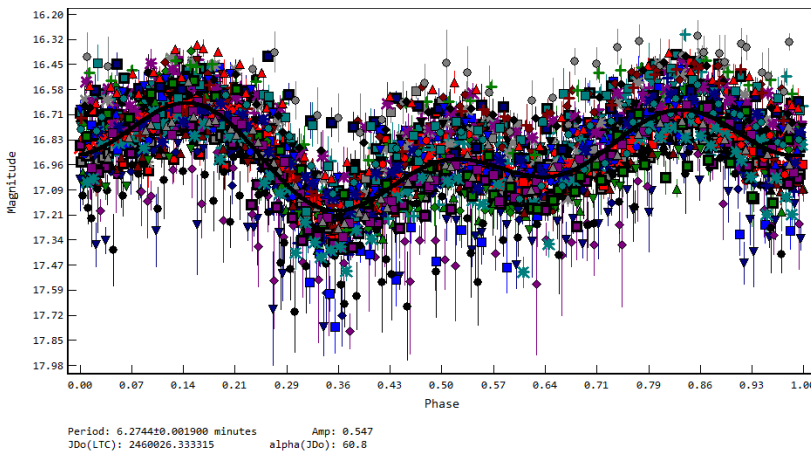
## Upcoming events

- 8<sup>th</sup> 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/>
- 55<sup>th</sup> 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>

## Rare close approaches in the next 10 years

The table shows the list of rare and very rare close approaches of known NEAs in the next 10 years, according to the Close Approach Index.

Object name	Close approach date	Miss distance in lunar distances	Miss distance in Earth radii	Miss distance in km	Size range in m	H magnitude	Close Approach Index
(99942) Apophis	2029-04-13	0.08	5	30 000	375	18.9	Very rare event
(153814) 2001 WN5	2028-06-26	0.63	38	240 000	932	18.3	Very rare event
(137108) 1999 AN10	2027-08-07	1.00	60	380 000	640–1400	18.1	Rare event
(35396) 1997 XF11	2028-10-26	2.40	145	920 000	700	16.9	Rare event
(4953) 1990 MU	2027-06-06	11.98	722	4 600 000	2800	15.0	Rare event
(292220) 2006 SU49	2029-01-28	3.17	191	1 200 000	330–750	19.5	Rare event
(242450) 2004 QY2	2029-07-15	18.32	1104	7 000 000	3000–7000	14.7	Rare event



Lightcurve of 2023 DZ2 obtained with the Calar Alto Schmidt telescope. The lightcurve contains photometric observations from different nights, phased together with a rotation period of 6.27 minutes. The unusual shape of the lightcurve highlights the irregular shape of this object.

Various lightcurves and other physical observations of this object were collected during the dedicated IAWN campaign.

[Credit: ESA / PDO / E. Petrescu, M. Micheli]

## 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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