

→ NEWSLETTER JULY 2025

ESA's NEO Coordination Centre

Current NEO statistics

The usual drop in discovery rates during Northern summer is already visible, mostly caused by shorter nights and less observing time.

- Known NEOs: 38 596 asteroids and 123 comets
- NEOs in risk list*: 1794
- NEOs designated during last month: 127
- NEOs discovered since 1 January 2025: 1300

Focus on

The last year of the current decade, 2029, has been officially recognized by the United Nations as the “International Year of Asteroid Awareness and Planetary Defence”. The reason for the choice of this particular year is the well-known and very rare passage of (99942) Apophis very close to our planet on 13 April of that year.

What is less known is that the 2 years before the Apophis fly-by will also be unique thanks to the passage of three other major asteroids in our neighbourhood, all of which will become significantly bright and easily observable with even modest instrumentation.

The period will begin in August 2027, with the fly-by of (137108) 1999 AN₁₀, continue with (153814) 2001 WN₅ and (35396) 1997 XF₁₁ in 2028, and conclude 20 months later with Apophis itself.

While Apophis will reach easy naked eye visibility, these three additional asteroids will all become brighter than magnitude 8.5, making them easy binocular targets even from moderately light-polluted areas.

The table and the figure in the next page provide more data on these events, and an overview of how they stand out in the overall scenario of Earth close approaches.

Upcoming interesting close approaches

We only know few predicted close approachers for July.

- 2005 VO₅ is the only known close approacher expected to reach magnitude 15 in July.

Recent interesting close approaches

Three objects became bright in June.

- (424482) 2008 DG₅, 2025 LT and 2025 LK were the three brightest close approachers of the month, becoming brighter than magnitude 15. While the former large asteroid was known in advance, the latter two were both smaller discoveries of the month, respectively Tunguska- and Chelyabinsk-sized.

News from the risk list

A newly discovered small asteroid entered the top positions of our risk list.

- 2025 LK, mentioned above as a close approacher, is also a new entry in the top-10 ranking of our risk list, for a 1 in 500 chance of impact in 2052. The asteroid is now unobservable, but it will become visible again for large telescopes this fall.

*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 first week of the Flyeye-1 Telescope Factory Acceptance took place on the week of 23 June. The software, mount and pointing/tracking capabilities were successfully validated. The second week of acceptance tests is planned for the second half of July.
- The annual Asteroid Day events happened in Luxembourg on 27 and 28 June 2025, with many additional asteroid-themed events organised all over the world. Some members of our team also participated in outreach activities during the period.
- The Vera C. Rubin Observatory has reported their first astrometric observations, obtained during the commissioning phase, to the Minor Planet Center. Their MPC code is X05.

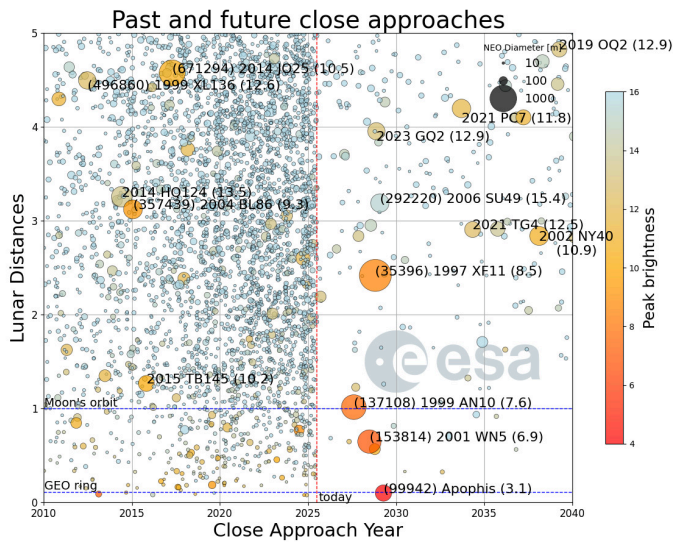
Upcoming events

- Meteoroids 2025, 7-11 July 2025, Perth, Australia
<https://meteoroids2025.gfo.rock>
- Europlanet Science Congress (EPSC) 2025 (joint meeting with the 57th Annual Meeting of the AAS Division for Planetary Sciences), 7-12 September 2025, Helsinki, Finland
<https://www.epsc-dps2025.eu/>

The biennium of close approaches

The table summarises the fly-by and observational characteristics of the four exceptional approaches of NEOs between 2027 and 2029 discussed in the “Focus on” section of this newsletter. No other known asteroid larger than 100 metres became brighter than approximately magnitude 9 during the past 15 years, while 4 such events will happen in less than two years at the end of this decade.

| Asteroid | Close Approach Date | Distance to Earth at closest approach in LD | Visual magnitude at closest approach | Diameter in m | H |
|--------------------|------------------------|---|---|------------------|------|
| (137108) 1999 AN10 | 2027-08-07 | 1.01 | 7.6 | 600 - 1400 | 18.1 |
| (153814) 2001 WN5 | 2028-06-26 | 0.65 | 6.9 | 940 | 18.3 |
| (35396) 1997 XF11 | 2028-10-26 | 2.42 | 8.5 | 700 | 17.0 |
| (99942) Apophis | 2029-04-13 | 0.10 | 3.1 | 375 | 18.9 |



The plot summarises closest approaches of known NEOs from 2010 to 2040. The size of each point is proportional to the asteroid diameter, and the colour informs about the peak brightness reached by the object at close approach.

The most striking feature of the plot is the much larger number of known approachers before the current time (red vertical line). This is an obvious consequence of the discovery process: most NEOs, especially small ones, are only found during close approaches, and therefore we don't yet know many of those that will come close in the future.

The other noticeable feature, i.e. the 4 bright approaches clustering between 2027 and 2029, is discussed in greater detail in the “Focus on” section of this newsletter.

[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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