

→ NEWSLETTER MAY 2024

ESA's NEO Coordination Centre

Current NEO statistics

The number of new NEOs discovered in 2024 is in line with 2023, but significantly lower than in 2022.

- Known NEOs: 34 807 asteroids and 122 comets
- NEOs in risk list*: 1615
- NEOs designated during last month: 212
- NEOs discovered since 1 January 2024: 816

Focus on

Asteroid observability from the ground depends on the object distance to the Sun and the observer, on the phase angle, on the object shape and on its surface reflectivity properties. Several magnitude systems have been proposed in the last decades to model the visual magnitude of the object based on the mentioned parameters. Independently of the magnitude system used, there is a three-dimensional representation of the geometrical locus of equal visual magnitude when this value is constrained for a given asteroid. ESA has recently released the [Synodic Orbit Visualisation Tool \(SOVT\)](#), a web utility that allows any user to analyse the graphical representation of a NEO trajectory in a reference system following the motion of the Earth and the observability region for a given limiting visual magnitude, the detection polar. The magnitude system used in the SOVT is the well known H-G model with a value of G equal to 0.15. The combination of the 3D representation of both the trajectory and the detection polar allows analysing in a very direct and intuitive manner when and how a NEO would become observable from Earth by a given telescope. Further to that, it is also possible to represent a cone to visualise a minimum solar elongation limit below which the Sun would preclude the observation of the object from the Earth. SOVT is thus the new member in NEOCC's [NEO Toolkit](#), which shall be hopefully very useful to any NEO observer.

Upcoming interesting close approaches

None of the asteroids known at the beginning of the month are expected to come closer than the Moon in May. As usual, small close approachers will likely be discovered during the next few days, right around their approach time.

Recent interesting close approaches

Two tiny asteroids had very close fly-bys in April.

- 2024 HA and 2024 GJ2 are two recently discovered tiny asteroids, both just a few metres in diameter. They flew-by the Earth in April at less than 20 000 km from the Earth's centre. The latter object was tracked by our team during the closest approach with the Zadko telescope in Australia.

News from the risk list

No objects left or entered the top positions of our risk list last month.

*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 Apophis T-5 workshop, and the last Hera Science Workshop before launch, were both held end of April at ESTEC. They were attended by over 200 scientists.
- Hera's Milani and Juventas CubeSat flight models have been delivered and integrated into Hera in preparation for the ElectroMagnetic Compatibility (EMC) testing, which has just begun.
- This year, the annual Asteroid Day events will be streamed from Luxembourg on June 28 and 29, together with many more independently hosted events all over the world. You can read about the initiative, schedule of events, and speakers at <https://asteroidday.org/>.

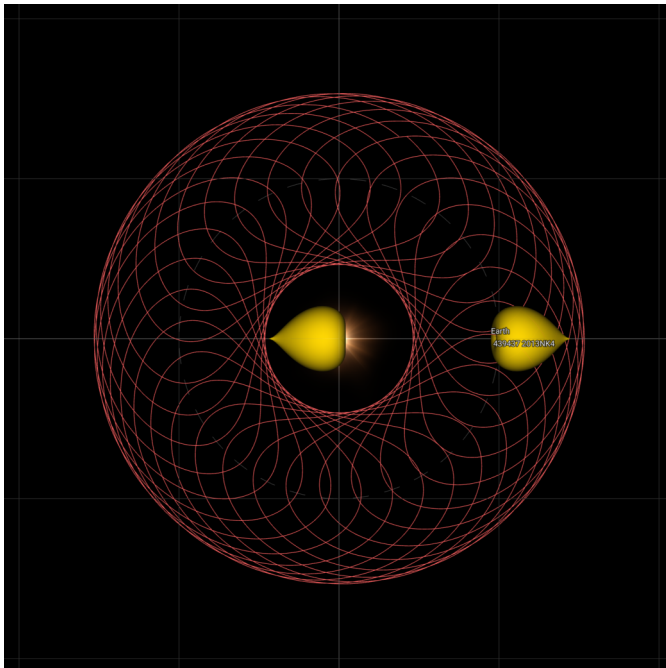
Upcoming events

- 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.saa.ac.za/>

NEAs in resonance 1:3 with the Earth

List of NEAs in resonance 1:3 with the Earth and MOID < 0.05 au. Objects with integer resonances with our planet are interesting cases to visualise with our SOVT: they create near-repeating regular patterns in the synodic reference frame.

Designation	Period in days	Earth MOID	Next close approach date
2023 UU1	1096.1	0.0037	2026-10-18
2023 CM2	1095.2	0.0052	2026-02-21
2024 EL1	1096.5	0.0104	2027-03-11
(518847) 2010 DM	1096.3	0.0325	2076-01-12
2015 KJ19	1096.6	0.0360	2024-05-14



Asteroid (439437) 2013 NK4 recently had an infrequent close approach with Earth. This object has an orbital period of 378.1 days. Being so close to the period of the Earth, this means that its synodic period is large, being indeed 29.5 years.

The figure obtained by making use of the SOVT between May 2009 and May 2039 provides the asteroid trajectory in a bit more than a full synodic period. As it can be observed, the trajectory nicely closes after that amount time, meaning that it will almost repeat this shape in a 29.5 year period.

The detection polar obtained for this object and a telescope with a limiting magnitude of 18 is represented by the 3D shapes in yellow. The section which is located close to the Earth allows determining when the object will be visible by the mentioned telescope. The section close to the Sun shall not be visible due to its low solar elongation.

[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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