

→ NEWSLETTER MARCH 2022

ESA's NEO Coordination Centre

Current NEO statistics

Average discovery rates in these first months of 2022 are similar to the past year.

- Known NEOs: 28 332 asteroids and 117 comets
- NEOs in risk list*: 1344
- NEOs designated during last month: 303
- NEOs discovered since 1 January 2022: 538

Focus on

On the night of 22 February our collaborator Erwin Schwab was observing with the ESA-funded Calar Alto Schmidt telescope in Spain when he found a new NEO. After confirmation observations were collected by other observatories, the object was announced with the designation 2022 DX. At first sight, the object appears to be a pretty normal very small NEO, with an expected diameter of about 10 metres. What makes it interesting is its motion with respect to the Earth: due to the nearly circular orbit and low inclination, its relative velocity is very low, roughly 1 km/s. An immediate consequence of this peculiarity is that this asteroid will remain in the vicinity of the Earth for many months, and will therefore remain observable for much longer compared to other 10-meter-class asteroids. This offers a unique opportunity to accurately determine the orbit of a very small asteroid, which is subject to weak non-gravitational forces like the pressure of solar radiation acting on its surface. This is a subtle effect that has been directly observed only on a handful of objects, and 2022 DX could be our next opportunity to study this interesting interaction.

Upcoming interesting close approaches

No significant close approaches of currently known NEOs are expected in March.

- (138971) 2001 CB₂₁, a 600-metre asteroid, will come to 13 lunar distances in March. It is the only object among the currently known close approachers that is expected to reach a magnitude brighter than 15.

Recent interesting close approaches

A few objects became moderately bright during close approaches in February.

- 2022 CJ₅ is a tiny asteroid of about 3 metres that came closer than the geostationary ring on 10 February. Because of its tiny size, it never got brighter than magnitude 14, even at its closest distance.
- On the other hand, 2022 CG₇ and 2022 CO₆ both reached magnitude 13, despite larger approach distances, due to their intrinsic larger sizes.

News from the risk list

The risk from a few recently discovered asteroids dropped during the month of February.

- 2022 AP₇, announced in early February as a new high-rated impactor, has been removed from our risk list thanks to observations obtained by our team with the Schmidt telescope on Calar Alto, Spain.
- 2022 CA₁ also reached a high risk rating at discovery, but its impact probability has now dropped to less than 1 in 50 000 thanks to subsequent observations.

*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

- Asteroid Day has announced their 2022 programme of activities beginning 29 June and running through 2 July. Visit asteroidday.org to learn more.

Upcoming events

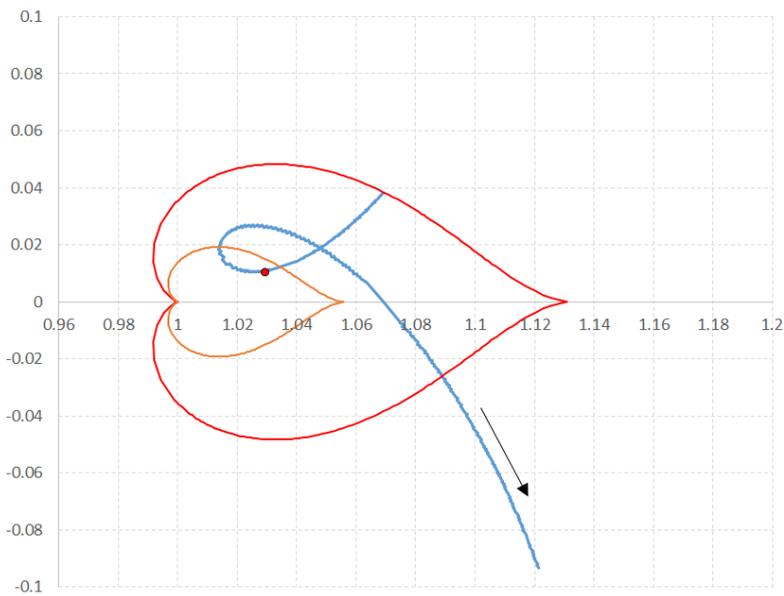
Four events are in the list of relevant international meetings in the coming months.

- 53rd Lunar and Planetary Science Conference, 7-11 March 2022, The Woodlands, Texas, USA
<https://www.hou.usra.edu/meetings/lpsc2022>
- Apophis T-7 Years: Knowledge Opportunities for the Science of Planetary Defense, 11-13 May 2022, virtual
<https://www.hou.usra.edu/meetings/apophis2022>
- Europlanet Science Congress (EPSC) 2022, 18-23 September 2022, Granada, Spain
<https://www.epsc2022.eu>
- 54th Annual Meeting of the AAS Division for Planetary Sciences, 2-7 October 2022, London, Canada
<https://dps.aas.org/meetings/future>

Closest approaches in the next 10 years

The table shows the list of closest approaches of known NEAs in the next 10 years. It only contains objects with approaches at less than 1 lunar distance.

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
(99942) Apophis	2029-04-13	0.08	5	30 000	375	18.9
2016 NL39	~ 2030-06-30	~ 0.31	~ 19	~ 120 000	8–18	27.6
(153814) 2001 WN5	2028-06-26	0.63	38	240 000	932	18.3
2022 DM4	2022-03-02	0.66	40	250 000	4–8	29.3
2001 AV43	2029-11-11	0.80	48	300 000	28–60	24.9
2021 E02	2028-05-19	~ 0.87	~ 53	~ 300 000	7–16	27.9



Trajectory of 2022 DX in an Ecliptic reference frame centred at the Sun, rotating and pulsating with the motion of the Earth. The Earth is located at position (1,0) and axes are expressed in astronomical units.

Detection polars for this asteroid using the H-G system (a model developed for the purpose of predicting the visual magnitude of an asteroid as a function of solar phase angle) are provided for visual magnitude values of $V = 24$ (red) and $V = 22$ (orange). The asteroid was discovered from Calar Alto (Spain) close to the local midnight on 22 February at a V smaller than 22 (marked with the point in red). The asteroid will exit the $V = 24$ curve at the end of June 2022.

[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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