→ NEWSLETTER NOVEMBER 2026

ESA's NEO Coordination Centre

Current NEO statistics

A new near-Earth comet, P/2026 R2 (Leonard), the first one in more than 2 years, has been announced. It's a Halley-type comet in a highly inclined 22-year orbit.

- Known NEOs: 42 832 asteroids and 125 comets
- NEOs in risk list*: 2195
- NEOs designated during last month: 276
- NEOs discovered since 1 January 2026: 2301

Focus on

Radar astrometry provides some of the most precise measurements for determining the orbits of near-Earth objects. The travel time of a radio echo measures the asteroid's distance, while its Doppler shift reveals its radial velocity. Such measurements can reach precisions of a few metres and millimetres per second, respectively. They are complementary to the angular positions measured by optical telescopes, allowing to greatly reduce the orbital uncertainties of NEOs. They are of first importance for virtual impactors. In March 2021, Goldstone and Green Bank observations helped rule out the remaining impact scenarios for Apophis, including a possible collision in 2068. The combined radar and optical observations reduced its predicted positional uncertainty at the 2029 encounter from hundreds of kilometres to only a few kilometres, allowing its removal from the risk list. Arecibo's final such case was 2020 NK1: observations on 31 July 2020 excluded seven possible impacts between 2086 and 2101, shortly before the cable failure that halted operations in August. Beyond precise tracking, radar also reveals an object's size, shape and rotation. A memorable example is 2015 TB145, observed by Arecibo during a campaign that included its Halloween flyby on 31 October 2015. The roughly 600-metre asteroid safely passed Earth at about 1.3 lunar distances, while its radar images revealed a peculiar resemblance to a human skull.

Upcoming interesting close approaches

None of the NEOs known at the beginning of November are expected to have a noticeable fly-by during the month.

Recent interesting close approaches

Two significant close approaches happened in mid-October.

- 2026 TP128 was the most notable close approacher of October. A tiny asteroid just 1 to 2 metres in diameter, it flew by Earth on 15 October, just 1130 km above Earth's surface, making it the fourth-closest non-impacting approach ever observed. It was discovered by the PASTIS observatory in France, using a 28 cm telescope.
- 2026 TN77 is a much larger asteroid, 10 to 20 metres in diameter, discovered by the ATLAS survey in South Africa. It had a fly-by roughly 50 000 km away, reaching magnitude 12.5 thanks to its larger size.

News from the risk list

None of the objects that entered the risk list in October reached a noticeably high rating during the 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

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In other news

- By the end of October, the Hera spacecraft has already successfully implemented the braking manoeuvres and is now obtaining resolved images of Didymos and Dimorphos.

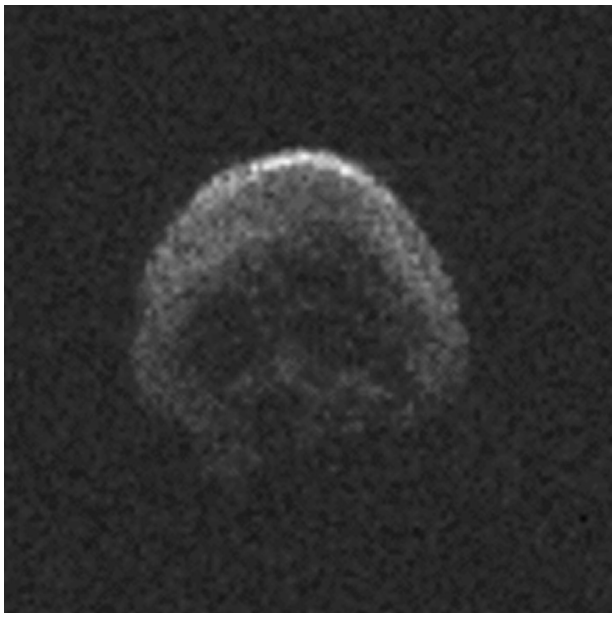
Upcoming events

- 10th IAA Planetary Defense Conference, 3-7 May 2027, Montreal, Canada
  https://iaaspace.org/event/10th-iaa-planetary-defense-conference-2027

List of radar transmitting stations

The table lists all antennas that have ever submitted radar astrometry of NEOs as transmitting stations. Many more stations have served as receivers, but only a few facilities worldwide are capable of actually transmitting radio signals towards an asteroid. All but 3 are part of the NASA Deep Space Network.

Telescope location	Facility	Antenna	MPC code	Number of observed NEAs	Diameter in m	Operative
Arecibo	-	-	251	802	305	From 1963 to 2020
Goldstone	GDS CC	DSS-14	253	488	70	Under maintenance
Goldstone	GDS CC	DSS-13	252	7	34	Yes
Goldstone	GDS CC	DSS-26	316	1	34	Yes
Canberra	CDS CC	DSS-43	265	24	70	Yes
Canberra	CDS CC	DSS-36	264	3	34	Yes
Canberra	CDS CC	DSS-35	263	4	34	Yes
Canberra	CDS CC	DSS-34	272	1	34	Yes
Madrid	MDS CC	DSS-63	R47	1	70	Yes
Tromso	EISCAT	UHF system	259	1	32	Yes
Westford	MIT Haystack Observatory	LRIR	254	1	37	Yes



Radar image of asteroid 2015 TB145, obtained with the Arecibo Observatory on 30 October 2015, the day before it flew past Earth at about 1.26 lunar distances.

Dark patches observed in the radar image make the object look like a skull, making it a Halloween favourite.

[Credits: NAIC-Arecibo / NSF]

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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