→ CAFS FOR 2024 PDC25, EPOCH 1

ESA's NEO Coordination Centre

Exercise Exercise Exercise

This document does not describe a real asteroid impact threat. The information here is fictional and provided only to support an international exercise conducted in the framework of the Space Mission Planning Advisory Group (SMPAG).

Close approach fact sheet for asteroid 2024 PDC25

Possible impact date	2041-04-21
Possible impact time	~ 16:20 UTC
Velocity at entry interface point	~ 13.8 km/s
Size range	110-240 m
Discovery date	2024-06-05
Discovery site	Catalina Sky Survey

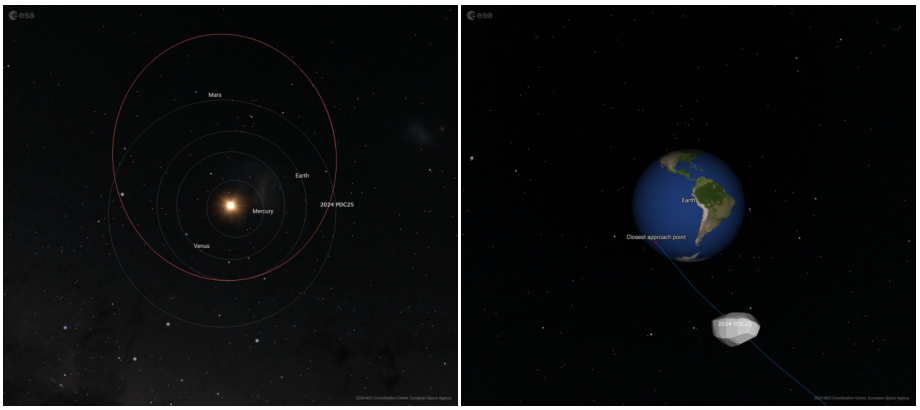
All error bars quoted in this table correspond to one standard deviation.

Orbit information

All orbital elements in this table are referred to the ecliptic reference system at J2000.0 epoch and to the preimpact conditions.

Date before the possible impact	Orbital period (year/days)	Aphelion distance (au)	Perihelion distance (au)	Eccentricity	Inclination (deg)
2041-03-25	2.120/774	2.294	1.001	3.905	10.690

All orbital elements in this table are referred to the ecliptic at the epoch of J2000.0



In the image to the left, the hypothetical orbit is depicted – showing how it would be affected in the case of a close flyby. In the image to the right, the hypothetical flyby trajectory (blue line) and a geostationary orbit (red line) are visualised. N.B.: the size of the object appears magnified due to the virtual observer in the Flyby Visualisation Tool (FVT) being closer to the asteroid than to Earth.

Physical and mitigation information

An object in this size range would constitute a significant potential threat. Therefore it meets the criteria for the activation of both the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG).

Days to closest approach	Cumulative impact probability	Composition	Rotation period (hours)
6109 days	0.016	Unknown	Unknown

Observational information

The asteroid would be observable at present with an approximate magnitude around 22. It would remain observable with large telescopes until the mid of December 2024. It would then become unobservable for terrestrial telescopes until the second half of August 2025 due to low solar elongation. The observations of the 2025 apparition would likely increase the accuracy of the orbital information to a large extend, either confirming or ruling out a hypothetical impact.

Other information

Encounter peculiarities	Previous encounter	Next encounter
Possible impact	Not available	Not applicable

Only encounters within 0.05 au are considered.

Links

NEO information:
https://neo.ssa.esa.int/2025-pdc-impact-excercise
Close approaches page:
https://neo.ssa.esa.int/close-approaches

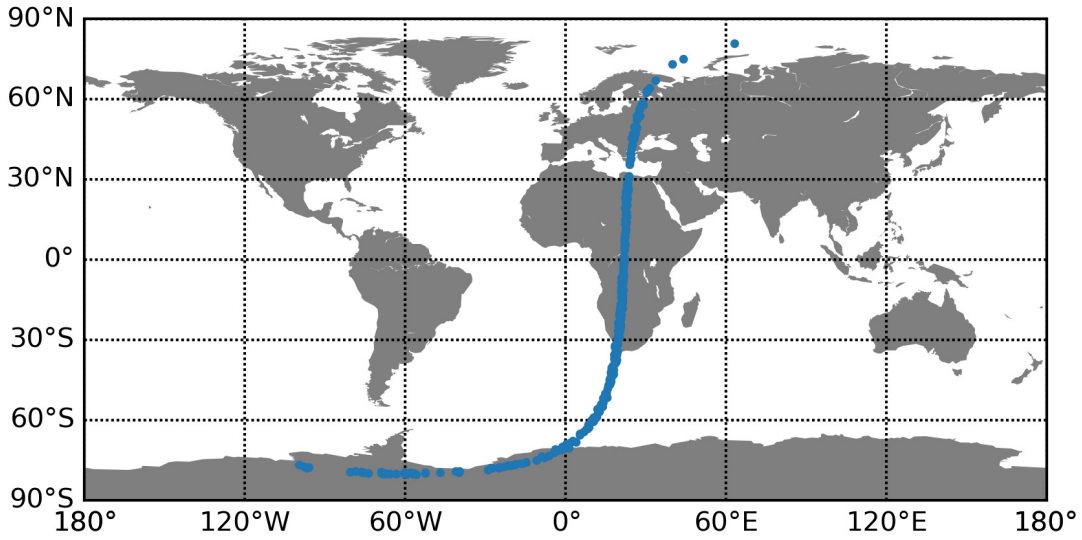
Impact risk information sheet for asteroid 2025 PDC

Impact information

Size (m)	Impact date (UTC)	IP	TS	Velocity (km/s)	Flight path angle (°)	Expected energy (Mt TNT equiv.)
110-240	2041-04-24 ~ 16:20:00	0.016	3	13.8	between ~ -20 and ~ 90	~ 98

The hypothetical impact corridor for this object (calculated at 100 km altitude, within 1 sigma) would span a large distance, mostly from north to south. In the northern hemisphere it would cross parts of Eastern Europe, the eastern part of the Mediterranean Sea and northern to central Africa. In the southern Hemisphere, the impact corridor would progress over southern Africa from the Barents Sea to the Cape of Good Hope and then over the South Atlantic to Antarctica and finally parts of the South Pacific.

Impact corridor plot



Source: JPL

Impact effects

Due to the range in potential sizes, impact effects would vary from a large airburst to ground impact with unsurvivable damage levels over large areas on the scale from tens of kilometers up to approximately 200 km in radius. Impacts over Antarctica or over oceans would likely not cause high levels of destruction to human infrastructure. Impacts over inhabitet areas or near major population centres would potentially cause widespread and massive damage levels with large numbers of casualties to be expected.