

→ NEWSLETTER SEPTEMBER 2025

ESA's NEO Coordination Centre

Current NEO statistics

The number of discoveries remained high during the month of August, with more than 300 new NEOs added to the catalogue, bringing the total known population above 39 000. It should be noted that the Vera C. Rubin Telescope is not yet contributing regular asteroid observations.

- Known NEOs: 39 151 asteroids and 123 comets
- NEOs in risk list*: 1817
- NEOs designated during last month: 360
- NEOs discovered since 1 January 2025: 1808

Focus on

Newly discovered asteroids need to have their orbits constrained quickly, to determine the possibility of Earth impact and schedule follow-up observations before the object is lost. To perform this task, ESA's NEOCC developed the *Meerkat Asteroid Guard*, an automated warning service for imminent impacting asteroids. Meerkat continually scans the MPC's Near-Earth Object Confirmation Page (NEOCP), using the method of systematic ranging to find likely orbital solutions, physical properties, and potential impacts in the next 30 days. Over its five years of operations, Meerkat has successfully delivered alerts for all six of the imminent impactors discovered before their impact.

This month version 2.0 of Meerkat will be released, a major update featuring ESA's new flight dynamics library GODOT. The new software is faster, less error-prone and includes several new features to help observers and analysts, such as the impact velocity, impact flight path angle, time to enter Earth's shadow and object prioritisation queue. The figure in the next page shows an example of a new Meerkat impact plot, displaying the potential impact locations derived from Monte Carlo sampling.

Upcoming interesting close approaches

IAWN is organizing a campaign targeting a close approach in September.

- 2025 FA22 will likely be the most significant close approach of the month of September. Discovered in March this year at 0.8 au, this 150 m asteroid rated high in our risk list for a few weeks, before being removed. It is now coming back for a closer approach, at about 2 lunar distances, during which it will reach magnitude 13. Since it will be an easy target for all kinds of observations, IAWN is organizing a campaign dedicated to its physical characterization.

Recent interesting close approaches

Two tiny asteroids came close in August, both discovered around their close approach.

- 2025 PF2 and 2025 PU1 are two tiny asteroids, just a few metres in diameter, that came closer than the geostationary ring during the month of August.

News from the risk list

No objects entered or left high-rated positions of the list during the month of August.

*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 Hera spacecraft is performing well. The team is currently preparing for the asteroid phase, and they have found a way to arrive at Didymos a month earlier than planned.
- Hera also recently observed asteroids (1126) Otero and (18805) Kellyday.

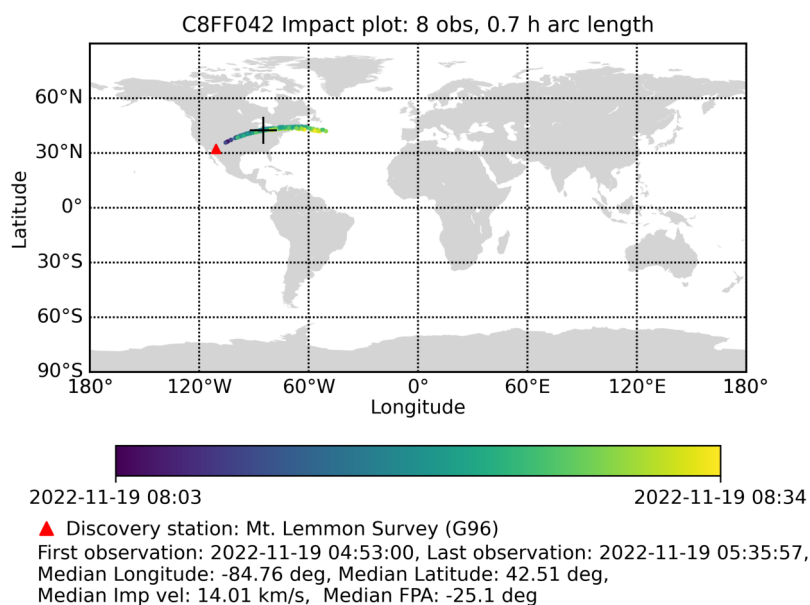
Upcoming events

- 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/>
- International Meteor Conference (IMC) 2025, 18-21 September 2025, Soest, The Netherlands
<https://imc2025.imo.net/>
- Asteroids, Comets, Meteors Conference, 6-10 July 2026, Poznań, Poland
<https://acm2026.eu/>

IAWN campaigns

The International Asteroid Warning Network (IAWN) routinely organises observing campaigns to prepare the community of observers to various aspects of NEO follow-up. This table lists the campaigns organised so far, including the currently ongoing one targeting 2025 FA22.

Target name	Year	Campaign goal	Publication
2012 TC4	2017	Recovery and astrometric follow-up	Reddy V., et al.; Icarus 326:133 (2019)
(66391) Moshup	2019	Physical characterisation	Reddy V., et al.; Icarus 374:114790 (2022)
(99942) Apophis	2020	Preparation for 2029 fly-by	Reddy V., et al.; PSJ 3:123 (2022)
(679648) 2019 XS	2021	Timing assessment	Farnocchia D., et al.; PSJ 3:156 (2022)
(741081) 2005 LW3	2022	Timing assessment	Farnocchia D., et al.; PSJ 4:203 (2023)
2023 DZ2	2023	Rapid response for physical characterisation	Reddy V., et al.; PSJ 5:141 (2024)
2025 FA22	2025	Physical characterisation	(Campaign ongoing)



The Meerkat impact plot for 2022 WJ1 with 8 observations. The discovery station is indicated by a red triangle, and the median impact location is marked with a black cross. Different possible impact points are also marked, with a colour scale indicating the associated impact time. The median impact velocity and flight-path angle are indicated at the bottom of the plot.

[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>

neo.ssa.esa.int

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