

→ NEWSLETTER OCTOBER 2021

ESA's NEO Coordination Centre

Current NEO statistics

Two new near-Earth comets were announced this month.

- Known NEOs: 26 806 asteroids and 117 comets
- NEOs in risk list*: 1215
- Number of NEOs designated during last month: 308
- NEOs discovered since 1 January 2021: 2098

Focus on

The discovery of new NEOs is typically seen as the main goal of the observational efforts in our field. However, the importance of follow-up, i.e., acquiring post-discovery observations to secure the object's orbit, is often overlooked. Most NEOs are typically easy to observe for the days or weeks after discovery. This is the result of discoveries usually happening near a favourable close approach, when the object is brighter than average. However, obtaining additional observations often quickly becomes harder: many NEOs are then neglected by both professional and amateur follow-up efforts, until a future chance for recovery and/or rediscovery. This lack of follow-up is of course nearly inevitable, given the current impressive discovery rates, and the limited number of follow-up programs worldwide. In order to address this issue, ESA has built up a good network of follow-up telescopes. Thanks to all contributors!

Nevertheless, the consequences are easily noticeable in our NEO catalogue: of the almost 27 000 discovered NEOs, about 25% have an observed arc of less than a week, and 50% have been seen for less than a month. Many of these objects will likely be already unrecoverable at their next favourable apparition, and will have to be rediscovered in the future.

Upcoming interesting close approaches

Only one known object will have a moderately bright close approach in October.

- 1996 VB₃ is a 140 metre object that will have a fly-by in October, at less than 9 lunar distances, and is expected to reach magnitude 16 at its closest distance.

Recent interesting close approaches

The month of September was rich of interesting close approaches.

- 2021 SP and 2021 RS₁ are two tiny objects, about 3 to 5 metres in diameter, which flew-by the Earth at only 8000 km and 15 000 km from the surface.
- 2021 QB₃ and 2021 SG are two larger objects of about 60 metres that came to 1.7 and 0.6 lunar distances respectively, and became brighter than magnitude 13.

News from the risk list

A new object discovered in August has now reached the top position in our risk list.

- 2021 QM₁ is still at the top of our risk list, with an impact probability of about 1 in 3000 in April 2052. Additional observation opportunities with large aperture telescopes will begin next spring.

*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 International Asteroid Warning Network (IAWN) has announced a new observing campaign targeting asteroid 2019 XS in early November. The campaign is designed to provide observers with an opportunity to assess the accuracy of their timing, thanks to the fast angular speed of the object's motion.
- Lucy, NASA's mission to first visit a number of Trojan asteroids, is expected to be launched in the second part of October.

Upcoming events

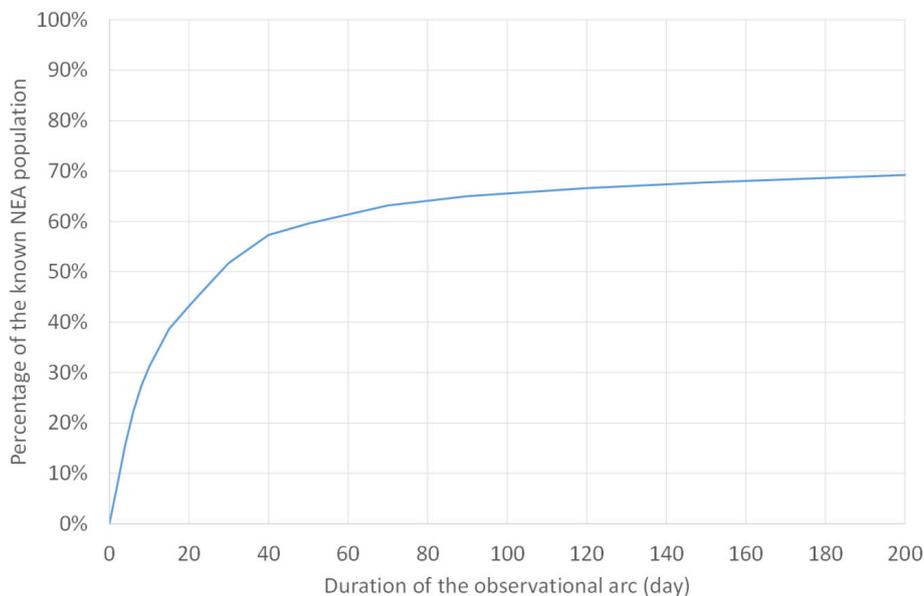
One event in the list of relevant international meetings over the next months.

- 53rd Annual Meeting of the AAS Division for Planetary Sciences, 3-8 October 2021, virtual <https://dps.aas.org/meetings/current>

Distribution of NEAs versus Observational Arc Duration

The following table provides the cumulative distribution of the duration of the observational arc for the known population of NEAs. The present distribution is also represented in the figure below.

Percentile of the NEA population	Duration of observational arc
10%	< 2.5 days
20%	< 5.1 days
30%	< 9.2 days
40%	< 16 days
50%	< 28 days
60%	< 52 days
70%	< 243 days
80%	< 6.6 years
90%	< 15.5 years



Cumulative distribution of the relative number of NEAs as a function of the observational arc duration. The data for the plot is also contained in the above table and it is discussed in the Focus on for this month.

In summary, 25% of the known NEAs have observational arcs of less than 7 days. Roughly 50% of them have observational arcs smaller than 28 days. This demonstrates that a large number of objects are quickly lost after discovery.

[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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