

→ NEWSLETTER SEPTEMBER 2022

ESA's NEO Coordination Centre

Current NEO statistics

Our risk list now contains more than 1400 objects, including a new one in its first position.

- Known NEOs: 29 533 asteroids and 117 comets
- NEOs in risk list*: 1404
- NEOs designated during last month: 240
- NEOs discovered since 1 January 2022: 1100

Focus on

A recent [survey](#) of a few dozen experts in the field of planetary defence reveals some interesting opinions of the community on the current and future state of our field. Among the most widespread opinions is the need for more observational facilities, and for improvements in the area of NEO discovery. Other aspects of NEO science, such as orbital characterisation, are seen as already sufficiently mature. The poll also shows that the experts are still divided on their judgement of our capability to effectively mitigate a predicted large-sized asteroid impact. Interestingly, there seems to be widespread concern on the effects of the rapidly-increasing number of artificial satellites in Earth orbit, with as much as 1 expert in 4 expressing "extreme concern" for the situation. In fact, the issue of satellite trails might be particularly relevant for NEO surveys, more than for other fields of astronomy, due to the twilight and low-altitude observations that are often needed to discover and track NEOs at low solar elongation.

Upcoming interesting close approaches

None of the asteroids known at the beginning of the month will come closer than the Moon during the month of September. In addition, no object larger than 100 m is expected to come closer than 20 lunar distances.

Recent interesting close approaches

A few objects reached magnitude 14 to 15 during close approaches in August, easily observable via CCD imaging even with small instrumentation.

- 2022 PX1 is a newly discovered object of about 100 metres which had a close approach at 2.8 lunar distances on 12 August. Around the time of close approach it reached magnitude 14, thanks to its significant size.
- 2022 QE1 and 2022 QW1 both reached magnitude 15 on 20 August. In this case they are much smaller objects, about 10 metres in size, but they came to about half lunar distance from the Earth.
- 2022 QN4 had a similar encounter a few days earlier, on 11 August.

News from the risk list

A new small asteroid reaches the top of our list.

- 2022 QX4 is the new #1 object of our risk list. With a Palermo Scale value of almost -2, and a Torino Scale rating of 1, it is one of the most prominent new discoveries of the year. Its highest-rated impact solution is for September 2068, currently rated at a probability of about 1 in 220, but other lower-probability impact circumstances exist. The asteroid has a size of about 40 metres.

*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 launch of Artemis I will include a small-sized but very significant NEO element. A component of the secondary payload is a small CubeSat called NEA Scout. It will use its solar sail to fly-by the smallest NEO ever visited by a spacecraft.
- NASA's DART spacecraft will impact the secondary of the Didymos asteroid binary on 26 September, around 23:14 UTC. About 10 days before impact the spacecraft will release LICIAcube, a CubeSat of the Italian Space Agency, which will fly-by the system and monitor the impact.

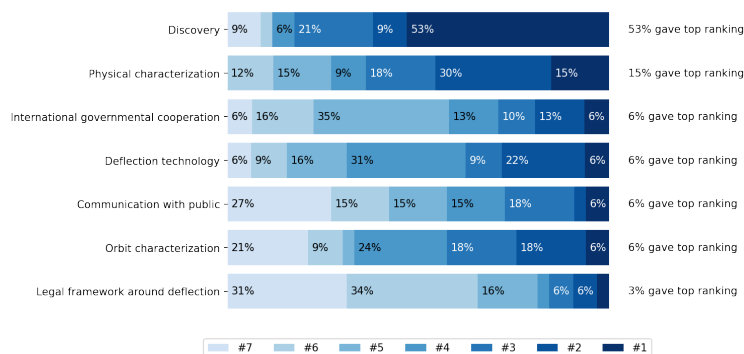
Upcoming events

- 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://aas.org/meetings/dps54>
- Exploration of Asteroids Symposium at the 2nd International Stardust Conference, 7-11 November 2022, Noordwijk, The Netherlands
<http://www.stardust-network.eu/starcon2/>

Largest known binary NEAs

The largest NEAs known to be binary or multiple are listed in this table, sorted by the absolute magnitude of the entire system. Most of them have been discovered either via lightcurve or by radar.

Designation	Absolute magnitude	Size range in m	Notes
(1866) Sisyphus	12.4	6 860	Binary nature discovered by lightcurve and confirmed with archival radar data
(5143) Heracles	14.0	3 410	
(3122) Florence	14.0	4 350	Triple system, two small satellites found by radar
(16960) 1998 QS52	14.4	4 300	
(7888) 1993 UC	15.1	2 720	
(10150) 1994 PN	15.4	2 200 – 5 000	
(5646) 1990 TR	15.4	2 723	
(1943) Anteros	15.7	2 480	
(4503) Cleobulus	15.8	2 700	
(3352) McAuliffe	15.9	1 800 – 4 000	Binary nature uncertain
(5828) 1991 AM	15.9	1 400	



One of the most interesting results of the survey discussed before is summarised in this figure. It contains a ranking of which areas of planetary defence the community of experts thinks need the most urgent improvements.

Observational tasks such as discovery and characterisation scored the highest, while other important topics, such as orbit characterisation, are seen as already more mature.

[Credit: Apollo Academic Surveys / Chris Said]

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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