→ NEWSLETTER DECEMBER 2020

ESA's NEO Coordination Centre

Current NEO statistics

The monthly average of NEA discoveries this year is above 240 new objects per month.

- Known NEOs: 24 364 asteroids and 113 comets
- NEOs in risk list*: 1071
- Number of NEOs designated during last month: 264
- NEOs discovered since 1 January 2020: 2677

Focus on

Since the first release of the web portal of ESA's NEO Coordination Centre in 2012, we have been providing reliable estimates of the trajectories of near-Earth asteroids and the threat that they pose to Earth. The underlying computations were performed by the University of Pisa's NEODyS system. At that time, ESA had reached an agreement with that university and its spin-off company SpaceDyS to integrate their orbit determination and impact monitoring services within the newly created web portal of ESA's NEO segment. Since then, ESA has been providing the results from NEODyS' computations in the NEOCC web portal. In the last years, ESA has awarded dedicated contracts to SpaceDyS to improve and migrate the NEODyS software to ESA. Whereas the orbit determination part of this suite was already migrated and put in operations in the first quarter of 2019, the remaining impact monitoring part has only been recently migrated. Consequently, since 20 November the data presented in our portal are the result of the full orbit determination and impact monitoring computations being performed at our premises. This is done with the so-called AstOD software, i.e. the improved version of the original software. We are grateful to the work done by NEODyS and SpaceDyS scientists and particularly to the vision and outstanding contribution of Prof. Andrea Milani and Dr. Giovanni Valsecchi that have allowed reaching the present status.

Upcoming interesting close approaches

A new object is now in Earth orbit, but growing evidence shows its artificial origin.

- 2020 SO, a temporary captured object, is reaching its first perigee this month.

Recent interesting close approaches

The closest non-impacting approacher ever was discovered a few hours after fly-by.

- 2020 VT4 became the closest non-impacting approacher ever discovered in space, when it flew just 370 km over the Pacific Ocean on 13 November.

News from the risk list

The month of November saw two very high-rated additions to the risk list.

- 2020 VV, a Chelyabinsk-sized new asteroid, reached an impact probability of about 3% for a close approach in 2033. Subsequent observations showed that there is no impact risk for that year, while a 0.05% chance of impact in 2050 still remains.
- 2020 WB3 is a larger object that reached a Palermo Scale higher than –2 during the month, but it has now dropped to background levels due to new observations.

---

* The risk list of all known objects with a non-zero (although usually very low) impact probability can be found at http://neo.ssa.esa.int/risk-page

In other news

- We are releasing our seventh PDO riddle with this newsletter and with a deadline on 31 December. Solution will be published on 4 January. Find the release information here: http://neo.ssa.esa.int/neocc-riddles.

Upcoming events

Relevant international meetings over the next months.

- 7th IAA Planetary Defense Conference, 26-30 April 2021. In consideration of the prevailing circumstances, the PDC organisers have decided that the 2021 PDC will be conducted virtually.
  https://iaaspace.org/event/7th-iaa-planetary-defense-conference-2021/

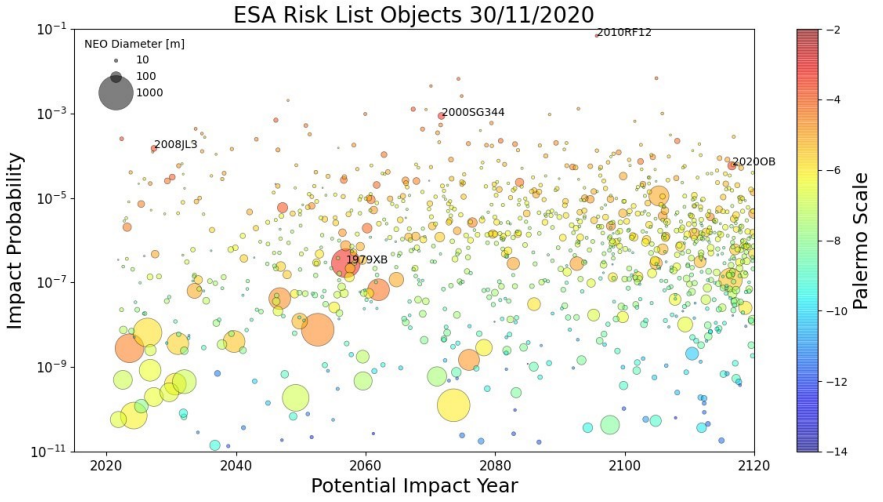
Current risk list

As commented in our focus-on, the impact risk list currently provided in our portal is computed by the newly deployed AstOD software at NEOCC premises. The following table provides the risk list as of the end of November. Please note that special cases (including Apophis) are currently still being recomputed. We will release the impact risk results on those objects as soon as they become available.

Object name	Size range in m	Date of possible impact	Impact probability	Palermo Scale	Torino Scale	Velocity in km/s
2010 RF12	6–13	2095-09-05 23:49	1 / 14	-3.07	0	12.29
1979 XB	500–1200	2056-12-12 21:39	1 / 3 500 000	-3.22	0	27.54
2000 SG344	29–70	2071-09-16 00:57	1 / 1 100	-3.37	0	11.27
2020 OB	50–110	2116-07-23 09:34	1 / 17 000	-3.51	0	28.08
2008 JL3	23–50	2027-05-01 09:06	1 / 7 000	-3.66	0	14.01
2009 JF1	10–22	2022-05-06 08:13	1 / 4 000	-3.70	0	26.41
2018 JD	12–27	2067-05-08 13:22	1 / 800	-3.82	0	13.76
2011 DU9	12–27	2046-02-23 20:45	1 / 1 400	-3.90	0	14.21
2012 QD8	60–140	2047-03-08 23:18	1 / 170 000	-3.90	0	23.58
2005 QK76	25–55	2030-02-26 08:15	1 / 32 000	-4.05	0	22.66

Links for more information

Website: http://neo.ssa.esa.int
Close approaches: http://neo.ssa.esa.int/close-approaches
Risk List: http://neo.ssa.esa.int/risk-page



Plot of the impact probability associated to all the objects currently in our risk list versus the potential impact year.

Each potential impactor is represented by a circle with its diameter proportional to the object size and coloured in terms of its Palermo Scale value.

[Credit: ESA/NEOCC]