

ESA's NEO Coordination Centre

Current NEO statistics

2020 has been a record-breaking year for NEA discoveries, with 25% more than in 2019.

- Known NEOs: 24 632 asteroids and 113 comets
- NEOs in risk list*: 1088
- Number of NEOs designated during last month: 268
- NEOs discovered since 1 January 2020: 2941

Focus on

On 6 November 2020, the Minor Planet Center announced the discovery of 2020 VV, a new 10-meter-class asteroid found the previous day by the Catalina Sky Survey. Our initial risk computations immediately showed that the object had many future impact opportunities, with an overall impact probability of about 0.3% over the next century. During the following days, additional observations were obtained by various observatories, including our team in collaboration with ESO's VLT. The impact probability of this object continued to rise, in particular for a close approach on 12 October 2033. On 17 November the risk assessment had risen to a very significant impact probability of about 4%, one of the highest ever seen since impact monitoring activities began two decades ago. However, the flow of new observations did not stop: with new data available almost every day, the impact probability started to slowly decrease, and about a week later the close approach circumstances for year 2033 became clear enough to exclude a possible impact on that date. Impacts on future years are still possible though, for an overall remaining chance for the next century still around 0.25%. The evolution of the impact risk for this object followed an unusual track, with a slow increase of probability followed by a comparably slow decrease. This is slightly unusual, since it is common for impact probabilities to drop suddenly once new crucial observations are added. The more gradual behaviour of this object is probably due to the near-daily inflow of many observations, which allowed the impact predictions to closely follow the gradual increase of information on the object's orbit, without any sudden jump of the orbital quality.

Upcoming interesting close approaches

No object known at the end of December will have any significant close approach during the month of January.

Recent interesting close approaches

One object had a close approach below the geostationary ring in December.

- 2020 XK1 is a tiny asteroid of about 3 meters that had a very close approach on 7 December, flying by the Earth at less than 15 000 km from its surface.

News from the risk list

One object reached the top list in our risk list and exited it a few days later.

- 2020 XR, a 400 m asteroid, reached a high Palermo Scale value for an impact in December 2028 and left the risk list after subsequent 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

- On 5 December, the capsule of the Japanese Hayabusa2 probe entered the Earth atmosphere and landed in the region of Woomera (Australia). The samples from Ryugu are currently being extracted for further analyses.

Upcoming events

Relevant international meetings over the next months.

- 7th IAA Planetary Defense Conference, 26–30 April 2021, Virtual
<https://iaaspace.org/event/7th-iaa-planetary-defense-conference-2021/>

2020 VV risk history

The table shows the risk evolution of asteroid 2020 VV from its discovery until the end of November. On 25 November, the 2033 virtual impactor risk was surpassed by the impactor in 2044, whereas on 27 November the impactor in 2033 was not present anymore and the one in 2050 surpassed the 2044 one (two last lines in the table).

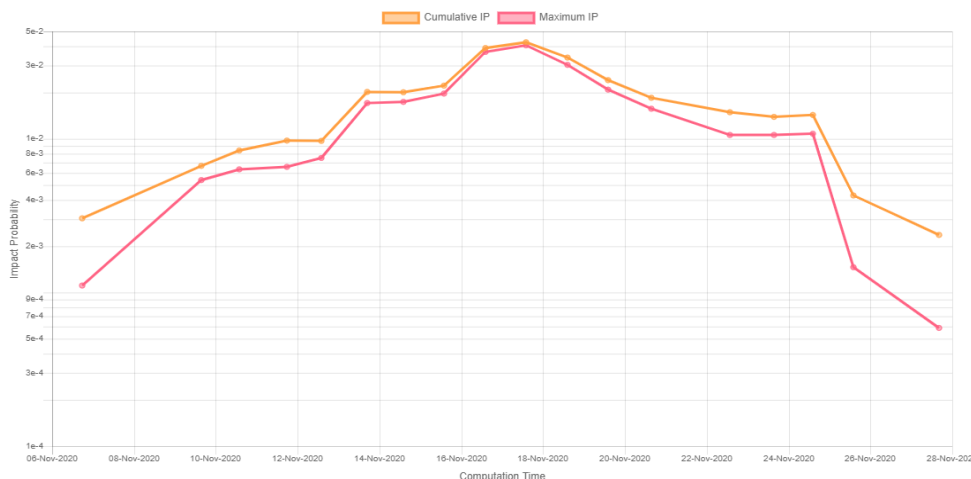
Computation date	Impact date	Maximum Impact Probability	Cumulative Impact Probability	Maximum Palermo Scale	Cumulative Palermo Scale
2020-11-06	2033-10-12	1 / 900	1 / 320	-3.58	-3.19
2020-11-09	2033-10-12	1 / 190	1 / 150	-2.92	-2.88
2020-11-10	2033-10-12	1 / 160	1 / 120	-2.87	-2.81
2020-11-11	2033-10-12	1 / 150	1 / 100	-2.87	-2.77
2020-11-12	2033-10-12	1 / 130	1 / 100	-2.82	-2.77
2020-11-13	2033-10-12	1 / 60	1 / 50	-2.47	-2.44
2020-11-15	2033-10-12	1 / 50	1 / 40	-2.43	-2.41
2020-11-16	2033-10-12	1 / 27	1 / 25	-2.17	-2.16
2020-11-17	2033-10-12	1 / 24	1 / 23	-2.13	-2.12
2020-11-18	2033-10-12	1 / 30	1 / 29	-2.26	-2.24
2020-11-19	2033-10-12	1 / 50	1 / 40	-2.43	-2.40
2020-11-20	2033-10-12	1 / 60	1 / 50	-2.56	-2.53
2020-11-22	2033-10-12	1 / 90	1 / 70	-2.74	-2.67
2020-11-25	2044-10-10	1 / 700	1 / 230	-3.85	-3.49
2020-11-27	2050-10-11	1 / 1 700	1 / 400	-4.39	-3.83

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 maximum and cumulative impact probability evolution for the 2020 VV asteroid since its discovery until the end of November. The two last data points respectively correspond to virtual impactors in 2044 and 2050.

[Credit: ESA/NEOCC]

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