

→ NEWSLETTER NOVEMBER 2020

ESA's NEO Coordination Centre

Current NEO statistics

This past month the known NEAs surpassed the number of 24 000 objects.

- Known NEOs: 24 100 asteroids and 111 comets
- NEOs in risk list*: 1093
- Number of NEOs designated during last month: 332
- NEOs discovered since 1 January 2020: 2412

Focus on

Asteroid 2018 VP1 is a tiny NEO that attracted some attention due to a moderate 0.5% chance of impact with the Earth on 2 November 2020. Being only a couple of metres in diameter, it poses no threat to our planet; however, its peculiar observability profile made it a challenging but interesting case for follow-up. The asteroid was discovered on 3 November 2018, just a few hours after its close approach. Before that day, it was unobservable due to its low elongation from the Sun. Actually, the object was undetectable to any survey telescope in the previous 20 years. After discovery, it quickly got fainter while receding from Earth. Two weeks later, it was already fainter than magnitude 26 when we detected it one last time with ESO's VLT, pushing the telescope close to its limiting magnitude. At the end of the discovery apparition, 2018 VP1 had been observed from the first to the last possible day, chasing it as far as possible with one of the most powerful telescopes on the planet. Nevertheless, a significant impact chance for 2020 remained. There was no other chance for observation until the possible impact, and even during the final approach it will be unobservable due to low solar elongation. This case is an example of an asteroid for which impact chances cannot be excluded even when all observational resources available worldwide are pooled together. Such cases are rare and usually involve tiny and difficult to observe asteroids like this one, which consequently pose little threat to our planet.

Upcoming interesting close approaches

The most meaningful close approach for November is the one discussed above.

- 2018 VP1 will definitely have a close approach with Earth, even if it does not hit. The exact distance is unknown, but the most likely value is about 100 000 km.

Recent interesting close approaches

Four objects came very close in October.

- 2020 UF3, 2020 UA, 2020 TE5 and 2020 TK7 all came to within 0.2 lunar distances during the month of October, a significant number for a single month.

News from the risk list

An object reached the top of the list, and later dropped thanks to dedicated follow-up.

- 2020 TK5 had an impact probability of about 1 in 8000 just after discovery, for a possible impact in 2039, but dropped to negligible values with 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 sixth PDO riddle with this newsletter and with a deadline on 25 November. Find the release information here: <http://neo.ssa.esa.int/neocc-riddles>.
- OSIRIS-REx successfully performed its Touch-And-Go (TAG) sample collection event over Bennu on 20 October.

Upcoming events

Relevant international meetings over the next months.

- Apophis T-9 Years, 4-6 November 2020 (virtual event)
<https://www.hou.usra.edu/meetings/apophis2020/>
- 7th IAA Planetary Defense Conference, 26-30 April 2021, Vienna, Austria
<https://iaaspace.org/event/7th-iaa-planetary-defense-conference-2021/>

List of NEAs in a 1:2 resonance with Earth and small MOID

List of objects in close 1:2 period resonance with the Earth (NEA revolving once about the Sun while the Earth has two orbits) and Minimum Orbit Intersection Distance (MOID) less than 0.01 au. Values are computed at the mean epoch of the observations and ordered by increasing MOID. 2018 VP1 was the NEA in those conditions with the smallest MOID. It will lose its 1:2 resonance condition after the pass of this month.

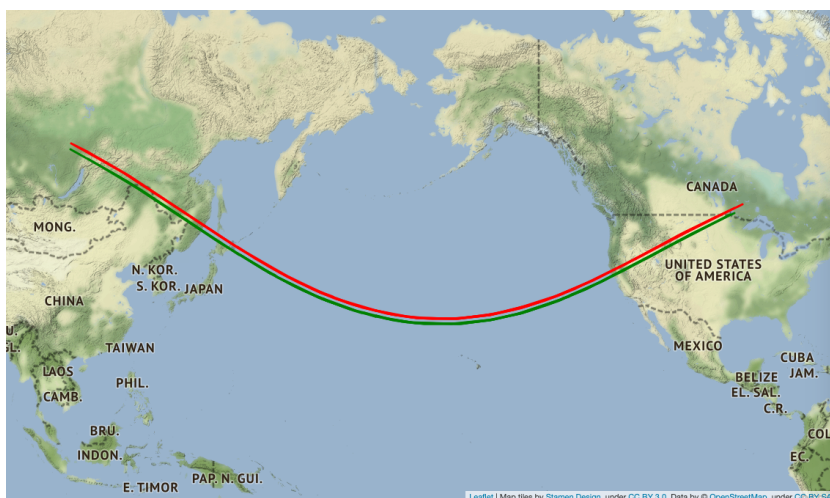
Object name	Perihelion in au	Aphelion in au	Inclination in degrees	MOID in au	Size range in m
2018 VP1	0.905	2.271	3.24	0.00006	2-4
2018 BR1	0.930	2.242	6.99	0.00028	3-7
2010 KK37	0.882	2.292	9.06	0.00036	19-40
2018 PY7	0.959	2.213	11.19	0.00212	11-25
2013 AH53	0.840	2.332	7.92	0.00235	19-42
2016 HP6	1.015	2.158	3.87	0.00518	23-50
2009 B55	0.972	2.202	1.63	0.00555	9-20
2007 FS3	0.923	2.251	3.22	0.00556	16-30
2015 EF	0.769	2.404	6.86	0.00626	11-25
2016 GB222	0.861	2.315	1.88	0.00726	12-26
2018 XE4	0.879	2.292	3.05	0.00791	13-29
2019 KN5	0.991	2.180	1.26	0.00822	10-22

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>



Calculated impact corridor for 2018 VP1 prior to its close approach on 2 November 2020, associated with an impact probability of 1/200. Roughly 60% of the corridor falls over the Pacific Ocean.

The green curve represents the corridor points at 100 km altitude and the red ones at the surface, after trajectory propagation in an airless atmosphere.

[Credit: ESA NEOCC]

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