

ESA's NEO Coordination Centre

Current NEO statistics

Most NEO surveys are fully operational despite the COVID-19 shutdowns. On the other hand, a significant number of follow-up facilities are still not operational.

- Known NEOs: 22 662 asteroids and 110 comets
- NEOs in risk list*: 1057
- Number of NEOs designated during last month: 268
- NEOs discovered since 1 January 2020: 977

Focus on

This month of May marks the 10th anniversary of the beginning of the official science mission of the Pan-STARRS telescope, which over the last decade has become one of the leading discoverers of NEOs and small Solar System objects. Thanks to an aperture of 1.8 metres and a camera with a large field of view, Pan-STARRS is capable of detecting objects down to magnitude 22. The location of the telescope, on the summit of Haleakala in Hawaii, provides exceptional observing conditions and good weather statistics all over the year, resulting in nearly continuous operations.

In a decade, the project has discovered more than 5000 NEOs, more than 200 comets, and the first known interstellar object, 1I/Oumuamua.

After starting its operations with a single telescope, a second one has now become fully operational, nearly doubling the rate of discovery. The project will likely play a crucial role in the NEO discovery community for many years to come.

Upcoming interesting close approaches

Two moderately close approaches of similar objects will happen in May.

- (388945) 2008 TZ₃ and (438908) 2009 XO are two well-known 300-metre asteroids that will come to about 8 lunar distances in May, reaching magnitude 14.

Recent interesting close approaches

An interesting very close fly-by, and a routine distant one, happened in April.

- 2020 HS₇, a ~5-metre object discovered by the Pan-STARRS₂ telescope, was initially estimated to have a ~10% chance of impact for the following day. Immediate follow-up from various Asian and European stations confirmed that it posed no threat, and the object was just going to have a very close fly-by with our planet.
- (52768) 1998 OR₂, a well-characterised 2-kilometre asteroid, had a safe fly-by at the end of April, which attracted media attention despite posing no threat to Earth.

News from the risk list

Two new top-rated objects of the risk list were followed up during the month of April.

- 2019 HJ₄ reached a high rating in our risk list, but was subsequently removed thanks to follow-up observations, including those provided by our team, and pre-discovery data from the Catalina survey archive.
- 2020 FT₃ also reached a high ranking, which was subsequently lowered by additional 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

- ESA's BepiColombo spacecraft had an Earth fly-by on 10 April, which was successfully observed by our team with a large number of telescopes.

Upcoming events

Most international conferences scheduled to happen over the next few months have been either cancelled or postponed due to the ongoing COVID-19 pandemic. Here we list the ones that have already been officially postponed.

- Apophis T-9 Years, 9–10 November 2020, Nice, France
<https://www.hou.usra.edu/meetings/apophis2020/>
- Hera Community Workshop, 11–13 November 2020, Nice, France
<https://www.cosmos.esa.int/web/hera-community-workshop/>

List of past close approaches of large objects

Closest approaches since 1950 of objects larger than 1 kilometre in diameter. The absence of (52768) 1998 OR2 shows that its close approach was not a particularly exceptional event.

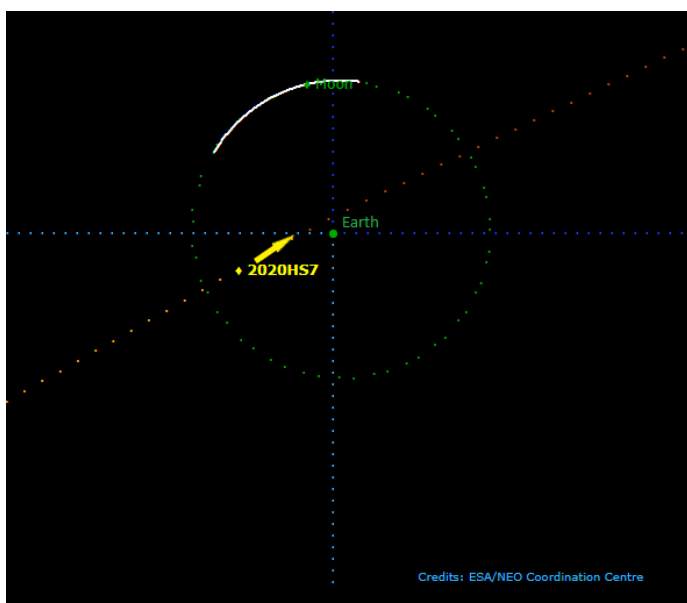
Object name	Close Approach Date	Miss distance in Earth radii	Miss distance in lunar distances	Miss distance in km from Earth surface	H magnitude	Size range in m	Maximum Brightness
(143651) 2003 Q0104	1981-05-18	165	2.7	1 100 000	16.2	2 290	10.5
(192642) 1999 RD32	1969-08-27	218	3.6	1 400 000	16.3	1 500–3 000	8.8
(4179) Toutatis	2004-09-29	242	4.0	1 500 000	15.3	2 800	8.7
(163243) 2002 FB3	1961-04-12	294	4.9	1 900 000	16.7	1 620	10.7
(164121) 2003 YT1	1997-04-28	314	5.2	2 000 000	16.4	1 100	9.2
(66391) Moshup	1984-05-25	376	6.2	2 400 000	16.8	1 500	9.9
(533671) 2014 LJ21	1989-08-01	422	7.0	2 700 000	16.1	1 600–4 000	10.3
(140288) 2001 SN289	1996-03-17	448	7.4	2 800 000	16.8	1 200	12.6
(163243) 2002 FB3	1959-04-13	450	7.5	2 900 000	16.7	1 620	11.6
(163243) 2002 FB3	1963-04-13	457	7.6	2 900 000	16.7	1 620	11.6

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 displaying the orbit of asteroid 2020 HS7 during its close Earth fly-by on 28 April 2020, as seen from the North Ecliptic Pole. The orbit of the Moon is also shown. The time interval covered by the plot spans between 28 April at 00:00 and 29 April at 12:00, expressed in UTC.

[Credit: ESA/NEOCC]

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