

## ESA'S NEO Coordination Centre

### Current NEO statistics

The number of NEO discoveries during last month is back to more than 200, thanks to the Catalina Sky Survey resuming operations after the summer monsoon break.

- Known NEOs: 20 904 asteroids and 108 comets
- NEOs in risk list\*: 886
- Number of NEOs designated during last month: 240
- NEOs discovered since 1 January 2019: 1619

### Focus on

On 30 August 2019 Gennady Borisov, an amateur astronomer in Crimea, used his self-built 65 cm telescope to discover a new cometary object at very low elongation in the morning sky. After about a week of follow-up observations the possibility of a hyperbolic nature for the object's orbit became evident, and was subsequently confirmed over the next few days thanks to hundreds of follow-up observations. Multiple observers also confirmed the cometary nature of the object, which displays evident activity and a tail almost an arcminute long.

The International Astronomical Union has now formally recognised this new discovery as the second known interstellar object. Its official name is now 2I/Borisov, following the tradition of designating cometary objects with the name of the discoverer.

The object will remain observable for more than a year, giving astronomers an opportunity to investigate its nature, composition and dynamics in much greater detail compared to the only other previously known interstellar object, 1I/'Oumuamua.

### Upcoming interesting close approaches

A large numbered NEO will have a bright close approach in October.

- (162082) 1998 HL<sub>1</sub> is a 500 m object that will reach magnitude 12 this month. The fly-by on 25 October will happen at about 17 lunar distances.

### Recent interesting close approaches

Eight known objects came closer than the Moon last month.

- 2019 RP<sub>1</sub> came to less than a tenth of the distance of the Moon on 5 September, and was discovered by the Catalina Sky Survey just 7.5 hours after the approach.
- Seven other objects of 2 to 20 metres came closer than the Moon last month.

### News from the risk list

There is a new addition in the top ten and a tiny impact risk predicted long time ago for this month.

- 2019 SU<sub>3</sub> is a new object that entered the top ten of our risk list in late September, for a possible impact with a 1 in 400 chance of occurring in year 2084. Its small size of about 15 metres would result in limited consequences even in case of an impact.
- 2007 FT<sub>3</sub> is a moderately large object with an extremely small 1 in 30 million chance of impact on the Earth on 3 October 2019. Such low probabilities are at the limit of what can currently be determined by the impact monitoring software.

\* 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

- The proposed space-based infrared discovery survey known as “NEOCam” has been approved by NASA, and will be launched with the name of “Near-Earth Object Surveillance Mission” (NEOSM).
- The International Asteroid Warning Network (IAWN) and Space Mission Planning Advisory Group (SMPAG) held their meetings on 12 and 13 September at the ESO headquarters in Garching, Germany.
- A joint edition of the EPSC and DPS conferences was held in Geneva, Switzerland between 15 and 20 September, attended by more than 1700 participants from more than 50 countries.
- A workshop dedicated to the AIDA mission was held in Rome, Italy, between 11 and 13 September.

## Upcoming events

Relevant international meetings over the next months.

- Asteroids, Comets, Meteors Conference , 14–19 June 2020, Flagstaff, USA  
<https://www.hou.usra.edu/meetings/acm2020/>

## Comparison of the two currently known interstellar objects

Basic orbital properties of the two known interstellar objects, referred to the Solar System barycentre.

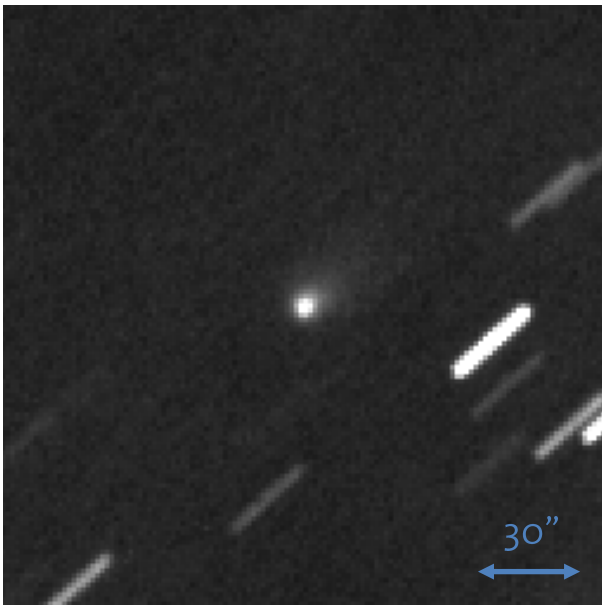
Object name	Pericentre date	Perihelion distance in au	Eccentricity	Inclination in degrees	Velocity at infinity in km/s	Closest approach to Earth in au	Discovery date
1I/‘Oumuamua	2017-09-09	0.26	1.20	123	26	0.16	2017-10-19
2I/Borisov	2019-12-08	2.01	3.33	44	32	1.93	2019-08-30

## 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>



The new interstellar comet 2I/Borisov observed on 26 September 2019 with ESA’s Optical Ground Station in Tenerife.

The image is a stack of 18 exposures, each one minute long. A tail of about 40” is visible in the image.

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