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: 1,619

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/ʻOumuamua.

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

- (162082) 1998 HL1 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 RP1 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 SU3 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 FT3 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.

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

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.

Credits: ESA NEOCC