

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

With the start of the monsoon season in Arizona, where the Catalina Sky Survey is located, the discovery rate of new NEOs is expected to drop for the next few months.

- Known NEOs: 18 341 asteroids and 107 comets
- NEOs in risk list*: 752
- Number of NEOs designated during last month: 131
- NEOs discovered since 1 January 2018: 885

Focus on

In October 2017 the Pan-STARRS survey discovered the first known interstellar object transiting through our Solar System. Named 'Oumuamua by the discoverers, it soon became the focus of numerous observations by the world's largest professional telescopes. A few days ago a new result was published in the journal Nature. By analysing the accurate astrometric observations obtained with these many telescopes and observatories worldwide Marco Micheli from the NEOCC noted that a weak, unexpected force was acting on 'Oumuamua. This force was pushing it slightly off track with respect to the orbit it would have followed if only gravitational forces of the Sun and planets were present. In the study the researchers explored a variety of possible explanations, concluding that a weak emission of gas from the object, too little to be observable in the available optical images, would be sufficient to explain the observed acceleration. Therefore, 'Oumuamua is likely a small comet after all.

Upcoming interesting close approaches

Very few known close approachers this month.

- 2018 MB7, a recently discovered ~ 80 metre object, is the only known asteroid forecast to come to less than 10 lunar distances from the Earth in July, at ~ 3 lunar distances.

Recent interesting close approaches

Only three known asteroids came closer than the Moon in June, but one of them impacted the Earth.

- Apart from 2018 LA, the small asteroid that collided with Earth in Botswana on 02 June, the other two are 2018 MZ4 and 2018 LV3.

News from the risk list

A new object topped our risk list for a few days in June.

- 2018 LB1 is a newly discovered NEO that during the month of June reached a Torino Scale value of 1, and Palermo Scale value of -1.0. Subsequent observations resulted in the quick exclusion of all possible impact dates, and the object is already out of our risk list.

* 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/web/guest/risk-page>

In other news

- The Japanese spacecraft Hayabusa2 reached asteroid (162173) Ryugu after 2.5 years of cruising.
- This year, for the Asteroid Day celebrations on 30 June, ESA joined ESO in Garching, near Munich, Germany for a day of asteroid-themed activities at the newly inaugurated ESO Supernova outreach building.

Upcoming events

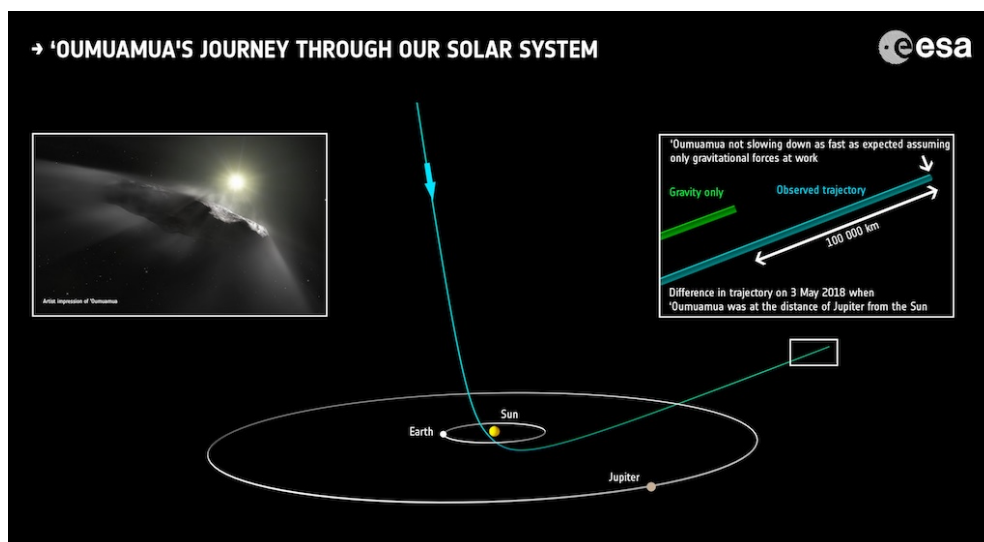
Relevant international meetings over the next months.

- COSPAR 2018: "The Golden Age of Small Bodies, Science and Exploration", 14–22 July 2018, Pasadena, USA https://www.cospar-assembly.org/admin/session_cospar.php?session=680
- Asteroids and comets—inside out workshop, 4–6 September 2018, Tampere, Finland <http://www.tut.fi/en/asteroids-and-comets-inside-out-workshop/>
- European Planetary Science Congress, 16–21 September 2018, Berlin, Germany <http://www.epsc2018.eu/>

List of NEOs visited or scheduled to be visited by spacecraft

Four NEAs and five NECs have been visited by spacecraft so far, and one more is planned for this year.

Object name	Object type	Spacecraft	Year	Agency	Mission status	Mission type
21P/Giacobini-Zinner	Comet	ICE	1985	NASA+ESA	Completed	Fly-by (no imaging)
1P/Halley	Comet	Giotto / Vega 1 & 2	1986	ESA / USSR	Completed	Fly-by
26P/Grigg-Skjellerup	Comet	Giotto	1992	ESA	Completed	Fly-by (no imaging)
(433) Eros	Asteroid	NEAR Shoemaker	1998	NASA	Completed	Rendezvous, landing
(25143) Itokawa	Asteroid	Hayabusa	2005	JAXA	Completed	Rendezvous, sample return
103P/Hartley	Comet	EPOXI	2010	NASA	Completed	Fly-by
(4179) Toutatis	Asteroid	Chang'e 2	2012	CNSA	Completed	Fly-by
67P/Churyumov-Gerasimenko	Comet	Rosetta	2014	ESA	Completed	Rendezvous, landing
(162173) Ryugu	Asteroid	Hayabusa 2	2018	JAXA	In operational phase	Rendezvous, sample return
(101955) Bennu	Asteroid	OSIRIS-REX	2018	NASA	In cruise	Rendezvous, sample return



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>

Schematic representation of the orbit of 'Oumuamua, with an artist impression of the object (left) and a schematic representation of the offset introduced by the newly discovered non-gravitational forces (right).

[Credit: ESA; artist impression: ESA/Hubble, NASA, ESO, M. Kornmesser]

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