

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

During the month of March we crossed the threshold of 14 000 known NEOs.

- Known NEOs: 14 051 asteroids and 106 comets
- NEOs in risk list*: 533
- New NEO discoveries since last month: 166
- NEOs discovered since 1 January 2016: 520

Focus on

We took the opportunity of the ExoMars 2016 launch to organize a ground-based observational campaign. The goal was to test, in a reverse mode, the observational scenario needed to monitor the approach of a small Earth impactor. The spacecraft and other hardware related to the launch was successfully imaged; please see the details in the news published on our web portal <http://neo.ssa.esa.int>.

Upcoming interesting close approaches

A large new object and a tiny old one will come moderately close this month.

- 2016 FY3 is a newly discovered 300-metre object that will come to about 6.5 lunar distances on 25 April, reaching magnitude 14.
- 2008 HU4 is a tiny 10-metre object with non-zero (but extremely small) impact probability, which will come back to about 5 lunar distances in mid-April.

Recent interesting close approaches

Two comets and a few asteroids had interesting close approaches this month.

- 252P/LINEAR and P/2016 BA14 (PANSTARRS) are two near-Earth comets that came close to Earth last month. The former passed about 5.4 million kilometres away on 21 March, the latter at 3.5 million kilometres just a day later. They are travelling on very similar orbits, and are possibly fragments of a single body that split long ago.
- 2016 EF195 came to about 30 000 km of the Earth on 10 March, at magnitude 12.
- 2016 EK1, 2016 EL1, 2016 EV28, 2016 FC1 and 2016 FU6 are five objects of 5–10 metres in diameter that passed at about half the distance of the Moon in March. They all reached magnitude 17 or brighter as seen from Earth during the close approach.

News from the risk list

A new object reached Torino Scale 1 for a few days but has now been removed.

- 2016 EU85, a ~500 m object discovered by Pan-STARRS on 6 March and confirmed by our team with ESA's OGS telescope two nights later, reached a Torino Scale level of 1 for two possible impacts in 2052 and 2067, but was subsequently removed thanks to precovery observations we found in the Pan-STARRS archive.
- 1994 WR12, presently ranked 9th in our risk list, was mentioned last month as having a unique but difficult recovery opportunity. We are currently organizing an observational campaign to detect it.

* The risk list of all known objects with a non-zero (although usually very low) impact probability can be found at <http://bit.ly/neorisklist>

In other news

- One year ago we published the first issue of this monthly newsletter, which was distributed internally and to a small list of collaborators. Today, our distribution list includes more than 200 people, and many more are reached on mailing-lists or direct access via our web portal.
- On 18 March the collision of a small object with Jupiter was recorded on video by at least two amateur observers in Europe.

Upcoming events

The next large international event regarding small solar system objects will be the combined IMC and Meteoroids conferences in the Netherlands in June.

- International Meteor Conference (IMC 2016), 2–5 June 2016, Egmond aan Zee, The Netherlands, followed by the Meteoroids 2016 conference, 6–10 June 2016, ESTEC, Noordwijk, The Netherlands
<http://imc2016.imo.net>, <http://www.cosmos.esa.int/web/meteoroids2016>
- AAS Division for Planetary Sciences Meeting (joint with EPSC), 16–21 October 2016, Pasadena, USA
<http://dps.aas.org/meetings/current>
- IAUS 330: Astrometry and Astrophysics in the Gaia sky, 5–9 December 2016, Nice, France
<http://www.iau.org/science/meetings/future/symposia/1163/>
- IAA Planetary Defense Conference, 15–19 May 2017, Tokyo, Japan
<http://pdc.iaaweb.org/>

List of close approaches in the last month

Objects that approached Earth surface in March 2016 to within about 1 lunar distance.

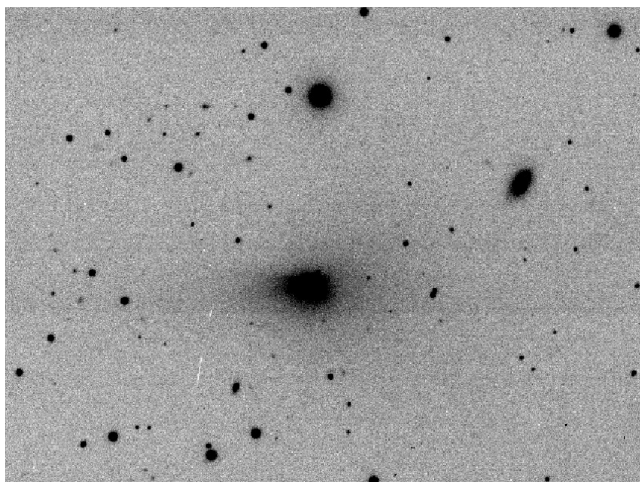
Object name	Close approach date	Miss distance in lunar distances	Miss distance in Earth radii	Miss distance in km	Size in m	H magnitude
2016 EF195	2016-03-10	0.07	4.1	26 000	~ 30	25.7
2016 EV28	2016-03-08	0.39	23.2	148 000	~ 10	28.4
2016 FC1	2016-03-14	0.42	25.4	161 000	~ 5	29.1
2016 EK1	2016-03-03	0.51	30.8	196 000	~ 5	29.1
2016 FU6	2016-03-25	0.45	27.1	173 000	~ 5	29.0
2016 EL1	2016-03-04	0.58	35.1	224 000	~ 10	27.8
2016 EN157	2016-03-10	0.82	49.6	316 000	~ 10	28.2
2016 DV1	2016-03-03	1.01	61.1	389 000	~ 45	24.8

Links for more information

Website: <http://neo.ssa.esa.int>

Close approaches: <http://neo.ssa.esa.int/web/guest/close-approaches>

Risk List: <http://neo.ssa.esa.int/web/guest/risk-page> or <http://bit.ly/neorisklist>



Near-Earth comet 333P/LINEAR observed with the 8.4-metre Large Binocular Telescope in Arizona, USA on 1 March 2016.

This object was discovered in 2007 by the LINEAR survey as an inactive asteroid in a peculiar retrograde orbit, and was therefore designated 2007 VA85 following the asteroidal scheme. It remained inactive during its entire 2007 apparition, but in early 2016 it started showing activity, and has now been formally reclassified as a periodic comet.

Image credit: LBTO/INAF/ESA

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