

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

During the last month the global numbered asteroid catalogue (including main belt asteroid) surpassed the threshold of half million objects. The number of known NEOs surpassed 17 000, thanks to more than 300 discoveries in a single month.

- Known NEOs: 17 003 asteroids and 106 comets
- NEOs in risk list*: 676
- Number of NEOs designated during last month: 305
- NEOs discovered since 1 January 2017: 1598

Focus on

On 20 October the Catalina Sky Survey discovered an object they internally designated YU36830, which immediately looked like a close approacher. Our collaborator Erwin Schwab was able to obtain follow-up observations less than 12 hours after discovery, using the Schmidt telescope on Calar Alto; his observations confirmed that the object had just flown by the Earth one day earlier, at about 11 500 km from the Earth surface. This ~3-metre object is now officially designated 2017 UJ2, and its flyby was the closest known passage of an asteroid to our planet since 2017 GM earlier this year.

Upcoming interesting close approaches

Next medium size asteroid will reach magnitude ~14.5 in November.

- (444584) 2006 UK, with its ~400-metre diameter, will pass at 8.7 lunar distances on 17 November.

Recent interesting close approaches

Eight objects passed by the Earth closer than the Moon in October, the closest being 2017 UJ2.

- 2017 UJ2, 2012 TC4, 2017 SX17, 2017 TH5, 2017 TD6, 2017 TF5, 2017 UR2 and 2017 UF, with diameters ranging from ~3 m to ~50 m, passed by our planet last month. The brightest was the well-studied 2012 TC4, reaching magnitude ~12.5.
- (171576) 1999 VP11 is a large ~800-metre object that passed at 5.8 lunar distances on 22 October, reaching V~12.5.

News from the risk list

There is a new object at the top of our risk list, 2017 RH16.

- 2017 RH16 is a ~30 metre object that reached the top of the risk list once a set of VLT observations obtained by our team, in collaboration with ESO, were included in the orbit computation.
- 2017 SA20 with its ~10 metre diameter, reached an impact probability of ~1% in October, but has now dropped to more routine level also thanks to additional VLT follow-up.
- 2017 SF20 (~10 metre diameter), 2017 RZ17 (~400 m diameter) and 2017 UK1 (~20 m diameter), all entered the risk list this month with Palermo Scales of about -4.5.

* 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 annual AAS DPS Meeting was held in Provo, USA, last month.
- The 9th Meeting of the Space Mission Planning Advisory Group (SMPAG) took place in Toulouse, France, between 10 and 12 October.
- The newly designated object A/2017 U1 is believed to be the first known interstellar object.

Upcoming events

The next major international meeting on NEOs will be in the spring of 2018.

- Planetary Defense session at the 2018 IEEE Aerospace Conference, 3–10 March 2018, Big Sky, USA
<http://www.aeroconf.org>

List of closest approaches of known asteroids

Since the advent of NEO surveys, only 10 objects have been discovered that came closer than two Earth radii from the Earth surface, including the two (2008 TC₃ and 2014 AA) that collided with it. Two of them have been discovered during the current year.

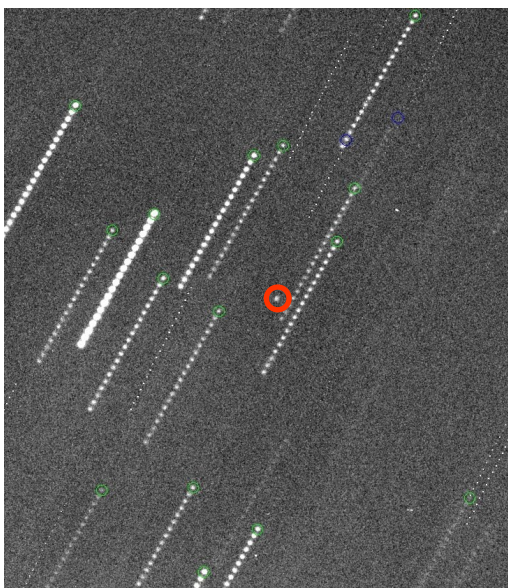
Object name	Close approach date	Miss distance in lunar distances	Miss distance in Earth radii	Miss distance in km	Size in m	H magnitude
2014 AA	2014-01-02	0	0	0	~ 3	30.9
2008 TC ₃	2008-10-07	0	0	0	4	30.3
2011 CQ ₁	2011-02-04	0.014	0.9	5 500	~ 2	32.1
2008 TS ₂₆	2008-10-09	~ 0.016	~ 1.0	~ 6 300	~ 1	33.2
2016 DY ₃₀	2016-02-25	0.021	1.2	7 900	~ 4	30.6
2017 GM	2017-04-04	0.026	1.6	9 900	~ 4	29.9
2004 FU ₁₆₂	2004-03-31	~ 0.03	~ 1.5	~ 10 000	~ 8	28.7
2014 LY ₂₁	2014-06-03	~ 0.03	~ 1.5	~ 10 000	~ 6	29.1
2017 UJ ₂	2017-10-20	0.030	1.8	11 500	~ 3	30.9
2011 MD	2011-06-27	0.032	1.9	12 300	~ 10	28.0

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>



Confirmation observation of 2017 UJ₂ obtained with the Calar Alto Schmidt telescope on 21 October 2017, just 11 hours after discovery.

In this stack of 20 separate exposures, each 20 seconds long, the object is clearly visible as the bright single source near the center of the image.

Image Credit: ESA NEOCC / E. Schwab

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