space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

More NEOs were discovered in the first 9 months of 2016 than the typical annual rate of the last decade.

- Known NEOs: 14 886 asteroids and 107 comets
- NEOs in risk list*: 562
- New NEO discoveries since last month: 163
- NEOs discovered since 1 January 2016: 1367

Focus on

The month of September was unusually rich of close approaches. Nine objects, all with a diameter of about 10 metres, flew by our planet closer than about the distance of the Moon.

The closest was 2016 RN41, which came to just 25 000 km, closer than the ring of geostationary satellites; it was the smallest of the group, only about 3 metres in diameter, and it was discovered 8 hours before its close approach on 11 September.

A few days earlier the slightly larger 2016 RB1 passed by, a bit farther away over the South Pole.

The list of the closest approachers of the month is presented in the next page.

Upcoming interesting close approaches

Two large objects will safely fly-by in late October. One will become easily observable.

- (164121) 2003 YT1 is a large kilometre-sized asteroid that will safely fly-by at 13.5 lunar distances at the end of October. During the fly-by it will reach magnitude 11, and become observable visually with moderately sized amateur telescopes.
- (413260) 2003 TL4 is a 400-metre object which will have a fly-by just a few days earlier, at 10 lunar distances. During its closest approach it will be very close to the North pole.

Recent interesting close approaches

Apart for the nine 10-metre-sized objects discussed above, a larger one flew by a little farther away.

- 2016 SF1 is a 50-metre object discovered by Pan-STARRS on 21 September, which had a close approach at 1.3 lunar distances eleven days earlier.

News from the risk list

There was a new entry, and new observations took place.

- A new object entered the top-10 of our list. Designated 2016 NL56, it was observed for only three days in July. Its orbit is poorly known and the total impact probability is extremely low,
- Our team recovered 2016 FV13, an object fainter than magnitude 26. The object is still present in the risk list due to a single possible impact in April 2114.

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* 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

- On 14 September the first release of the star catalogue produced by the Gaia mission has been published. The superb accuracy of the stellar positions will lead to significant enhancements on the accuracy of asteroid positions and orbits.
- Our web portal has now surpassed 50 000 visits, from almost 150 countries.

Upcoming events

The joint DPS/EPSC meeting will happen this month in Pasadena, USA.

- AAS Division for Planetary Sciences Meeting (jointly with EPSC), 16–21 October 2016, Pasadena, USA
  http://dps.aas.org/meetings/current
- Stardust Final Conference, 31 October–4 November 2016, ESTEC, Noordwijk, The Netherlands
  http://www.stardust2013.eu/Training/Conferences/StardustFinalConference/tabid/5484/Default.aspx
- Asteroids & Planetary Defense session at the AGU Fall Meeting, 12–16 December 2016, San Francisco, USA
  https://fallmeeting.agu.org/2016/
- Asteroids, Comets and Meteors (ACM 2017) Conference, 10–14 April 2017, Montevideo, Uruguay
  http://acm2017.uy/
- IAUS 330: Astrometry and Astrophysics in the Gaia sky, 24–28 April 2017, 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 closest approaches in the past month

The following table lists all the known objects that came closer than about one lunar distance in September.

Object name	Close approach date	Miss distance in lunar distances	Miss distance in Earth radii	Miss distance in km	Size in m	Maximum brightness
2016 RN41	2016-09-11	0.06	3.9	25 000	~ 3	13.6
2016 RB1	2016-09-07	0.11	6.4	40 000	~ 9	12.3
2016 RR1	2016-09-02	0.34	20.3	129 000	~ 12	13.6
2016 SJ	2016-09-21	0.39	23.4	149 000	~ 7	16.2
2016 RS1	2016-09-03	0.50	29.9	190 000	~ 6	17.1
2016 TD	2016-09-30	0.59	35.5	226 000	~ 10	15.8
2016 SA2	2016-09-25	0.80	48.2	307 000	~ 10	16.2
2016 SU2	2016-09-24	0.91	55.1	351 000	~ 12	17.2
2016 SW3	2016-09-26	1.00	60.5	385 000	~ 10	16.9

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

Goodbye Rosetta: on 30 September one of the most celebrated missions in the history of space exploration has come to a successful end.

Image credit: ESA/Rosetta/NavCam