

## space situational awareness

### → NEAR-EARTH OBJECTS

#### Current NEO statistics

For the first time since it was established, the ESA/NEODyS Risk List contains more than 500 objects.

- Known NEOs: 12 634 asteroids and 101 comets
- NEOs in risk list\*: 502
- New NEO discoveries since last month: 111
- NEOs discovered since 1 January 2015: 686

#### Focus on

In recent years, it has become increasingly common for ground-based surveys to discover small objects that seem to be in distant Earth-centred orbits. Most of them turn out to be man-made spacecraft or upper stages of spent rockets residing in Earth's region. One such example happened last April, when a new object discovered by the Pan-STARRS survey, and designated 2015 HP116, was then recognized to be ESA's Gaia spacecraft. These spurious discoveries, although disappointing, show that the current surveys are monitoring Earth's neighbourhood carefully enough to spot objects just a few meters in diameter many lunar distances away from our planet.

#### Upcoming interesting close approaches

Three large objects will come within 20 lunar distances in June, but none of them have any chance of collision.

- (293726) 2007 RQ17, 2010 LN14 and 2010 NY65 are all larger than 100 meters. Although they will not come any closer than 17 lunar distances, they will all reach magnitude 18 during the month of June.
- Among the new discoveries, the closest approach known as of today will be that of 2015 KM57, at 6.6 lunar distances.

#### Recent interesting close approaches

At least 14 objects came within 10 lunar distances of Earth in May. None of them were known when we last issued this newsletter one month ago.

- 2015 JF1, discovered on 12 May, came closer than the Moon only three days later.
- 2015 KO57, on the other hand, reached 15 lunar distances, but is much larger, at about 100 meters.

#### News from the risk list

Only six of the new NEOs discovered in May are still in the risk list.

- 2015 KP18, a recent discovery of the Catalina Sky Survey, has a cumulative probability of about 1 in 100 000 of impacting Earth in the next century. It has a diameter of about 100 meters.
- 2015 KE, also a new discovery, has a comparable impact probability, but its diameter is much smaller, about 20 meters – comparable with the 2013 Chelyabinsk impactor.

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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

- ESA published a new video explaining the operations of the AIDA mission currently under study together with NASA: <http://www.esa.int/aimprofile>
- A NEO workshop with representatives from ESA Member States will take place at ESOC, 18–19 June 2015. The purpose is to discuss the information to be provided and communication flow in case of a real impact threat.

## Upcoming events

The next major international conference on NEOs will be the IAU Symposium 318 held during the IAU General Assembly in August, titled “Asteroids: New Observations, New Models”

- IAU General Assembly, 3–17 August 2015, Honolulu, USA  
<http://astronomy2015.org>
- European Planetary Science Congress, 17 September – 2 October 2015, Nantes, France  
<http://www.epsc2015.eu>
- AAS Division for Planetary Sciences Meeting, 8–13 November 2015, National Harbor, USA  
<http://aas.org/meetings/dps47>

## Top 10 table of objects with the highest impact probability

The Risk List is usually ranked by Palermo Scale, a parameter that combines probability, impact energy and time until impact. There are therefore a few objects with relatively high impact probability that don't rank particularly high in terms of Palermo Scale, because they are very small and don't carry a lot of kinetic energy.

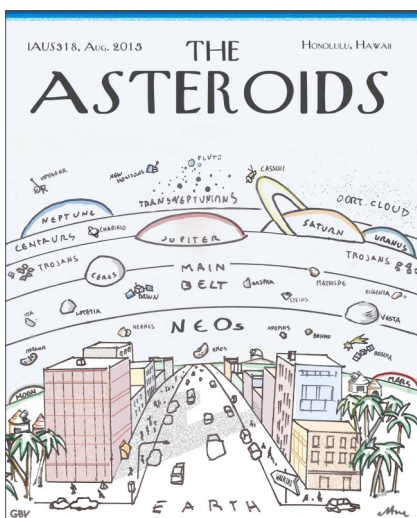
Object name	Size in m	Date/Time of possible impact (UTC)	Impact probability	Palermo Scale	Torino Scale	Velocity in km/s	In list since (days)
2010 RF12	~ 9	2095-09-05 23:50	1/11	-3.11	0	12.29	1653
(410777) 2009 FD	472	2185-03-29 18:06	1/370	-0.43	n/a	19.41	1635
2014 JR24	~ 6	2069-05-01 22:21	1/610	-5.11	0	11.78	356
2006 JY26	~ 9	2074-05-03 00:48	1/740	-4.85	0	11.57	3234
2014 OM207	~ 6	2101-07-25 21:40	1/1050	-5.35	0	13.86	282
2000 SG344	~ 46	2071-09-16 00:55	1/2100	-3.62	0	11.27	5322
2009 BE	~ 25	2083-01-25 02:21	1/2100	-4.04	0	16.01	2277
2011 AM37	~ 5	2048-01-11 10:06	1/2800	-5.80	0	11.76	1422
2009 JF1	~ 16	2022-05-06 08:12	1/2900	-3.57	0	26.41	2169

## 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/neaorisklist>



The official artwork of the IAU Symposium 318 “Asteroids: New Observations, New Models” is now out. Inspired by a famous cover of The New Yorker magazine, it was created by Ettore Perozzi and Giovanni Valsecchi.

[neo.ssa.esa.int](http://neo.ssa.esa.int)

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