

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

A refinement of the method used for analysing the asteroid hazard led to an increase in the number of objects in the risk list.

- Known NEOs: 15 271 asteroids and 106 comets
- NEOs in risk list*: 576
- New NEO discoveries since last month: 161
- NEOs discovered since 1 January 2016: 1750

Focus on

Whenever a new set of observations for an object is published, our Impact Monitoring routines perform a new search for possibly impacting orbits compatible with such set of observations. The system is capable of detecting all possibly impacting orbits down to an impact probability threshold, named “generic completeness level”. The search begins by investigating a set of initial conditions taken along a specific line of parameters, called Line of Variations (LoV), inside the orbit uncertainty region. The NEODYs impact monitoring system was recently switched to a new method to sample the LoV, which decreased the generic completeness level from 4×10^{-7} to 10^{-7} (i.e. a factor of four better than the previous approach). The whole risk list has been updated with the outcome of the new method, and it is now available on both the NEODYs and the NEOCC risk pages.

Upcoming interesting close approaches

To date no known object is expected to come closer than one lunar distance to our planet in December, thus deserving special attention. New discoveries likely will.

- The closest known approach will be 2016 WQ3 at 1.5 lunar distances on 1 December.

Recent interesting close approaches

Four new objects came closer than the Moon in November.

- 2016 VA came to about 90 000 km from the Earth’s surface on the second day of November, reaching magnitude 12. It crossed the Earth shadow for a few minutes, challenging amateur astronomers to observe a peculiar “asteroidal eclipse”.
- 2016 VB1, 2016 WT, 2016 WW2 and 2016 WT3 also passed within one lunar distance but did not reach a significant brightness.

News from the risk list

A new object entered the top ten risk list for a few days.

- 2016 WJ1, discovered by the Catalina Sky Survey on 19 November, scored 1 (out of 10) on the Torino scale for a few days, but it is now back to the routine level zero after our team found precovery observations of the object in the Pan-STARRS and CFHT archive, dating back as far as July 2003.

* 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

- Our team has started operating the new ESA Test-Bed Telescope recently installed in Cebreros, near Madrid.
- ESA Council Meeting at Ministerial Level, which gathers the ESA member states for discussing the Agency's programmes, is being held at Luzern (Switzerland) from 1 to 2 December.

Upcoming events

There will be a session about asteroids at the AGU meeting this month.

- 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/>

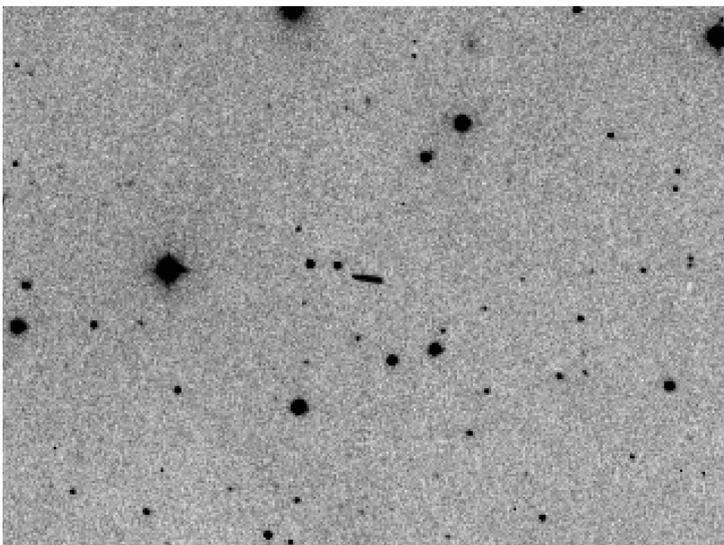
Top-10 table of risky objects

The first ten entries of the risk list computed with the upgraded NEODyS algorithm, as of 01 December. Note the temporary high ranking of 2016 WJ1, which is now out of the top-10.

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)
(29075) 1950 DA	2000	2880-03-16 23:48	1/7000	-1.36	n/a	17.99	275
(410777) 2009 FD	150	2185-03-29 18:06	1/700	-1.83	n/a	19.41	2133
2016 WJ1	~ 230	2065-06-12 23:02	1/8000	-2.05	1	18.64	8
(101955) Bennu	484	2196-09-24 07:55	1/10600	-2.32	n/a	12.68	2683
2010 RF12	~ 9	2095-09-05 23:47	1/16	-3.26	0	12.29	2278
1979 XB	~ 860	2113-12-14 18:07	1/2000000	-3.28	0	26.04	13485
2000 SG344	~ 50	2071-09-16 00:26	1/2000	-3.63	0	11.26	5887
(99942) Apophis	375	2068-04-12 15:13	1/532000	-3.67	0	12.62	4174
2016 NL56	~ 560	2020-06-22 15:42	1/1000000000	-3.70	0	38.42	61
2009 JF1	~ 16	2022-05-06 08:12	1/4500	-3.75	0	26.41	2750

Links for more information

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



The new risk list object 2016 WJ1 observed by ESA's OGS telescope in Tenerife, Canary Islands, on the evening of 28 November 2016.

Image credits: ESA/NEOCC

neo.ssa.esa.int

To subscribe or unsubscribe to this newsletter and for further information please send an email to neocc@ssa.esa.int

