

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

A new near-Earth comet has been discovered, P/2017 Y3 (Leonard), with a perihelion distance of 1.27 au and an orbital period of 29 years.

- Known NEOs: 17 629 asteroids and 107 comets
- NEOs in risk list*: 709
- Number of NEOs designated during last month: 191
- NEOs discovered since 1 January 2018: 191

Focus on

On 10 February 1896 at 09:30 a large fireball appeared in the sky over the Spanish capital, Madrid. The bolide exploded at high-altitude and an air-burst was reported by many observers. Slightly more than one minute after the explosion the shock wave reached the city, causing quite some fear among the population. Breaking of window glasses, shaking of buildings and falling of several meteorites in different parts of the city were reported. The analysis of the collected pieces indicated that the original asteroid was an ordinary chondrite of L6 type.

A more recent similar event occurred five years ago on 15 February in Chelyabinsk, Russia, and had a large resonance in the media and the society. Cameras filmed the spectacular fireball in the sky and the effects of the shock wave, whose effects on the ground resulted in about 1500 people injured. The object falling to the Earth was an LL5 ordinary chondrite.

These events remind us that, even if the possibility of an asteroid falling on Earth is small, these events happen regularly, and when over populated areas they can have significant consequences.

Upcoming interesting close approaches

A large, numbered object will be passing by this month.

- (276033) 2002 AJ129 is a ~ 800 m object that will reach magnitude 12.5 this month.

Recent interesting close approaches

Two newly discovered objects had significant close approaches last month.

- 2018 AH is a ~ 130 m object which came closer than the Moon in early January.
- 2018 BD, only about 4 metres in diameter, came to less than 45 000 km from the Earth surface on 18 January.

News from the risk list

A Chelyabinsk-sized asteroid appeared within the top ten positions of our risk list.

- 2017 YZ1, which reached Torino Scale level 1 last month, was first degraded to level 0, and then removed as a risk, with new observations collected in early January.
- During the same period 2017 XO1, already mentioned last month, also rose to Torino Scale 1. In this case, prediscovery observations from 2011 found in the Pan-STARRS archive resulted in the removal of every impact possibility on 28 January.

* 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

- A newly discovered object, 2018 AV2, has a peculiar dynamical behavior: its relative velocity with respect to Earth is so low that for a few weeks, from early December 2017 to mid-February 2018, it will be in an orbit with eccentricity less than 1 with respect to the Earth. However, the object will not be stably captured, and it will continue in its outgoing heliocentric trajectory after that.

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>
- Planetary Asteroid Science Intersections with In-Space Mine Engineering, 16–17 April 2018, Esch sur Alzette, Luxembourg
<https://asime.uni.lu>

Latest 10 objects reaching non-zero Torino Scale

Table of the last 10 objects to be ranked at a Torino Scale (TS) level greater than zero. As of the date of this newsletter, all of them are either downgraded to level zero, or entirely out of the risk list.

No object in this list (nor any other object in the last decade) ever reached a level greater than 1.

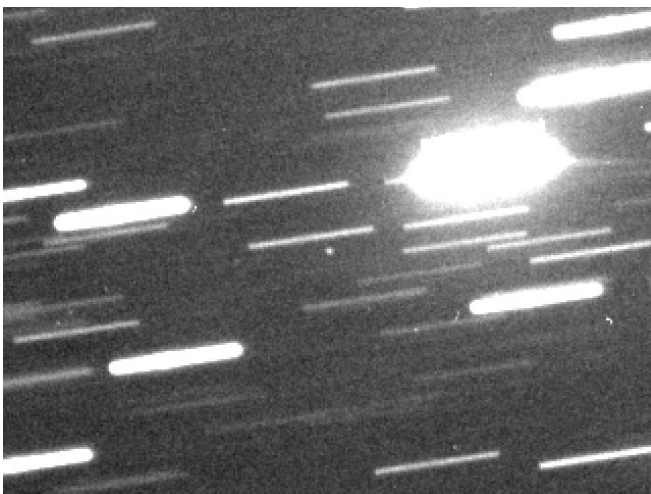
Object name	Size range in m	Date entering TS>0	Date exiting TS>0	Days at TS>0	Max. TS
2017 X02	90 - 200	2018-01-20	2018-01-28	8	1
2017 YZ1	220 - 500	2018-01-05	2018-01-11	6	1
2017 LU	500 - 1100	2017-06-15	2017-06-24	9	1
2017 CH1	700 - 1600	2017-02-07	2017-02-10	3	1
2017 BL30	60 - 130	2017-02-03	2017-02-11	8	1
2017 AM4	400 - 900	2017-01-19	2017-01-20	1	1
2016 WJ1	150 - 300	2016-11-24	2016-12-03	9	1
2016 EU85	400 - 800	2016-03-24	2016-03-30	6	1
2016 BE	50 - 110	2016-01-25	2016-01-26	1	1
2015 PU228	240 - 500	2015-08-23	2015-09-11	19	1

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>



The low-velocity object 2018 AV2 as seen from the ESA OGS telescope on 15 January 2018, when it was 2.5 million kilometres away from the Earth.

Image Credit: ESA NEOCC

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