space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

Over the past six months, almost 1000 NEOs have been discovered. Until 2013 this was the typical number of objects discovered in one full year.

- Known NEOs: 14 478 asteroids and 107 comets
- NEOs in risk list*: 549
- New NEO discoveries since last month: 93
- NEOs discovered since 1 January 2016: 958

Focus on

The newly discovered asteroid (469219) 2016 HO3 has been attracting the interest of the NEO community because of its peculiar orbital path. Having the same period of revolution of the Earth but a higher eccentricity and being properly phased, this object appears to circle our planet in a retrograde "quasi-satellite" orbit with period one year. The reason why it is not a true satellite of the Earth is that the asteroid is in a heliocentric orbit and it is not gravitationally bound to our planet. The interest for celestial mechanics is that 2016 HO3 represents a "natural" example of the so-called "Distant Retrograde Orbits" (DRO) which are at present extensively studied for space mission applications. Asteroid 2016 HO3 has a distance to Earth that varies between 40 and 100 lunar distances. It will stay in this orbit for several hundred years, but not permanently.

Upcoming interesting close approaches

Due to the decreased NEO discovery rate in the Northern hemisphere summer months, only a few objects are known to have close fly-bys in July.

- The only June discovery expected to have a close fly-by in July is 2016 MK, a 100 meter object which will reach magnitude 18 near the middle of the month.

Recent interesting close approaches

Four newly discovered NEOs became brighter than magnitude 16 in June.

- 2016 LP10 and 2016 LT1 both came to less than half a lunar distance in June. Even if they were only about 5 metres in diameter, they became brighter than magnitude 16 during the close approach.
- 2016 LV and 2016 LB flew-by about 10 times farther away, but being 100 metres in diameter made them even brighter, reaching magnitude 15.

News from the risk list

None of the objects currently on the risk list will be easily observable in July.

- Among the objects currently included in the risk list, only 2016 LG10 and 2015 KE are expected to be brighter than magnitude 23 and far enough from the Sun to be observable over the month of July.

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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

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European Space Agency

In other news

- The second edition of Asteroid Day was held on 30 June all over the world, with ESA being one of the main partners of the event.

Upcoming events

The International Meteor Conference and the Meteoroids conference were held in The Netherlands in June.

- AAS Division for Planetary Sciences Meeting (joint with EPSC), 16–21 October 2016, Pasadena, USA
  http://dps.aas.org/meetings/current
- 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/

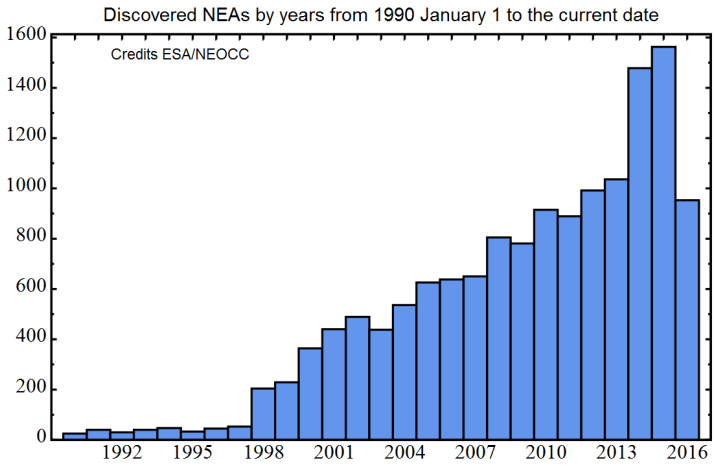
List of smallest near-Earth asteroids

The known NEAs smaller than about 3 meters are all of the Apollo and Aten classes, as expected since they came very close to the Earth when they were discovered. Interestingly, three of the smallest ones were found in October 2008.

Object name	Size in m	H magnitude	Orbital class	Discovery date
2008 TS26	1.0	33.2	Apollo	2008-10-09
2008 UM1	1.6	32.1	Apollo	2008-10-22
2011 CQ1	1.6	32.0	Aten	2011-02-04
2013 YB	2.2	31.4	Apollo	2013-12-23
2008 US	2.2	31.4	Apollo	2008-10-21
2013 RZ53	2.5	31.2	Apollo	2013-09-13
2012 BV1	2.7	31.0	Apollo	2012-01-18
2007 RS1	2.7	31.0	Apollo	2007-09-04
2015 FU344	2.7	31.0	Apollo	2015-03-17
2011 CF22	2.7	30.9	Apollo	2011-02-07
2014 AA	2.7	30.9	Apollo	2014-01-01

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



The yearly discovery rate of NEAs from 1990 to date.

Two clear jumps are visible. The first in 1998 roughly corresponds to the activation of the US LINEAR (Lincoln Near-Earth Asteroid Research) program. The second in 2014 is mostly due to the significant increase of discoveries by the Pan-STARRS survey once the telescope became fully dedicated to NEO observations.

Image credit: ESA / NEOCC