

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

Three new near-Earth comets were announced last month. They are periodic comets discovered by the SOHO spacecraft.

- Known NEOs: 12 758 asteroids and 104 comets
- NEOs in risk list*: 515
- New NEO discoveries since last month: 65
- NEOs discovered since 1 January 2015: 800

Focus on

Some media attention was given to the distant fly-by of asteroid (1566) Icarus. Although the event in itself posed no collision threat whatsoever, Icarus is indeed an interesting object for the history of NEOs. For decades after its discovery (in 1949) it had the distinction of being the only known asteroid with the smallest perihelion distance (hence its mythological name); it was therefore the ideal study case for physical phenomena such as the perihelion precession predicted by General Relativity. Icarus was also the first NEO detected by radar during its 1968 close approach, and the subject of the first case study for asteroid deflection, developed at MIT in 1967.

Upcoming interesting close approaches

A 75 m object discovered earlier this year will get as close as the Moon in July 2015.

- 2015 HM10 is a 75 m object discovered last April with the new DECam instrument on the 4 m Blanco telescope, Cerro Tololo, Chile. It will pass by at ~1 lunar distance on 8 July and be observable as a morning object around magnitude 17 in the following days.

Recent interesting close approaches

Six newly discovered objects came within 5 lunar distances from Earth in June. One of them was estimated to be about 100 metres in diameter.

- 2015 KA122 is a 100 m object that came within 3 lunar distances in June, just a couple of weeks after being discovered by the Catalina Sky Survey.
- Five other smaller objects, of a size comparable with the Chelyabinsk impactor, came within the same distance in June. All were discovered in May–June 2015.

News from the risk list

Two interesting objects appeared in the risk list in June. One has been removed thanks to a large number of observations, the other is still there.

- 2015 KP18 has been observed by various telescopes, including the ESO VLT, but it is still on the risk list. An impact possibility remains for June 2068, with a probability of about 1 in 60 000. It is currently in solar conjunction, but may become observable again with large telescopes later this year.
- 2015 KH157 briefly appeared on the risk list with an estimated impact probability of about 1 in 150 000 for December 2100. It has since been removed thanks to observations obtained by various observatories, including the ESA OGS telescope.

* 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

- An NEO workshop with representatives from ESA Member States took place at ESOC, 18–19 June 2015. A report on the event is available via <http://neo.ssa.esa.int>.
- ESA's NEO team contributed to Asteroid Day (<http://www.asteroidday.org>) by participating in public events devoted to raising awareness of asteroid hazards and mitigation.

Upcoming events

The IAU Symposium 318, entitled “Asteroids: New Observations, New Models”, will be held next month in Honolulu, Hawaii, during the IAU General Assembly.

- 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>
- Planetary Defense session at the 2016 IEEE Aerospace Conference, 5–12 March 2016, Big Sky, USA
<http://www.aeroconf.org/>

List of NEOs visited or scheduled to be visited by spacecraft

Three NEAs and five NECs have been visited by spacecraft so far, and a few more are planned for the next decade.

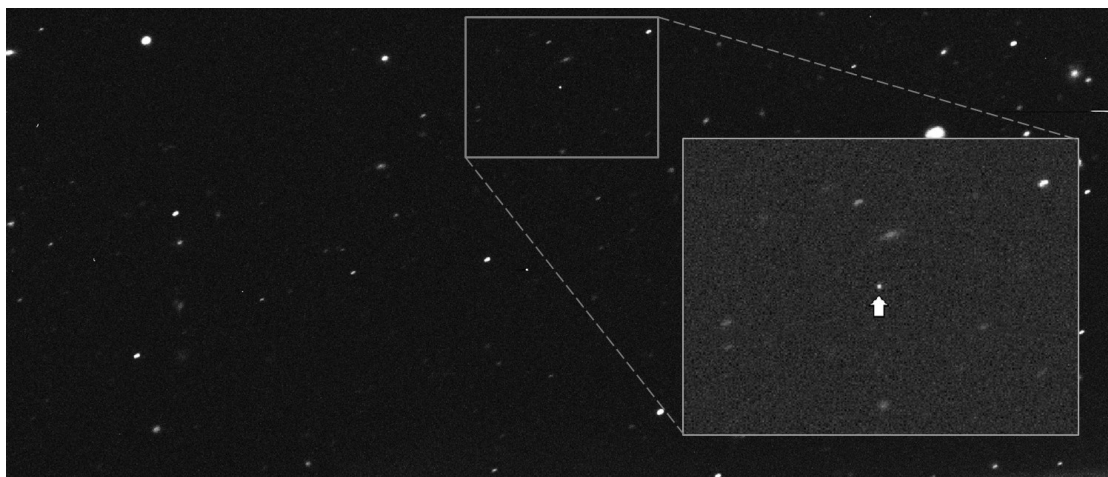
Object name	Spacecraft	Year	Agency	Mission status	Mission type
21P/Giacobini-Zinner	ICE	1985	NASA+ESA	Completed	Fly-by (no imaging)
1P/Halley	Giotto / Vega 1 & 2	1986	ESA / USSR	Completed	Fly-by
26P/Grigg-Skjellerup	Giotto	1992	ESA	Completed	Fly-by (no imaging)
(433) Eros	NEAR Shoemaker	1998	NASA	Completed	Rendezvous, landing
(25143) Itokawa	Hayabusa	2005	JAXA	Completed	Rendezvous, sample return
103P/Hartley	EPOXI	2010	NASA	Completed	Fly-by
(4179) Toutatis	Chang'e 2	2012	CNSA	Completed	Fly-by
67P/Churyumov-Gerasimenko	Rosetta	2014	ESA	Ongoing	Rendezvous, landing
(162173) 1999 JU3	Hayabusa 2	2018	JAXA	Launched	Rendezvous, sample return
(101955) Benu	OSIRIS-REx	2020	NASA	Planned	Rendezvous, sample return

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 newest high-rated entry in the risk list, 2015 KP18, as seen by the ESO VLT telescope on 16 June 2015.

Image credit: ESO / ESA / Olivier Hainaut / Detlef Koschny / Marco Micheli

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