→ NEWSLETTER SEPTEMBER 2019

ESA's NEO Coordination Centre

Current NEO statistics

About 4% of the known NEO population is in the risk list. This value has remained roughly constant over the past years even if the discovery rate has increased.

- Known NEOs: 20 664 asteroids and 108 comets
- NEOs in risk list*: 872
- Number of NEOs designated during last month: 162
- NEOs discovered since 1 January 2019: 1377

Focus on

Thirty years ago in August, the first good radar animation of an asteroid was synthesised from radar signals emitted from the Arecibo antenna and collected at Goldstone. The target asteroid was (4769) Castalia, which was revealed to be a contact binary. NASA's efforts to gather radar measurements from asteroids dates back to the first detection in 1968 of asteroid (1566) Icarus, and has continued now for more than 50 years. As of today, JPL's radar system has collected measurements of 138 main belt asteroids, 873 NEAs and 21 comets. Radar allows the determination of many asteroid properties, from their accurate position, to their nature (single bodies or multiple system), size and rotational state. In many cases, it can also constrain surface properties from the reflectivity of the material on the surface. In summary, radar measurements are an invaluable source of information about small bodies.

Upcoming interesting close approaches

No bright close approaches of NEOs are expected to happen in September.

- An approximately 30-metre asteroid, 2019 RA, will pass by the Earth at 4.5 lunar distance on 7 September, reaching magnitude 16.5.
- 2019 QY4, a much smaller 8-metre object, will be the closest known NEO this month, flying-by at about 2.5 lunar distance.

Recent interesting close approaches

Four known small asteroids came closer than the Moon in August.

- 2019 QH2 and 2019 QQ3 are 5-metre objects that flew by the Earth at less than 0.3 lunar distances, reaching a maximum brightness of about 15.5.
- 2019 QB1 and 2019 QD are 10-metre objects that had a fly-by at respectively 0.3 and 0.8 lunar distances on August 20 and 22.
- 2019 OU1 and 2019 PH3 are the brightest of the known close approachers of the month, both reaching a magnitude brighter than 15 during the fly-by.

News from the risk list

New observations led to the removal from the risk list of a well know object.

- Asteroid 2006 QV89 had a very small chance of impact with the Earth on 9 September 2019. In July the possibility that this object would impact the Earth was ruled out by making a "non-detection". The direct detection on 10-11 August by CFHT led to the complete removal of all impact solutions for the next century.

---

* 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/risk-page

In other news

- On 12 August NASA announced the final selection of four candidate sites for asteroid sample return of its OSIRIS-REx mission on asteroid Bennu

Upcoming events

Relevant international meetings over the next months.

- AIDA International Workshop, 11–13 September 2019, Rome, Italy
  https://www.cosmos.esa.int/web/aida-international-workshop/home
- EPSC-DPS Joint Meeting 2019, 15–20 September 2019, Geneva, Switzerland
  https://www.epsc-dps2019.eu/home.html

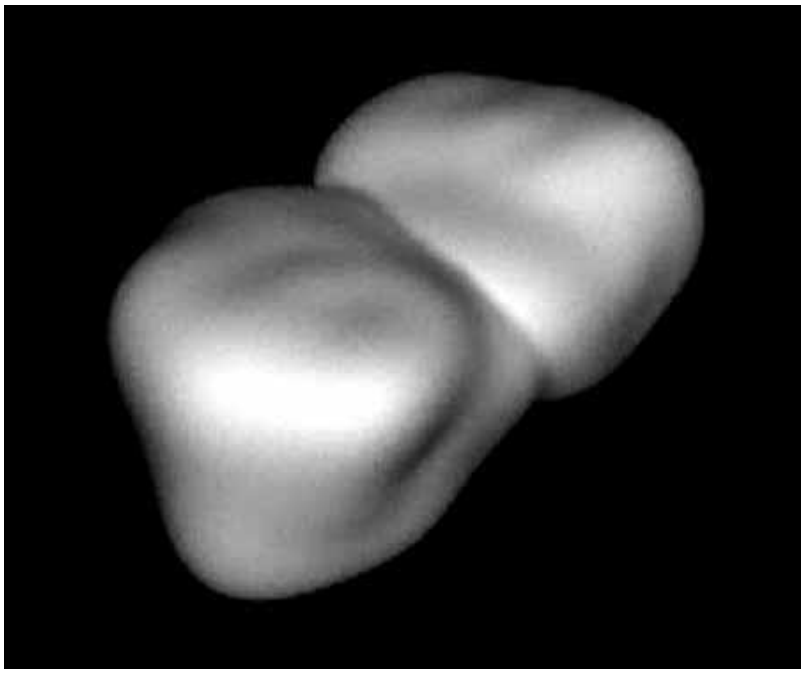
List of closest approaches in the past year

Five known objects came closer than 50 000 km to the Earth surface over the past 10 months (since we last reported on this in our newsletter), including the impactor 2019 MO last June.

Object name	Close Approach Date	Miss distance in lunar distances	Miss distance in Earth radii	Miss distance in km from Earth surface	Size range in m	H magnitude	Discovery date
2019 MO	2019-06-22	0	0	0	4–8	29.3	2019-06-22
2019 AS5	2019-01-08	0.04	2.4	15 000	1–2	32.3	2019-01-08
2019 EH1	2019-03-01	0.06	3.7	23 000	3–6	29.9	2019-03-01
2018 WG	2018-11-16	0.08	4.8	30 000	4–8	29.4	2018-11-17
2018 WV1	2018-12-02	0.09	5.2	33 000	3–6	30.0	2018-11-29

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



Tridimensional model of asteroid (4769) Castalia derived from the radar data collected in August 1989.

Credits: NASA