

ESA'S NEO Coordination Centre

Current NEO statistics

For the first time since 2012 the year that just ended did not break all records of annual NEO discoveries. This was mostly due to unusually poor weather in Hawaii, where many current NEO discovery surveys are located.

- Known NEOs: 19 275 asteroids and 107 comets
- NEOs in risk list*: 805
- Number of NEOs designated during last month: 153
- NEOs discovered since 1 January 2018: 1822

Focus on

During 2018, two spacecraft, JAXA's Hayabusa2 and NASA's OSIRIS-REx, reached their respective target asteroids (162173) Ryugu and (101955) Bennu.

The two objects were known to be pretty similar both dynamically and in composition, but the resolved images recently obtained by the spacecraft showed additional impressive similarities in their shapes and surface properties. Both objects are "diamond shaped", roughly spherical but with a raised equatorial ridge. This feature is thought to be the consequence of their rubble pile compositions: the objects are likely loose aggregates of smaller building blocks, and this shape is the result of a balance between the objects' self gravity and their rotation. Both objects also show large boulders on their surface, indirectly confirming their aggregate structure.

Coincidentally, both asteroids also share another similarity: they were both discovered in 1999, and both by the then-leading LINEAR survey.

The most significant difference between the two objects is their size: Bennu has an equatorial diameter of ~500 m, while Ryugu is almost twice as large, at ~900 m.

Upcoming interesting close approaches

No known object is expected to have a bright fly-by in January.

- 2013 CW32 will be the brightest among the currently known asteroids having a fly-by this month, with a magnitude of about 16. It is still unrecovered as of today.

Recent interesting close approaches

A close fly-by of a large asteroid was used to test two Italian radio telescopes.

- (163899) 2003 SD220, a 1600-metre Aten asteroid, flew-by at about 7 lunar distances on 22 December. The asteroid was imaged via bistatic radar by the Goldstone and Green Bank radio telescopes. A detection has also been obtained by ASI together with JPL using the 64 m SDSA antenna in Sardinia and INAF Medicina.

News from the risk list

Three objects entered and left the top-10 of our risk list in December.

- 2018 XV5, 2018 XG5 and 2018 YJ are all newly discovered asteroids that reached a Palermo Scale value higher than -4 during the month of December. Thanks to additional observations, the first object is now off the risk list, while the other two are now known to have lower impact probabilities.

* 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

- An internal reorganisation of ESA led to the formation of a “Space Safety Office” within the Directorate of Operations of ESA. The NEO Coordination Centre is now managed by the Planetary Defence Office within the Space Safety Office.

Upcoming events

Relevant international meetings over the next months.

- NEO and Debris Detection Conference, 22–24 January 2019, Darmstadt, Germany
<https://neo-sst-conference.sdo.esoc.esa.int/>
- EGU General Assembly 2019: “Near Earth Objects and Planetary Defence”, 7–12 April 2019, Vienna, Austria
<https://meetingorganizer.copernicus.org/EGU2019/session/31957>
- IAA Planetary Defense Conference, 29 April–3 May 2019, College Park, USA
<http://pdc.iaaweb.org/>

Highest rated objects added to the risk list in 2018

The table shows the top 10 objects entering the risk list in 2018 and which are still present, ranked by current Palermo Scale.

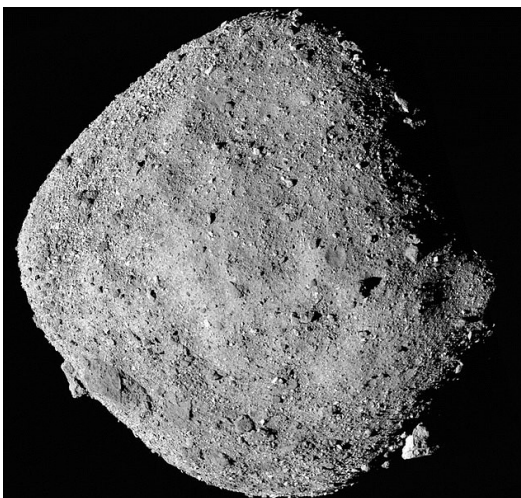
Object name	Size in m	Date of possible impact	Impact probability	Palermo Scale	Torino Scale	Velocity in km/s
2018 VP1	~ 3	2020-11-02 01:13	1/400	-4.07	0	14.69
2018 XB4	~ 70	2092-06-22 22:51	1/40 000	-4.36	0	13.36
2018 XG5	~ 400	2083-04-23 21:16	1/5 000 000	-4.47	0	17.33
2018 TY4	~ 10	2033-10-05 16:22	1/3 000	-4.52	0	15.45
2018 DQ	~ 6	2027-02-21 16:52	1/4 000	-4.54	0	23.67
2018 JD	~ 19	2067-05-08 13:29	1/8 000	-4.82	0	13.75
2018 NJ	~ 11	2083-07-10 01:55	1/1 600	-4.87	0	12.62
2018 NL	~ 30	2060-06-29 00:29	1/60 000	-5.02	0	13.91
2018 VS6	~ 18	2083-11-09 08:12	1/11 000	-5.08	0	16.26
2018 GR4	~ 16	2058-03-07 07:11	1/13 000	-5.26	0	11.48

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>



Mosaic image of asteroid (101955) Bennu obtained by NASA’s OSIRIS-REx spacecraft.

The approximately round shape with a raised equatorial ridge is clearly visible, as are the many boulders on the surface.

[Credit: NASA/Goddard/University of Arizona]

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