

ESA's NEO Coordination Centre

Current NEO statistics

Our database of asteroids with good orbital information has surpassed 1 million.

- Known NEOs*: 26 498 asteroids and 115 comets
- NEOs in risk list**: 1190
- Number of NEOs designated during last month: 294
- NEOs discovered since 1 January 2021: 1714

Focus on

This month marks the 30th anniversary of the publication of the article identifying the Chicxulub crater as the one resulting from the impact of a minor body that wiped out the dinosaurs and many other species from Earth. Ten years before, in 1980, L. W. Álvarez *et al.* had found anomalously high concentrations of iridium in the sedimentary layer corresponding to the Cretaceous-Paleogene boundary (the so-called K-Pg boundary) dated 66 million years ago. They attributed such large concentrations of iridium to the impact of an extra-terrestrial body of a size that they estimated to be of $10 \text{ km} \pm 4 \text{ km}$. However, no crater had been found at that time that corresponded to such a large possible impact. It took roughly a decade to locate the crater. In September 1991, A.R. Hildebrand *et al.* published the definitive article about this global search for the impact crater. In their publication, they provided the geological clues in terms of gravity and magnetic data, stratigraphy, petrology and morphology to justify their inferences on the age and origin of the causing impact object. With all that in hand, they concluded that the resulting $\sim 180 \text{ km}$ crater, hidden below the surface and sea of the Yucatán Peninsula, was the perfect candidate for the long search that the international geology community had undertaken to find the K-Pg boundary culprit.

Upcoming interesting close approaches

None of the known objects will have particularly close approaches in September.

- 2010 RJ53 is the only one among currently known objects expected to become brighter than magnitude 18 during a fly-by in September.

Recent interesting close approaches

Two very different objects had bright close approaches in August.

- 2021 PC was a small object with a diameter of about 15 metres which flew-by at 0.4 lunar distances in early August, reaching magnitude 13.
- 2016 AJ193 also reached magnitude 13, but in this case it was a much larger 1300 metre object, passing by at 9 lunar distances.

News from the risk list

A few new objects reached moderately high Palermo Scale values in August. Most of them dropped to negligible levels after follow-up observations.

- 2021 QM1 is the highest rated of the recently discovered objects. It's a moderately large 50-metre object with multiple possible impacts over the next century, but only amounting to a total impact probability of about 1 in 15 000.

*Current figures are subject to revision due to some discrepancies with the source of the data

**The risk list of all known objects with a non-zero (although usually very low) impact probability can be found at <https://neo.ssa.esa.int/risk-list>

In other news

- A newly discovered asteroid, 2021 PH27, has been found to be the one with the shortest orbital period among the population of known NEAs. It orbits the Sun in 115 days, surpassed only by planet Mercury with its 89 days.

Upcoming events

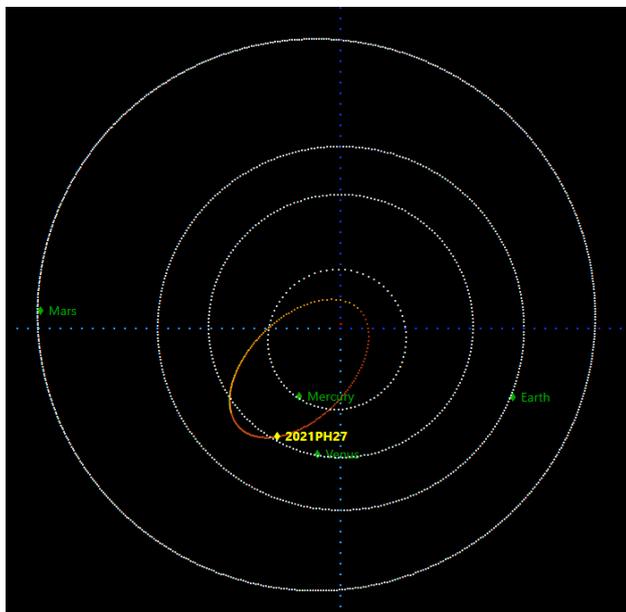
One event in the list of relevant international meetings over the next months.

- 53rd Annual Meeting of the AAS Division for Planetary Sciences, 3-8 October, virtual
<https://dps.aas.org/meetings/current>

List of Atiras with smallest period

The following table provides the list of currently known Atiras with a period smaller than 200 days and ordered by period, together with their absolute magnitude and main orbital elements. 2021 PH27 is the first asteroid in this list.

Designator	Abs. Magnitude (mag)	Orbit Period (days)	Perihelion (au)	Aphelion (au)	Inclination (deg)
2021 PH27	17.7	114.6	0.1331	0.7903	31.94
2019 LF6	17.3	151.2	0.3170	0.7939	29.51
2020 AV2	16.3	151.2	0.4571	0.6538	15.87
2019 AQ3	17.5	165.0	0.4036	0.7737	47.22
2021 BS1	18.5	169.1	0.3963	0.8005	31.73
2013 JX28	20.1	170.1	0.2619	0.9398	10.76
(418265) 2008 EA32	16.5	176.6	0.4281	0.8038	28.26
(164294) 2004 XZ130	20.4	177.2	0.3368	0.8982	2.95
2010 XB11	19.9	177.5	0.2881	0.9480	29.89
2017 YH	18.4	184.5	0.3283	0.9404	19.84
(434326) 2004 JG6	18.5	184.9	0.2979	0.9726	18.94
2020 OV1	18.7	185.9	0.4753	0.7996	32.58
2015 DR215	20.5	198.7	0.3521	0.9806	4.09



Ecliptic projection of the orbit of 2021 PH27 and the inner Solar System planets on 30 August 2021, date of the latest observations done by our team. This asteroid is currently the one with the shortest orbital period. The highly eccentric orbit of this Atira can be clearly observed as well as the observation geometry at that epoch.

Thanks to those observations an improvement of about an order of magnitude in the uncertainties on all orbital elements was obtained. For more information press [here](#).

[Credit: ESA/PDO]

Links for more information

Website: <https://neo.ssa.esa.int>

Close approaches page: <https://neo.ssa.esa.int/close-approaches>

Risk List: <https://neo.ssa.esa.int/risk-list>

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