

INTERNATIONAL ASTEROID WARNING NETWORK (IAWN)**POTENTIAL ASTEROID IMPACT NOTIFICATION – HYPOTHETICAL SIMULATION**

Date: October 23, 2024
From: International Asteroid Warning Network
To: Chair, Space Mission Planning Advisory Group (SMPAG);
United Nations Office of Outer Space Affairs
Title: Potential for Impact of Near-Earth Asteroid 2023 PDC

Impact Probability:	100% as calculated by NASA JPL CNEOS and ESA NEOCC
Impact Date:	22 OCTOBER 2036
Impact Risk Corridor:	West Africa, extending from south of the Canary Islands southeast to the southern Congo River region
Approximate Size:	300 - 880 meters (970 - 2980 feet) determined from observations of brightness and color, and an assumed range of surface reflectivities
Expected Damage Level if Impact Occurs:	Uncertain – Regional to Continental. Energy release estimated to be 76 MT to 10 Gt.

ADDITIONAL DETAILS:

- There is a 100% probability that asteroid 2023 PDC will impact Earth on 22 October 2036 as calculated by the NASA JPL Center for Near-Earth Object Studies and the ESA Near-Earth Objects Coordination Centre, based on observations from the worldwide network of observatories.
- The impact risk corridor, which is the region of Earth where it is possible that 2023 PDC could impact, extends from south of the Canary Islands southeast across West Africa to the southern Congo River region.
- The asteroid 2023 PDC has been tracked by Earth-based telescopes except for late June – Nov. 2023 when it was too close to the Sun to observe. Since observations resumed in Nov. 2023, the impact probability of asteroid 2023 PDC has risen to 100%.
- The size of 2023 PDC is estimated to be 300 - 880 meters (970 - 2900 feet). This updated size estimate is based on color data from ground-based telescopes, which indicates something about the surface reflectivity and the type of asteroid, along with its observed brightness (absolute magnitude H is determined to be 19.4).
- The asteroid is too distant for radar observations and will not come within range until 2036.
- There is a high probability that hundreds of thousands to millions of people on the African continent could be affected by the potential damage of the impact based on the latest predicted impact corridor and risk modeling. See Impact Risk Summary quad chart below for further details.

This notification is issued by the International Asteroid Warning Network (IAWN) in accordance with report [SMPAG-RP-003](#) on Recommended Criteria & Thresholds for Action for Potential NEO Impact Threat that defines the threshold for issuing warnings of possible impact effects, which is a probability of impact is greater than 1% and a rough size estimated to be greater than 10 meters (33 feet).

IAWN is a worldwide collaboration of asteroid observers and modelers that was recommended by the United Nations. <https://iawn.net>

Point of Contact: IAWN Coordinating Officer for the IAWN Steering Committee [email]

Graphics:

- Impact risk corridor map
- Impact Risk Summary quad chart



HYPOTHETICAL EXERCISE

Impact Risk Summary

Assessment 2: Remote Observations Before Mission Launch, 23 October 2023

Asteroid Characterization Summary

- Potential impact date: 22 Oct. 2036
- Earth impact probability: 100%
- Likeliest asteroid size range increased based on color data from ground observations refining estimates of asteroid type
- Diameter: 170–2100 m (550–6900 ft), most likely 300–880 m (970–2890 ft), median 620 m (2020 ft)
- Asteroid Energy: 76–190,000 megatons (Mt), most likely 76–10,400 Mt, median 4,850 Mt

Risk Region Swath Map

Regions potentially at risk, given range of damage sizes and locations. Median-sized damage areas are shown at sample locations.

Hazard Summary

- Damage risk has increased substantially due to confirmed Earth impact likely over land, and higher likelihood of larger asteroid sizes
- Impact would cause large blast & thermal damage reaching unsurvivable levels, with serious damage likely extending ~100–240 km (~60–150 mi) outward, and possibly 600 km (400 mi) or more
- Largest impacts could cause catastrophic global effects (9% chance)
- Tsunami could still pose significant damage/risk if large impactors were partially deflected into the ocean
- Large uncertainties in potential damage sizes, severities, and locations remain

Affected Population Risks

Affected Population	Probability
10	<0.1%
100	3%
1K	11%
10K	8%
100K	34%
1M	30%
10M	7%
100M	5%
1B	0.6%

Probabilities of how many people could be affected by the potential damage

Total avg. risk: 32M
Median: 712K
Likely 100s-of-thousands or millions
Possibly up to 2B or more

2023 PDC, Epoch 2

HYPOTHETICAL EXERCISE

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