

The logo for the International Asteroid Warning Network (IAWN) is located in the top left corner. It features a stylized Earth with a red line representing an asteroid's trajectory passing through it. To the right of the Earth, the text "International Asteroid Warning Network" is written in a blue, sans-serif font, with each word on a new line.

International
Asteroid
Warning
Network

PDC 2023 Simulated Impact Threat Scenario

Notification by the International Asteroid Warning Network
(IAWN)

Kelly Fast
IAWN Coordinating Officer

6th IAA Planetary Defense Conference
April 2023

<https://iawn.net/>

Background

IAWN is a worldwide collaboration of asteroid observers and modelers that was recommended by the United Nations

From the IAWN Statement of Intent:

“The intent of the International Asteroid Warning Network (IAWN) is to establish a worldwide effort to detect, track, and physically characterize near-Earth objects (NEOs) to determine those that are potential impact threats to Earth. This network is comprised of a partnership of scientific institutions, observatories, and other interested parties performing observations, orbit computation, modeling, and other scientific research related to the impact potential and effects of asteroids.”

Currently 50 signatories from over 20 countries

UN Office of Outer Space Affairs Committee on Peaceful Uses of Outer Space

Overview for NEO Threat Response



United Nations
COPUOS/OOSA

*Inform in case of
credible threat*

Parent Government Delegates

Determine Impact time,
location and severity

International Asteroid
Warning Network
(IAWN)
www.iawn.net

Coordinated
by NASA

Observers, analysts, modelers...

Potential deflection
mission plans

Space Missions Planning
Advisory Group
(SMPAG)
www.smpag.net

Chaired
by ESA

Space agencies and offices



Notification by IAWN - Threshold

IAWN shall warn of predicted impacts exceeding a probability of **1%** for all objects characterized to be greater than **10 meters** in size*

Reference: Report SMPAG-RP-003 on Recommended Criteria & Thresholds for Action for Potential NEO Impact Threat (led by IAWN) at smpag.net

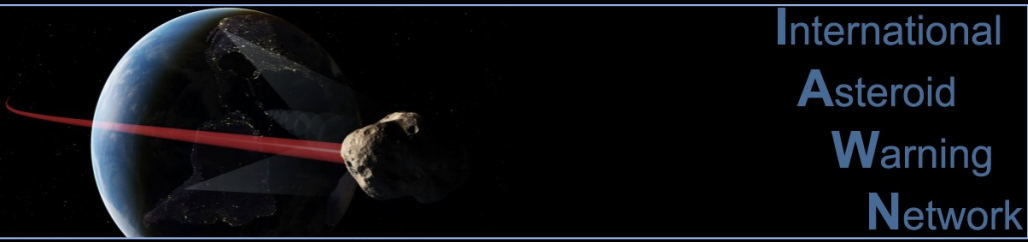
**Roughly equivalent to absolute magnitude of 28 if only brightness data can be collected.*

Notification by IAWN – Who?

The IAWN Coordinating Officer or a member of the IAWN Steering Committee will notify:

- Chair, Space Mission Planning Advisory Group (SMPAG)
- United Nations Office of Outer Space Affairs (UNOOSA)
 - UNOOSA will notify UN Member States

IAWN signatories will also notify and work with their own governments according to their own national policies, as applicable.



Notification by IAWN – 2023 PDC

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INTERNATIONAL ASTEROID WARNING NETWORK (IAWN)

POTENTIAL ASTEROID IMPACT NOTIFICATION – HYPOTHETICAL SIMULATION

Date: April 3, 2023
 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:	1% as calculated by NASA JPL CNEOS and ESA NEOCC
Impact Date:	22 OCTOBER 2036
Impact Risk Corridor:	From the South Pacific to the southern Indian Ocean, crossing North America, the Atlantic Ocean, and Africa
Approximate Size:	220 - 660 meters (720 - 2160 feet) determined from its observed brightness and an assumed range of most likely surface reflectivities
Expected Damage Level if Impact Occurs:	Uncertain – Regional to Continental. Energy released most likely to be in the range 54 Mt to 5.5 Gt

ADDITIONAL DETAILS:

- There is a 1% 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. While there is uncertainty in whether the asteroid will impact Earth, if an impact occurs it will be on this date.
- The impact risk corridor, which is the region of Earth where it is possible that 2023 PDC could impact, extends from the South Pacific to the southern Indian Ocean, crossing North America, the Atlantic Ocean, and Africa.
- The asteroid 2023 PDC has been tracked since it was first observed on 10 January 2023 by an international team using the Dark Energy Camera (DECam) at the Victor M. Blanco 4-meter Telescope at Cerro Tololo Inter-American Observatory in Chile and searching in the twilight region of the sky looking for asteroids in the inner Solar System.
- Further observations will reduce the uncertainty in the asteroid's trajectory and impact probability. The asteroid will be almost continuously observable after late 2023, although it will be distant and quite faint and will likely require large (2-meter) telescopes.
- The asteroid size of 220 - 660 meters (720 - 2160 feet) is determined from its observed brightness (absolute magnitude H is determined to be 19.4) and an assumed range of most likely surface reflectivities.
- The size cannot be estimated with further precision without radar observations or imagery from a spacecraft that can closely approach the asteroid. The asteroid is too distant for radar observations and will not come within range until 2036.

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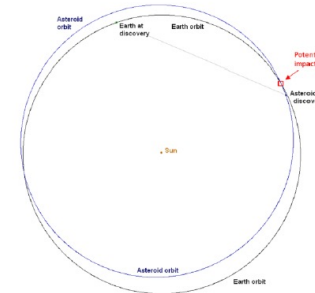
This notification is issued by the International Asteroid Warning Network (IAWN) in accordance with report [SMPAG-RP-003](#) on Recommended Criteria & Thresholds for Action for Potential NEO Impact Threat that defines the threshold for issuing warnings of possible impact effects, which is a probability 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:

- Helio-centric orbit diagram relative to Earth orbit
- Impact risk corridor maps



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Notification by IAWN – 2023 PDC

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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: 1% as calculated by NASA JPL CNEOS and ESA NEOCC

Impact Date: 22 OCTOBER 2036

Impact Risk Corridor: From the South Pacific to the southern Indian Ocean, crossing North America, the Atlantic Ocean, and Africa

Approximate Size: 220 - 660 meters (720 - 2160 feet) determined from its observed brightness and an assumed range of most likely surface reflectivities

Expected Damage

Level if Impact Occurs: Uncertain – Regional to Continental. Energy released most likely to be in the range 54 Mt to 5.5 Gt

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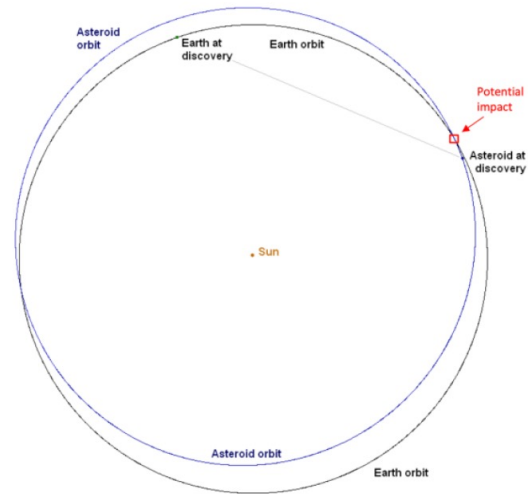
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- **Additional details and risk assessment will be briefed by respective IAWN subject matter experts**

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- **Based on this IAWN notification, SMPAG has recommended that a reconnaissance mission be quickly developed and launched**

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The logo features a stylized Earth with a red line representing an asteroid's path. The text 'International Asteroid Warning Network' is stacked vertically to the right of the graphic.

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End