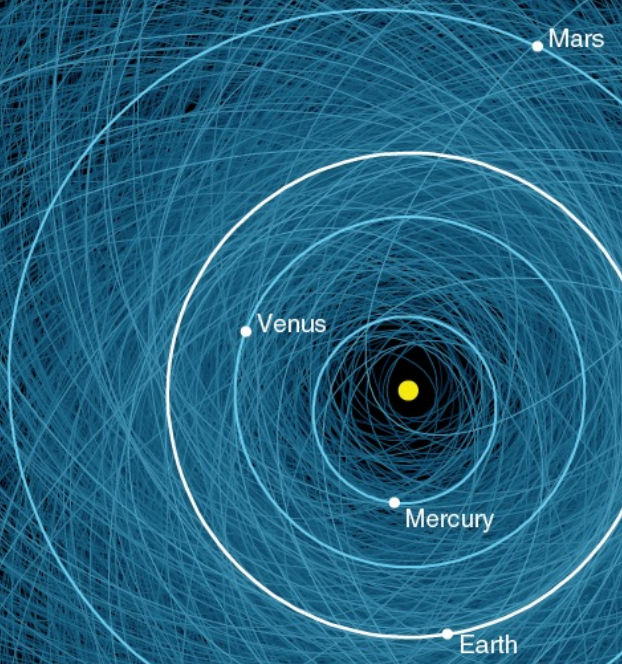
HYPOTHETICAL EXERCISE

The 2023 PDC Hypothetical Impact Scenario: Epoch 2 Summary



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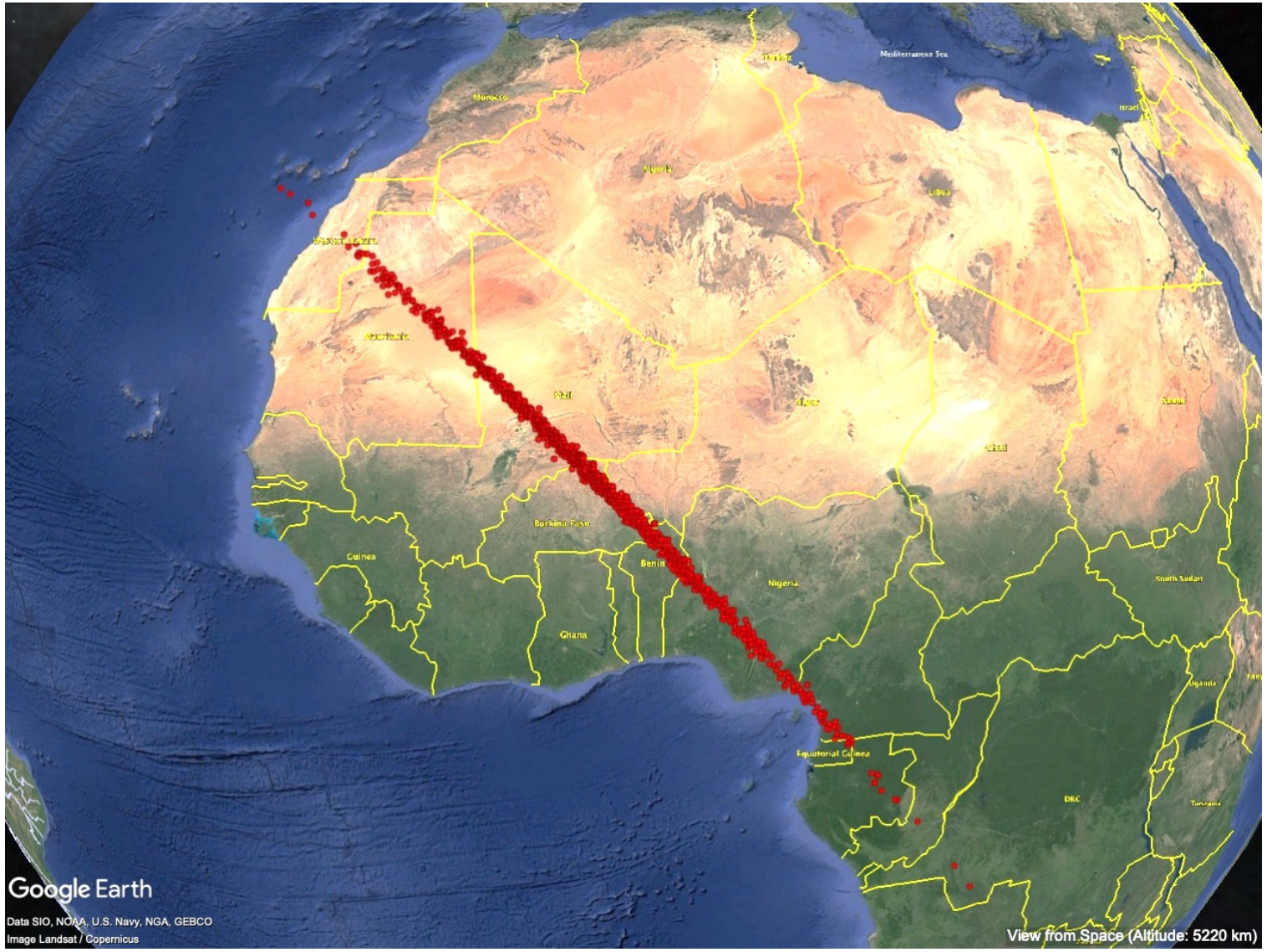
HYPOTHETICAL EXERCISE

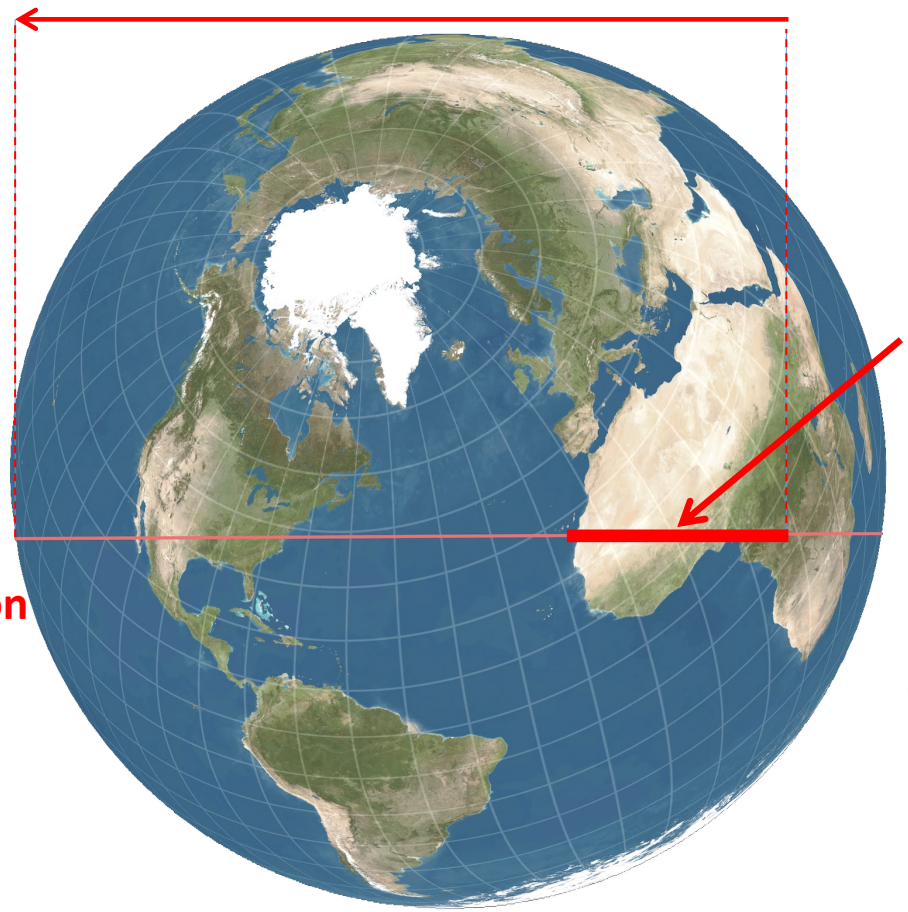
Asteroid 2023 PDC Chance of Earth Impact Now 100%

- 18 months have passed and now it is **100% certain** that asteroid 2023 PDC is on a trajectory that will impact Earth on Oct. 22, 2036, 12 years from now
- The impact probability reached 10% by the end of June, 2023, when the asteroid became unobservable from Earth due to its low elongation from the Sun
  - The Space Mission Planning Advisory Group (SMPAG), recommended in July 2023 that space agencies begin developing missions to the asteroid for both reconnaissance and deflection
- When observations resumed in Nov. 2023, the impact probability quickly rose to 100%
- The latest orbit estimates indicate that the predicted impact footprint is within the **continent of Africa**
- Estimates of the size of 2023 PDC have been updated based on color data from ground observations, which help refine the asteroid type and likely albedo
- The diameter of 2023 PDC is most likely in the range of **300 to 880 meters** (970 to 2900 ft); if the asteroid impacts, the energy released is most likely in the range **76 Mt to 10 Gt** (see Damage Assessment Briefing)
- A simple **flyby reconnaissance mission** has been on a fast-track development path for 1.5 years and is now ready to launch; it will encounter the asteroid in December 2025, 25 months from now
- Other missions to 2023 PDC have also been under development (see Mission Options Briefing)

2023 PDC: Predicted Impact Footprint for Epoch 2

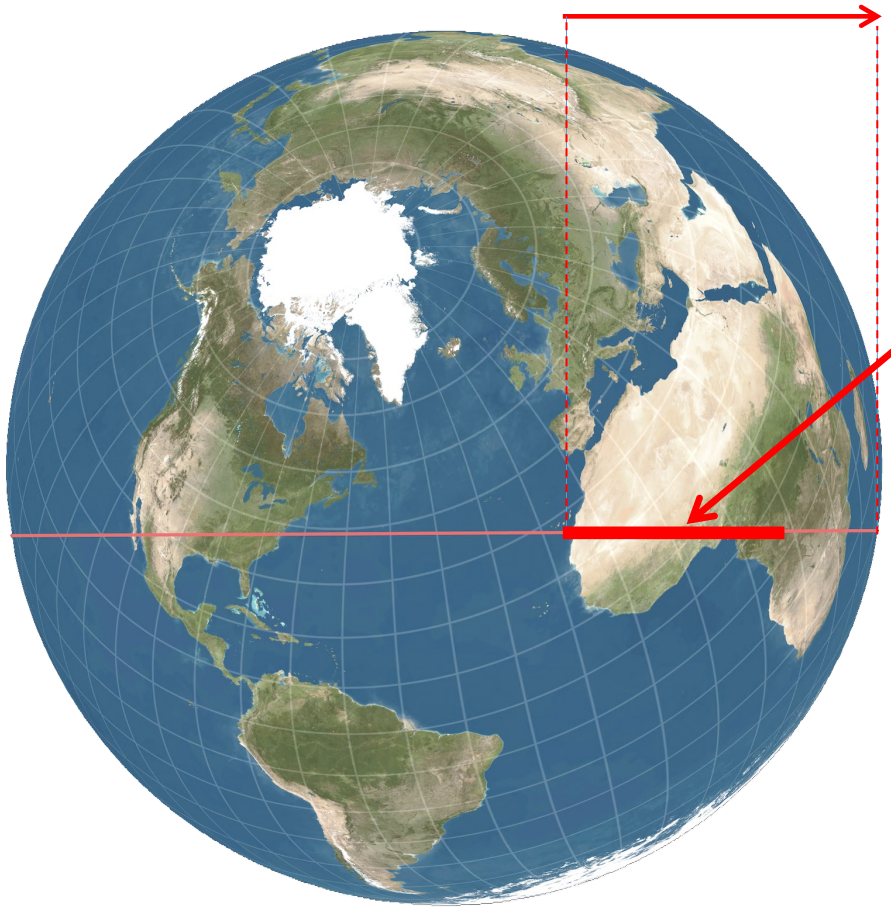


2023 PDC: Updated Considerations for KI Deflection



- The impact is now constrained to lie within a range of zeta coordinates and it is positioned very unfavorably for KI
- The easier direction is westwards and would move the impact footprint across N. America
- Since 2023 PDC is large, multiple KI missions will certainly be required
- Since we don't know 2023 PDC's mass to within even an order of magnitude accuracy, we cannot yet predict how much delta-V any given KI mission can achieve
- The KI technique is clearly impractical

2023 PDC: Updated Considerations for Nuclear Deflection



- The impact is now constrained to lie within to a range of zeta coordinates
- The deflection directions are equally difficult, so choose to go the shortest way
- But, since we don't know 2023 PDC's mass to within even an order of magnitude accuracy, we still must design the deflection to succeed with the largest likely asteroid mass