

B B C FROM THE BIG BANG TO TODAY: A COSMIC ERAS TOUR

#239 APRIL 2025

Sky at Night

THE UK'S BEST-SELLING ASTRONOMY MAGAZINE

GALAXY SEASON

Explore the treasure trove of star systems that lie in spring skies

NEW WAYS TO VIEW THE SUN AT PEAK ACTIVITY

MANUFACTURING IN SPACE: MAKING THE FUTURE NOW



*DWARF 3 SMART SCOPE:
NEW FEATURES TESTED*

*HIDDEN OCEANS, ALIEN LIFE:
INSIDE THE ICY MOONS*

*WATCH THE CRESCENT MOON
JOIN THE SEVEN SISTERS*

PLUS
Where black holes come from and how we see them

BULLETIN



Comment

by Chris Lintott

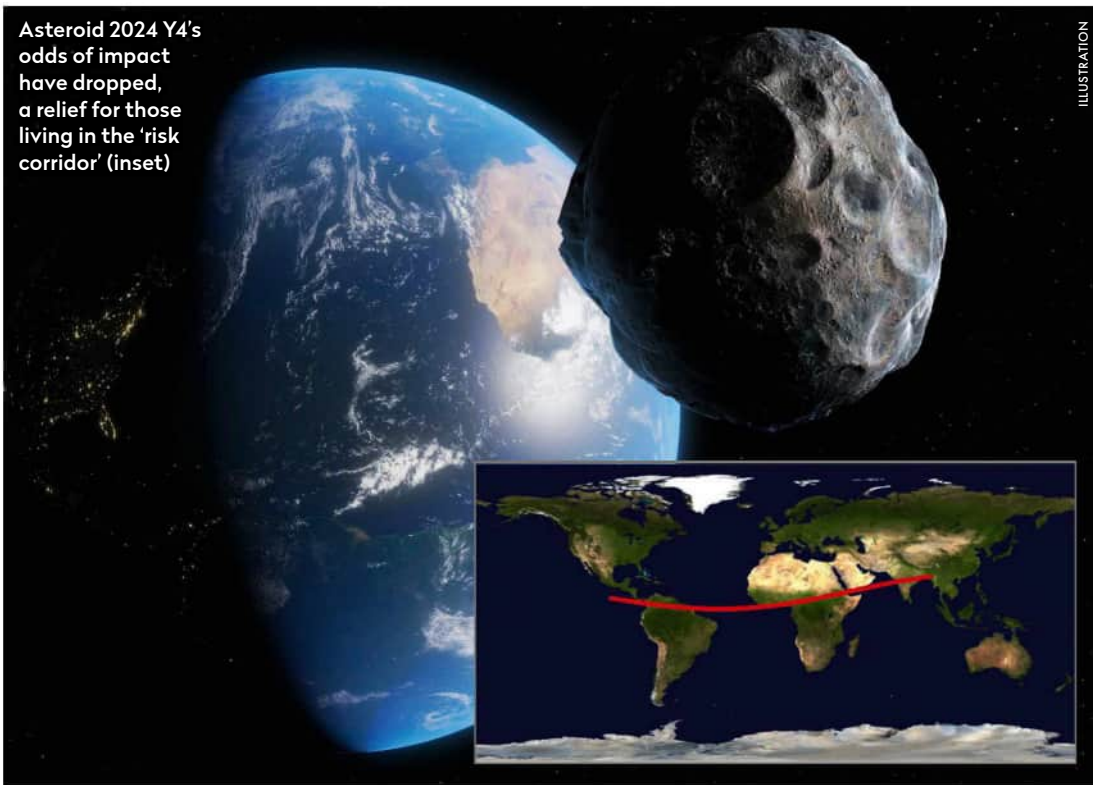
If you're worried: relax. Rather than causing undue alarm, knowing there's a small chance 2024 YR4 might hit us is a sign of success. The threatening rock is probably no larger than a jumbo jet and yet we have spotted it many years before it might pose a threat. When the last thing this size hit Earth, most likely in Tunguska, Siberia in 1908, we had no idea it was coming until several miles of pine forest had a very bad day.

Soon, most things the size of 2024 YR4 will be routinely tracked, and missions like DART can defend us if needed. For the first time in human history, we have the knowledge and the techniques to defend against this threat from the skies.

Chris Lintott
co-presents
The Sky at Night

Asteroid 2024 YR4's odds of impact have dropped, a relief for those living in the 'risk corridor' (inset)

ILLUSTRATION



Narrow escape from a 'city-killer' asteroid

The close call shows Earth is ready should another space rock approach

The sighting of a dangerous asteroid on a potential collision course with Earth has triggered planetary defence response procedures for the first time ever. Fortunately, the process successfully tracked the asteroid to reveal it will almost certainly miss Earth.

Asteroid 2024 YR4, discovered in December 2024, is estimated to be 40–90 metres in diameter. When astronomers realised the danger, they mounted an observing campaign to measure its orbit and more accurately gauge whether it would impact Earth. The probability of impact with Earth fluctuated as more measurements came in, reaching as high as 3.1 per cent.

That put the space rock at a three out of 10 on the Torino scale, which measures the danger of potential impacts – only asteroid Apophis has been rated more highly. The scale combines both the destructive potential of the asteroid and its probability of hitting Earth. Humanity can breathe a sigh of relief, however, as further orbit measurements soon dropped the impact chance to almost zero per cent.

Astronomers will continue to measure YR4's trajectory before it travels too far from Earth in its current orbit. Even the James Webb Space Telescope (JWST) will be put to work, making observations in March and May. There will be another chance to observe the asteroid when it circles back towards Earth again in 2028, before the potentially hazardous pass in 2032.

Had YR4 been on a collision course with Earth, it would have been large enough to destroy a city. The 'risk corridor' passed over regions of South America, Africa, India and China, areas with an estimated population of 100 million people. If the asteroid had been headed for a populated area, authorities may have attempted to deflect it. NASA proved this can be done with the DART mission, which altered the path of asteroid Dimorphos in 2022.

Though YR4 was a close call, it's a timely reminder of the danger asteroids pose to our planet. cneos.jpl.nasa.gov