Asteroid YR4

***Prelims**: Current events of national and international importance| Indian Geography*

Why in news?

Recently NASA announced that there was a 3.8% chance Asteroid YR4 could collide with the moon on December 22, 2032.

- **Asteroid YR4** – It is a ***near-earth asteroid***, an object orbiting the sun whose closest approach to the star is within 1.3-times the earth-sun distance.

  Near-Earth asteroids (NEAs) are asteroids with orbits that bring them close to Earth, potentially crossing Earth's orbital path.

- Such asteroids are classified as potentially hazardous objects if their orbits cross the earth's and they are more than 140 m wide.
- **Discovery** – It was discovered in December 2024 using ATLAS telescope in Rio Hurtado, Chile.

  The ATLAS telescope is a NASA-funded asteroid detection system that scans the entire night sky every 24 hours for near-Earth objects (NEOs) with four telescopes now operating in Hawaii, Chile, and South Africa.

- **Physical characteristics** – Infrared observations from the James Webb Space Telescope have revealed a clearer picture of the asteroid's size.
- It is now estimated to be 65 m wide, about the size of a 10-storey building.
- For comparison, dinosaur-extinction asteroid was 10 km wide.
- **Earth Impact Assessment –** NASA initially predicted that the asteroid has 3.1% chance of hitting Earth in 2032.
- Later revised assessment that the chance of hitting Earth is actually negligible.
- **Moon Impact Possibility –** NASA now predicts that there is 3.8% chance of colliding with moon on December 22, 2032.
- If impact occurs, would create 500-2,000-meter-wide crater.
- Impact explosion would be 340 times more powerful than Hiroshima bomb.
- **Future monitoring -** YR4 will pass by Earth again in 2028 and this will provide opportunity to collect more data after four-year gap.
- It will provoide opportunity to acquire more data, with refined models, and develop a better picture of whether the asteroid might strike the moon.

Reference

[The Hindu| Asteroid YR4]