

## Cubic Kilometre Neutrino Telescope (KM3NeT)

### Why in News?

*Recently, the scientists have deployed 2 telescopes under the Mediterranean Sea to detect high-energy neutrinos.*

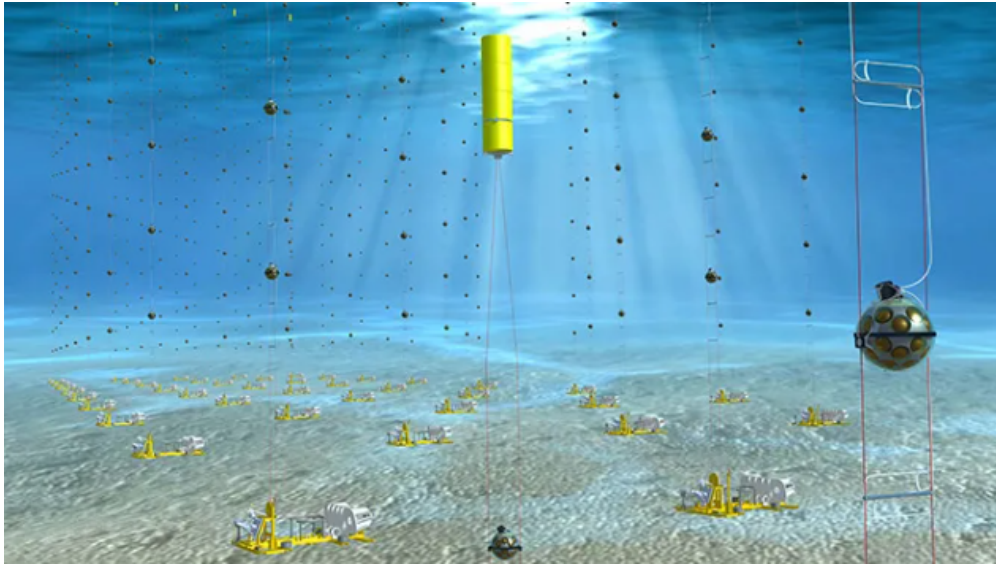
- It is an **underwater Neutrino telescope**.
- **Aim** - To study high-energy neutrinos also known as ghost particles that could reveal secrets of the cosmos.

***Neutrinos** are weakly interacting subatomic particles that can travel astronomical distances undisturbed. They are the 2<sup>nd</sup> most abundant subatomic particles after photons.*

- **Need for underwater Neutrino telescope** - While both frozen ice and deep sea waters are used for detecting neutrinos, underwater neutrino telescopes could be more efficient than IceCube.
- That is because **water scatters light less**, which gives a more accurate idea about where the detected neutrinos came from.

*Neutrino detectors need to be in dark because it looks for flashes of **Cherenkov radiation**, a light that neutrinos produce when they interact with a water or ice molecule. These flashes trace the path of that neutrino, giving details of its source, the amount of energy it contains, and its origins.*

- **Features** - It consists of 2 telescopes made up of glass baubles arranged on vertical cables.
- Each strand dangles in the water like a pearl necklace that's up to 700 meters long.
- Each bauble, a pressure-resistant sphere 44 centimeters wide, contains 31 photomultiplier tubes that sense light generated when neutrinos crash into the seawater.



- **Deployment** - Detectors are deployed in 1 month-long campaign every year and at the end of 2024, the telescopes boasted 57 strands.
  - Eventually, 100's of such cables will sway in the currents, a few kilometers below the surface off the coasts of Sicily and the South of France.
- **Sicilian telescope** - Study high-energy neutrinos from space.
- **French telescope** - Study neutrinos from the atmosphere to understand how they oscillate, or change from 1 type of neutrino to another.
- **Disadvantage of underwater neutrino telescope** - Water absorbs light more and as a result, there will be less light to examine.

## References

1. [The Indian Express| Underwater Neutrino Telescope](#)
2. [Science News| Cubic Kilometer Neutrino Telescope](#)

**Related News** - [Neutinos and IceCube Neutrino Observatory](#)