



Tokyo Atacama Observatory

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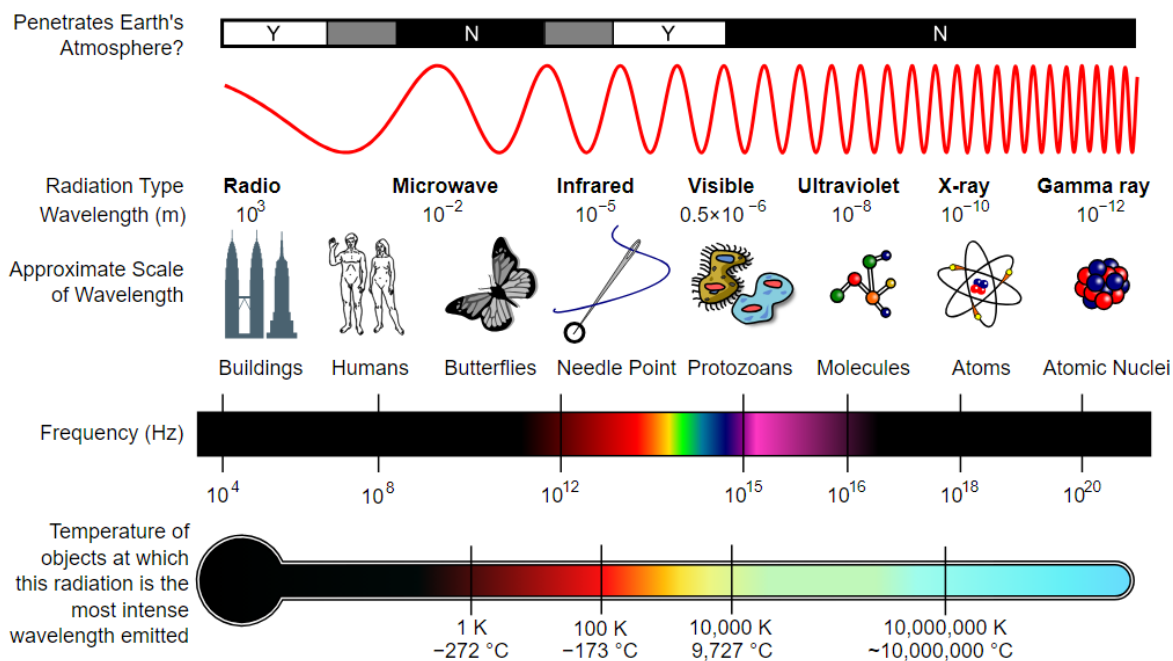
Why in News?

The **University of Tokyo Atacama Observatory (TAO)** has recently been inaugurated. It is now the highest astronomical observatory (altitude of 18,500 feet) in the world, even surpassing the famous [Atacama Large Millimeter Array \(ALMA\)](#), which stands at 16,570 feet.



What is the Tokyo Atacama Observatory?

- **About:** The TAO telescope, measuring 6.5 metres in optical-infrared capacity, is perched at an altitude of 18,500 feet on **Mount Chajnantor** in **Chile's Atacama Desert**.
 - Co. Chajnantor is located in the **Andes Mountains** near the Atacama Desert.
 - The **Atacama Desert** is one of the best locations on Earth for astronomical observations due to its **high altitude, low humidity, and clear skies**, which provide excellent conditions for studying the cosmos.
 - The area's **elevated altitude, sparse atmosphere, and consistently dry weather** make it perfect for observing nearly the full spectrum of **near-infrared wavelengths**.
 - [Infrared radiation](#) has a wavelength longer than visible light but shorter than microwaves.



- **Instruments:** TAO's **6.5-meter telescope** is equipped with **2 science instruments** designed for infrared observations.
 - **SWIMS (Simultaneous-colour Wide-field Infrared Multi-object Spectrograph):** Aimed at understanding the evolution of galaxies.
 - **MIMIZUKU (Mid-Infrared Multi-field Imager for gaZing at the UnKnown Universe):** Used to study planet formation and the origin of materials.

What are Some Other Major Observatories in India and Around the World?

- **India:**
 - [Giant Metrewave Radio Telescope, Pune \(Maharashtra\)](#)
 - [Kodaikanal Solar Observatory, Kodaikanal \(Tamil Nadu\)](#)
 - [Indian Astronomical Observatory \(IAO\), Hanle \(Ladakh\)](#)
- **Other International Observatories:**
 - **Mauna Kea Observatories (Hawaii, USA)**
 - **Kitt Peak National Observatory (Arizona, USA)**
 - **Mount Wilson Observatory (California, USA)**
 - [Square Kilometre Array Observatory](#)

Note: The **Square Kilometre Array Observatory (SKAO)** is an international organisation in charge of building the world's largest radio telescope.

- It will be a next-generation radio astronomy facility designed to study the Universe's evolution and answer profound questions about **dark matter, dark energy, and the formation of galaxies.**
- It will be composed of two large telescope arrays deployed in South Africa and Australia.
- Countries like the **UK, Australia, South Africa, Canada, China, France, India, Italy, and Germany** are involved in its development.
 - India has played a crucial role in developing the **Telescope Manager software**, which controls the telescope's operations.

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UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. Consider the following (2008):

Assertion (A): Radio waves bend in a magnetic field.

Reason (R): Radio waves are electromagnetic in nature.

Which of the following is correct?

- (a) Both A and R are individually true, and R is the correct explanation of A
- (b) Both A and R are individually true, but R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Ans: (a)

Q. A layer in the Earth's atmosphere called Ionosphere facilitates radio communication. Why? (2011)

1. The presence of ozone cause the reflection of radio waves to Earth.
2. Radio waves have a very long wavelength.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (d)