

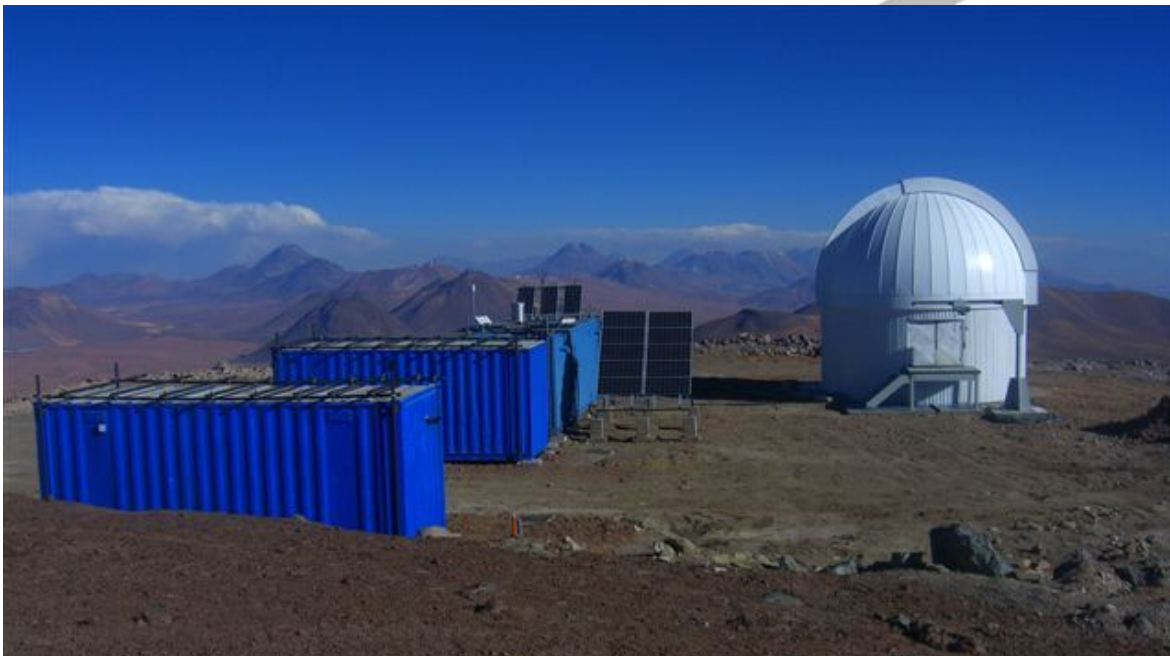


# Tokyo Atacama Observatory

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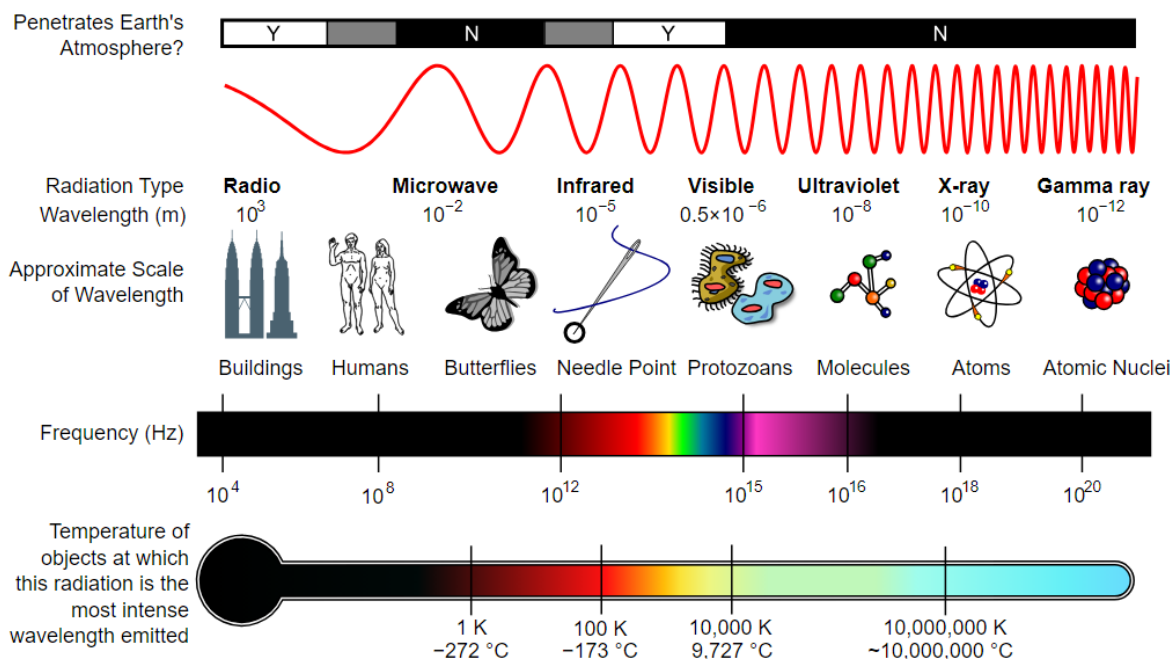
## Why in News?

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)**

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