***DATE: 29 JUNE 2026***

# 1 How are Islands Formed? (Source: PIB)

**Formation of Volcanic Islands**

- **Hotspot Volcanism**: Volcanic islands form when an oceanic plate moves over a stationary mantle plume (hotspot). Repeated eruptions create a chain of volcanic islands, with the youngest island located directly above the hotspot. Example: Hawaiian Islands.
- **Divergent Plate Boundary**: At divergent boundaries, tectonic plates move apart, allowing magma to rise through the gap and solidify. Continuous volcanic activity can build submarine volcanoes into islands. Example: Iceland on the Mid-Atlantic Ridge.

- **Convergent Plate Boundary**: At convergent boundaries, one oceanic plate subducts beneath another plate. The subducted plate melts, producing magma that rises to form volcanic island arcs. Examples: Japan, Indonesia, and Philippines.

**Stages of Island Formation**

- **Volcanic Island Emergence**: A submarine volcano erupts and rises above sea level, forming a volcanic island. The island is surrounded by shallow, warm tropical waters suitable for coral growth.
- **Fringing Reef Formation**: Coral polyps colonize the shallow waters around the volcanic island. A fringing reef develops, attached directly to the island's coast with little or no lagoon.
- **Barrier Reef Formation**: The volcanic island gradually subsides (sinks) or the sea level rises. Corals continue growing upward toward sunlight. A lagoon forms between the island and the reef, creating a barrier reef.
- **Atoll Formation**: The volcanic island sinks completely below sea level. Only the ring-shaped coral reef remains, enclosing a central lagoon. This structure is called an atoll.
- **Coral Island Formation**: Waves and currents deposit coral sand, shells, and reef debris on the atoll. Vegetation gradually establishes itself, leading to the formation of a low-lying coral island.

# ENLITE IAS

ENLIGHTENING MINDS, LIGHTENING JOURNEYS

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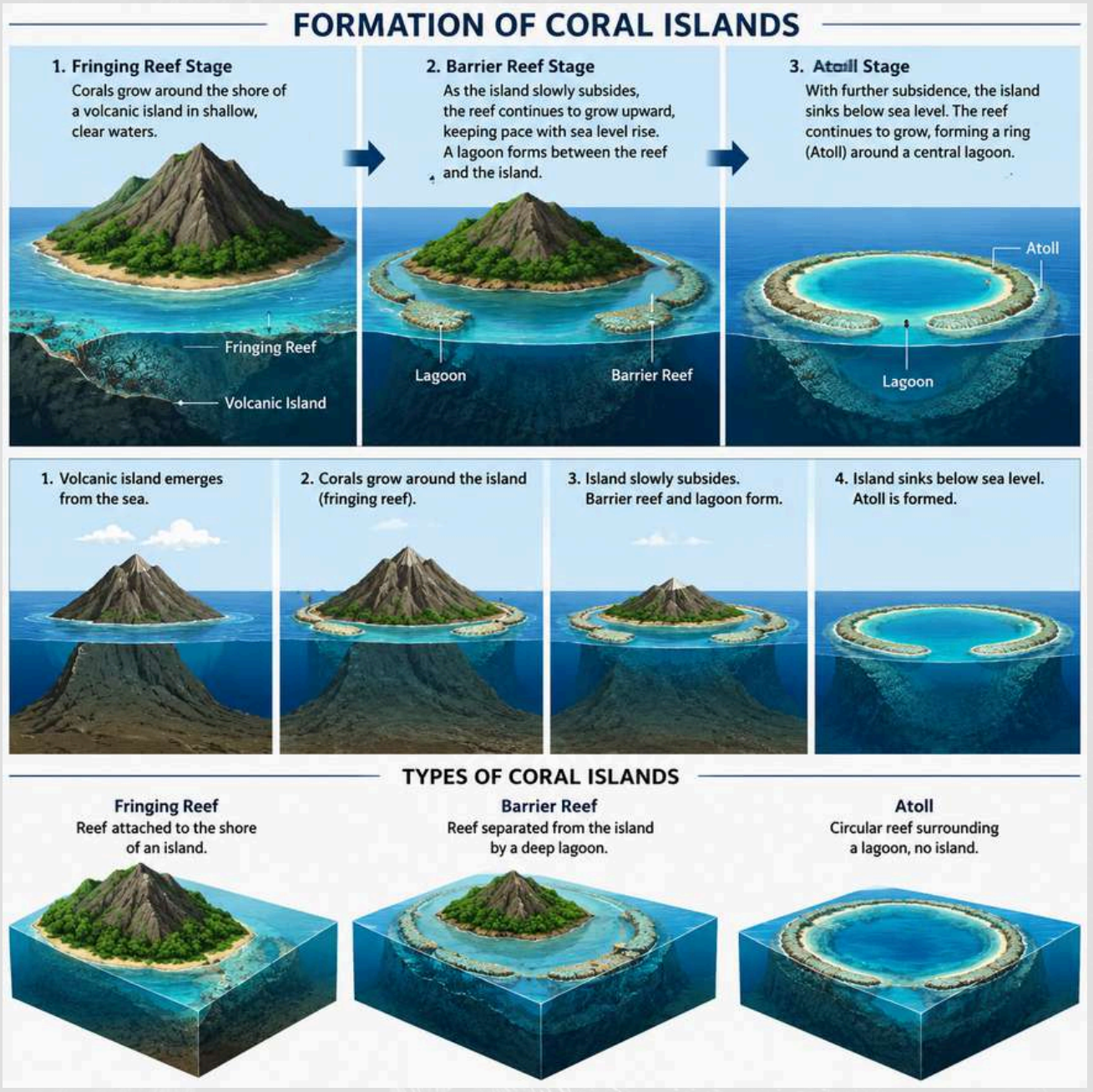

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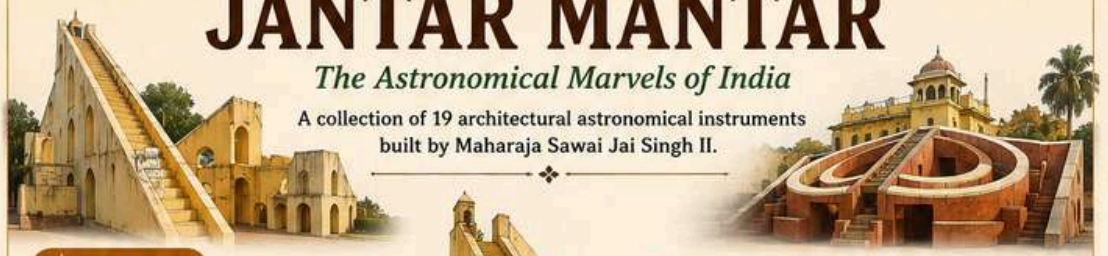
## 2 Jantar Mandir (Source: The Hindu)

# JANTAR MANTAR

*The Astronomical Marvels of India*

A collection of 19 architectural astronomical instruments built by Maharaja Sawai Jai Singh II.



### HISTORY

- Built between 1724 and 1734 by Maharaja Sawai Jai Singh II, the Rajput king of Amber (Jaipur).
- Jai Singh II was a great scholar of astronomy and mathematics.
- The observatories were constructed to compile accurate astronomical data and to prepare the "Zij-e-Muhammadi", an astronomical table.
- Five Jantar Mantars were built in India.

### FIVE JANTAR MANTARS IN INDIA

| | |
|---|---|
| Jaipur | (Rajasthan) |
| Delhi | (Delhi) |
| Ujjain | (Madhya Pradesh) |
| Varanasi | (Uttar Pradesh) |
| Mathura | (Uttar Pradesh) |

The Jaipur Jantar Mantar is the largest and best preserved.

### PURPOSE & SIGNIFICANCE

- To observe celestial positions with the naked eye.
- To measure time, predict eclipses, track planetary movements and determine astrological calculations.
- Demonstrates the scientific temper and advanced knowledge of medieval India.
- A unique blend of science, architecture and traditional Indian knowledge systems.

### MAJOR INSTRUMENTS

**SAMRAT YANTRA**
The world's largest stone sundial. It can measure time with an accuracy of about 2 seconds.

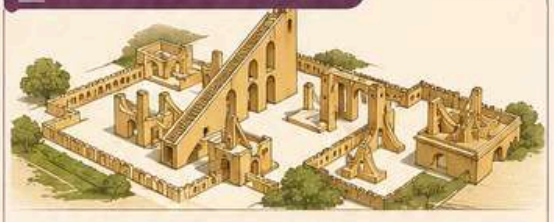
**JAI PRAKASH YANTRA**
Consists of two hemispherical structures used to measure the positions of celestial bodies.

**RAM YANTRA**
Measures the altitude and azimuth of celestial bodies.

**MISRA YANTRA**
A combination of five different instruments for various astronomical calculations.

**NADIVALAYA YANTRA**
Used to determine the time by the position of the sun.

### ARCHITECTURAL FEATURES



- Built using large stone and masonry without any mechanical devices.
- Instruments are fixed with great precision aligned with celestial coordinates.
- Combines geometric accuracy with aesthetic design.

### QUICK FACTS

| | |
|---|---|
| Built by | Maharaja Sawai Jai Singh II |
| Period | 1724 – 1734 |
| Total Instruments | 19 |
| Material | Stone, limestone, marble, brass |
| UNESCO Status | Jaipur Jantar Mantar is a UNESCO World Heritage Site (2010). |

UNESCO World Heritage Site

### DID YOU KNOW?

Jantar Mantar is an outstanding example of India's rich scientific heritage and the vision of Maharaja Jai Singh II, who saw astronomy as a means to understand the universe and serve humanity.

*"These instruments are a testimony to India's ancient scientific brilliance and its timeless quest to measure the cosmos."*