



DATE: 7 OCTOBER 2026

1

COP31 of UNFCCC (Source: The Hindu)

Host

- Antalya, Türkiye

Presidency

- Joint presidency involving Türkiye, Australia, and Pacific partners.

Aim

- To accelerate implementation of the Paris Agreement by turning past commitments into measurable action, especially after the Global Stocktake (GST) and the new climate finance goal (NCQG) agreed at COP 30.

Objectives

- **Emission Targets and Implementation**
 - Ensure countries deliver on strengthened Nationally Determined Contributions (NDCs 3.0) aligned with the 1.5°C goal and GST recommendations.
 - Push for clearer, bigger, and implementable climate targets to close the pre-2030 emissions gap.
- **Climate Finance**
 - Operationalize the New Collective Quantified Goal (NCQG) on climate finance agreed at COP 30, ensuring predictable flows to developing and vulnerable countries.
 - Facilitate access to finance for mitigation, adaptation, and loss & damage, including support for investable project pipelines.
- **Adaptation and Resilience**
 - Strengthen National Adaptation Plans (NAPs) and adaptation action, with special focus on Small Island Developing States (SIDS) and other vulnerable communities.
 - Advance Loss and Damage funding mechanisms and resilience-building in critical sectors.

Key Themes

- Clean energy transition & electrification
- Zero waste and methane reduction
- Climate-resilient cities and buildings
- Green industrialization
- Youth and education
- Food security and climate-smart agriculture
- Oceans and seas
- Climate-resilient health systems
- Rio synergies (climate–biodiversity–desertification)
- Climate Implementation Bridge (support NDC implementation)



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2 IceCube Neutrino Observatory (Source: The Hindu)

The IceCube Neutrino Observatory is the world's largest neutrino detector, located at the Amundsen–Scott South Pole Station in Antarctica.

- **Aim:** Designed mainly to detect high-energy neutrinos originating from cosmic sources.
- **Key Areas of Study:** Neutrino Astronomy, Cosmic Accelerators, Origin of Cosmic Rays, Fundamental Physics, Dark Matter.
- **Components:**
 - **IceCube:** Main underground neutrino detector.
 - **DeepCore:** Densely instrumented region for detecting lower-energy neutrinos and studying neutrino oscillations.
 - **IceTop:** Surface array mainly used for studying cosmic-ray air showers.
- **Recent Update:** The 2026 Nobel Prize in Physics was awarded to physicist Francis Halzen “for decisive contributions to the IceCube Neutrino Observatory and the discovery of high-energy neutrinos of astrophysical origin.”

3 Neutrinos (Source: The Indian Express)

What is it?

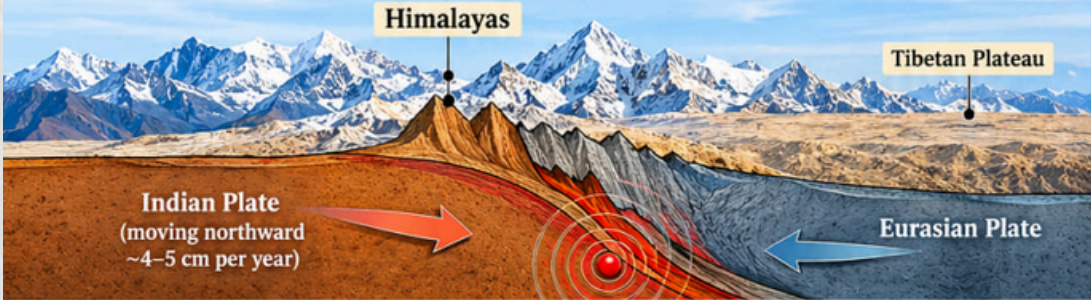
- Neutrinos are electrically neutral, extremely light subatomic particles belonging to the lepton family.
- They interact very weakly with matter, making them extremely difficult to detect.
- They are often called “ghost particles” because trillions can pass through matter, including the human body, without interacting.

Major Sources

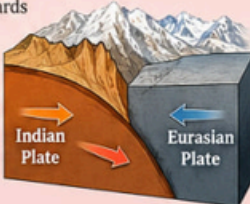
- Major sources include the Sun and other stars, supernova explosions, cosmic-ray interactions in Earth's atmosphere, nuclear reactors, particle accelerators, and radioactive decay.

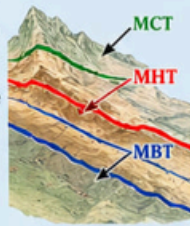
4 Major Reasons for Earthquakes in the Himalayan Region (Source: The Indian Express)

Major Reasons for Earthquakes in the Himalayan Region

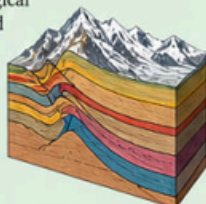


- #### 1 Continental Plate Collision

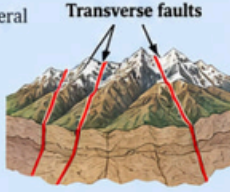
 - The Indian Plate is moving northwards at about 4–5 cm per year and colliding with the Eurasian Plate.
 - This ongoing convergence compresses and deforms the Earth's crust, generating huge stress.
 - The accumulated stress is released suddenly along faults, causing earthquakes.
- #### 2 Presence of Active Faults

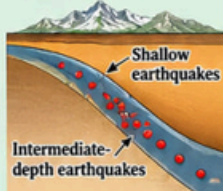
 - The region is cut by several active faults such as the Main Himalayan Thrust (MHT), Main Boundary Thrust (MBT), Main Central Thrust (MCT) and other transverse faults.
 - Movement along these faults, due to accumulated tectonic stress, triggers earthquakes of varying magnitude.
- #### 3 High Seismic Strain Accumulation

 - The Himalayan region is a zone of high seismic strain due to continuous crustal shortening and uplift.
 - Much of the stress remains locked in the crust, which is released episodically in the form of large earthquakes.
- #### 4 Complex Geology and Lithology

 - The region has a complex geological structure with young, folded and fractured rocks.
 - Weak and fractured rocks make the crust more susceptible to movement along faults.
 - The presence of multiple thrusts, folds and shear zones enhances seismic activity.
- #### 5 High Strain Energy Due to Uplift and Isostatic Adjustment

 - The Himalayas are still rising due to ongoing collision.
 - Isostatic adjustment, due to erosion and unloading of large amounts of material, also causes readjustment in the crust, contributing to earthquakes.
- #### 6 Influence of Transverse Faults

 - Besides the main thrusts, several transverse and oblique faults cross the Himalayas.
 - These faults transfer and redistribute stress, often triggering moderate to large earthquakes.
- #### 7 Deep and Shallow Seismicity

 - Most earthquakes occur at shallow depths (<70 km) along the main thrusts.
 - Some intermediate-depth earthquakes (70–300 km) occur due to the subducting Indian slab beneath the Himalayas (Hindu Kush region).
- #### 8 Other Contributing Factors

 - Seismicity may also be influenced by:
 - Local landslides and rock avalanches
 - Glacial retreat and reduction in load
 - Reservoir-induced seismicity (large dams)
 - Groundwater extraction
 - Triggered seismicity due to nearby earthquakes in the region.