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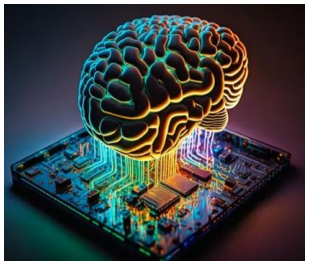
Neuromorphic Computing

Context: *IISc's recent neuromorphic computing breakthrough processes data in 16,500 states, advancing AI efficiency.*

Overview:



- IISc's new analog computing platform stores and processes data in 16,500 states, surpassing digital limits.
- The new brain-inspired platform could enable complex AI tasks on personal devices, democratising AI development.
- **Neuromorphic computing** designs computers that emulate brain systems, utilising artificial neurons and synapses.
- introduced in the 1980s, neuromorphic computing mimics the human brain and nervous system.
- **Technology Basis**: Involves Artificial Neural Networks (ANN) and Spiking Neural Networks (SNN) to process information similarly to the human brain.
- **Working Mechanism**: Uses artificial neurons to pass signals in layers, converting input into output through electrical spikes.

Significance of Neuromorphic Computing

- **Energy Efficiency**: Uses separate memory and processing units, neuromorphic systems integrate both functions, significantly reducing energy and time.
- **Advancements in AI**: Facilitates more efficient processing of complex AI tasks, meeting escalating computational demands in the era of artificial intelligence.
- **Technological Revolution**: Promotes rapid growth in computer engineering and AI, enhancing information processing and technology.

Recent Breakthrough by IISc

- **Innovation**: A brain-inspired analog computing platform with 16,500 conductance states in a molecular film.
- **Potential Impact**: Could enable complex AI tasks on personal devices, democratising AI development.
- **Molecular System**: Uses a "molecular diary" to map molecular movements to electrical signals with precise voltage pulses, mimicking a synapse through ScN (a semiconductor material).
- **Practical Demonstrations**: Successfully recreated the **James Webb Space Telescope's "Pillars of Creation"** image on a tabletop computer with less time and energy than traditional systems.

Broader Implications

- **Industrial and Strategic Impact**: Could transform AI hardware in India, positioning the country as a leader in global technology innovation.
- **Future Directions**: IISc aims to develop a fully indigenous integrated neuromorphic chip, supported by the Ministry of Electronics and Information Technology.
- **National Importance**: The breakthrough holds significant potential for industrial, consumer, and strategic applications in the context of the India Semiconductor Mission.

Rohingya Refugee

Context: *PM Modi criticised Jharkhand's coalition government for neglecting Rohingya infiltration,*

Overview:

- Union Home Ministry and UIDAI reported a 16% decline in tribal population due to infiltration.
- PM pledged to investigate recent job aspirant deaths, promising justice after NDA forms government.

Who are Rohingyas?

- **Ethnic Background**: Indigenous to Myanmar's Rakhine state, Rohingyas are a Muslim Indo-Aryan group with historical roots in the region since the 15th century.
- **Government's Stance**: Myanmar considers Rohingyas illegal immigrants from Bangladesh, denying them citizenship and basic rights.
- **Persecution**: Rohingyas are among the world's most persecuted minorities, suffering from systematic violence and genocide.
- **Population**: Approximately 1.1 to 1.3 million Rohingyas before the 2015 crisis; around 40,000 currently in India.
- The Rohingya refugee crisis involves the mass migration of Rohingya Muslims from Myanmar to neighbouring countries, including Bangladesh, Malaysia, Thailand, and Indonesia.

Timeline of Crisis

2012

- Conflict between Rakhine Buddhists and Rohingya Muslims led to 88 deaths, over 90,000 displaced, and 2,500 houses burned.

2015

- Systematic isolation of Rohingyas prompted mass migration by sea. Around 25,000 Rohingyas were smuggled in rickety boats, with many dying in transit.

2016-17

- Increased military aggression led to burning villages and widespread human rights abuses. Nearly 92,000 Rohingyas were displaced, with significant violence including gang rapes and killings.

The Legal Status of Rohingyas

- **Citizenship**: Rohingyas are stateless, with no formal recognition or citizenship status from the Myanmar government.

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- **Identification Cards**: Temporary white cards allowed some rights but were cancelled in 2015.
- **Census Issues**: UN census in 2014 allowed registration as Rohingya initially but later required identification as Bengalis.

What is Being Done to Handle the Refugee Crisis?

➢ **The UN Response**
- **Kofi Annan Commission**: Established in August 2016, proposed solutions to reduce tensions and support development.
- **Final Report**: Submitted on August 23, 2017, with recommendations to address communal tensions and support development.

➢ **ASEAN Response**
- **Lack of Coordination**: No unified ASEAN response; regional division on handling the crisis.
- **Individual Responses**:
  - **Malaysia**: Initially refused refuge but later provided temporary support.
  - **Indonesia**: Agreed to temporary refuge.
  - **Thailand**: Provided humanitarian assistance and allowed boats to enter.

➢ **Bangladesh**
- **Government's Position**: Criticised Rohingyas, relocated registered refugees, and planned to move refugees to remote islands.
- **Relocation**: Initial plans for Thengar Char; later, Hatiya Island was selected.

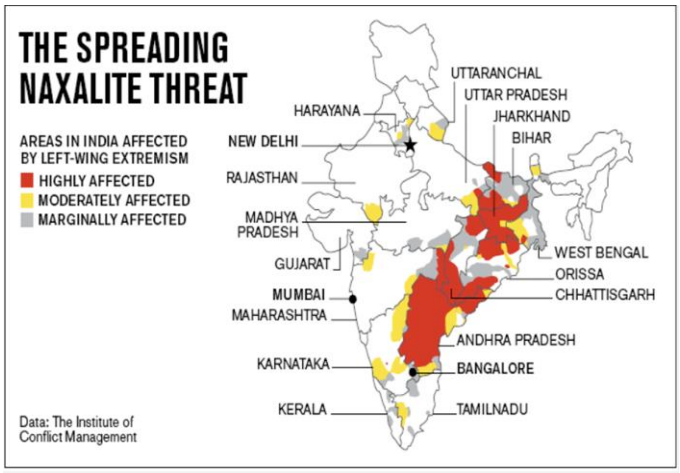
➢ **The United States**
- **Refugee Intake**: Expressed intent to accept Rohingya refugees; 13,000 Myanmar refugees accepted since 2002.
- **Chicago**: Home to one of the largest Rohingya populations in the U.S.

➢ **India's Response Towards Rohingya Refugees**
- **Current Situation**: Approximately 40,000 Rohingyas in India.
- **Government Actions**:
  - **Relief Efforts**: Donation of $1 million in 2012 for relief.
  - **Deportation Plans**: August 2017 plan to deport 40,000 Rohingyas as illegal immigrants.
  - **Policy**: No UNHCR refugee camps; assistance only for Tibetan and Sri Lankan refugees.

Naxalism in India

Context:*The Centre doubled RCPLWEA funds for 2024-25, supporting Amit Shah's goal to end Left-Wing naxalism by March 2026.*

➢ **Overview:**
- The Centre doubled the Road Connectivity Project for Left Wing Extremism Affected Areas (RCPLWEA) funds for 2024-25, to eradicate Left-Wing Extremism .
- Under Pradhan Mantri Gram Sadak Yojana (PMGSY), RCPLWEA will enhance road connectivity in 44 critical LWE districts across nine states.



➢ **What is Naxalism?**
- Naxalism is named after the village of **Naxalbari** in West Bengal.
- It began as a rebellion against local landlords after a peasant was assaulted over a land dispute.
- The movement expanded into Eastern India, affecting less developed areas in states such as Chhattisgarh, Odisha, and Andhra Pradesh.

➢ **Objective:**
- Naxalites aim to overthrow the Indian government through an armed revolution.
- Their goal is to establish a communist state based on Maoist principles.
- They perceive the state as oppressive and serving only the ruling elite, seeking to address socio-economic grievances through armed struggle.

➢ **Modus Operandi:**
- Naxalite groups engage in guerrilla warfare, attacks on security forces, extortion, and propaganda.
- They seek to capture state power through a combination of armed insurgency, mass mobilisation, and strategic alliances.
- Their targets include government institutions, infrastructure, economic interests, and perceived collaborators.
- Naxalites often establish parallel governance structures in controlled areas, providing basic services and administering justice.

➢ **Current Status of Left-Wing Extremism (LWE) in India:**
- Violent incidents in Naxalism-affected states decreased by 77% compared to 2010, and the number of affected districts dropped from 90 to 45.
- Deaths of security forces and civilians due to LWE violence fell by 90% in 2022 compared to 2010.

➢ **States Affected by LWE:**
- The states affected by Naxalism include Chhattisgarh, Jharkhand, Odisha, Bihar, West Bengal, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh, and Kerala.
- The Red Corridor is the region in central, eastern, and southern India that experiences severe Naxalism-Maoist insurgency.

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Government Initiatives Against Naxalism

- **National Policy and Action Plan (2015):** A comprehensive strategy designed to address Left-Wing Extremism with a holistic approach.
- **SAMADHAN:** A specific strategy focusing on effective measures to combat Naxalism through various initiatives.
- **Aspirational Districts Programme:** Aims to improve conditions in districts significantly affected by Naxalism by focusing on development and governance.
- **Security Related Expenditure (SRE) Scheme:** This scheme provides funding for the training and operational needs of security forces, ex-gratia payments to families of victims, rehabilitation of surrendered Naxalites, and other related activities.
- **Special Central Assistance (SCA):** Targets filling critical gaps in public infrastructure and services in the most affected districts.
- **Scheme of Fortified Police Stations:** Under this scheme, 604 fortified police stations have been constructed in LWE-affected areas to enhance security and operational effectiveness.
- **Road Connectivity Project for LWE Affected Areas (RCPLWE):** Focuses on improving road connectivity in LWE-affected states to facilitate development and enhance security measures.

NEWS IN BETWEEN THE LINES

Onam

Recently, the President, Vice President and Prime Minister have greeted people on the occasion of Onam.

About Onam:

- Onam is a major **harvest festival** celebrated in Kerala.
- It is a **10-day festival** that honours the homecoming of the **mythical King Mahabali**, who brought peace and prosperity to Kerala.
- It is celebrated in the month of **Chingam**, which is the first month of the Malayalam calendar and usually falls in **August–September** on the Gregorian calendar.
- It is one of the three major festivals of Kerala, the other two are **Vishu** and **Thiruvathira**.
- This festival is celebrated with **floral designs** (Pookkalam), **traditional feasts** (Ona Sadya), **boat races** (Vallam Kali), **tiger dances** (Pulikali), **mask dances** (Kummattikali), **martial arts** (Onathallu) and group dances (Kaikottikali).

Ashtamudi Lake

Recently, the Central Pollution Control Board (CPCB) informed the National Green Tribunal that water quality at four locations in Ashtamudi Lake does not meet the Primary Water Quality Criteria for Bathing as per The Environment (Protection) Rules, 1986.

About Ashtamudi Lake:

- Ashtamudi Lake, **also known as Ashtamudi Kayal,** is a lake in the Kollam district of **Kerala**.
- It is the second largest lake in Kerala and is **known as the "Gateway to Kerala Backwaters**".
- The lake is famous for its **houseboat rides and backwater resorts** and is also home to many plant and bird species.
- The name Ashtamudi comes from the Malayalam words **Ashta meaning "eight**" and **Mudi meaning "peaks" or "branches**".
- The lake has **eight arms or channels** and its shape has been described as both palm-shaped and octopus-shaped.
- It is a unique wetland ecosystem that combines **freshwater** and **saltwater**, making it a biodiversity hotspot.
- The **lake is fed by the Kallada River,** which originates in the Western Ghats.
- In **2012**, Ashtamudi Lake was **designated a Ramsar site**, a wetland of international importance.

Lok Adalat

Recently, over one crore cases were settled during the third national Lok Adalat, organized by the National Legal Services Authority (NALSA).

About the Lok Adalat:

- Lok Adalat, also **known as People's Court** is alternative dispute resolution mechanism that helps settle cases in court or before litigation.
- It is a **part of India's judicial system** and is meant to provide fair and simple justice in an amicable way.
- Lok Adalat can be **used for pending court cases**, **potential disputes**, **compulsory pre-litigation for public utility services** and **family disputes.**
- It has been **given statutory status** under the **Legal Services Authorities Act, 1987**.
- There are different types of Lok Adalats, including **regular Lok Adalats** and **daily Lok Adalats**.
- The **first Lok Adalat camp** was organized in **Gujarat in 1982**
- The Lok Adalat shall have the **same powers as are vested in a Civil Court** under the **Code of Civil Procedure (1908).**

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Chamran-1 Satellite

Recently, Iran launched the Chamran-1 research satellite, marking a notable advancement in its aerospace program amid ongoing Western criticism.

About the Chamran-1 Satellite:

- Chamran-1 satellite is a **research satellite** designed for testing purposes.
- The primary purpose of Chamran-1 is to **test hardware and software** systems related to orbital manoeuvre technology.
- The Chamran-1 satellite, **weighing approximately 60 kg,** was launched **using the Ghaem-100 carrier rocket**.
- It was designed and **built by Iranian Electronics Industries**, which is affiliated with Iran's Defense Ministry.

Place in News

Laos

India on 15th of September launched Operation Sadbhav to provide humanitarian assistance and disaster relief (HADR) to Laos, Myanmar, and Vietnam that have been hit by severe flooding caused by Typhoon Yagi.

Laos (Capital: Vientiane)

Location: Laos, officially known as the Lao People's Democratic Republic is the only **landlocked country in Southeast Asia.**

Political Boundaries: Laos shares its borders with **Vietnam** (East & Northeast), **Thailand** (West & Southwest), **China** (North) **Myanmar** (Northwest) and **Cambodia** (South).

Physical Features:

- The highest point in Laos is **Phou Bia**.
- The major rivers in Laos include the **Mekong River,** forming a significant part of the western border, and the **Nam Ou River**, a main tributary of the Mekong.
- The **Annamite Range** runs along the eastern border with Vietnam.
- Laos possesses significant mineral resources, including **coal**, **bauxite**, **tin**, **copper** and **gold**.
- Laos has a **tropical monsoon climate**.

POINTS TO PONDER

- What are coelacanths? **– Deep-sea fish.**
- What does the Viability Gap Funding (VGF) scheme aim to support? **– Renewable energy**
- Where is the Assam cascade or hill stream frog endemic to? **– Himalayan regions of India, Bangladesh, Bhutan, and Nepal.**
- With which country was the INDUS-X initiative established? **– USA(India-U.S. Defense Acceleration Ecosystem.)**
- Who developed the Zorawar tanks? **– DRDO and L&T**

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