

## WEEKLY UPDATES – (28<sup>th</sup> Jan-3<sup>rd</sup> Feb)

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## ENVIRONMENT

### Radioactive Discharges from Indian Nuclear Plants

**Context:** Recently, Bhabha Atomic Research Centre (BARC) researchers conducted an analysis on Radioactive Discharges from Indian Nuclear Plants.

#### Key Findings of the Analysis

- **Minimal Environmental Impact**

- Radioactive discharges from nuclear plants had minimal impact on the environment.
- Concentrations of fission products beyond 5 km radius were below minimum detectable activity, making monitored values "insignificant."

- **Types of Radioactive Discharges**

- Gaseous waste includes fission product noble gases, Argon 41, radioiodine, and particulate radionuclides.
- Liquid discharge consists of fission product radionuclides, radioiodine, tritium, strontium-90, caesium-137, and cobalt-60.

- **Air Particulates**

- Average gross alpha activity in air particulates at all nuclear plants was less than 0.1 megabecquerel (mBq) per cubic meter.
- Narora Atomic Power Station, Uttar Pradesh, exhibited higher values due to a higher atmospheric dust load.

- **Specific Marker Concentrations**

- Average concentrations of radionuclides in air particulates were below 1 mBq per cubic meter.
- Caesium-137 and strontium-90 concentrations in water bodies near nuclear plants were below specified levels.

- **Sediment Concentrations**

- Concentrations of caesium-137 and strontium-90 in sediments were within statistical variation, showing no trend of deposition or accumulation.

- **Tritium Detection**

- Tritium detectable at all sites except Kudankulam Nuclear Power Station.
- Relatively higher tritium concentrations at Rajasthan Atomic Power Station.

#### Bhabha Atomic Research Centre (BARC)

- ✓ India's premier nuclear research facility located in Mumbai, Maharashtra.
- ✓ Multidisciplinary center focused on advancing peaceful applications of nuclear energy, particularly for power generation.

#### Significance of the Findings

- ✓ Reinforces India's commitment to advancing its nuclear power program.
- ✓ Minimal public doses highlight the safe operation of Indian nuclear power plants.

#### Implications of Radioactive Discharge

Implications of Radioactive Discharge	
<b>Environmental Impact</b>	<ul style="list-style-type: none"> <li>• Radioactive substances can impact ecosystems, contaminating soil, water bodies, and affecting plant and animal life.</li> </ul>
<b>Human Health Concerns</b>	<ul style="list-style-type: none"> <li>• Exposure to ionizing radiation from radioactive discharges may increase the risk of radiation-related health issues, including cancer.</li> </ul>
<b>Long-term Health Risks</b>	<ul style="list-style-type: none"> <li>• Certain radioactive substances pose an increased risk of cancer and genetic mutations, potentially affecting future generations.</li> </ul>

<b>Impact on Agriculture and Food Chain</b>	<ul style="list-style-type: none"> <li>Radioactive substances entering the food chain may contaminate agricultural products and livestock, posing risks to consumers.</li> </ul>
<b>Economic Consequences</b>	<ul style="list-style-type: none"> <li>Areas near nuclear facilities may experience a decline in property values due to safety concerns, affecting the nuclear industry's reputation and development.</li> </ul>

## Initiatives Related to Safe Radioactive Discharge

### International Conventions & Agreements

- Early Notification of a Nuclear Accident (1986)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997)
- Convention on Nuclear Safety (1994)

### European Union (EU) Directives

- EU Directives on Radioactive Waste and Spent Fuel Management.

### India's Initiatives

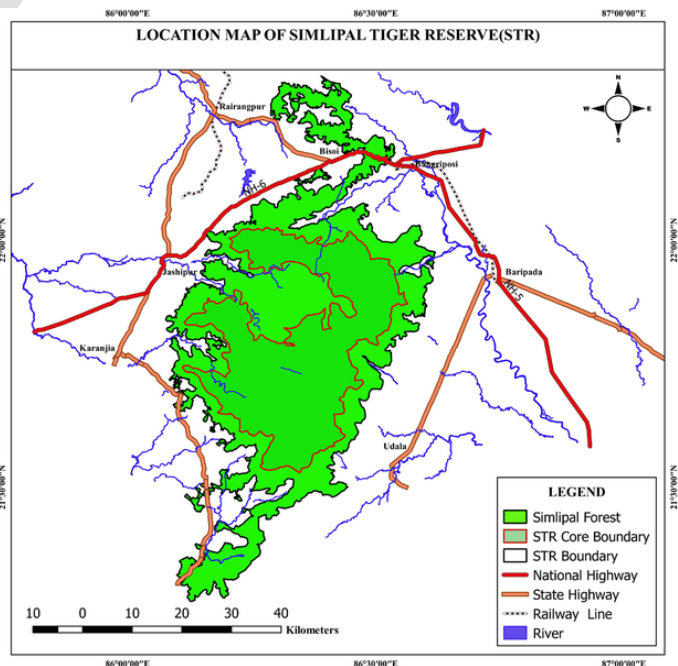
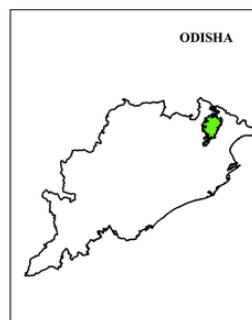
- Atomic Energy Regulatory Board (AERB) ensures nuclear and radiation safety in India.
- Environmental Impact Assessment (EIA) for rigorous assessment of potential environmental and health impacts.
- Effluent Treatment and Dilution techniques used to manage liquid radioactive waste before discharge.

## Black Tigers or Melanistic Tigers

**Context:** The Odisha government plans to establish a melanistic tiger safari near Similipal Tiger Reserve (STR), expected to be open for visitors by October this year. It will be the world's first safari of its kind, offering tourists a chance to witness the rare and majestic melanistic tiger species unique to Odisha.

### Similipal Tiger Reserve (STR)

- Located in Mayurbhanj district, Odisha, covering 2,750 km<sup>2</sup>.
- Part of the Mayurbhanj Elephant Reserve, including Similipal Tiger Reserve, Hadagarh Wildlife Sanctuary, and Kuldiha Wildlife Sanctuary.
- Home to Bengal tigers, Asian elephants, gaur, and chausingha.



- Designated as a UNESCO World Network of Biosphere Reserves since 2009.
- Asia's second-largest biosphere and the only habitat for melanistic royal Bengal tigers in India.

### Black Tigers or Melanistic Tigers

- Melanism is a genetic condition resulting in increased melanin production, causing black or nearly black skin, feathers, or hair.
- Similipal's royal Bengal tigers have a unique lineage with higher melanin levels, leading to black and yellow interspersed stripes (pseudo-melanistic).
- According to the 2022 All-India Tiger Estimation, 16 tigers recorded at STR, with 10 being melanistic.



### What are Black Tigers or Melanistic Tigers?

- They are a **rare colour variant of the tiger** and are not a distinct species or geographic subspecies.
- The **abnormally dark** or black coat in such tigers is termed pseudomelanistic or false coloured.
- The **darker coat colour of the mutants** offers them a selective advantage when hunting in the dense closed-canopy and relatively darker forested areas.

### What Makes Tigers (Pseudo) Melanistic?

- Research by the National Centre for Biological Sciences suggests a single mutation in the gene Taqpep causes stripes to enlarge.
- Similipal black tigers may have originated from a small founding population, leading to inbreeding due to isolation from other tiger populations.

### Odisha's Plan for Melanistic Tiger Safari

- In-principle approval from the National Tiger Conservation Authority's (NTCA) technical committee.
- Proposed safari site identified along Dhanbad-Balasore NH-18, 15 km from STR.
- Initial inhabitants to include three melanistic tigers from Nandankanan zoo and rescued/orphaned tigers not fit for the wild.
- NTCA committee to conduct a feasibility study before final clearance, requiring other statutory approvals, including Central Zoo Authority.

### Why Odisha Came up with this Plan?

- Aims to facilitate close encounters for wildlife conservationists, researchers, and enthusiasts with rare big cats.
- Addresses the challenge of tiger sightings in the vast STR, enhancing Similipal's appeal for visitors.
- Demonstrates the state's commitment to biodiversity preservation and awareness.

## The Report on the Status of Snow Leopards in India

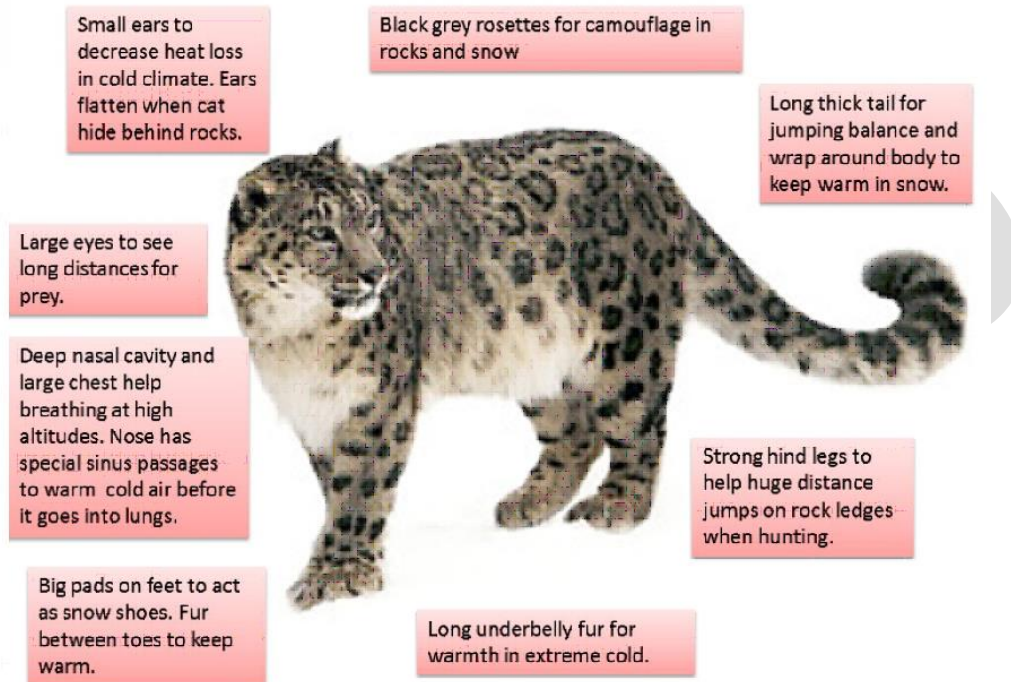
**Context:** The Union Minister of Environment, Forest and Climate Change unveiled the Status of Snow Leopards in India report during the National Board for Wildlife meeting in New Delhi.

### Snow Leopard Overview

- Snow leopard belongs to the Felidae family in the Carnivora order.
- Classified as Vulnerable on the IUCN Red List, native to Central and South Asian mountain ranges.
- Global presence in 12 countries, with the largest habitat in China's Tibetan plateau, followed by Mongolia and India.
- Other countries include Russia, Afghanistan, Pakistan, Nepal, Bhutan, Kazakhstan, Tajikistan, and Uzbekistan.

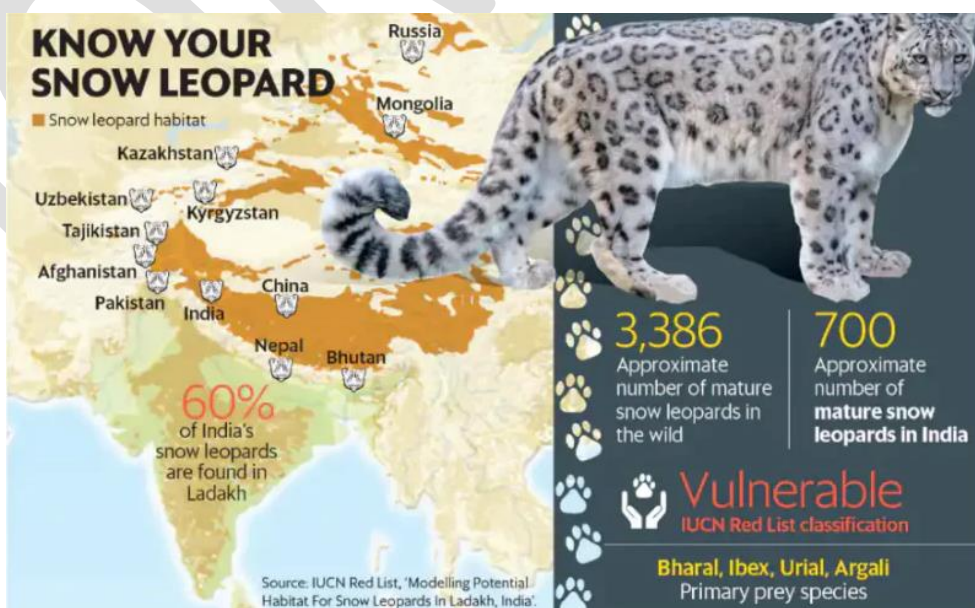
- In India, primarily found in high-altitude terrains of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.
- Key role as a top predator, indicator of high-altitude habitat health, and a signal for climate change impacts on mountain environments.
- Threats include poaching, habitat loss, decline in natural prey, and human-wildlife conflict.

## Snow Leopard (*Panthera Uncia*) adaptations to its cold high altitude



## Global Snow Leopard Population

- Estimated between 4,000 and 6,500 according to the Global Snow Leopard & Ecosystem Protection Programme.



## Snow Leopard Population Assessment in India (SPAI) Program

<b>About</b>	<ul style="list-style-type: none"> <li>Conducted by the Wildlife Institute of India (WII) with support from snow leopard range states and conservation partners.</li> <li>Spanning 2019 to 2023, covering over 70% of potential snow leopard range using a two-step framework.</li> <li>Step 1: Evaluate spatial distribution through occupancy-based sampling.</li> <li>Step 2: Estimate abundance using camera traps in identified stratified regions.</li> </ul>
<b>Findings of the SPAI Program</b>	<ul style="list-style-type: none"> <li>India has an estimated 718 snow leopards in the wild.</li> <li>Distributed across two Union Territories and four states in the Himalayan Mountain range.</li> <li>State-wise estimates: Ladakh (477), Uttarakhand (124), Himachal Pradesh (51), Arunachal Pradesh (36), Sikkim (21), and Jammu and Kashmir (9).</li> </ul>
<b>Significance of the SPAI Program</b>	<ul style="list-style-type: none"> <li>Essential for long-term survival with consistent monitoring.</li> <li>Recent surveys provide a clearer understanding of the snow leopard range in India compared to earlier estimates.</li> <li>Data showcases coexistence between local communities and snow leopards.</li> <li>Regular assessments offer insights for identifying challenges, addressing threats, and formulating conservation strategies.</li> </ul>
<b>Recommendations of the SPAI Program</b>	<ul style="list-style-type: none"> <li>Advocate for establishing a dedicated Snow Leopard Cell at WII focusing on long-term population monitoring.</li> <li>Emphasize well-structured study designs and consistent field surveys.</li> <li>Propose periodic population estimation every 4th year in the snow leopard range for states and Union Territories.</li> </ul>

## Acid Rain

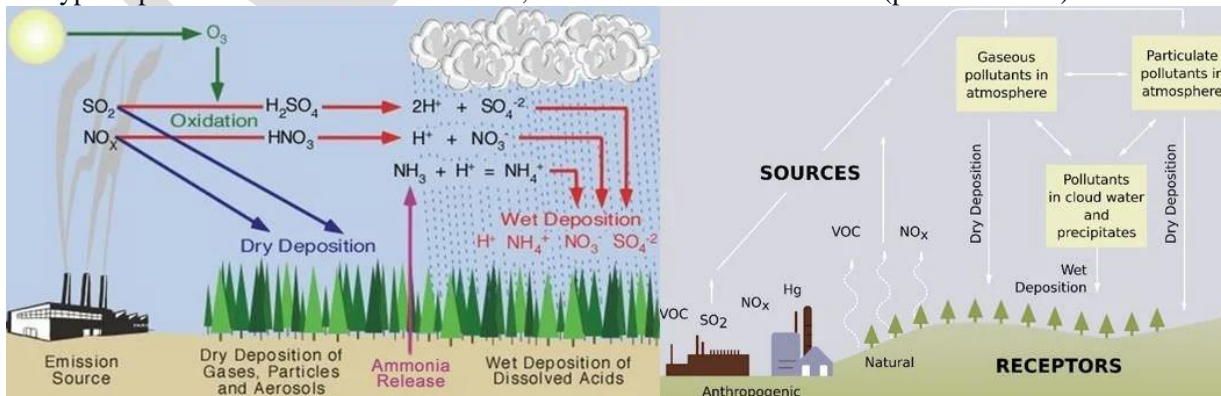
**Context:** Acid Rain is a complex environmental issue with various causes and widespread consequences, originating from Fossil Fuels.

### What is Acid Rain?

Acid rain or acid deposition encompasses any precipitation with acidic components, such as sulfuric or nitric acid, falling to the ground in wet or dry forms. It includes rain, snow, fog, hail, or acidic dust.

### Formation of Acid Rain

- SO<sub>2</sub> (Sulphur Dioxide) and NO<sub>x</sub> (Nitrogen Oxide) combine with water and oxygen, forming sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) and nitric acid (HNO<sub>3</sub>).
- These acids dissolve in water droplets, resulting in the formation of acid rain, snow, or fog.
- Typical pH of acid rain is around 4.2-4.4, more acidic than normal rain (pH around 5.6).



## Causes of Acid Rain

### Fossil Fuel Combustion

Burning Fossil Fuels, especially sulfur-containing ones, releases SO<sub>2</sub> and, at higher temperatures, nitrogen oxides (NO<sub>x</sub>).

Prevalent in vehicles, power plants, and industrial processes.

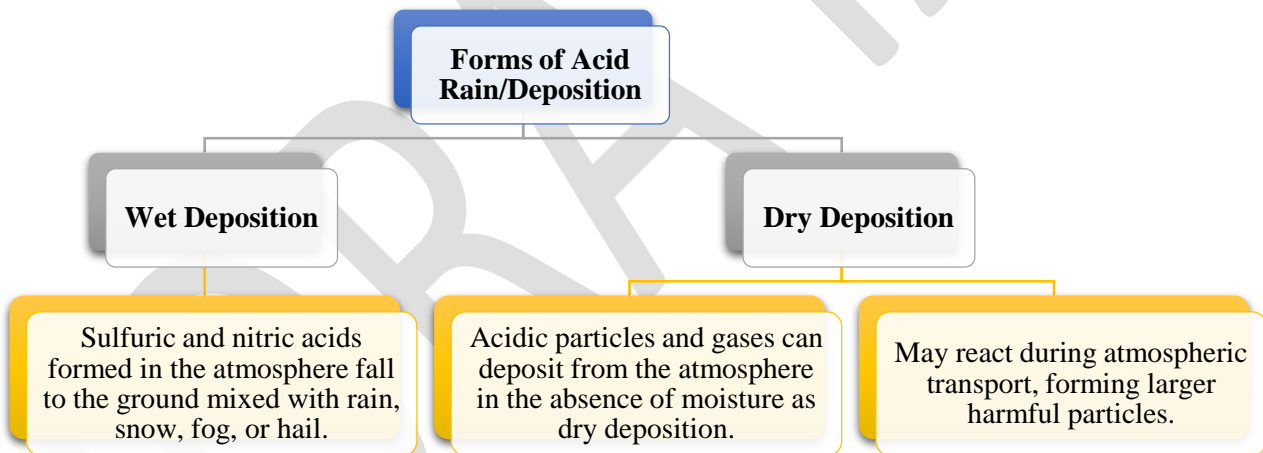
### Natural Sources

Volcanic Eruptions and Lightning contribute to sulfur dioxide and nitrogen oxides in the atmosphere.

### Air Pollution

SO<sub>2</sub> and NO<sub>x</sub> undergo chemical reactions in the atmosphere, forming sulfuric and nitric acids.

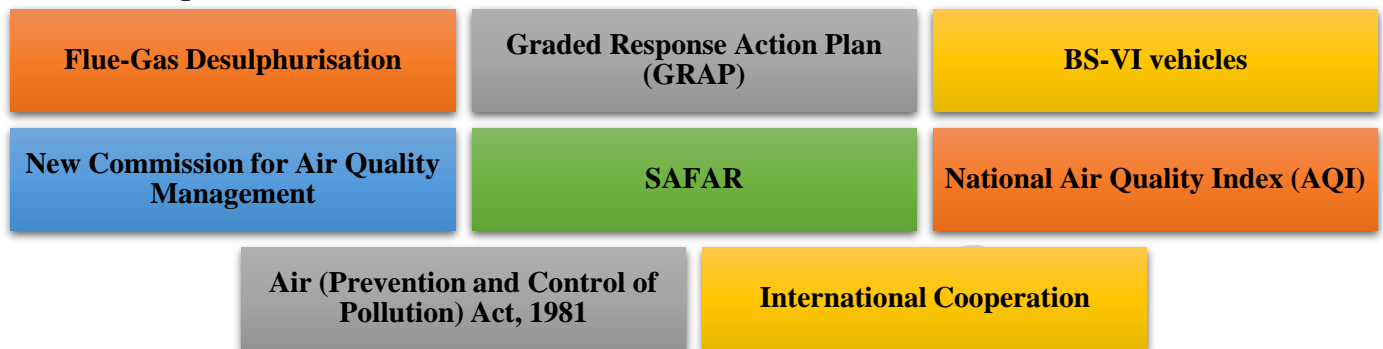
Combining with water vapor, they create acid rain during precipitation.



## Impacts of Acid Rain

- **Impact on Aquatic Life**
  - Makes water bodies inhospitable to certain aquatic species, disrupting reproductive patterns and leading to population decline.
- **Impacts on Marine Environment**
  - Alters pH of marine environments, affecting distribution and survival of organisms.
  - Acidification interferes with shell-forming marine species.
- **Impacts on Physical Infrastructure**
  - Poses threats to structures and monuments, causing deterioration and discoloration.
  - Notable examples include the Taj Mahal and buildings made of limestone or marble.

## Acid Rain Mitigation Measures



- **Flue-Gas Desulphurisation:** Implemented in coal power plants to reduce sulfur dioxide emissions by over 90%.
- **Graded Response Action Plan (GRAP):** Emergency measures to prevent air quality deterioration in Delhi-NCR region.
- **BS-VI vehicles, New Commission for Air Quality Management, SAFAR, National Air Quality Index (AQI), Air (Prevention and Control of Pollution) Act, 1981:** Measures and regulations addressing air quality and pollution.
- **International Cooperation:** Initiatives like the Acid Deposition Monitoring Network in East Asia (EANET) to monitor and address acid deposition.

Implement sustainable practices, promote renewable energy, enforce stringent emissions regulations, foster international cooperation, and invest in innovative technologies to address environmental challenges and combat climate change.

## POLITY

### BSF Jurisdiction

**Context:** The Supreme Court (SC) is scheduled to address the dispute concerning the expansion of Border Security Force (BSF) jurisdiction in Punjab.

#### BSF Overview

- The BSF, established in 1965 after the India-Pakistan war, is one of the seven Central Armed Police Forces under the Ministry of Home Affairs (MHA).
- Deployed along Pakistan and Bangladesh borders, involved in anti-Naxal operations, UN peacekeeping missions, and defending coastal areas like Sir Creek and Sundarbans.

#### BSF Jurisdiction Extension

- Ministry of Home Affairs expanded BSF's jurisdiction in Punjab, West Bengal, and Assam in 2021.
- Previously, BSF had a 15 km limit, now extended to 50 km, with specific powers under certain acts.
- Extension prompted by increased drone usage, cattle smuggling, and a push for uniform jurisdiction across states.

#### Issues Raised by States

- Concerns about encroachment on state powers related to police and public order.
- Viewed as a challenge to federalism principles, especially in states with diverse geographical considerations.

#### Solutions for Border Management

- Advocate a collaborative approach between central and state law enforcement agencies.
- Involve state police in border surveillance, akin to Coast Guard and Navy arrangements at sea.



- Invest in advanced surveillance technology and establish clear legal frameworks for roles and responsibilities.
- Regular consultations and international cooperation to address evolving security dynamics.

### Constitutional Viewpoint on Armed Forces Deployment

- Article 355 grants the central government authority to deploy forces for external aggression and internal disturbance without state request.
- If a state opposes deployment, the central government can issue directives under Article 355, resorting to Article 356 (President's Rule) if necessary.

## What is Ladakh's demand on Gilgit-Baltistan?

**Context:** The Leh Apex Body (LAB) and Kargil Democratic Alliance (KDA) have presented ongoing dialogues and demands on Gilgit-Baltistan to the Ministry of Home Affairs (MHA) regarding Ladakh's socio-political landscape.

### Ladakh's Current Status

- Ladakh, covering 59,146 square kilometers, became a Union Territory on August 5, 2019, after the abrogation of Article 370.
- Governed by elected hill councils (LAHDC-Kargil and LAHDC-Leh), lacking a legislature, and with a population of 2.74 lakh (2011 census).

### Latest Demands of the Region

- Protests against UT status, advocating for the restoration of statehood.
- Collective demand for special status under the Sixth Schedule and Article 371 to preserve ecological fragility.
- Seeking exclusive rights over recruitment and proposing Ladakh Public Service Commission for gazetted jobs.

### Territorial Control Expansion

- Historical connection to Gilgit-Baltistan emphasized, demanding territorial control extension.
- Advocacy for inclusion of Gilgit-Baltistan into Ladakh, with a request for reserved seats once a legislature is granted.
- Stresses strategic considerations for regional stability, especially along the Line of Actual Control (LAC) with China.

### Conclusion

- Ladakh's socio-political dialogue reflects diverse sentiments and demands.
- Historical context, strategic considerations, and ecological concerns shape ongoing negotiations.
- As Ladakh awaits resolutions, the dialogue remains crucial in navigating the complex dynamics between the Centre and this unique Union Territory.



### Centre's Response and Committees Formed

- Committees led by Ministers G. Kishan Reddy (2022) and Nityanand Rai (2024) formed in response to street protests.
- Assurance from the Centre to address language, culture, and land conservation issues.
- Ongoing talks aim to engage LAB and KDA members in structured dialogue.

## Budget Session begins and suspension of Opposition MPs revoked

**Context:** The suspension of 14 Opposition MPs, 11 from Rajya Sabha and three from Lok Sabha, was revoked on the eve of Parliament's Budget Session.

- The revocation aimed to allow their attendance at the customary President's address to both Houses of Parliament.

## Parliamentary Sessions

<b>Constitutional Provisions</b>	<ul style="list-style-type: none"> <li>Article 85 of the Indian Constitution empowers the President to summon each House of Parliament and prorogue or dissolve the Lok Sabha.</li> </ul>
<b>Power to Convene a Session</b>	<ul style="list-style-type: none"> <li>The Central government has the authority to call for a session, determined by the Cabinet Committee on Parliamentary Affairs (CCPA).</li> <li>The President, after finalizing the schedule, calls upon MPs through summons, providing details about the session.</li> </ul>
<b>Timetable</b>	<ul style="list-style-type: none"> <li>No fixed number of sessions or days is provided by the Constitution.</li> <li>Typically, three sessions occur each calendar year - Budget, Monsoon, and Winter sessions.</li> </ul>
<b>Current Status</b>	<ul style="list-style-type: none"> <li>The Budget Session runs from late January to the end of April or the first week of May, with a recess for Parliamentary Committees to discuss budget proposals.</li> <li>The Monsoon Session lasts three weeks in July and August, while the Winter Session spans three weeks from November to December.</li> </ul>

## Suspension of MPs

### Role and Duty of Presiding Officer

The Speaker of Lok Sabha and Chairman of Rajya Sabha maintain order to ensure smooth proceedings.

### Rules for Lok Sabha

Rule 373 allows the Speaker to direct an MP to withdraw for disorderly conduct, remaining absent for the day. Rules 374 and 374A deal with more persistent disruptions, allowing suspension for the remainder of the session.

### Rules for Rajya Sabha

Rule 255 empowers the Chairman to direct withdrawal for disorderly conduct. Rule 256 allows naming members persistently disregarding authority, with suspension through a motion, unlike Lok Sabha.

## Budget Session Begins and MP Suspensions Revoked

- The Budget session of Parliament's 17th Lok Sabha begins with the President's address on January 31.
- Suspension of 14 Opposition MPs, suspended during the Winter Session, revoked.
- Cases referred to Privileges Committees, and their return approved by Chairs in both Houses.

## President's Budget Session Speech

**Context:** The Budget Session of Parliament, the last before the upcoming Lok Sabha elections, began with President Droupadi Murmu addressing a joint sitting of both houses.

## Highlights of President's Budget Session Speech

- President Murmu highlighted the significance of the newly built Parliament building, reflecting the essence of 'Ek Bharat Shrestha Bharat' during the 'Amrit Kaal.'
- The government envisions a developed India with equal emphasis on economic, social, cultural, and strategic strengths.
- The four pillars for a developed India are identified as youth power, women power, farmers and the poor, with tax allocation for their empowerment.
- Achievements mentioned include the Women's Reservation Bill, successful G20 Summit, over 100 medals in the Asian Games, construction of Ram Temple in Ayodhya, abrogation of Article 370, and strict laws against triple talaq.
- Defence production crossed the Rs 1 lakh crore mark.

## Economic Achievements Highlighted by the President

- India emerged as the fastest-growing major economy amidst global crises, maintaining a growth rate of over 7.5% for two consecutive quarters.
- Reforms contributed to India's movement away from the "fragile five" and reduced inflation from double digits to within 4%.
- India became the second-largest exporter of mobile phones globally, with exports surpassing \$775 billion.
- FDI flows doubled, Forex reserve exceeded \$600 billion, Khadi and Village Industries product sales quadrupled, and Income Tax Return filings increased from 3.25 crore to 8.25 crore.
- The government is committed to empowering MSMEs, small entrepreneurs, and creating a conducive environment for them.

## Internet Shutdowns in India

**Context:** The Supreme Court raised questions regarding the Union Territory of Jammu and Kashmir's failure to publish orders related to the suspension of Internet services.

### About

- In recent years, India witnessed instances of violence due to legislative actions like the Citizenship Amendment Act and the abrogation of Article 370, leading to potential internal aggression.
- Internet shutdowns became a common practice during moments of tension to maintain peace.

### Legal Provisions

- Until 2017, shutdowns were primarily imposed under Section 144 of the Code of Criminal Procedure (CrPC).
- In 2017, the Temporary Suspension of Telecom Services (Public Emergency or Public Safety) Rule 2017 was enacted, allowing telecom/internet shutdowns in cases of public emergency or safety.
- The terms "public emergency" and "public safety" are not defined in the 1885 Act or the 2017 Rules.

## Sessions of Parliament

- Article 85(1) of the Indian Constitution empowers the President to summon each House of Parliament with a six-month gap between sessions.
- The decision on convening Parliament is made by the government, particularly the Cabinet Committee on Parliamentary Affairs.
- India follows a convention of three sessions in a year, with the longest being the Budget Session starting in late January and concluding by April or early May, including a recess for committee discussions.

## Union Budget/'Annual Financial Statement'

- Article 112 mandates the government to present an annual financial statement covering estimated receipts and expenditures from April 1 to March 31.
- The statement comprises three parts: Consolidated Fund, Contingency Fund, and Public Account.
- For each fund, the government presents statements of receipts and expenditures.

## President's Address

- Article 87 of the Constitution outlines instances when the President addresses both Houses.
- The President speaks at the beginning of the first session after a general election and the first session of each year (Budget session).
- The President's speech outlines government policy priorities, plans for the upcoming year, and provides a broad framework of the government's agenda.

## Arguments in Favor of Internet Shutdown by the Government



- **National Security:** Internet suspension is a temporary measure to prevent misinformation, coordinate unlawful activities, or address security threats.
- **Preventing Unrest and Violence:** Online communication suspension helps prevent protests, riots, or civil unrest.
- **Counteracting Fake News:** Shutdowns address the spread of false information during crises.
- **Temporary and Targeted Measures:** Shutdowns are temporary and narrowly focused, addressing specific and immediate concerns.

## Arguments Against Internet Shutdown by the Government



- **Impact on Freedom of Expression:** Shutdowns infringe upon the freedom of expression guaranteed by the Indian Constitution.
- **Economic Disruptions:** Internet shutdowns can lead to significant economic losses in India's growing digital economy.
- **Educational Challenges:** Shutdowns affect students' access to learning resources and online education platforms.
- **Healthcare Consequences:** Access to healthcare information and telemedicine services is hampered during shutdowns.
- **Social and Political Implications:** Shutdowns may be associated with controlling social unrest and limiting democratic dissent.

## Anuradha Bhasin v. Union of India Case

- In 2020, the Supreme Court ruled that indefinite internet shutdowns are not permissible under the Indian Constitution.
- Section 144 cannot be used to avoid genuine protests, and its imposition has specific parameters.
- **Key Highlights**
  - Internet usage is a fundamental right under Article 19.
  - Internet shutdowns can be temporary but not indefinite.
  - Government must publish all orders imposing restrictions under Section 144.
  - Orders related to internet shutdowns are subject to judicial scrutiny.

## Conclusion

Governments in a democracy should provide rationale for periodic internet disruptions. Transparent publication of all orders is crucial for maintaining transparency. Indiscriminate shutdowns have high social and economic costs and are often ineffective. A proportionality and necessity test are essential for better internet governance, and civil society should advocate for a transparent and accountable system.

## GOVERNANCE

### UGC's Draft Guidelines Spark Outrage over 'Dereservation' in Faculty Recruitment

**Context:** The Union government and the University Grants Commission (UGC) clarified that reserved faculty positions in universities for SC, ST, OBC, and EWS candidates will not be opened to the general category.

#### Mandate of UGC

- Promoting and coordinating university education.
- Determining and maintaining standards of teaching, examination, and research in universities.
- Framing regulations on minimum standards of education.
- Monitoring developments in collegiate and university education and disbursing grants.
- Serving as a vital link between the Union and State governments and advising on measures for the improvement of university education.

#### About University Grants Commission (UGC)

- The UGC is a statutory body under the UGC Act, 1956, responsible for coordinating, determining, and maintaining standards of higher education.
- It provides recognition to Indian universities, disburses funds to recognized universities and colleges, and operates under the Department of Higher Education, Ministry of Education.

#### News Summary

- In December 2023, the UGC shared draft guidelines on implementing the reservation policy in higher education institutions for public feedback.
- The draft proposed de-reservation of unfilled quota posts for teachers, officers, and employees in universities in exceptional circumstances, with adequate justification.
- Recommendations included submitting proposals for de-reservation to the Education Ministry for Group A and B posts and to the Executive Council for Group C and D posts.
- The draft faced criticism, leading to clarification by the UGC chairman that it is a draft, and considerations related to de-reservation will be removed in the final document.

#### Current Position

- Reserved faculty positions are not converted to recruit general candidates.
- The Department of Personnel and Training (DoPT) permits de-reservation in exceptional circumstances for Group A posts, but this provision has not been implemented in universities.
- Unfilled quota positions undergo re-advertisement, and universities conduct special recruitment drives without opening these positions to the general category.

## LABHA

**Context:** The Odisha government recently unveiled initiatives for the welfare of the tribal population.

#### LABHA (Laghu Bana Jatya Drabya Kraya) Yojana

- A 100% State-funded minimum support price (MSP) scheme for minor forest produce (MFP) was announced.
- The MSP will be determined annually by the State government.
- Primary collectors, predominantly tribal individuals, can sell MFP under this scheme.
- Tribal Development Cooperative Corporation Limited of Odisha (TDCCOL) will manage procurement centers.
- SHGs and other notified agencies, assisted by TDCCOL, will manage these procurement centers.
- Integration with Mission Shakti's Women SHGs, recognizing the majority of primary collectors as tribal women.
- Implementation of a procurement automation system to track total MFP collection, details of primary collectors, and procurement points.
- **Significance:** Aims to prevent distress sales of produce to middlemen.

### Commission for the Preservation and Promotion of the Tribal Languages

- Establishment of a commission dedicated to preserving and promoting tribal languages of Scheduled Tribes in Odisha.
- Objectives include encouraging multilingual education, documenting and preserving tribal languages, promoting language use, and protecting linguistic rights.
- Efforts to include tribal languages like Ho, Mundari, Kui, and Saora in the 8th Schedule of the Indian Constitution.

### Tribal Population in Odisha

- Odisha is home to 62 distinct tribes, including 13 Particularly Vulnerable Tribal Groups (PVTG).
- Scheduled Tribes in Scheduled Areas constitute about 68.09% of the total tribal population in the state.
- Odisha ranks as the third-largest concentration of tribal population, following Madhya Pradesh and Maharashtra.
- The state has 21 tribal languages.

## INTERNATIONAL RELATIONS

### Burkina, Mali, Niger quit West African bloc

**Context:** Military regimes in Burkina Faso, Mali, and Niger have declared an immediate withdrawal from the Economic Community of West African States (ECOWAS). Termed as a "sovereign decision," the exit was made promptly.

<b>About ECOWAS</b>	<ul style="list-style-type: none"> <li>• ECOWAS, formed on 28 May 1975 through the Treaty of Lagos, is a regional political and economic union.</li> <li>• Encompassing 15 West African countries, it spans over 5 million square kilometers with an estimated population of 424 million.</li> </ul>
<b>ECOWAS Objectives</b>	<ul style="list-style-type: none"> <li>• A key regional bloc within the Africa-wide African Economic Community.</li> <li>• Aims for continental integration, collective self-sufficiency, and the elimination of trade barriers to create a single integrated trading area.</li> <li>• Focuses on raising living standards and fostering economic development across West Africa.</li> </ul>

### Struggles with Insurgencies

- Burkina Faso, Mali, and Niger, facing jihadist insurgencies and deep poverty, have strained relations with ECOWAS.
- Military coups in Niger (2021), Burkina Faso (2022), and Mali (2020) resulted in their suspension despite sanctions.

### Formation of Sahel Alliance

- Junta leaders, facing ECOWAS penalties, established the "Alliance of Sahel States" to collectively address criticism.
- Regional security concerns drove their joint decision to withdraw.

### Reversals of Democratic Gains

- Military takeovers reversed democratic progress in West Africa, with suspended regimes resisting ECOWAS pressure for a swift return to civilian rule.

### Trade-offs Between Security and Democracy

- Withdrawal underscores tensions between stabilizing coup-affected nations and upholding democratic values.

- Balancing sanctions to support counter-insurgency efforts versus resisting unconstitutional governance changes is a complex trade-off.

### Uncertain Future for Citizens

- Exit leaves citizens in Burkina Faso, Mali, and Niger facing uncertain political and economic futures.
- Regimes show no signs of planning elections or relinquishing power, risking further isolation and economic hardships.

### Potential Consequences

- Prolonged uncertainty may lead to refugee outflows and radicalization.
- Economic and political disenfranchisement of younger citizens could increase vulnerability to militant recruitment.

### What's Next for Alliance States and Region

- The future of Burkina Faso, Mali, and Niger within the proclaimed Sahel Alliance remains uncertain.
- Progress depends on evolving security conditions, economic situations, and pressures to restore civilian administration.
- Withdrawal poses potential destabilizing threats to regional peace.

## India-UAE: Bilateral Investment Treaty

**Context:** Recently, the Union Cabinet approved the signing and ratification of a Bilateral Investment Treaty (BIT) with the United Arab Emirates (UAE) to significantly boost bilateral economic engagement, including Foreign Direct Investment (FDI).

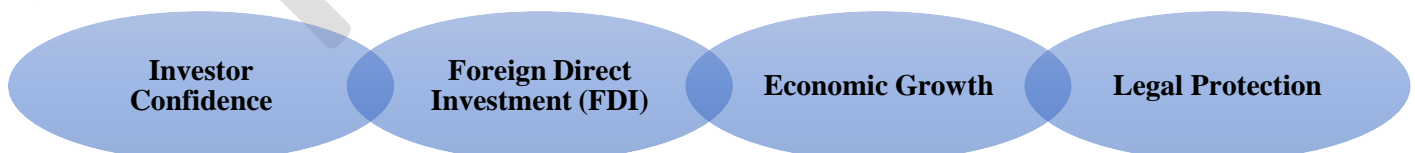
### About the Bilateral Investment Treaty (BIT)

- An agreement between two countries setting terms and conditions for private investment by nationals and companies of one state in another.
- Part of International Investment Agreements (IIAs) under the United Nations Conference on Trade and Development (UNCTAD).
- Expected to enhance investor confidence, increase foreign investments, overseas direct investment opportunities, and positively impact employment generation.

### India and BIT

- Actively negotiating Bilateral Investment Treaties (BITs) with various countries to boost Foreign Direct Investment (FDI).
- India's position highlighted in the recent Interim Budget, emphasizing negotiations from a position of strength.
- India adopted the model BIT in 2016, aiming to provide suitable protection to foreign and Indian investors while maintaining a balance between investor rights and government obligations.
- Pursuing economic integration with western nations, including the United Kingdom (UK) and the European Union, through Free Trade Agreements and investment treaties.

### Significance of BITs



- **Investor Confidence**
  - Boosts investor confidence by ensuring a level playing field and non-discrimination.
  - Provides an independent forum for dispute settlement through arbitration.

- **Foreign Direct Investment (FDI)**
  - Aids in increasing FDI inflow by addressing challenges, such as improving ease of enforcing contracts.
- **Economic Growth**
  - Attracts foreign investment, contributing to economic growth and employment generation in the host country.
- **Legal Protection**
  - Offers legal protection to investors, crucial in countries with unpredictable or unstable legal frameworks.
  - Imposes obligations under international law on host states to protect foreign investment.

## Challenges associated with BITs

### Unequal Distribution of Rights and Obligations

Creates an unequal distribution of rights and obligations between developed and developing countries.

### Risk of Litigation

Increases the risk of litigation, with some developing countries facing significant financial penalties.

### Ambiguous Legal Standards

Awards often based on expansive interpretations of ambiguous legal standards like 'fair and equitable treatment' and 'indirect expropriation.'

### Limitations in Addressing Issues

Unable to address all challenges companies face abroad, such as protecting and enforcing intellectual property rights.

### Loss of Policy Space

May lead to a loss of policy space for the host country, limiting its ability to regulate in the public interest.

### Treaty Shopping

Investors may exploit the most favorable nation clause in BITs to sue a host country under a treaty to which it is not a party.

## Conclusion and Way Forward

- Current trends indicate the global south is experiencing 'normal capitalism,' introducing new patterns of uneven development, inequality, and injustice.
- BITs are viewed as tools to boost investor confidence by ensuring a level playing field and non-discrimination.
- Negotiation and implementation of BITs require careful balancing of interests, considering the challenges involved.



## Rising tensions in the Korean peninsula

**Context:** Ongoing tensions in the Korean peninsula raise concerns about the deterioration of the international security environment.

### Background

- Korean peninsula divided post-World War II under Soviet Union and U.S. influence.
- Creation of ideologically different regimes reflecting Cold War dynamics.
- Korean War (1950-53) initiated by North's attempt to take over the South.
- Despite Cold War end, ideological and political divisions persist.

### India's Role in the Korean War

- Sponsored resolution accepted by both sides during the Korean War.
- Ceasefire declared on July 27, 1953, through the Korean Armistice Agreement.

### Recent Tensions in Korean Peninsula

- North Korea demonstrates nuclear weapons capability.
- Key stakeholders: U.S., China, and Russia engaged in global strategic competition.
- Russia and China strengthen ties with North Korea.
- South Korea enhances military alliance with the U.S.

### Threat to International Security

- North Korea's provocative actions, including military drills and cyber-attacks.
- Possibility of targeting the U.S. mainland with its nuclear arsenal.
- Russia and China gain from North Korea, creating a distraction for the U.S.

### India-Republic of Korea Bilateral Relations

- Diplomatic relations established in 1973.
- "Strategic Partnership" formed in 2010, elevated to "Special Strategic Partnership" in 2015.
- Economic relations boosted by CEPA implementation in 2010.
- 'Korea Plus' initiative promotes Korean investments in India.
- Bilateral trade in 2022 reaches record levels of US\$ 27.8 billion.
- Defense relations involve regular interactions between Defence Ministers since 2015.
- Annual service level talks across the three arms of the military.
- Roadmap for Defence Industries Cooperation signed in 2019.
- Indian community in ROK estimated around 15,000, with professionals in IT, shipping, and automobile sectors.

### Way Ahead

- Growing concern about tensions leading to conflict.
- Denuclearization of North Korea and ending the U.S. hostile policy necessary for global security and regional peace.



## HEALTH

### Brainware

**Context:** Scientists have recently achieved the seamless integration of brain-like tissue with electronics, resulting in the creation of Brainware, an 'organoid neural network (ONN)' capable of recognizing voices and solving complex mathematical problems.

#### What is Brainware?

Brainware is an innovative computing system that combines brain-like tissue with electronics. It integrates brain organoids with microelectrodes, forming an 'organoid neural network (ONN)' that directly incorporates living brain tissue into the computing process. Brain organoids are 3D tissues derived from human embryonic stem cells, simulating the structure and function of the human brain and used to study human brain development and related diseases.

#### Operational Mechanism: Three-Layered Architecture: Input, Reservoir, and Output

- **Input Signals Processing:** ONNs process electrical stimulation signals as input.
- **Reservoir:** The reservoir, acting as a black-box, converts signals into mathematical entities, eliminating constant back-and-forth data transfer.
- **Output Readout:** The output layer interprets Brainware's neural activity, providing tangible results using modified conventional computer hardware.

#### Advantages over Traditional Neuromorphic Computing

- **Memory and Processing Separation**
  - Traditional neural networks face challenges with separate memory and processing units, leading to increased time and energy demands.
  - Brainware's biological neural network, with live brain cells, addresses these inefficiencies, resulting in significantly lower energy consumption.
- **Challenges and Considerations**
  - The system faces challenges, including the need for technical expertise and infrastructure to maintain a biological neural network.
  - Ethical concerns arise regarding the consciousness of organoids and their mechanistic use.

#### Future Prospects

- While in its early stages, continued study of the 'organoid neural network' could provide foundational insights into learning mechanisms, neural development, and cognitive implications of neurodegenerative diseases.
- This research could contribute to advancements in neuroscience and medical research, exploring possibilities at the intersection of tissue engineering, electrophysiology, and neural computation.

### Western Equine Encephalitis Virus

**Context:** The Western Equine Encephalitis Virus outbreak has been identified in horses in Argentina and Uruguay.

<b>Outbreak of Virus</b>	<ul style="list-style-type: none"> <li>• <b>Background:</b> Argentina's International Health Regulations National Focal Point reported a human case of Western Equine Encephalitis Virus (WEEV) infection to PAHO/WHO.</li> <li>• <b>Outbreak Overview:</b> Concurrent outbreaks in horses in Argentina and Uruguay emphasize the severity and potential for cross-species transmission.</li> </ul>
<b>Historical Perspective</b>	<ul style="list-style-type: none"> <li>• <b>Past Human Cases:</b> Last reported human infections in Argentina occurred in 1982, 1983, and an isolated event in 1996, highlighting the re-emergence of Western Equine Encephalitis after a prolonged hiatus.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Regional Context:</b> Previous outbreaks and human cases have been documented in the U.S. and Canada, with over 3,000 reported cases over the years.</li> <li>• <b>Virus Threats:</b> The virus, a recombinant of Eastern Equine Encephalitis Virus (EEEV) and a Sindbis-like virus, poses a significant threat.</li> </ul>
<b>Virology and Transmission</b>	<p><b>Western Equine Encephalitis Virus (WEEV)</b></p> <ul style="list-style-type: none"> <li>• WEEV belongs to the Togaviridae family, with an 11.5-kilobase single-stranded RNA genome.</li> <li>• Passerine birds serve as reservoirs, while equine species act as intermediate hosts.</li> <li>• Mosquitoes, as vectors, transmit the virus to humans, emphasizing the importance of vector control.</li> </ul>
<b>Control and Prevention Strategies</b>	<ul style="list-style-type: none"> <li>• <b>PAHO/WHO Alert:</b> PAHO/WHO has issued an alert on the risk of WEE spread in the Americas.</li> <li>• <b>One Health Approach:</b> Emphasizes collaboration between human, animal, and environmental health sectors, crucial for effective control and prevention of the virus.</li> <li>• <b>Interventions:</b> Environmental modifications, vector control, and equine vaccination are recommended in affected and high-risk regions. Enhanced surveillance and detection are crucial for preventing further spread.</li> </ul>

### Way Forward

- The Western Equine Encephalitis outbreak in Argentina and Uruguay poses a significant public health threat.
- Immediate and coordinated efforts are essential to curb the spread, with a focus on the One Health approach and targeted interventions.

## SCIENCE & TECHNOLOGY

### The genomic revolution promises to transform cancer care

**Context:** Recent UK research involving 13,800 cancer patients demonstrates the potential of integrating genomic data with clinical information to identify new cancer targets, guide treatment strategies, and highlight inherited risks. The NHS is exploring the integration of genomic medicine in cancer care, with some trusts adopting preemptive sequencing practices.

#### Insights from Study

- **Whole-Genome Sequencing:** Central to the transformation of cancer care is whole-genome sequencing, enabling the comprehensive analysis of an individual's DNA in a single test.
- **Cancer Burden:** With cancer becoming a significant global health concern, initiatives like the Cancer Genome Atlas aim to understand the molecular basis of cancer, leading to the development of precision oncology therapies.
- **Precision Oncology:** Molecular tests determine eligibility for precision oncology therapies, with genomic medicine showing potential to revolutionize cancer treatment by customizing therapies based on genomic data.

#### Key Terms

##### Genome Sequencing

- Genome sequencing is the process of determining the complete DNA sequence of an organism's genome.
- It involves reading the order of nucleotides (A, T, C, and G) in DNA strands, providing insights into genetic variations and potential disease risks.

##### Oncology

- Oncology is the branch of medicine focused on the diagnosis, treatment, and prevention of cancer.
- Oncologists study the causes and progression of cancer, develop treatment plans such as surgery, chemotherapy, and radiation therapy, and work towards improving patient outcomes.

## End-to-end Encryption

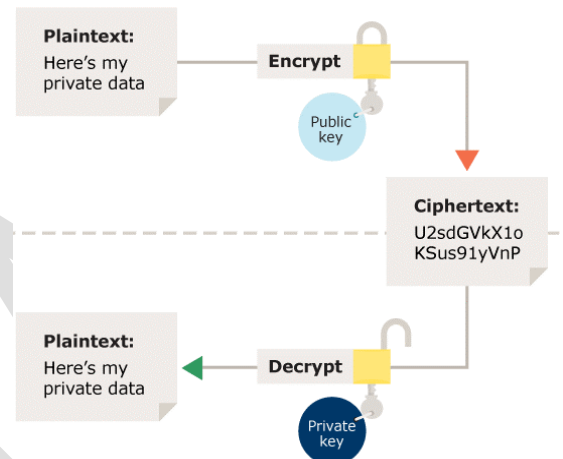
**Context:** End-to-end encryption is vital for cybersecurity, safeguarding the secure transmission of sensitive data by encoding it exclusively for the sender and recipient. It provides protection against unauthorized access, theft, surveillance, and tampering, particularly in the face of escalating cyber threats.

### What is Encryption?

- Encryption involves transforming consumable information into an unconsumable form according to various rules, fundamentally encompassing different rule sets.
- In this context, the key is a set of data that enables a computer to decrypt encrypted text by understanding the specific rules used to encrypt it.

### E2E Encryption

- E2E encryption involves securing specific points through which data is transmitted.
- When communicating on a messaging app, messages are encrypted during transit to prevent unauthorized access, employing both encryption-in-transit and end-to-end encryption (E2E).
- **Analogy:**
  - Regular message: Sending a postcard - anyone can read it.
  - End-to-end encryption: Sending a sealed, coded letter - only the recipient with the right code can read it.



### Process of Encryption

- Various encryption methods can be employed based on the desired level of secrecy and protection for information.
- Symmetric encryption uses the same key for both encrypting and decrypting information, with examples like Data Encryption Standard (DES) and Advanced Encryption Standard (AES).
- Asymmetric encryption, or public-key cryptography, uses a pair of keys (public and private) for secure communication without the need for both parties to share the same key.

### Vulnerabilities of E2E Encryption

- While E2E encryption is a robust security measure, factors like Man In the Middle (MITM) attacks, user complacency, malware threats, company backdoors, and legal requirements can impact overall security.

### Role of Hash Function

- Different symmetric and asymmetric schemes encrypt messages using various hash functions.
- The hash function encrypts a message while ensuring properties like message concealment, fixed-length output, and unique digests for unique messages.

## Mars Helicopter Ingenuity Grounded Permanently

**Context:** Recently, NASA declared the permanent grounding of its Mars robot helicopter, Ingenuity, marking the conclusion of its extraordinary mission.

### Ingenuity's Record-Breaking Flights

- Ingenuity surpassed its original plans, flying over the Martian terrain 14 times farther than anticipated.
- It logged over two hours and eight minutes of flight time, covering a remarkable distance of 10.5 miles (17 km) through a total of 72 flights.
- The peak altitude reached during its flights was measured at 78.7 feet (24 meters).

## Ingenuity helicopter: first powered flight on Mars

Expected to make its first flight attempt no earlier than April 11

**MAIN MISSION**  
First test of a powered flight on another planet

Test flights during a 30-Martian-day\* experimental window

Take off, fly, and land with minimal commands from Earth sent in advance

**PERSEVERANCE ROVER**

**INGENUITY:**

- 1 hitched a ride on rover's belly, which touched down on Feb 18
- 2 deployed to Martian surface on Apr 3

- FLIGHT ALTITUDE: up to 5 m
- RANGE: up to 300 m
- MARS ENVIRONMENT: Very thin atmosphere, less than 1% the density of Earth's
- HELICOPTER WEIGHT: 1.8 KG on Earth, 0.66 KG on Mars

Solar panel  
Power good for one 90-second flight per day

Antennas

Blades  
Span: 1.2 m

Avionics and body

Sensors, cameras

Batteries

Legs

\*Martian days: 24 h 37 mins  
Earth days: 23 h 56 mins

Sources (including helicopter image): NASA/JPL-Caltech

AFP

### Ingenuity's Arrival on Mars

- Ingenuity traveled to Mars attached to NASA's Perseverance rover, which landed in Jezero Crater three years ago for a mission focused on collecting surface samples for eventual return to Earth.

### Historic First Controlled Flight

- Ingenuity achieved the historic first controlled flight on another planet with a 39-second flight in the thin Martian atmosphere on April 19, 2021.
- NASA likened this accomplishment at Jezero Crater to the Wright brothers' historic first flight in 1903 near Kitty Hawk, North Carolina.

### Final Flight and Rotor Blade Damage

- The decision to end Ingenuity's mission came after JPL teams tested the helicopter's auto-navigational system in a barren area of Mars, pushing its capabilities to the limit.
- The rotor blades experienced damage during this period, contributing to the conclusion of the mission.

### Engineering Hurdles Overcome

- Ingenuity faced significant engineering challenges due to Mars' unique conditions – lower gravity but only 1% as dense atmosphere as Earth.

- The helicopter featured larger and faster-spinning rotor blades to compensate for the thin atmosphere.
- Enduring extreme cold, with nighttime temperatures dropping as low as minus 130 degrees Fahrenheit (minus 90 Celsius), added to the engineering complexities of the mission.

## Neuralink Implants

**Context:** The first human patient recently received an implant from Neuralink, a brain-chip startup.

### About

- Initial results indicate promising detection of neuron spikes.
- Neurons, described by the National Institute of Health, are cells using electrical and chemical signals for brain and body communication.
- Hope arises for overcoming paralysis and various neurological conditions.

### Neuralink

- Founded by Elon Musk in 2016, Neuralink focuses on developing brain-computer interfaces (BCIs) for human brain implants.
- **Goal:** Enable thought-controlled operation of computers and devices, potentially treating neurological conditions.
- Neuralink's BCI is a small, flexible device with electrodes implanted in the motor cortex, interpreting neuron electrical activity as commands.

### Brain-Computer Interfaces (BCIs)

- Systems bridging human thought and technology.
- Non-invasive BCIs use EEG sensors for brain wave measurement outside the skull.
- Partially invasive BCIs employ electrodes under the scalp, providing higher resolution in specific brain areas.
- Fully invasive BCIs, like Neuralink's, interface directly with brain tissue, offering the highest resolution but raising ethical and safety concerns.

### Application of Brain Computer Interface

- Human-technology interface revolutionizing technology interaction.
- **Communication and Control:** Aiding individuals with paralysis to control devices, prosthetics, or computers with their thoughts.
- **Sensory Restoration:** Addressing sight or hearing loss due to injuries or diseases.
- **Neurological Treatment:** Modulating brain activity to treat epilepsy, Parkinson's, and chronic pain.
- **Augmentation and Enhancement:** Potential amplification of cognitive abilities or memory.

### Challenges/Concerns

**Safety concerns for Neuralink include issues with monkey implants, such as paralysis, seizures, and brain swelling.**

**Ethical concerns regarding potential brain hacking or thought control.**

**Superhuman creation concerns, creating an enhanced class of individuals.**

**Privacy and Security: Ensuring secure and ethical use of brain data.**

**Accessibility and Equity: Ensuring equal access to BCI technology.**

**Human and Machine Integration: Defining boundaries between human thought and machine control.**

**Brain Enhancement: Considering implications of cognitive and sensory augmentation.**

### Way Ahead

- BCI research evolving rapidly with advancements in neuroscience, engineering, and artificial intelligence.
- Despite challenges, BCIs hold immense potential to transform healthcare, communication, and our understanding of the brain-computer interface.