WEEKLY NEWS

April 14-20, 2024

Sweden Joins Artemis Accord

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Merger GW230529

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HIGHLIGHTS

- FDI rules for space sector
- Advance Pricing Agreement

Amendment to Double Taxation Avoidance Agreement (DTAA)

Why in News?

- **Introduction of Principal Purpose Test (PPT):** Included to **prevent abuse of the treaty** for tax evasion and avoidance.
- **Condition:** Tax benefits under the treaty will **not apply if obtaining those benefits was the principal purpose** of any transaction or arrangement.
- **Objective:** Ensure compliance with **Base Erosion and Profit Shifting (BEPS)** Minimum Standards.

Significance of DTAA

- **Avoidance of Double Taxation:** Prevents taxation on the same declared asset in two different countries/territories.
- **Promotion of Cross-Border Investment: Reduces tax burden** on foreign investors.
- **Equitable Tax Allocation:** Determines the **right to tax** between the 'source' and 'residence' countries.
- **Legal Certainty:** Provides **assurance regarding the taxation** of international income.

DTAA Between India and Mauritius

- **Initial Signing:** 1982.
- **Amendment:** 2016.

- ***Issues Associated with DTAA***
  - **Treaty Shopping:** Residents of non-DTAA countries taking advantage of treaty provisions.
  - **Double Non-Taxation:** Abuse of DTAA to avoid paying taxes in both countries.
  - I**nterpretation Differences:** Varied interpretations leading to prolonged litigations.

- ***Base Erosion and Profit Shifting (BEPS)***
  - **Definition:** Tax planning strategies exploiting gaps in tax rules to shift profits to lower tax jurisdictions.
  - **Multilateral Convention:** Aims to update international tax rules and prevent tax avoidance by multinational enterprises.
  - **India's Involvement:** Signed the convention in **2017**.

Chinese Satellite Communication Technology

Why in News?

- **Development of Tiantong-1 Satellite Series:** Chinese scientists have created the world's first satellite series capable of enabling smartphone calls without ground-based infrastructure.

About Chinese Satellite Communication Technology (SCT)

- **Tiantong-1 Series:** Consists of three satellites in geosynchronous orbit at approximately 36,000 km altitude, covering the entire Asia-Pacific region.
- **Geosynchronous Orbit:** Position high above Earth allowing objects to maintain pace with the planet's rotation.
- **Huawei's Contribution:** In September 2023, Huawei released the world's first smartphone supporting satellite calls, connecting directly to Tiantong satellites.

Significance of SCT

- **Accessibility:** Provides seamless communication access in remote and hard-to-reach areas.
- **Contingency Planning:** Crucial during natural disasters or emergencies when terrestrial networks are disrupted.
- **Military and Defense Applications:** Enables secure communication, navigation, surveillance, and intelligence gathering.

- ***Concerns Associated with SCT***
  - **Space Debris and Orbital Congestion:** Risk of debris accumulation and congestion in orbit.
  - **Regulatory and Governance Challenges:** International coordination and liability issues.
  - **Cyber Threats:** Potential vulnerabilities to jamming, spoofing, etc.

- ***Satellite Communication Technology in India***
  - **Telecommunications Act, 2023:** Allows satellite communication companies to obtain spectrum without auction for point-to-point communications.
  - **Department of Telecommunication (DoT) Licensing:** Issues Global Mobile Personal Communications by Satellite (GMPCS) Licenses for satellite telephony.
  - **Previous License Issuance:** Bharati Group and Reliance Group have been issued GMPCS licenses in the past.

Advancements in Radiation Therapy

Why in News?

- **Introduction to Radiation Therapy:** A cancer treatment method using ionizing radiations like X-rays, gamma rays, etc., to kill cancerous cells.

Types of Radiation Therapy

- **External (Teletherapy):** Utilizes a linear accelerator to deliver radiations from a distance to target cells.
- **Internal (Brachytherapy):** Involves placing a radiation source inside the body.

Significance of Radiation Therapy

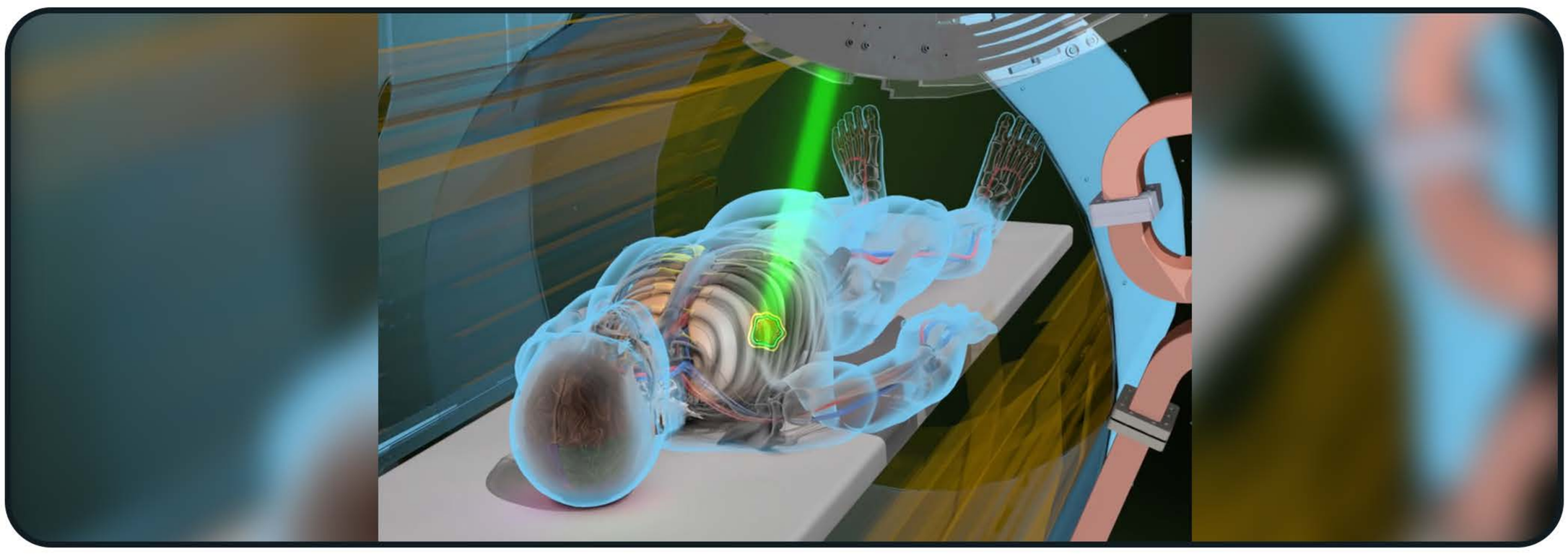
- **Effective Treatment:** Established method for treating various cancers like brain, breast, head and neck, etc., while minimizing damage to healthy tissues.

Potential Side-effects of Radiotherapy

- Fatigue
- Nausea
- Hair loss
- Loss of appetite

Proton Therapy: Advanced Radiation Treatment

- **Precise Treatment:** Focuses more energy on cancerous cells with less radiation to surrounding healthy tissues.



- ***Comparison: Traditional vs. Proton Therapy***

Parameters	Traditional Radiation Therapy	Proton Therapy
Risk of damaging the nearby healthy cells	*Low*	*Very low*
Applicability	*Not suitable for sensitive organs like eyes, brain, etc.*	*Suitable for sensitive organs like eyes, brain, etc.*
Cost	*Less expensive*	*More expensive*
Side Effects	*Mostly severe, affecting day to day activities*	*Less severe and do not interfere with normal functioning*

- ***Way Forward:***
  - Continued research and development in radiation therapy techniques to improve efficacy and reduce side-effects.
  - Increased accessibility and affordability of advanced treatments like proton therapy for cancer patients.

State Finances, NDRF Relief, and Constitutional Provisions

Why in News?

- Karnataka approached the Supreme Court seeking relief against the Center regarding the release of financial assistance from the **National Disaster Response Fund (NDRF)** for drought management.
- Earlier, Tamil Nadu also approached the Supreme Court due to the non-disbursal of funds by the Center under NDRF to deal with calamities such as **cyclone Michaung** and unprecedented floods.

State Finance Status

- **States finance only 58% of their revenue expenditure** from their revenue sources.
- The **debt-GDP ratio** of states stands at **27.5% as of March 2023**.

Reasons for State's Dependency on Centre

- GST compensation for states ended in June 2022, and **revenue collected under State Goods and Services Tax (SGST) is lower than revenue from taxes subsumed under GST.**
- **Increased use of cesses and surcharge by the Center,** which are not shared with states.
- **Strain on state finances** due to measures like **farm loan waivers.**

- ***Measures to Improve State Finance***
  - Scheme for Special Assistance to States for Capital Expenditure provides **50-year interest-free loans to States.**
  - The 15th Finance Commission recommended **performance-based additional borrowing space of 0.50% of State GDP to States in the power sector.**

- ***Way Forward***
  - **Foster business-friendly tax administration** to strengthen states' revenue collection.
  - **Revise user charges on electricity, water, and other public services** to increase non-tax revenue.

Constitutional Provisions related to States' Finances

Constitutional Provisions	*Description*
Article 275	*Parliament may by law provide grants-in-aid charged on the Consolidated Fund of India.*
Article 282	*Enables the Union (and states) to make discretionary grants for any 'public purpose.'*
Article 293	*Confers power on States to borrow money within limits prescribed by the State legislature.*
Article 275	*Parliament may by law provide grants-in-aid charged on the Consolidated Fund of India.*

Crowdfunding in India: Regulations and Implications

Why in News?

- Crowdfunding, the practice of **raising funds from multiple investors via web-based platforms or social networking sites**, has gained attention in India.
- The Securities and Exchange Board of India **(SEBI) regulates crowdfunding activities** in the country.

SEBI Guidelines on Crowdfunding:

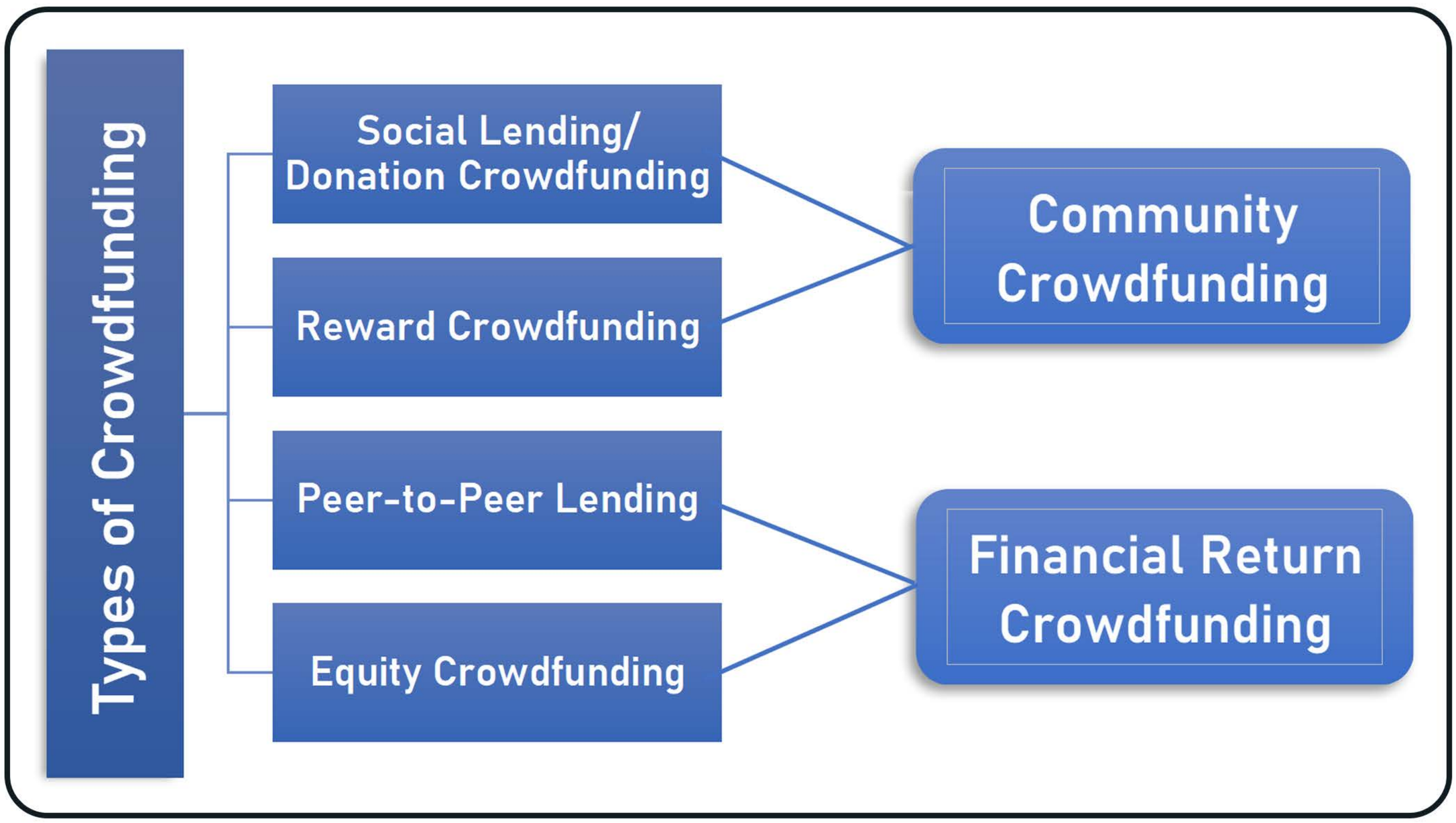
- Only **"Accredited Investors" are permitted to invest,** including companies with a minimum net worth of Rs 20 crore, High Net Worth Individuals with a minimum net worth of Rs 2 crore, and eligible retail investors with a minimum annual gross income of Rs. 10 lakhs.

Benefits of Crowdfunding:

- Promotion of **funding for new ideas and startups**.
- **Increased credit flow** to Small and Medium Enterprises (SMEs).
- Facilitation of **fundraising during natural calamities**.
- Provision of **financial assistance for individuals unable to afford medical expenses** for diseases like cancer.

- ***Risks of Crowdfunding:***
  - **Lack of understanding among retail investors about the risks associated** with investing in startups, potentially leading to loss of investments.
  - Possibility of genuine crowdfunding **websites being exploited by fraudsters.**
  - Inadequate monitoring of web-based platforms, posing risks such as **terror financing and money laundering.**

- ***Way Forward:***
  - **Enhance investor education and awareness** about the risks and benefits of crowdfunding.
  - **Strengthen regulatory oversight** and enforcement to mitigate the potential for fraudulent activities and misuse of funds.
  - Encourage the **development of transparent and accountable crowdfunding platforms** to safeguard investor interests.



Inter-Agency Space Debris Coordination Committee (IADC) Annual Meeting

Why in News?

- In a recent meeting, the ISRO Chief announced India's goal of achieving **debris-free space missions by 2030**.

Space Debris and its Implications

- Space debris encompasses all **non-functional, artificial objects** present in Earth's orbit or re-entering the Earth's atmosphere.
- Mitigating space debris is crucial due to its threat to space exploration, the **risk of the Kessler syndrome,** and potential harm to life on Earth from uncontrolled reentries.

Initiatives for Space Debris Mitigation

- **By ISRO:**

  ISRO System for Safe and Sustainable Space Operations Management (IS4OM) aims to efficiently manage information on on-orbit collision and fragmentation.

  Project **NETRA (Network for Space Objects Tracking and Analysis)** intends to establish a space surveillance and tracking network using RADARS and Optical Telescopes.

- **Global Initiatives:**

  REMOVEDEBRIS is a project focused on performing key **active debris removal (ADR)** technology demonstrations.

  UN Liability Convention (1972) and **UN Registration Convention (1976)** provide frameworks for addressing liability and registration of space objects.

- ***About IADC (Inter-Agency Space Debris Coordination Committee)***

  - **Genesis:** Established in **1993** as an international forum for space agencies, organizations, and governmental bodies.

    Purpose: Facilitate the **exchange of information on space debris research activities,** cooperation in debris research, and identification of mitigation options.

    Function: Provides **technical recommendations to the global space communities** but is not a regulatory body.

    Members: Space agencies of **13 countries,** including **ISRO, NASA, Roscosmos, ESA, CNSA**, among others.

Trade and Development Report Update

Why in News?

- A recent report highlights **challenges faced by global merchandise trade,** the impact of monetary policies of developed economies on developing nations, and the growing global debt crisis.

Challenges to Global Merchandise Trade

- In 2023, global merchandise trade **declined by approximately 1% in real terms** due to various factors including trade tensions among major economies, subdued global demand, and disruptions in key shipping routes.

Impact of Developed Economies' Monetary Policy on Developing Economies

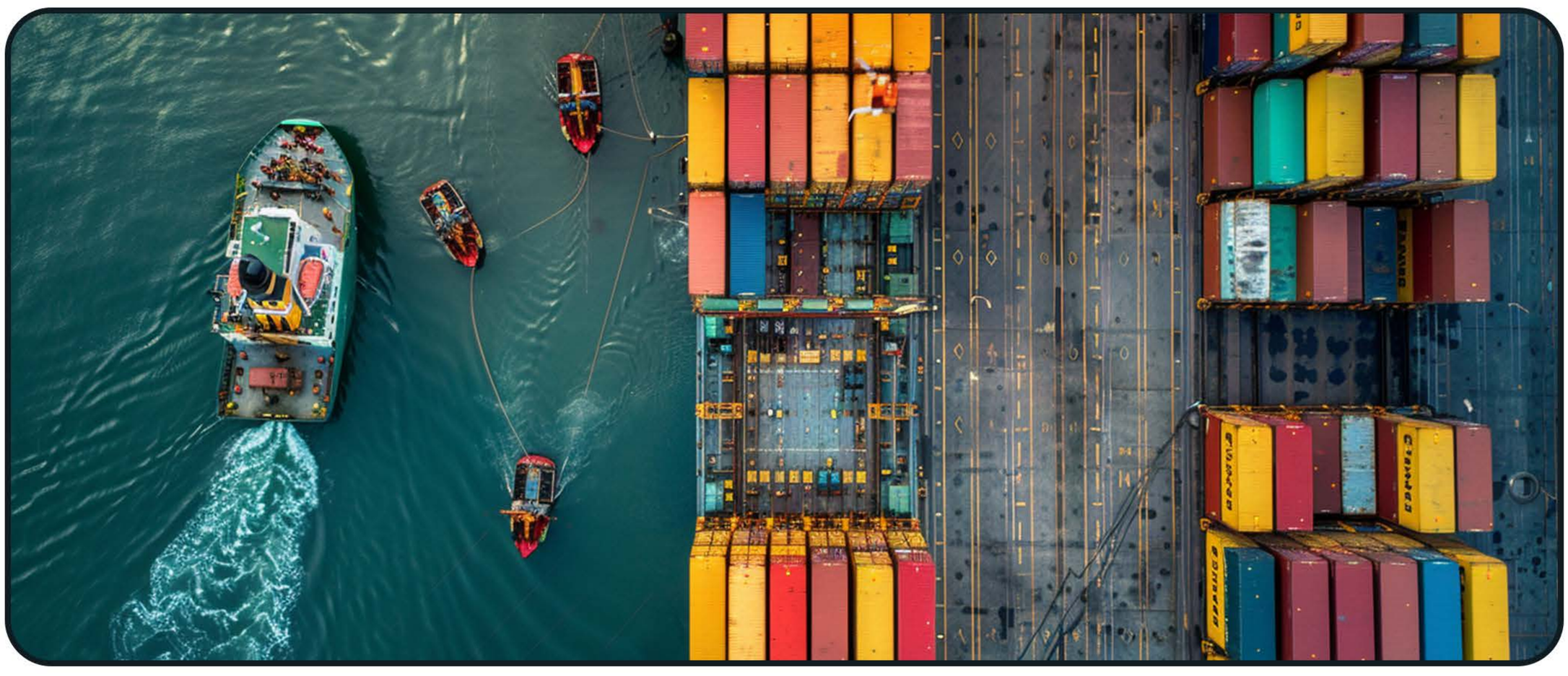
- **Rapid and simultaneous tightening of monetary policies** by major developed economies has led to **higher debt servicing costs and difficulties** in securing new financing options for developing nations.
- **Interest rate hikes in developed countries** have caused depreciation of currencies in developing nations, exacerbating the situation.
- **Double-digit interest rates set by central banks** in many developing countries have adversely affected domestic demand, employment, and household incomes.

Global Debt Crisis

- Developing countries' governments are struggling with **increasing debt payment obligations,** with $50 billion more paid to external creditors than received in new loans in 2022.
- 2022 marked the **first occurrence of a net negative resource transfer** from developing countries to developed countries since 2008.
- By 2023, nine low-income countries had fallen **into debt distress,** with an additional 25 on the brink of similar situations.

Related Development: IMF Reforms

- The IMF Executive Board endorsed reforms aimed at **enhancing the IMF's capacity to support countries undergoing debt restructurings** amidst the ongoing global sovereign debt challenges.
- These reforms are intended to **bolster the existing architecture for debt resolution by streamlining processes** to facilitate timely and effective interventions during debt crises.



Advance Pricing Agreements (APAs)

Why in News?

- The signing of 125 Advance Pricing Agreements (APAs) in a single financial year marks the highest ever since the launch of the APA programme in 2012.

Key Statistics

- The 125 APAs include 86 Unilateral APAs (UAPAs) and 39 Bilateral APAs (BAPAs).

Overview of APA

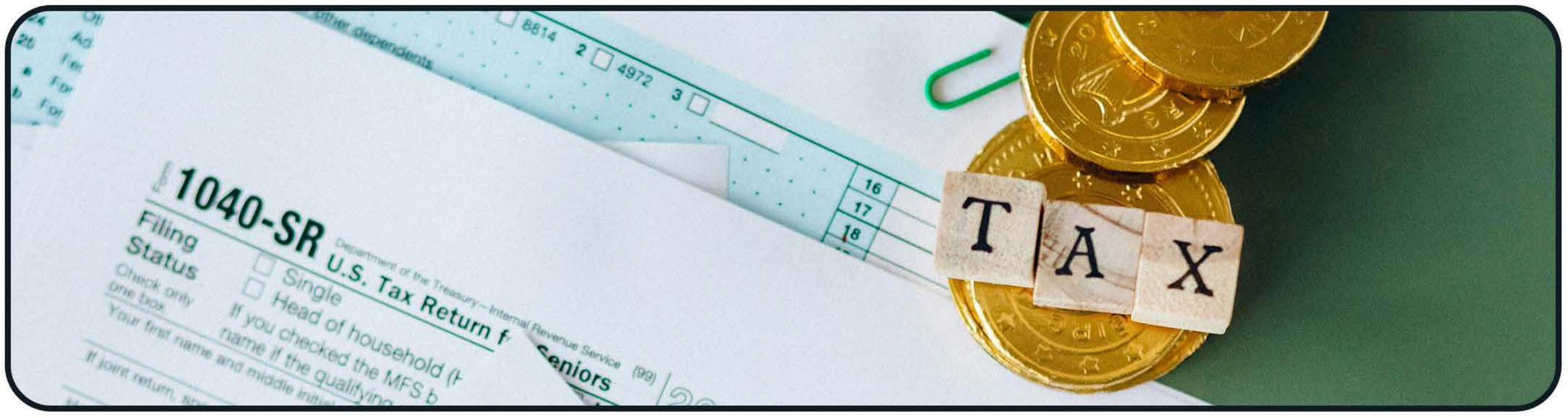
- APA is an **agreement between the Tax Authority and a taxpayer** that determines the **arm's length price** or **specifies the method for determining the arm's length price for international transactions.**
- **Arm's length price** refers to a **transaction where parties act independently without exerting influence on each other.**

Key Features

- Signed under the **Income-tax Act, 1961.**
- **Voluntary** in nature.
- **Duration:** Maximum of **5 future years,** extendable for an **additional 4 proceedings years.**

Types of APAs

- **Unilateral:** Involves only the taxpayer and the tax authority of the taxpayer's country.
- **Bilateral:** Involves the taxpayer, the tax administration of the host country, and the foreign tax administration.
- **Multilateral:** Involves the taxpayer, the tax administration of the host country, and multiple foreign tax administrations.



- ***Key Benefits***
  - Supplements the **Double Taxation Avoidance Agreement (DTAA)** mechanism for resolving transfer pricing disputes.
  - Promotes ease of doing business, particularly for Multinational Enterprises (MNEs).

- ***About CBDT***
  - **Central Board of Direct Taxes (CBDT) is a statutory body** established under the **Central Board of Revenue Act, 1963.**
  - It operates under the **Department of Revenue, Ministry of Finance.**
  - CBDT **formulates policies** related to the **assessment and collection of direct taxes.**

Foreign Direct Investment (FDI) rules for space sector

Why in News?

- The introduction of the **'Foreign Exchange Management (Non-debt Instruments) (Third Amendment) Rules, 2024'** has brought significant changes to the **Foreign Exchange Management (Non-debt Instruments) Rules, 2019**, impacting Foreign Direct Investment (FDI) in India's space sector.

Key Amendments

- The amendments allow **100% FDI in various segments of the space sector,** including satellites manufacturing and operation, satellite data products, ground segment, user segment, launch vehicles, spaceports creation, and manufacturing of satellite components.
- The amendments specify different sectoral caps and entry routes for FDI in each segment, with some allowing up to 100% FDI through automatic route and others requiring government approval beyond certain thresholds.

Sectoral Cap and Entry Route Amendments

Space Sector	Sectoral Cap	Entry Route
Satellites *- Manufacturing & Operation, Satellite Data Products, Ground Segment & User Segment*	*100%*	***Up to 74%:*** *Automatic* ***Beyond 74%:*** *Government route*
Launch Vehicles and associated systems *or subsystems, Creation of Spaceports for launching and receiving Spacecraft*	*100%*	***Up to 49%:*** *Automatic* ***Beyond 49%:*** *Government route*
Manufacturing of components *and systems/sub-systems for satellites, ground segment, and user segment*	*100%*	***Up to 100%:*** *Automatic*

- ***Need of FDI in Space Sector***
  - **Integration** of Indian companies **into global value chains.**
  - **Attraction of potential foreign investors** in Indian space companies to **enhance the ease of doing business.**
  - FDI inflows can **generate employment opportunities** and contribute to an enhanced share of the global space economy.

India's Tree Cover Declines: Causes, Implications, and Initiatives

Why in News?

- A recent report highlights a **6% decrease in tree cover in India** during the period of 2001-2023, signaling significant environmental changes.

Key Findings

- **Tree cover** refers to **estimated areas comprising of tree patches and isolated trees outside recorded forests,** while **forest cover is defined as areas more than 1 hectare with tree canopy density of 10% and above.**
- Five states, including **Assam, Mizoram, Arunachal Pradesh, Nagaland, and Manipur,** contributed to **60% of all tree cover loss** between 2001 and 2023.
- India observed a net carbon sink of 89.9 million tons between 2001 and 2022.
- **Lakshadweep** has the **largest relative plantation area at 76%.**

Drivers of Tree Cover Loss

- **Deforestation** contributed to **3.3% of tree cover loss** from 2001 to 2022.
- Climate change, particularly extreme heat leading to **wildfires**, has fueled the loss of tree cover, with **Odisha** and **Arunachal Pradesh** experiencing the highest tree cover loss due to fires.

India's Initiatives to Improve Tree Cover

- The **Green India Mission** aims to **increase forest/tree cover by 5 million hectares** and improve the **quality of forest/tree cover on another 5 million hectares** of forest/non-forest lands.
- The **Nagar Van Yojana** focuses on enhancing **green cover in urban and peri-urban areas.**

Global Forest Watch

- Established by the **World Resources Institute (WRI) in 1997**, the **Global Forest Watch (GFW)** is an **online platform that provides data and tools for monitoring forests.**
- It offers near **real-time information** on forest changes worldwide, aiding in global forest conservation efforts.

Predictive AI

Why in News?

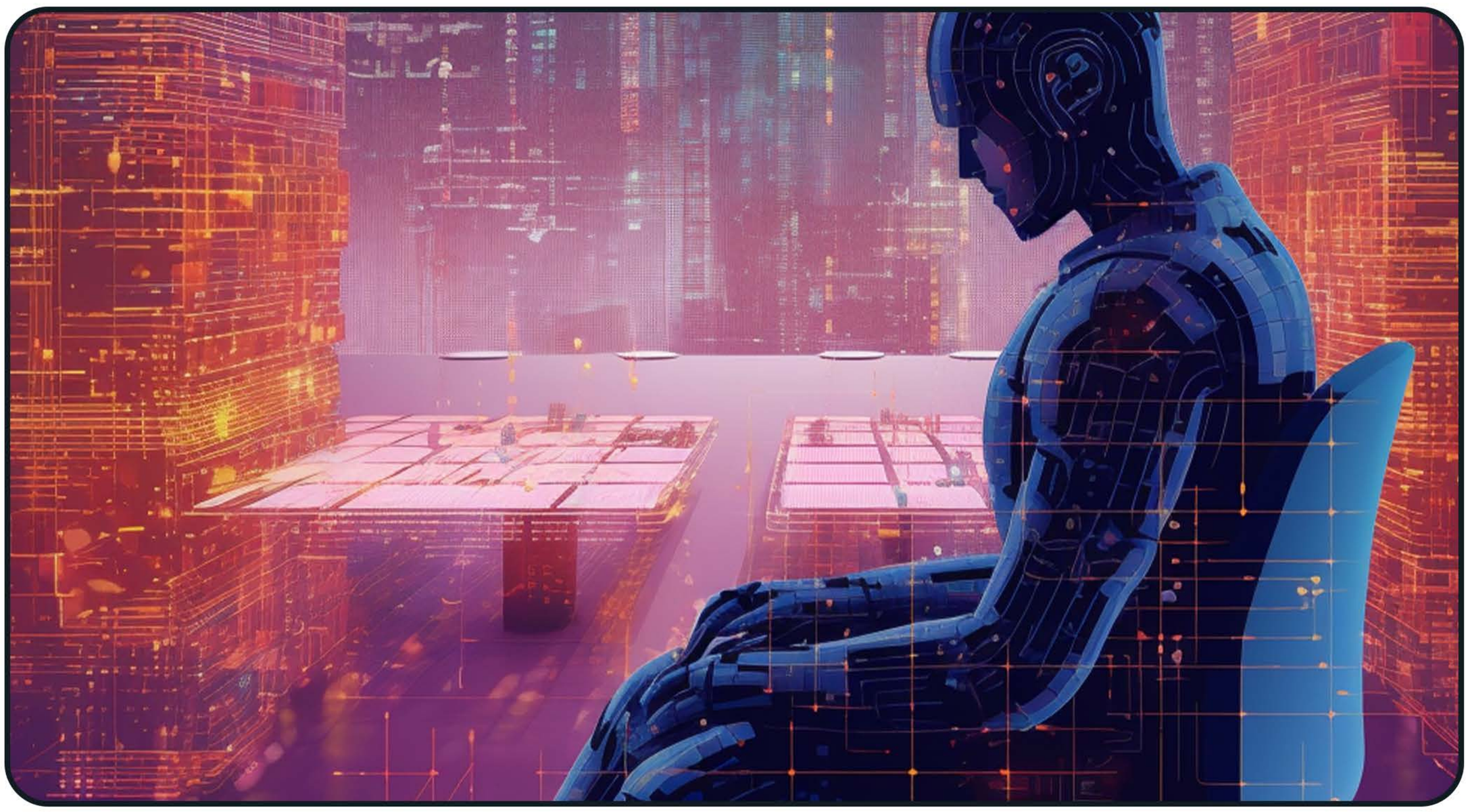
- The emergence of predictive AI is transforming the way businesses analyze data, make decisions, and maintain a competitive edge in their industries.

What is Predictive AI?

- Predictive AI utilizes machine learning to recognize patterns in historical data and forecast future events.
- It transcends traditional data analysis, converting data into predictive assets.
- Organizations leverage predictive AI to anticipate outcomes and market shifts.
- Strategic decisions are made with unparalleled foresight thanks to predictive AI capabilities.

How does Predictive AI Work?

- **Big data:** Accessing extensive data sets is essential.
- **Machine learning (ML):** Applied to vast data collections in predictive AI.
- **Identifying patterns:** Predictive AI examines hundreds or thousands of factors to detect recurring patterns indicative of future events.



- ***Predictive AI Applications***
  - Predictive AI analyzes severe weather events like volcanic eruptions, aiding in predicting disruptions in air travel.
  - Yandex, based in Moscow, has launched an interactive map for real-time monitoring of ash clouds post-eruptions.
  - In oil and gas exploration, predictive AI uses historical geological data to forecast potential drilling locations.
  - Saudi Aramco utilizes predictive AI, such as metabrain generative AI, to analyze drilling strategies and geological data for precise predictions.
  - Predictive AI models are applied in medical research, especially in drug discovery, to foster collaboration and enhance data analysis.

Discovery of Merger GW230529

Why in News?

- **GW230529**, detected by the **LIGO-Virgo-Kagra** collaboration in 2023.
- **Components:** Resulted from the merger of a neutron star and a mystery object within the 'mass gap'.

  Neutron Star: Formed from the collapse of a massive star.

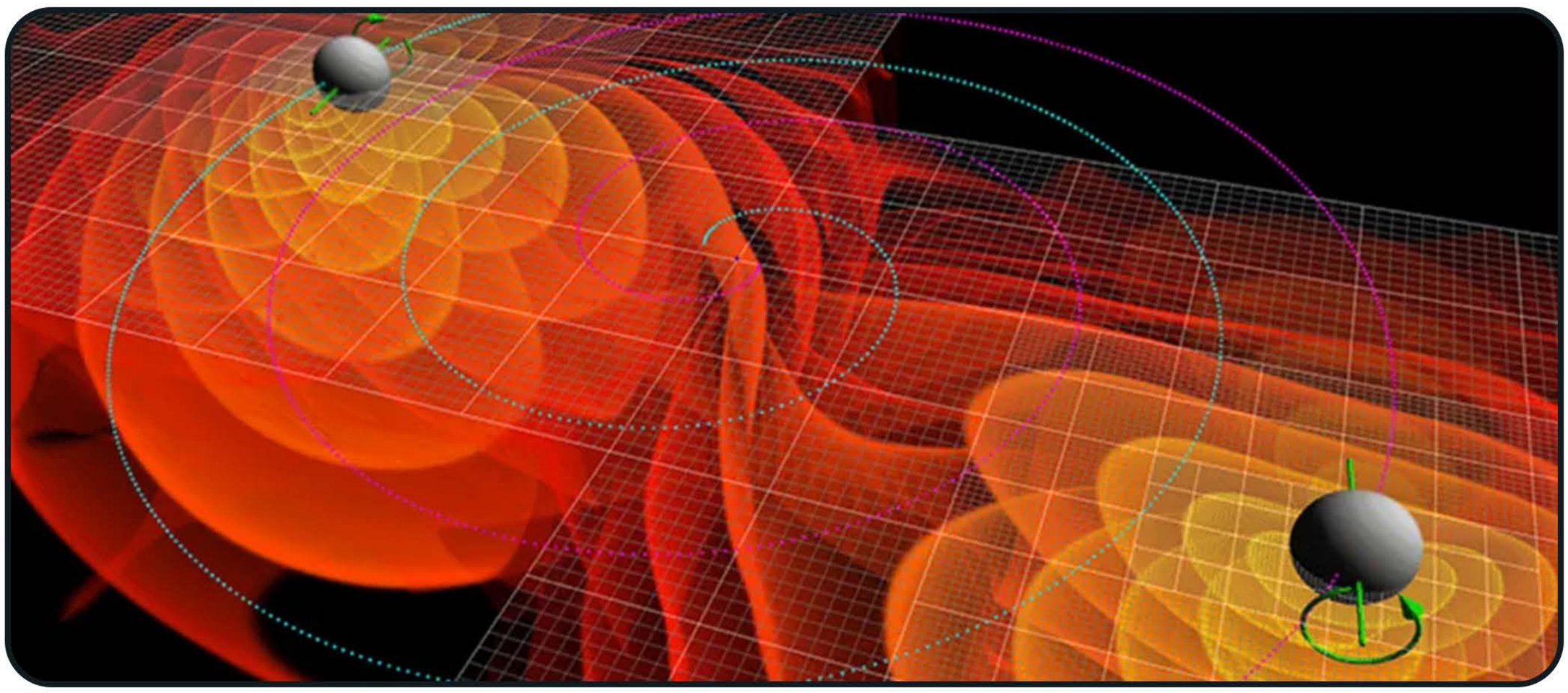
  Mystery Object: Lies within the mass range between the heaviest neutron star and the lightest black hole.

Key Features of Gravitational Waves (GWs)

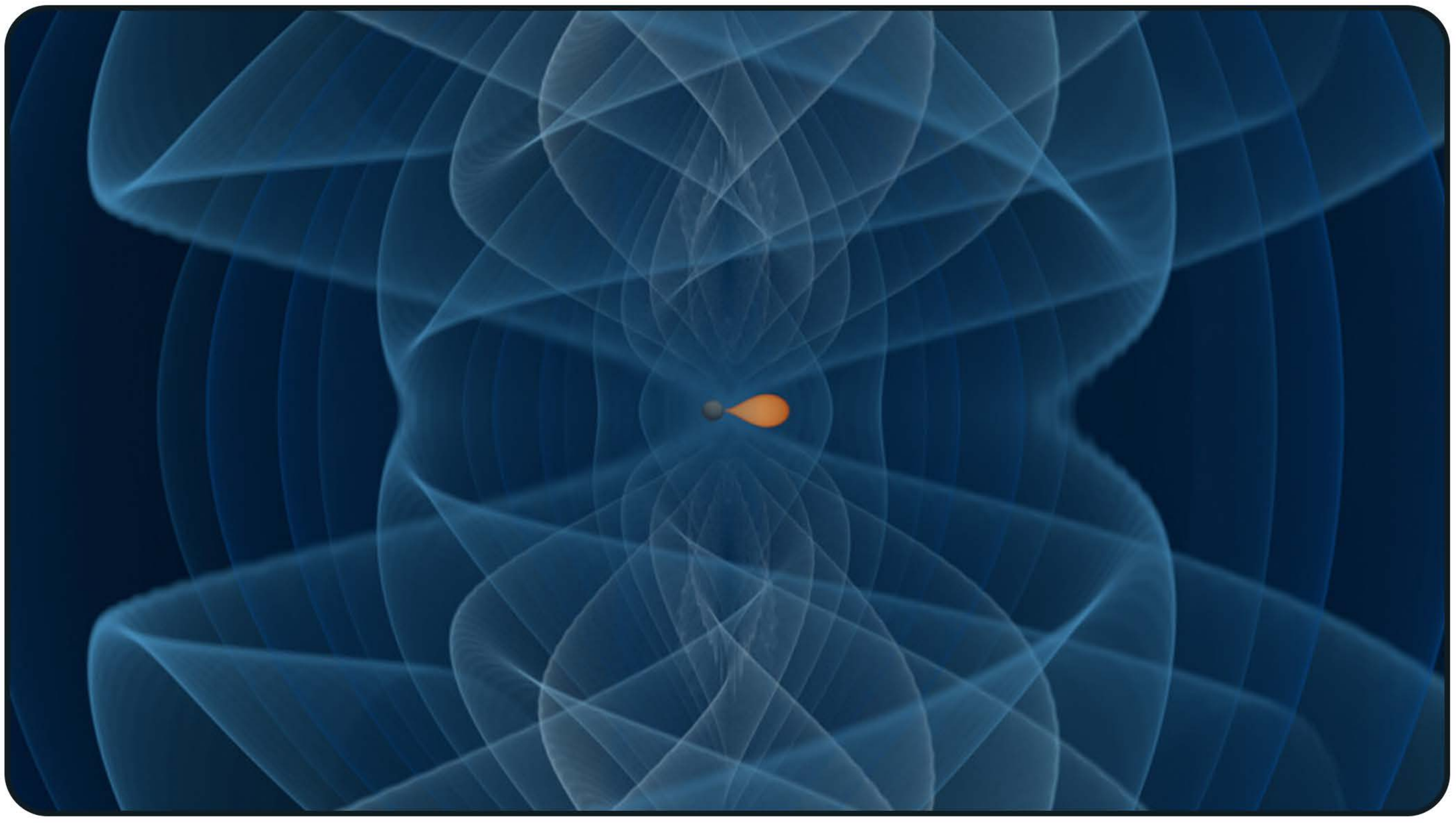
- **Nature:** Ripples in space-time predicted by Einstein's General Theory of Relativity (1916).
- **Propagation:** Travel at the speed of light.
- **Sources:** Produced by cataclysmic events such as colliding black holes, exploding stars, and merging neutron stars.
- **First Detection:** In 2015 at the Laser Interferometer Gravitational-Wave Observatory (LIGO).

Significance of Gravitational Waves

- **Information Carrier:** Carries details about their origins and provides insights into the nature of gravity.
- **Complementary Data:** Offers information about the universe not observable through electromagnetic waves.



- ***About LIGO***
  - **Composition:** Consists of two interferometers with two 4 km long arms each arranged in an "L" shape.
  - **Functionality:** Acts as antennae to detect gravitational waves.
  - **Components:** Includes high-power lasers, precisely figured mirrors, vibration isolation systems, and feedback systems.
  - **Expansion:** LIGO-India, to be constructed by the Department of Atomic Energy (DAE) and the Department of Science and Technology (DST) in Maharashtra.



Jobs for Resilience Report

Why in News?

- The World Bank (WB) cautioned in its 'South Asia Regional Update: Jobs for Resilience report' that the South Asia region, including India, was failing to capitalize on its demographic advantage.

Key Highlights

- The World Bank projected a strong growth of 6.0-6.1% for the South Asia region in 2024-25.
- India's employment growth lagged its working-age population growth from 2000 to 2023.
- India's employment ratio declined significantly up to 2022, except for a 3-percentage point rebound in 2023.
- The Indian economy was expected to achieve robust growth of 7.5% in FY23/24.
- The region could experience 16% higher output growth if the employment rate matched other emerging market and developing economies.
- Weak employment trends in South Asia were primarily observed in non-agricultural sectors.

Suggested Steps

- Job creation and financial market reforms have the potential to stimulate growth, private investment, government revenues, and climate adaptation.
- Institutional quality, competitive real exchange rates, and openness to trade and capital flows are crucial for sustained private investment.
- Public support for adaptation is more effective when guided by comprehensive policies that prioritize "double dividends" and align with non-climate goals.
- Sustaining growth requires increasing employment, especially in non-agricultural sectors and among women, through measures such as removing business obstacles, enhancing trade openness, easing labor market restrictions, improving human capital, and promoting gender equality.

‘Zero Orbital Debris’ Milestone

Why in News?

- ISRO's PSLV-C58/XPoSat mission resulted in virtually zero debris in Earth's orbit.
- The last stage of the PSLV was repurposed into an orbital station called PSLV Orbital Experimental Module-3 (POEM-3).

About POEM

- POEM, developed by the Vikram Sarabhai Space Centre, serves as a cost-effective space platform.
- It utilizes the spent fourth stage of a PSLV rocket as an orbital platform.
- First employed in the PSLV-C53 mission in 2022.

Importance of POEM-3's Milestone

- ISRO's Space Situational Assessment Report 2022 revealed that 2,533 objects were deployed into space through 179 launches in 2022.
- This number marks an increase from the previous year.
- Space debris presents risks to various space assets.
- It also contributes to the 'Kessler syndrome,' where one collision triggers cascading collisions, generating more debris.

- ***Laws on Space Debris***
  - There are currently no international space laws concerning debris in Low Earth Orbit (LEO).
  - However, many space-exploring nations follow the Space Debris Mitigation Guidelines 2002, endorsed by the UN in 2007.

- ***Addressing Space Debris: What Space Agencies are Doing***
  - NASA established its Orbital Debris Program in 1979 to address space debris.
  - The European Space Agency has embraced a 'Zero Debris charter' with the goal of achieving zero space debris by 2030.
  - Japan launched the Commercial Removal of Debris Demonstration (CRD2) to combat space junk.
  - An Indian startup named Manastu Space is developing technologies such as in-space refueling, de-orbiting of old satellites, and satellite life extension.

Artemis Accords: Fostering Peaceful Space Cooperation

About Artemis Accords:

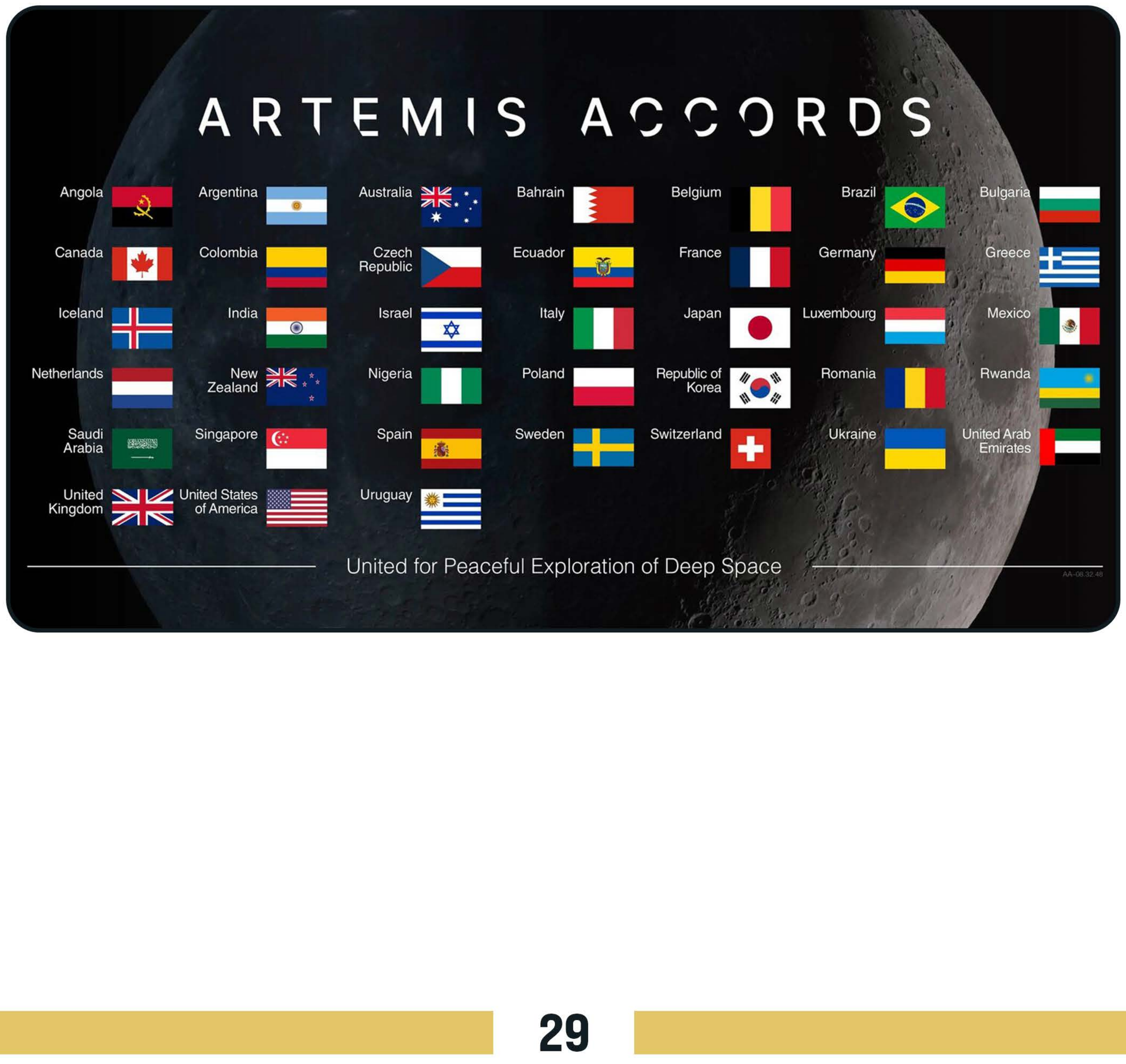
- **Sweden** becomes **38th country** to join Artemis Accords
- **Established in 2020 by NASA and the US Department of State**, along with seven other founding member nations.
- Built upon the principles of the **Outer Space Treaty (OST) of 1967.**
- **Non-binding set of principles** aimed at guiding civil space exploration and use in the 21st century.
- Represents **multilateral leadership in civil space diplomacy,** fostering peaceful cooperation among signatory nations.

Commitments of Signatories:

- **Dissemination of national space policies and scientific information** resulting from space activities.
- Recognition of the development of **interoperable and common exploration infrastructure and standards.**
- Implementation of Memorandums of Understanding (MoUs) between governments or agencies in accordance with the Outer Space Treaty of 1967.
- **Preservation of outer space heritage,** including historic landing sites and evidence of activity on celestial bodies.
- **Mitigation of orbital debris** and ensuring safe and timely disposal of spacecraft at the end of missions.

- ***International Treaties Governing Outer Space:***
  - **Outer Space Treaty (1967):** Provides the basic framework for international space law.
  - **Rescue Agreement (1968):** Addresses the rescue and assistance of astronauts in distress.
  - **Liability Convention (1972):** Holds launching states liable for damage caused by their space objects.
  - **Registration Convention (1976):** Mandates the registration of objects launched into outer space.
  - **Moon Agreement (1979):** Declares the Moon and its resources as the common heritage of humankind. India is a signatory to this agreement.

- ***India's Position:***
  - **India** has **ratified all** the aforementioned treaties **except the Moon Agreement of 1979,** to which it is a **signatory**.



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