DHYEYA IAS
most trusted since 2003

DAILY pre PARE
Current affairs summary for prelims

6 May, 2024

Artificial General Intelligence (AGI)

Context: *During a recent interview, Sam Altman, CEO of OpenAI, reiterated his dedication to investing billions of dollars in the advancement of Artificial General Intelligence (AGI).*

What is AGI?

- AGI, or Artificial General Intelligence, encompasses machines or software capable of performing any intellectual task akin to humans.
- It involves abilities like reasoning, common sense, abstract thinking, background knowledge, and discerning cause and effect.

Difference between AGI and Narrow AI:

- Narrow AI focuses on specific tasks like image recognition or translation, operating within set parameters.
- AGI, however, aims for a broader, generalised intelligence, capable of adapting to diverse tasks similar to human cognition.

History and Concept of AGI:

- Alan Turing's 1950 paper introduced the Turing test, a benchmark for machine intelligence, laying the groundwork for AGI.
- AGI's aspiration for human-like cognitive abilities positions it as the pinnacle of artificial intelligence development.

Potential Applications of AGI:

- In healthcare, AGI could revolutionise diagnostics, treatment planning, and personalised medicine through extensive data analysis.
- In finance and business, it could automate processes and improve decision-making with real-time analytics and market predictions.
- In education, AGI could enable adaptive learning systems tailored to individual student needs, enhancing global access to personalised education.

Concerns and Skepticism Surrounding AGI:

- **Environmental impact:** Developing AGI requires massive computational power, raising concerns about energy consumption and e-waste.
- **Socio-economic implications:** AGI adoption may lead to job displacement, concentration of power, and socio-economic disparity.
- **Security vulnerabilities:** AGI development may introduce unforeseen security risks and outpace regulatory frameworks.

Ethical and Safety Concerns:

- Fear of loss of control: AGI's autonomous capabilities could surpass human comprehension and prediction, posing risks to human well-being.
- Prominent figures like Stephen Hawking and AI pioneers have warned about the existential risks of AGI development.
- Advocates emphasise the need for stringent regulations to ensure AGI aligns with human values and safety standards.

Catatumbo lightning

Context: *There was an article published about it in The Hindu.*

Overview:

- Catatumbo lightning occurs at the mouth of the Catatumbo River where it meets Lake Maracaibo in Venezuela.
- The phenomenon is named after the Bari people's term meaning "House of Thunder."
- It happens for 140 to 160 nights annually, lasting nine hours per day, with lightning strikes ranging from 16 to 40 times per minute.
- The area witnesses the world's highest density of lightning, with 250 strikes per km2.

Location and Mechanism:

- Catatumbo lightning forms between specific coordinates west of Lake Maracaibo, influenced by winds across the lake and surrounding plains.
- Air masses carrying heat and moisture converge with mountain ridges, resulting in thunderstorm activity.
- Lightning occurs predominantly within the clouds, generating significant ozone.

Cause:

- Research suggests multiple epicentres for the lightning, including marshes and western Lake Maracaibo.
- The phenomenon may result from the meeting of cold and warm air currents or the presence of methane from swamps and oil deposits.

- Various atmospheric variables influence the lightning's daily, seasonal, and year-to-year variability.
- **Predictability:** Studies indicate the potential to forecast lightning in the Lake Maracaibo basin months in advance, based on climate modes and atmospheric conditions.

➢ **Historical References:**

- Colonial sources referred to the phenomenon as "Lanterns of Saint Anthony" or the "Lighthouse of Maracaibo."
- Notable explorers like Alexander von Humboldt and Agustin Codazzi documented the lightning in the 19th century.
- The phenomenon is depicted on the flag and coat of arms of the state of Zulia and has cultural significance in the region.

➢ **Cultural Impact:**

- Catatumbo lightning is celebrated in the state anthem of Zulia and has been known for centuries as a navigational guide around Lake Maracaibo.
- Some historical references have been misinterpreted as early literary allusions to the lightning.

Goldene

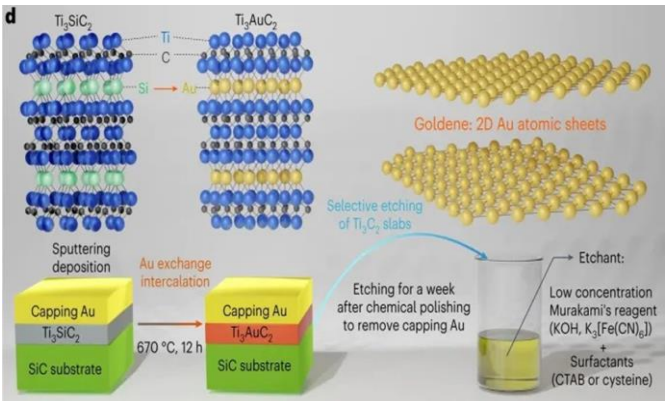
Context: *Researchers have achieved a groundbreaking milestone by producing a single-atom-thick, free-standing sheet of gold, dubbed "golden," akin to graphene.*

➢ **Introduction to Goldene:**

- Goldene is a 2-dimensional allotrope of gold, an ultra-thin material with significant potential in various applications.
- Compared to traditional gold leaf, goldene is remarkably thinner, approximately 400 times thinner than the thinnest commercial gold leaf.

➢ **Synthesis of Goldene:**

- Researchers at Linköping University synthesised goldene in 2024 by incorporating gold atoms into a material containing silicene between layers of titanium carbide.
- Gold atoms replaced silicon in the structure, creating a single layer of gold atoms.
- The process involved etching away the titanium carbide layers using Murukami's reagent, a traditional Japanese chemical technique, to release free-standing goldene sheets.



➢ **Properties of Goldene:**

- Goldene exhibits a lattice contraction of 9% compared to bulk gold.
- It displays an increase in the binding energy of gold atoms and acts as a semiconductor, with specific electronic properties making it suitable for various applications.
- This material represents the first free-standing 2D metal, offering exciting possibilities for future research and development.

➢ **Comparison with Graphene and Challenges:**

- Forming 2D allotropes of metals, including gold, has historically been challenging due to the tendency of metal atoms to form nanoparticles rather than nanosheets.
- Unlike graphene, which is composed of carbon atoms, creating 2D metallic sheets has posed unique difficulties.

➢ **Potential Applications of Goldene:**

- Goldene holds promise in revolutionizing the electronics industry by offering a more economically viable alternative to traditional gold.
- Its potential as a catalyst could lead to advancements in various fields such as carbon dioxide conversion, hydrogen generation, and water purification.
- The technique used to create goldene may also be applicable to other metallic materials, expanding the scope of 2D metal research.

➢ **Future Research and Development:**

- Researchers are exploring the synthesis of 2D sheets of other metals like iridium and platinum using similar methods.
- The unique properties of goldene, including its atomic arrangement and thinness, suggest a wide range of potential applications yet to be fully explored.

DHYEYA IAS
most trusted since 2003

DAILY pre PARE
Current affairs summary for prelims

6 May, 2024

NEWS IN BETWEEN THE LINES

Kolleru Lake

Recently, the Kolleru Lake in Eluru district of Vijayawada has dried up, revealing its barren state amidst a harsh summer.

About Kolleru Lake:

- Kolleru Lake is a natural **freshwater lake in Andhra Pradesh**.
- This lake is situated **between the Krishna and Godavari river deltas**.
- It is **one of the largest freshwater lakes** in India and the **largest shallow freshwater lake in Asia**, covering 308 square kilometers.
- The lake is a vital habitat for around 20 million residents and many migratory bird species, including **Siberian cranes**, ibis, **painted storks** and grey pelicans.
- In **1999**, the lake was **designated a Wildlife Sanctuary** under India's Wildlife Protection Act of 1972 and in **2002, the Ramsar Convention** recognized the Kolleru Lake wetland as a Wetland of International Importance.
- The lake is a natural **flood-balancing reservoir for the Krishna and Godavari rivers** and is fed by the seasonal Budameru and Tammileru streams.
- It's connected to the Krishna and Godavari systems by more than 68 channels and drains.

Paliyar Tribe

Recently, a study on Paliyar Tribals in Kodaikanal and Theni areas of Tamil Nadu found no government job placements for any of the 1,173 families in 36 villages. The State government is urged to promptly uplift Paliyar tribes and other Adivasi communities.

About Paliyar Tribe:

- The Paliyar tribe is one of several **indigenous communities** residing in **Tamil Nadu** and **Kerala**.
- Historically known by various names such as **Paliyans**, **Pazhaiyarares** and **Panaiyars**, they have inhabited the regions surrounding the Western Ghats.
- They are believed to be indigenous to the Palani hills, which are located near Kodaikanal.
- They **speak Tamil** and **use the Tamil script for communication.**
- They were historically described as **hunters** and **gatherers**, but today engage in activities such as trading forest products, **cultivation**, **beekeeping** and occasional wage labour.
- They have a **unique system of governance** within their groups, with **committees headed by leaders** who value collective decision-making.
- They **preserve water sources** and only utilize resources according to their needs, **using ethnomedicines** derived from forest flora for healing.
- They offer prayers to the **Vanadevadai** in the interior forest and **worship the god Karuppan** by visiting a remote area of the forest with their families.
- They also **do not burn dead bodies**.

Koothandavar Festival

The Koothandavar festival of Koovagam in Tamil Nadu is an important celebration of transgender culture with rituals depicting marriage and widowhood.

About Koothandavar Festival:

- The Koothandavar festival is **held annually in Koovagam, Tamil Nadu**, during the Tamil month of Chithirai, which spans from **mid-April to mid-May**, covering duration of 18 days.
- Koovagam serves as a **focal point for transgender** celebrations.
- **Rooted in Tamil Mahabharata** lore, the festival commemorates the **sacrifice of Aravan**, who offered himself for the victory of the **Pandavas in war,** eventually leading to **Lord Krishna marrying Aravan** in the **form of Mohini.**
- Transgender women participate in symbolic rituals**, dressing as brides on the 17th day,** where priests of the Koothandavar temple tie thaalis (sacred yellow threads) around their necks.
- On the final day, parts of the Koothandavar idol are brought from different parts of Tamil Nadu and assembled, followed by a ceremonial procession on a chariot, during which transgender women perform the **traditional kummi dance**.

	▪ The culmination of the festival involves priests **breaking the bangles** and **cutting the thaalis** of transgender women, **symbolizing the death of Lord Koothandavar** and eliciting sorrowful emotions among the participants.
Crimean Peninsula 	*Recently, the Russian defence ministry revealed that its air defence forces shot down four US-produced long-range missiles over the Crimea peninsular, weapons known as Army Tactical Missile Systems (ATACMS) that Washington has shipped to Ukraine in recent weeks.* **About Crimean Peninsula:** ▪ The Crimean Peninsula is a peninsula in **Eastern Europe** that is located on the **Black Sea's northern coast**. ▪ It is almost entirely surrounded by **the Black Sea** and the **Sea of Azov,** and is connected to mainland Ukraine by the **Isthmus of Perekop**. ▪ The peninsula has historical and cultural ties to both **Russia and Ukraine.** ▪ In **1768**, **Catherine the Great of Russia captured Crimea** to increase her nation's power in the East and it became part of the Russian Empire. ▪ In **1954**, Crimea was transferred from the **Russian Soviet Federative Socialist Republic** to the Ukrainian Soviet Socialist Republic within the Soviet Union. ▪ After the Soviet Union dissolved in **1991**, **Crimea became part of an independent Ukraine.** ▪ Russia and Ukraine dispute ownership of the Crimean territory, but **Crimea is currently under Russian administration.** ▪ The Russian government has argued that most of the people in Crimea are of Russian origin.
Place in News **Sweden**	*Recently, India and Sweden convened the seventh session of Foreign Office Consultations in Stockholm.* **Sweden (Capital: Stockholm)** **Location:** Sweden is located in Northern **Europe** on the Scandinavian Peninsula. **Boundaries:** Sweden shares its borders with **Finland** (East), **Norway** (West and North) and the **Baltic Sea** and **Gulf of Bothnia** (South and East). **Physical Features:** ▪ The lowest elevation in Sweden is in the bay of **Lake Hammarsjön**, near Kristianstad. ▪ **Kebnekaise** is the highest point in Sweden. ▪ **Öland** is the second-largest Swedish island and the smallest of the traditional provinces of Sweden

POINTS TO PONDER

- What is the name of the online portal launched by the Pension Department for tracking pension payments and sanctions for government retirees? **– Bhavishya portal**
- With which African country did NPCI's overseas arm sign an agreement to develop a UPI-like instant payment system? **– Namibia**
- Where was the event titled “Localizing the SDGs: Women in Local Governance in India Lead the Way” organized? **– New York**
- Who received the ‘Green Oscar’ Whitley Gold Award 2024 for safeguarding the endangered Hargila or Greater Adjutant Stork? **– Purnima Devi Barman**
- According to the recently released OECD report, what is the expected growth rate of India’s economy in 2024-25? **– 6.6%**