DAILY CURRENT AFFAIRS 04-10-2025

GS-1

1. **Thumri Music**
2. **Niger River**

GS-3

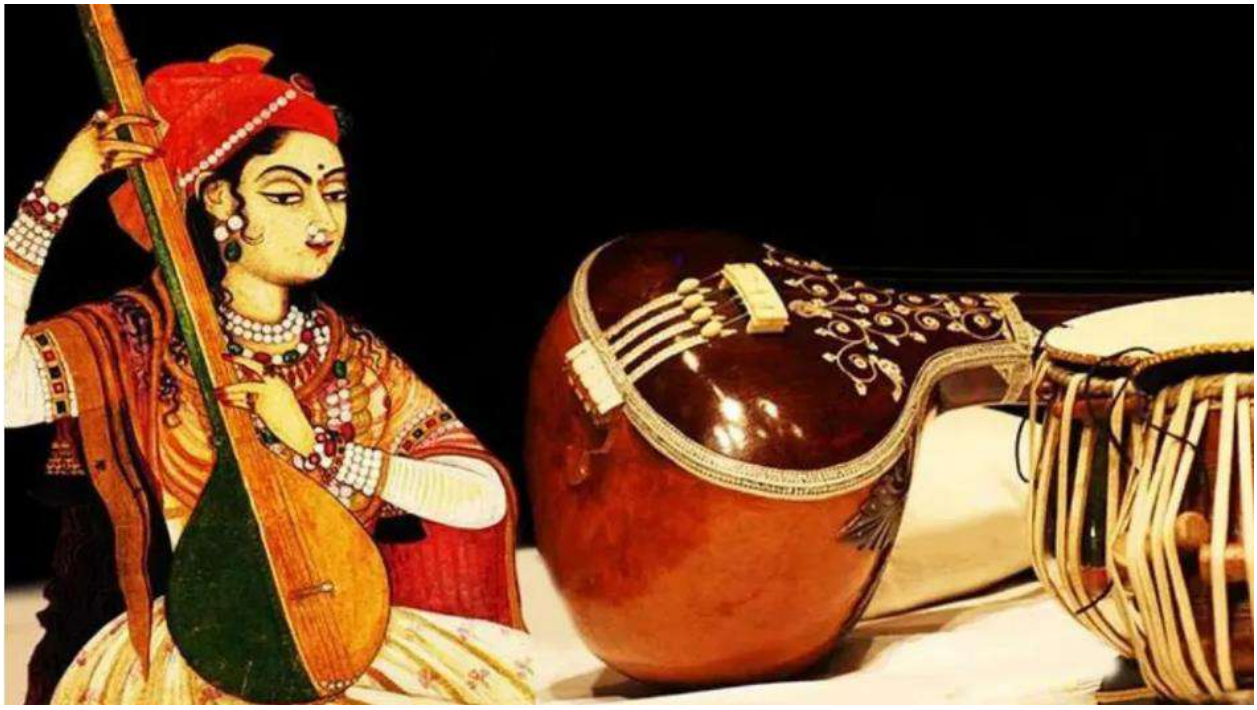
3. **False Smut Disease**
4. **Interstellar Mapping and Acceleration Probe (IMAP)**
5. **Dendritic Nanotubes (DNTs)**

Thumri Music

Syllabus: GS-1; Art & Culture

Context

- **Recently,** The world of Thumri lost a towering voice with the demise of **Pandit Chhannulal Mishra (1936–2025)**, Padma Vibhushan awardee, and one of the last great exponents of the *Purab Ang* of the **Banaras Gharana**.



About Thumri Music

- **Definition**: A semi-classical vocal form of Hindustani music, often called the *"lyric of Indian classical music"*.
- **Origin**: Developed in the **18th century CE** in **Eastern Uttar Pradesh (Lucknow & Benares)** by **Sadiq Ali Shah**.
- **Themes**:
  - Love, longing, and separation.
  - Radha-Krishna devotion.
- **Language**: Sung mainly in **Braj Bhasha, Awadhi, Hindi dialects**, with touches of **Urdu & Sanskrit**.
- **Distinct Feature**:
  - Emphasis on **bhava (emotion)** over rigid raga rules.
  - Freedom in **improvisation**.

- **Associated Dance**: Linked closely with **Kathak**, enriching narrative expression.
- **Folk Influences**: Incorporates elements of **Hori, Kajri, Dadra, Jhoola, Chaiti**.

Types of Thumri

1. **Purbi Thumri (Eastern/Slow tempo)**
    a. Emotional and lyrical.
    b. Associated with **Banaras Gharana**.
2. **Punjabi Thumri (Fast tempo)**
    a. Lively, energetic.
    b. Linked with **Patiala Gharana**.

Major Gharanas of Thumri & Exponents

- **Banaras Gharana**: Girija Devi, Rasoolan Bai, Siddheshwari Devi, **Chhannulal Mishra**.
- **Lucknow Gharana**: Known for courtly refinement under Nawabs, Begum Akhtar.
- **Patiala Gharana**: Vibrant style with rhythmic variations.

Niger River

Syllabus: GS-1; Geography- Mapping

Context

- A recent boat accident on the Niger River in north-central Nigeria killed at least 26 people.

About Niger River

- **Principal river of Western Africa**.
- **Length**: 4,200 km → 3rd longest river in Africa (after Nile & Congo).
- **Nickname**: *"Boomerang River"* (due to its serpentine shape).

Course

- Source: Guinea (just 240 km from the Atlantic Ocean).
- Initially flows *away from the ocean* into the Sahara Desert.
- Makes a sharp eastward bend near **Timbuktu (Mali)**.
- Flows through **Mali → Niger → Benin → Nigeria**.

- Empties into the **Atlantic Ocean (Gulf of Guinea)** via the **Niger Delta**.

Niger Delta

- Located in **southern Nigeria**.
- Largest river delta in Africa.
- Contains the **5th largest mangrove forest** on Earth.

Key Features

- Passes through diverse **vegetational zones**: grasslands, rainforests, swamps.
- **Niger River Basin**: Covers ~7.5% of Africa.
- **Main tributary**: Benue River.
- **Niger Bend**: Northern section, crucial as nearest major water source to Sahara Desert.
- **Major cities** along river: **Bamako (Mali), Niamey (Niger), Onitsha (Nigeria)**.

False Smut Disease

Syllabus: GS-3;Agriculture

Context

- The paddy crop in Punjab, at the maturing and harvest stage, has been widely affected by **false smut disease**, causing significant damage.

About False Smut Disease

- False smut, also called **haldi rog**, is an important fungal disease of rice (paddy).
- Caused by the fungus **Ustilaginoidea virens**.
- Also known as **Lakshmi disease** or **Oothupathi disease** of rice.
- Infection occurs during the **flowering stage**; symptoms appear after rice panicles emerge.
- **Typical symptoms:** Black fungal mycelium growth on grains, which are covered by yellow fungal growth in the field.
- **Spore coloration:** Mature spores are orange and turn yellowish green or greenish black.
- Usually, only a few grains in a panicle are infected; the rest remain normal.
- It **does not directly affect other plant parts**.
- Causes **chalkiness of grains**, reducing grain weight and seed germination.
- **Yield loss** depends on the percentage of infected panicles and extent of infection per panicle.

Favorable Conditions

- **Warm and humid weather:** Temperatures between 25–30°C and high humidity (>80%) promote fungal growth.
- **Infected plant debris:** Spores survive on leftover stubble and straw from previous harvests.
- **High nitrogen content in soil:** Excessive nitrogen increases susceptibility.

Management & Challenges

- Fungicide application can **control false smut**, but overuse has led to **resistance in the fungus** and environmental pollution.
- Continuous rains in Punjab prevented timely fungicide sprays, **worsening the outbreak**.

Interstellar Mapping and Acceleration Probe (IMAP)

Syllabus: GS-3; Science & Technology

Context

- NASA recently launched IMAP to study how solar particles are energized and how the heliosphere shields the solar system.

Location:

- Stationed at the **Earth-Sun L1 Lagrange point**, ~1 million miles from Earth toward the Sun.

Objectives:

- Map the **heliosphere's boundary**.
- Trace **energetic particles** from the Sun.
- Support **real-time space weather monitoring** to protect satellites and astronauts.
- Understand **fundamental cosmic physics** at both tiny and large scales.
- Determine **basic cosmic building blocks** of the universe.
- Improve forecasting of **solar wind disturbances** and **particle radiation hazards**.
- Draw a picture of our **nearby galactic neighborhood**.

Heliosphere:

- A vast bubble created by the Sun's solar wind that encapsulates the solar system.
- Acts as a shield against **cosmic rays**, protecting life on Earth.

Components & Instruments:

- Equipped with **10 scientific instruments** for different space phenomena.
- Key instruments: **Energetic neutral-atom detectors** – IMAP-Lo, IMAP-Hi, IMAP-Ultra (capture neutral atoms that were once charged ions).
- Other instruments measure **charged particles, magnetic fields, interstellar dust, and solar-wind structures**.

Significance:

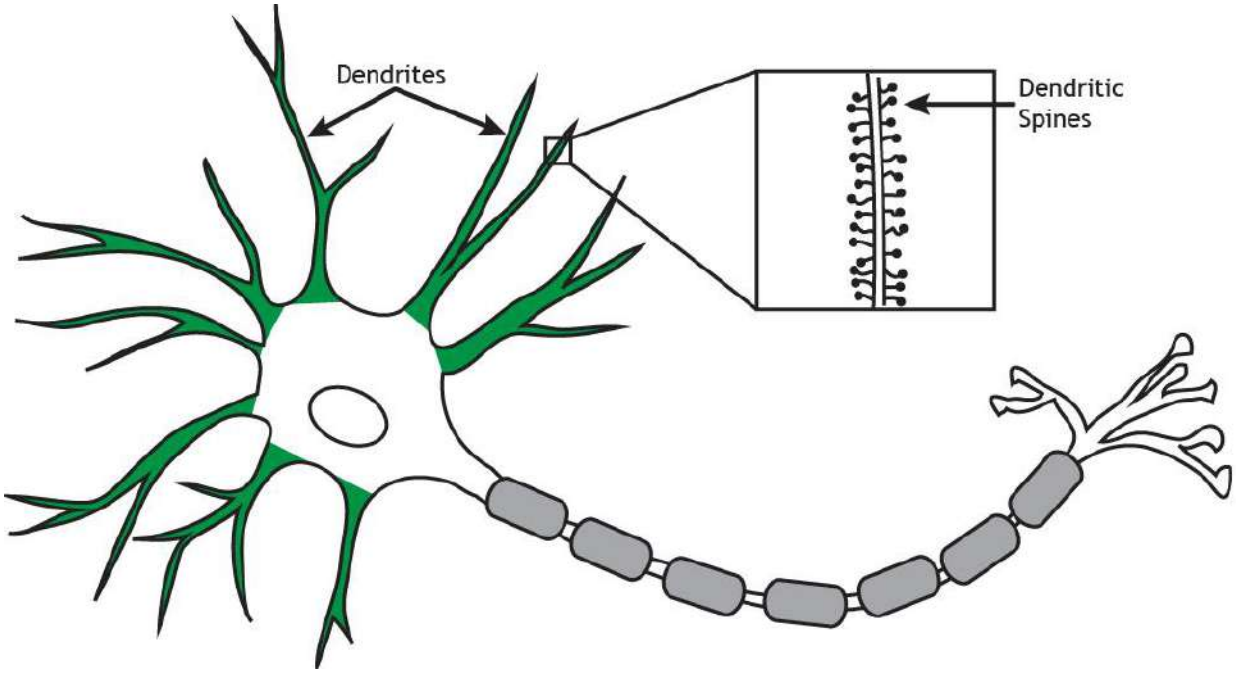
- Supports **near real-time monitoring** of solar wind and space weather.
- Helps scientists better understand how the heliosphere **protects life on Earth**.

Dendritic Nanotubes (DNTs)

Syllabus: GS-3; Science & Technology

Context

- Recently, researchers identified dendritic nanotubes (DNTs) in mice and human brains.



- DNTs connect dendrites of neurons directly, forming a hidden network.
- They allow transfer of electrical signals and proteins, including amyloid-beta linked to Alzheimer's disease.
- This is a new form of neuron-to-neuron connection beyond synapses.

Importance of the Discovery

- Shows a new dimension of neuronal communication, not limited to synapses.
- DNTs may spread pathogenic proteins like amyloid-beta, tau, and alpha-synuclein, possibly explaining progression of neurodegenerative diseases.
- Could contribute to brain network resilience and plasticity.
- May change how connectomes and computational brain models are built.

Neuron Basics

- Dendrites receive incoming signals.

- Soma (cell body) integrates signals.
- Axon carries impulses away from the cell body.
- Axon terminals release neurotransmitters at synapses.
- Traditionally, neurons communicate at synapses, but DNTs add an extra route for direct communication.

Relation to Previous Research

- Tunneling nanotubes (TNTs) were earlier observed in immune and other cells for transferring vesicles and organelles.
- The new discovery shows a neuron-specific version of nanotubes, called dendritic nanotubes (DNTs).
- These may be more specialized and stable compared to TNTs.

Limitations and Open Questions

- How common are DNTs across brain regions and species is still unknown.
- More structural imaging is needed to confirm their presence in humans.
- Functional role in real-life brain activity needs deeper validation.
- Unclear how DNTs are formed, maintained, or removed in the brain.
- They might allow both helpful and harmful transfers between neurons.
- Targeting DNTs for therapy could affect both disease and normal brain processes.