



DAILY CURRENT AFFAIRS 27-04-2024

GS-2

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GS-3

2. IBD cases
3. Artemis Accords
4. 'Sleeping giant' black hole
5. Forth global mass coral bleaching triggered

SC declines petition to end collegium, revive NJAC

Syllabus: GS-2: Indian Judiciary – Structure and functioning.

Context:

- *The Supreme Court Registry declined to accept a petition aiming to abolish the Collegium system for judicial appointments and reinstate the National Judicial Appointments Commission (NJAC).*
- *The decision aimed to prevent unnecessary consumption of judicial resources.*

What is the Collegium System?

- *It's a method for **appointing and transferring judges.***
- *It developed through judgments of the Supreme Court rather than being established by an Act of Parliament or a provision of the Constitution.*

Evolution of the System:

First Judges Case (1981):

- *Stated that the Chief Justice of India's (CJI) recommendation for judicial appointments and transfers could be rejected with "**cogent reasons.**"*
- *This decision gave the Executive (government) superiority over the Judiciary in these matters for the next 12 years.*

Second Judges Case (1993):

- *Introduced the Collegium system, interpreting "consultation" to mean "concurrence."*
- *Decided that it wasn't just the CJI's individual opinion but an institutional one formed in consultation with the two most senior judges in the Supreme Court.*

Third Judges Case (1998):

- *Expanded the Collegium to a **five-member body**, including the CJI and four of his senior-most colleagues, in response to a reference from the **President under Article 143 of the Constitution.***

Leadership in the Collegium System:

- *The Supreme Court collegium is led by the Chief Justice of India and includes the four other most senior judges of the court.*
- *A High Court collegium is headed by the Chief Justice of that court and includes two other senior-most judges.*

Appointment Process:

- *Judges of the higher judiciary are appointed solely through the collegium system.*
- *The government's involvement occurs only after the collegium has decided on names.*

Issues with collegium system:

Exclusion of Executive:

- *The complete exclusion of the executive from the judicial appointment process results in a system where a select few judges appoint others in total secrecy.*
- **Lack of accountability** to any administrative body may lead to the selection of the wrong candidates while overlooking suitable ones.

Chances of Favouritism and Nepotism:

- *The collegium system lacks specific criteria for evaluating candidates for the post of Chief Justice of India (CJI), increasing the potential for **nepotism and favoritism**.*
- **Non-transparency** in the judicial system due to the collegium system is detrimental to maintaining law and order in the country.

Against the Principle of Checks and Balances:

- *The collegium system violates the principle of checks and balances by giving the judiciary excessive power without adequate oversight.*
- *This undermines the balance between the three branches of government in India.*

Close-Door Mechanism:

- *Critics argue that the collegium system lacks transparency, with no public knowledge of when or how a collegium meets or makes decisions.*
- *There are no official records or minutes of collegium proceedings, further contributing to the perception of secrecy.*

Unequal Representation:

- *Women are significantly underrepresented in the higher judiciary, raising concerns about diversity and equal representation within the system.*

Attempted Reform:

- *The government tried to replace the collegium system with a '**National Judicial Appointments Commission**' (through the **Ninety-ninth Amendment Act, 2014**).*
- *However, the Supreme Court struck down this attempt in 2015, citing concerns about its impact on judicial independence.*

Way Forward:

- *Filling judicial vacancies is an ongoing process that requires collaboration between the executive and judiciary, without strict timeframes.*
- *There's a need to consider establishing a permanent, independent body to institutionalize the appointment process, ensuring judicial independence while incorporating adequate safeguards.*
- *This body should guarantee judicial primacy while avoiding judicial exclusivity.*
- *It must prioritize independence, diversity, professional competence, and integrity in its functioning.*

IBD cases

Syllabus: GS-3; General Science – diseases.

Context:

- *The increasing prevalence of **Inflammatory Bowel Disease (IBD)** globally is raising concerns among medical experts.*

Global Trends in Inflammatory Bowel Disease (IBD):

- *Incidence of IBD is increasing globally, especially in **North America and Western Europe**.*
- *Expected rise in prevalence from 0.5% to 0.6% in the United States.*
- *Increase in early onset cases, particularly in individuals under 18.*
- *Difficulty in diagnosing **Crohn's disease** in India due to similarities with **intestinal tuberculosis**.*

Contributing Factors in India:

- *Lifestyle changes, like adopting a Westernized diet high in fat, sugar, and processed foods.*
- *Environmental factors and lifestyle changes contributing to a nearly doubled incidence of IBD in India from 1990 to 2019.*

About Inflammatory Bowel Disease (IBD):

- *Chronic inflammatory conditions affecting the gastrointestinal (GI) tract.*
- *Differs from **Irritable Bowel Syndrome (IBS)** as it involves inflammation.*
- *Includes Crohn's disease and ulcerative colitis, both immune-mediated diseases involving dysregulated immune responses.*

- *Interaction between genetic factors, external environment, and gut bacteria contributes to the disease.*

Types of IBD:

- **Crohn's Disease:** *Can affect any part of the GI tract, often involving deeper layers of the intestinal wall.*
- **Ulcerative Colitis:** *Primarily affects the colon and rectum, causing inflammation and ulcers on the inner lining of the colon.*

Symptoms of Inflammatory Bowel Disease:

- *Vary depending on type and severity of inflammation.*
- *Include abdominal pain, cramping, diarrhea (sometimes bloody), rectal bleeding, weight loss, fatigue, fever, reduced appetite, and urgent need to have a bowel movement.*

Causes and Risk Factors:

- *IBD's exact cause is unknown but likely involves **genetics, environment, and immune factors.***
- *Risk factors include family history, smoking, certain medications, and environmental factors like diet and stress.*

Diagnosis and Delay:

- *Diagnosis may be delayed, especially in young people, due to symptom overlap with other conditions like Irritable Bowel Syndrome.*
- *Diagnosis requires a thorough evaluation, including physical examination, lab tests, and endoscopy.*

Treatment:

- *Treatment has advanced, including biological therapies targeting inflammation and oral small molecules.*
- **Biological therapy** *reduces hospital stays and surgeries, improving disease management.*
- *Medications aim to reduce inflammation, control symptoms, and achieve remission, including anti-inflammatory drugs, immunomodulators, and biologic therapies.*
- *Dietary and lifestyle changes, like avoiding trigger foods, staying hydrated, and exercising, may help some individuals.*

Complications:

- *Complications may include bowel obstruction, fistulas, abscesses, malnutrition, and colon cancer (especially in long-standing ulcerative colitis cases).*

Artemis Accords

Syllabus: GS-3: Science and Technology – Space science.

Context:

- *Slovenia signs NASA's Artemis Accords for cooperative space exploration.*

What are Artemis accords?

- *The Artemis Accords are established by the **U.S. State Department and NASA along with seven other founding members: Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, and the United Kingdom in 2020.***
- *Their purpose is to **set common principles governing the civil exploration and use of outer space, including the Moon, Mars, comets, and asteroids, for peaceful purposes.***
- *They build upon the foundation of the **Outer Space Treaty of 1967.***
- *The Outer Space Treaty, a multilateral pact under the United Nations, forms the basis of international space law.*
- *The treaty emphasizes space as a shared resource for humanity, prohibits national appropriation, and promotes the peaceful use of space.*

Commitments under the Accords:

Commitment	Description
<i>Peaceful Purposes</i>	<i>Conduct space activities for peaceful purposes in accordance with international law, implementing MOUs between governments or agencies.</i>
<i>Common Infrastructure</i>	<i>Acknowledge the importance of common exploration infrastructure to enhance scientific discovery and commercial utilization.</i>
<i>Registration and Data Sharing</i>	<i>Register relevant space objects and openly share scientific data in a timely manner. Private sectors are exempt unless acting on behalf of a signatory.</i>
<i>Preservation Heritage</i>	<i>of Preserve historic landing sites, artifacts, and evidence of activity on celestial bodies.</i>
<i>Utilization of Space Resources</i>	<i>Ensure utilization of space resources supports safe and sustainable activities without interfering with other signatories' activities. Share information to prevent interference.</i>
<i>Mitigation of Debris</i>	<i>Plan for the safe disposal of spacecraft and limit the generation of</i>

Commitment	Description
	<i>harmful debris.</i>

Missions under Artemis Program:

Artemis-I: Unmanned Mission to the Moon

- *Launched the spacecraft "Orion" on the Space Launch System (SLS) from NASA's Kennedy Space Center on November 16, 2022.*
- *The SLS carried Orion directly to the moon on a single mission.*

Artemis-II: Crewed Lunar Flyby Mission

- *Scheduled for 2024, it will be the first crewed mission under the Artemis program.*
- *Four astronauts will be aboard the SLS, performing maneuvers on an expanding orbit around Earth.*
- *The mission will involve a lunar flyby before returning to Earth.*

Artemis-III: Human Return to the Moon

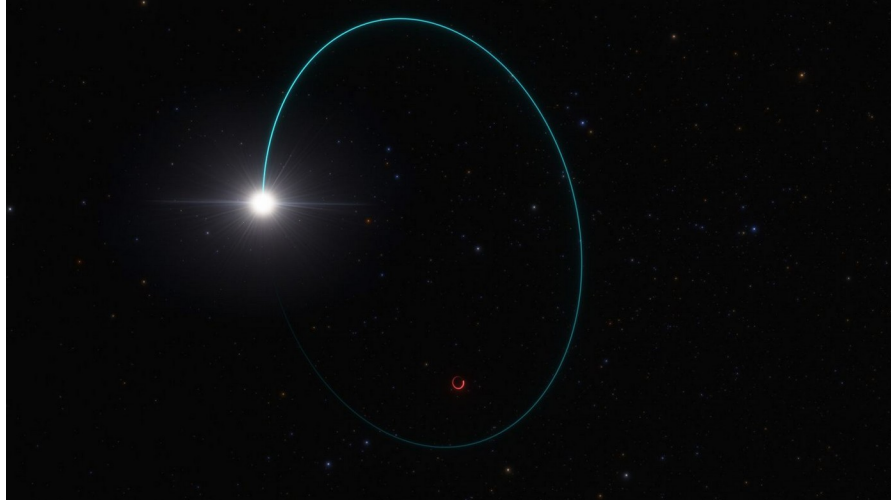
- *Set for 2025, this mission marks a significant milestone in human space exploration.*
- *Astronauts will land on the lunar surface, going beyond the lunar flyby of Artemis-II to study the moon extensively.*
- *Establishment of Lunar Gateway Station*
- *Planned for 2029.*
- *This station will serve as a docking point for astronauts and facilitate scientific research and experiments.*

'Sleeping giant' black hole

Syllabus: GS-3: Science and Technology.

Context:

- *Astronomers found the most massive known stellar black hole in the Milky Way.*
- *Named "Gaia BH3," it's located in the **Aquila constellation**, 1,926 light-years away.*
- *It's nearly 33 times the mass of our sun, making it the second-closest known black hole to Earth.*



Observational Technique

- *Discovered through observations from the **European Space Agency's Gaia space telescope.***
- *Detected an unusual wobble caused by Gaia BH3's gravitational influence on a nearby companion.*
- *This wobble indicated an orbital dance between the black hole and a nearby giant star.*

Characteristics of Dormant Black Holes

- *Many "dormant" black holes are difficult to spot because **they lack a companion star to siphon material from.***
- *Black holes that interact with companion stars emit bright **X-rays**, making them easier to detect.*

Supermassive vs. Stellar Black Holes

- *The title for the most massive black hole in our galaxy belongs to **Sagittarius A***, a supermassive black hole at the Milky Way's center.*
- *Supermassive black holes, like Sagittarius A*, are much larger than stellar black holes and form differently.*
- *Stellar black holes, such as Gaia BH3, form from the collapse of massive stars.*

Gaia BH3

- *Gaia BH3 is the most massive known stellar black hole in our galaxy.*
- *It has a mass nearly 33 times that of the sun and is located in the Aquila constellation, 1,926 light-years away.*
- *Previously, the largest known stellar black hole was Cygnus X-1, which is 21 times the mass of the sun.*

Formation and Characteristics

- *Gaia BH3's discovery sheds light on the **link between high-mass black holes and metal-poor stars.***
- *High-mass black holes, like Gaia BH3, likely form from metal-poor stars that collapse.*
- *Metal-poor stars contain mainly **hydrogen and helium**, retaining more mass throughout their lifetimes.*

Research Impact

- *The discovery of Gaia BH3 allows astronomers to study the colossal black hole and uncover more secrets.*
- *Gaia's ongoing data release, scheduled for late 2025, is expected to further enhance understanding of black holes and stellar evolution.*

Feature	Supermassive Black Holes	Stellar Black Holes
Size	<i>Much larger, with masses ranging from millions to billions of times that of the sun</i>	<i>Smaller, with masses typically ranging from a few to several dozen times that of the sun</i>
Formation	<i>Formed at the centers of galaxies, including our Milky Way</i>	<i>Formed from the collapse of massive stars</i>
Location	<i>Found at the center of galaxies, such as Sagittarius A* in the Milky Way</i>	<i>Scattered throughout galaxies, including our Milky Way</i>
Origin of Material	<i>Accumulate material from surrounding stars, gas, and dust</i>	<i>Formed from the remains of massive stars</i>
Observable Effects	<i>Influence the orbits of stars and emit powerful radiation when consuming nearby material</i>	<i>Emit X-rays when siphoning material from companion stars</i>
Research Interest	<i>Studying their formation, evolution, and impact on galaxy formation and dynamics</i>	<i>Understanding stellar evolution, black hole mergers, and their role in galaxy ecosystems</i>

About Black Hole

- *Black holes are regions of spacetime where gravity is so strong that not even light can escape.*

- *They form when massive stars collapse under their own gravity at the end of their lifecycle.*

Formation

- *Stellar black holes form from the remnants of massive stars (> 20 times the mass of the sun) that undergo supernova explosions.*
- *Supermassive black holes are found at the centers of galaxies and are millions to billions of times more massive than the sun. Their formation mechanism is still under study.*

Characteristics

- *Stellar black holes typically have masses ranging from a few to several dozen times that of the sun.*
- *Supermassive black holes, such as Sagittarius A* at the center of the Milky Way, have masses ranging from millions to billions of solar masses.*

Observational Signatures

- *Black holes themselves are invisible since no light escapes them.*
- *However, their presence can be inferred by observing the effects of their gravity on nearby matter, such as the orbits of stars or the emission of X-rays from material falling into them.*

Key Concepts

- *Event Horizon: The boundary around a black hole beyond which nothing can escape.*
- *Singularity: The central point of infinite density within a black hole.*
- *Hawking Radiation: Theoretical radiation predicted by physicist Stephen Hawking, which suggests that black holes can emit radiation and lose mass over time.*

Forth global mass coral bleaching triggered

Syllabus: GS-3: Impact of climate change on biodiversity.

Context:

- **Fourth global mass coral bleaching** event triggered by unusually high ocean temperatures
- **US National Oceanic and Atmospheric Administration (NOAA)** reported the event

- *Potential serious consequences for ocean life and communities relying on reefs for food, jobs, and coastal defense*

Background:

- *Since mid-March 2023, **average sea surface temperature** has been abnormally high*
- **March 2024** recorded a monthly high of 21.07 degrees Celsius, a record according to **EU Copernicus Climate Change Service (C3S)**
- *Rising emissions of heat-trapping greenhouse gases (GHGs) like carbon dioxide and methane in the atmosphere are primary reasons for soaring temperatures*
- **Nearly 90% of the additional heat trapped** by GHGs has been absorbed by oceans, causing them to warm.

What are corals?

- *Corals are animals that attach themselves to the ocean floor and **catch food using tentacle-like structures.***
- *Corals have a **symbiotic relationship with algae called zooxanthellae**, which provide them with oxygen and organic products of photosynthesis.*
- **Individual coral animals are called polyps**, and they live in colonies consisting of hundreds to thousands of genetically identical polyps.
- *Corals are classified as **either hard coral or soft coral**, with hard corals being the architects of coral reefs.*
- **Hard corals have stony skeletons made of limestone**, which are produced by coral polyps. When polyps die, their skeletons remain and provide a foundation for new polyps.
- *Coral reefs are **complex three-dimensional structures** built up over thousands of years by hard corals.*



Significance of corals:

- *Coral reefs play a **crucial role in marine ecosystems**, supporting thousands of marine species.*

- For example, the **Great Barrier Reef** alone contains over 400 coral species, 1,500 fish species, 4,000 mollusc species, and six of the world's seven sea turtle species.
- Research suggests there may be **millions of undiscovered species** living in and around coral reefs.
- Coral reefs provide **economic goods and services** valued at about \$375 billion annually.
- Over 500 million people worldwide **rely on coral reefs for food, income, and coastal protection** from storms and floods.
- Coral reefs can absorb up to **97% of the energy from waves, storms, and floods**, helping prevent loss of life, property damage, and soil erosion.
- The **absence of coral reefs** would have severe consequences for marine life and humans alike.

What is coral bleaching?

- Corals have a **symbiotic relationship** with algae called zooxanthellae, which provide them with oxygen and organic products of photosynthesis.
- Coral bleaching occurs when **corals expel their zooxanthellae** due to stress, resulting in the corals turning entirely white.
- Stressors like **changes in light and temperature** can trigger coral bleaching.
- Coral bleaching does **not immediately kill corals**, but it increases their vulnerability to mortality and reduces their reproductive ability.
- Corals can recover from bleaching **if the stress is not severe**.
- **Global mass bleaching** of coral reefs occurs when significant coral bleaching is observed in the Atlantic, Indian, and Pacific oceans.
- The first global bleaching event happened in 1998, affecting 20% of the world's reef areas. Subsequent events occurred in 2010 (35% affected) and between 2014 and 2017 (56% affected).

What is happening right now?

- NOAA has confirmed the occurrence of the **fourth global coral bleaching event**.
- **Approximately 54 countries, territories, and local economies** have reported coral bleaching, spanning from Florida, USA, to Fiji.
- **The Great Barrier Reef** is experiencing its most severe bleaching event, with about a third of surveyed reefs showing very high or extreme bleaching.
- Bleaching has been confirmed in the **Western Indian Ocean**, including Tanzania, Kenya, Mauritius, Seychelles, and off the western coast of Indonesia.
- **Over 54% of the world's coral area** has experienced bleaching-level heat stress in the past year, with the percentage increasing by about 1% per week.
- **Higher ocean temperatures** are the main driver of the current bleaching event, exacerbated by the **El Niño weather pattern**, which is associated with warmer oceans.

- *The weakening of El Niño and the potential onset of a cooler La Niña by the end of the year may mitigate the bleaching event's duration.*

What might be the impact?

- *The full **impact of the event is not yet known**, but scientists are deeply concerned about its implications.*
- *With global temperatures rising, such events are expected to become more frequent and prolonged.*
- *According to a 2018 report by the Intergovernmental Panel on Climate Change (IPCC), coral reefs may be severely affected by global warming, with the majority lost at 1.5 degrees Celsius of warming and virtually all lost at 2 degrees Celsius.*
- *The Earth's average global temperature has already increased by at least 1.1 degrees Celsius since 1850.*
- *To limit global warming to no more than 1.5 degrees Celsius, countries must reduce greenhouse gas (GHG) emissions to net zero by 2050, as outlined in the Paris Agreement.*
- *However, achieving this goal is challenging as GHG emissions continue to reach record levels.*

Practice Question

Q. How does the escalation of the fourth global coral bleaching event underscore the critical intersection between environmental degradation, climate change, and the sustainability of marine ecosystems and human livelihoods? (15 marks, 250 words)