ESO 300-16

Context: The Hubble Space Telescope snapped an image of the irregular galaxy ESO 300-16, found 28.7 million light-years away in the Eridanus constellation.

Irregular Galaxies:

- Irregular galaxies lack a defined shape like spiral or elliptical types and span from dwarf (100 million solar masses) to large (10 billion solar masses). They are characterized by ample gas and dust content.

Formation of Irregular Galaxies:

- Irregular galaxy formation stems from various mechanisms. Galaxies can become irregular through collisions, where gravitational forces induce unique rotational patterns. Young galaxies may also exhibit irregular shapes due to ongoing asymmetrical rotation.

Characteristics of Irregular Galaxies:

- Irregular galaxies resulting from collisions or interactions contain a mixture of young and old stars, contributing to their diverse appearance.

The Hubble Space Telescope (HST):

- Constructed under NASA's oversight, the HST honors Edwin Hubble, a prominent 20th-century astronomer. It was launched aboard the space shuttle Discovery on April 25, 1990, orbiting at approximately 600 km (370 miles) above Earth.

Significance of the Hubble Space Telescope:

- Revered as a paramount scientific instrument, the HST has produced over 1.5 million observations, contributing to around 18,000 research papers. With dimensions exceeding those of a school bus and a 7.9 feet mirror, the telescope captures captivating deep space imagery. Its role in observing distant celestial bodies has substantially enhanced our comprehension of the universe's intricacies.

James Webb Space Telescope

- **Purpose**: The JWST is a sophisticated space observatory developed by NASA, ESA, and CSA to succeed the Hubble Space Telescope.
- **Launch and Location**: It will be launched via an Ariane 5 rocket from French Guiana and positioned at the second Lagrange point (L2), 1.5 million kilometers from Earth.
- **Infrared Focus**: JWST excels in observing the infrared spectrum, aiding studies of distant galaxies, star formation, and exoplanet atmospheres.
- **Tech Specs**: With a 6.5-meter primary mirror (over 2.5 times Hubble's), JWST boasts advanced tools like the Near Infrared Camera (NIRCam) and Mid-Infrared Instrument (MIRI).
- **Mission Goals**: JWST aims to explore galaxy, star, and planetary system evolution, assess exoplanet habitability, and unveil insights into early universe conditions.

Debt for Nature Swap Delas

Context: Gabon announces $500 million debt-for-nature swap deal for marine conservation.

- **Debt Relief for Nature**: This concept involves easing the debt burden of developing countries in exchange for a commitment to finance nature conservation efforts.
- **Origins in 1980 Debt Crisis**: The idea has its roots in the debt crisis of the 1980s.
- **International Financial Aid**: Developing nations can secure financial assistance from financial institutions in developed countries through this mechanism.
- **Environmental Commitment**: Developed countries assume the debt of developing nations on the condition that the latter allocate funds to protect natural resources.
- **Debt Replacement**: Typically, banks in developed nations purchase the debts of developing countries and replace them with new loans featuring longer maturities and lower interest rates, promoting conservation initiatives.

Gabon's Deal

- **Gabon's Debt-for-Nature Swap**: Gabon has introduced a substantial $500 million debt-for-nature swap initiative, focusing on marine conservation efforts.
- **Blue Bond Strategy**: This marks the world's second-largest deal under the blue bond framework, which combines debt refinancing with marine resource preservation.
- **African Milestone**: This arrangement also signifies Africa's largest such deal, as no other country on the continent has undertaken a debt-for-nature swap of this magnitude while prioritizing marine conservation.
- **Dual Purpose**: Through this move, Gabon seeks to refinance $500 million of its national debt while directing these funds toward bolstering marine conservation endeavors within its borders.

Blue Bonds

- **Blue Bonds Defined**: Innovative financial tools supporting marine projects, addressing environmental and economic needs.

- **Subset of Green Bonds**: Specialized instruments funding marine conservation, fisheries, and oceanic projects.
- **World Bank's Perspective**: Blue bonds are debt instruments issued by governments or development banks, funding projects with environmental, economic, and climate benefits.
- **Seychelles' Trailblazing**: Seychelles launched the first sovereign blue bond in 2018, showcasing potential for global ocean conservation.
- **Gabon's Debt-for-Nature Swap**: Gabon's $500 million debt-for-nature initiative emphasizes marine conservation.
- **Blue Bond Strategy**: Second-largest blue bond deal, merging debt refinancing with marine preservation.
- **African Milestone**: Africa's largest debt-for-nature swap, focusing on marine conservation.
- **Dual Purpose**: Gabon aims to refinance $500 million debt for marine conservation within its borders.

Bye Elections

Context: The Election Commission has made the decision to conduct a by-election in Uttar Pradesh for the Council of States to fill a casual vacancy.

Casual Vacancy

- A casual vacancy occurs when a seat in a legislative house becomes empty due to reasons like resignation or death of a member. In such cases, a by-election takes place within six months of the vacancy to fill the seat.

Bye-Elections (Bypolls)

- Bypolls, also referred to as bye-elections or special elections, are conducted to fill vacant seats in legislative bodies.
- Bypolls hold significance within the electoral cycle as they address unforeseen vacancies.
- The main purpose of bypolls is to ensure prompt representation for the affected constituency or district in the legislative body.
- Bypolls are scheduled when a seat in the legislature becomes vacant due to the death, resignation, disqualification, or expulsion of a sitting member.
- Section 151A of the Representation of the People Act, 1951, mandates the Election Commission to fill casual vacancies in the Houses of Parliament and State Legislatures through by-elections within six months from the vacancy's occurrence, if the remaining term of a member is one year or more.
- There is no requirement to hold bypolls if the remaining term of the Lok Sabha is less than one year from the vacancy's occurrence.

Formula for Election of Rajya Sabha

- **Rajya Sabha Voting Process**: The Rajya Sabha members are selected by MLAs. However, this doesn't always align with the strength of parties in the Lok Sabha.
- **Preference-Based Voting**: Instead of individually voting for each seat, MLAs rank candidates by preference, allowing for a broader representation.
- **Election Criteria**: Candidates winning a certain number of first-choice votes get elected. Surplus votes then move to other candidates with diminishing values, even from different parties.
- **First Preference System**: Candidates securing the top rank from an MLA earn a first preference vote. To win, candidates need a specific quota of these first preference votes, contingent on the state Assembly's size and Rajya Sabha MPs.
- **Quota Formula**: The winning quota for a candidate is calculated as = [Total votes / (Number of Rajya Sabha seats + 1)] + 1.
- **Multiple Seats**: When multiple seats need to be filled, the formula changes: Total votes required = [(Votes x 100) / (Number of vacancies + 1)] + 1.

NEWS IN BETWEEN THE LINES

African Swine Fever

Recently, the highly contagious African swine fever virus has spread across 49 countries since 2021.

What is African Swine Fever?

African Swine Fever (ASF) is a highly contagious viral disease that affects domestic and wild pigs. It has a very high mortality rate and poses a significant threat to pig populations.

Impact:

- ASF has spread to 49 countries since January 2021.
- It causes nearly 100% mortality in infected pigs.
- It has resulted in substantial animal losses, affecting both domestic pigs and wild boars.
- The disease has major economic implications for pig farming and food security.

Global Presence:

- ASF is present in various regions across the world, including Asia, Africa, Americas, Europe and Oceania.
- The disease was first reported in Kenya in 1921.

	ASF Characteristics: ➢ Spreads via contact, contaminated items, ticks. ➢ No cure or vaccine. ➢ Control: culling, disposal, biosecurity and awareness. **India's Experience:** ➢ India managed to avoid ASF for a long time, with the first case reported in 2020. ➢ Recent cases were reported even in 2023, indicating the persistence of the disease. **Recommendations:** World Organisation for Animal Health (WOAH) suggests science-based control programs.
Methanotrophs 	Recently, a bacterial strain, Methylotuvimicrobium buryatense 5GB1C, has shown the ability to consume methane, a key contributor to 30% of global warming. **About Methanotrophs:** Microorganisms (bacteria) that consume methane as their energy source. **Role:** They play a vital role in reducing methane emissions, a potent greenhouse gas contributing to global warming. **Conversion:** Methanotrophs convert methane into biomass and byproducts, preventing its release into the atmosphere. **Low Concentrations:** Some methanotrophs, like Methylotuvimicrobium buryatense 5GB1C, can consume methane even at low levels (200-500 ppm). **Impact:** By reducing methane, they help mitigate global warming's effects, as methane is more warming-effective than CO2. **Applications:** Methanotrophs have biotechnological uses in bioremediation and bioenergy production.
Spotless Ziraffe 	Recently, a rare event occurred at Brights Zoo in Tennessee—a baby giraffe was born on July 31 without any spots. **About:** ➢ A rare, spotless giraffe with brown fur was born in a Tennessee zoo on July 31. ➢ Standing at six feet tall, this calf's distinct appearance makes it a global one-of-a-kind. ➢ The zoo offers "Unique," "Unusual," "Most Beautiful," and "One of Great Beauty" as name options, inviting public voting until September 4. ➢ People can vote for their preferred name until September 4, with the most popular choice to be revealed later. ➢ The zoo partners with 'Save Giraffes Now' for wildlife preservation, aiming to protect these creatures for the future. In 2016, Tanzania's Tarangire National Park witnessed white giraffes with leucism, showcasing exceptional coloration.
Neelam River 	After renewed India-Pakistan ceasefire, Keran village in North Kashmir witnesses bunkers turning to homestays along Neelam River for tourism, aligned with broader efforts. **About:** ➢ Neelam River (Tributary: Jelum River) ➢ Neelam River (Kishanganga) originates in Jammu and Kashmir. ➢ Flows northwest through mountainous terrain. ➢ Runs near the Line of Control between India and Pakistan. ➢ Holds geopolitical significance due to its location. ➢ Kishanganga Hydroelectric Plant harnesses its energy. ➢ Disputed project affecting bilateral relations.
Fukushima Daiichi Nuclear Power Plant 	Recently, it has been announced that the Fukushima Daiichi nuclear power plant in Japan will begin releasing treated radioactive water into the sea starting from August 24. **About:** ➢ The Fukushima Daiichi nuclear power plant is located in Fukushima Prefecture, Japan. ➢ The plant suffered a catastrophic incident following an earthquake and tsunami on March 11, 2011. ➢ The plant had six nuclear reactors at the time of the disaster. ➢ The earthquake and subsequent tsunami led to the meltdown of three reactors, causing a severe nuclear accident. ➢ The reactor meltdowns resulted in the release of radioactive materials into the environment, leading to a significant contamination of the surrounding area. ➢ Japanese government approved the disposal of radioactive water from the plant into the Pacific Ocean.

Mullaperiyar Dam

Recently, the water level in the Mullaperiyar dam stood at 119.20 feet, which is below the permissible level of 142 feet.

About:

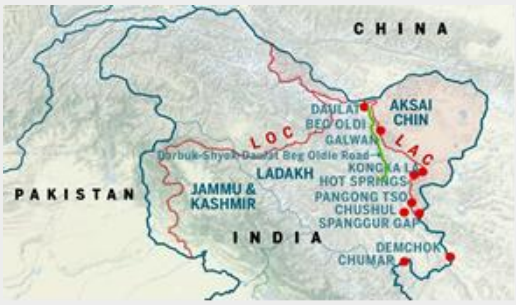
- The Mullaperiyar Dam is situated on the River Periyar and its tributary, the Mullayar.
- Its name "Mullaperiyar" is a combination of "Mulla" (a tributary of the Periyar) and "Periyar."
- The dam is located at an elevation of 881 meters (2,890 feet) above mean sea level.
- It is situated in the Cardamom Hills of the Western Ghats, near Thekkady in the Idukki district of Kerala, India.
- The dam was constructed between 1887 and 1895 by the British engineer John Pennycuick.
- The primary purpose of the dam was to divert water from the Periyar River eastward to provide irrigation and support agricultural activities in the Madras presidency (now Tamil Nadu).
- The dam's operation and water-sharing arrangements have been a source of dispute and legal battles between Kerala and Tamil Nadu.

Places in News

'Likaru-Mig La-Fukche' Road

Recently, the Border Roads Organisation (BRO) has started building the 'Likaru-Mig La-Fukche' road in Ladakh's Demchok sector.

Location: Demchok sector, Ladakh
Initiated by: Border Roads Organisation (BRO)
Objective: Establish connectivity to military outposts in Fukche sector near Line of Actual Control (LAC)
Elevation: About 19,400 feet
Significance: World's highest motorable road, surpassing Umling La
All-Woman Supervision:
Supervision: Led by Colonel Ponung Doming, all-woman BRO unit
Promotes: Gender-inclusive contributions in critical infrastructure projects



Other Notable Projects:

- Shinku La Tunnel: Part of BRO's initiatives to enhance connectivity
- 'Nyoma Airfield' Construction: Contributes to improving regional infrastructure

POINTS TO PONDER

- **Who is elected as the new Prime Minister of Thailand?** – Mr. Srettha Thavisin
- **Where is the BROCS Summit commencing in 2023?** – South Africa
- **With which country did the Central Board of Indirect Taxes and Customs (CBIC) sign a Mutual Recognition Arrangement (MRA)?** – Australia
- **Which nation is hosting the international conference on 'Preserving Information Integrity and Public Trust in Elections'?** – Brazil
- **In which country's local currency has India made its inaugural payment for crude oil?** – UAE