Prelim Bits 24-04-2022 & 25-04-2022 | UPSC Daily Current Affairs

NASA's Space Equity Action Plan

The National Aeronautics and Space Administration (NASA) has released an equity action plan to "make space more accessible".

- The Space Equity Action Plan is NASA's response to the U.S. government's 2021 executive order aimed at "advancing racial equity and support for underserved communities".
- This plan deepens NASA's commitment to further **identify and remove the systemic barriers** that limit opportunity in underserved and underrepresented communities, and ensure representation.
- It anchors **fairness as a core component** in every NASA mission to make the work that NASA does in space & beyond more accessible to all.
- **Focus Areas** - The space equity action plan lists four focus areas for underserved communities.
    1. Increasing integration and utilization of contractors and businesses from underserved communities and expanding equity in NASA's procurement process,
    2. Enhancing grants and cooperative agreements to advance opportunities, access, and representation for underserved communities,
    3. Leveraging Earth Science and socioeconomic data to help mitigate environmental challenges in underserved communities, and
    4. Advancing external civil rights compliance and expanding access to limited English proficient populations within underserved communities.

Targets

- By the fiscal year 2029, NASA aims to increase the number of outreach events for underserved communities by 50%.
- Using earth science and other data to help mitigate environmental challenges:
    1. To make information on earth science easily available to all, NASA will make its 50 most-requested environmental data sets of last year available on the internet, and
    2. The full transfer of NASA Earth science data to the cloud will be complete by 2025.
- NASA will also train around 2,700 users on how to use the agency's data effectively to address environmental parameters like air quality and water resource management.
- NASA plans to increase its civil rights compliance reviews to 10% by the financial year 2024.
- By January 2023, NASA will publish an updated language access plan.

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Blue Straggler Stars

Bengaluru-based Indian Institute of Astrophysics (IIAP) has found support for one way to understand the aberrant behavior of blue stragglers, a particular type of star seen in clusters and also, sometimes, alone.

For this, the IIAP made use of the observations by the Ultra Violet Imaging Telescope (UVIT) instrument of ASTROSAT, India's first science observatory in space.

Stellar ageing

- To know what blue stragglers are, it is necessary to understand how stars are classified and their evolution, studied.
- A **main sequence star** (for example, our Sun)**,** given its mass and age, is expected that once it has converted all its hydrogen into helium, its core will get denser.
- As the outer layers expand, it will swell into a **red giant**.
- After this phase, its fuel spent, it will shrink, becoming a smaller, cooling star called a **white dwarf** star at the end of its life.
- To study the behaviour of the star, a **colour-magnitude diagram** can be drawn, in which, we of
    1. The colour of the star, which is an indication of its surface temperature, is plotted in a graph against
    2. The magnitude of the star, which is related to the total energy given off by it.
- In a globular cluster of stars, a large number of stars are seen to find a place within a band known as the main sequence.
- The expectation is that all main sequence stars follow a similar pattern of evolution. But the blue straggler stars violate standard theories of stellar evolution.

Blue stragglers

- There are few stars, just at the stage of their lives, when they are expected to expand in size and cooling down, do just the opposite.
- They grow **brighter and hotter** as indicated by their **blue colour**, thus standing out from the cooler red stars in their vicinity.
- As they are blue in colour, and lag behind their peers in the evolution they are called blue stragglers.
- Blue stragglers are a class of star observed in old, dense stellar systems such as globular clusters, and also, sometimes, alone.
- They stand out because old stellar populations are expected to be devoid of blue (high-mass) stars which possess **very short lifespans**.
- The blue stragglers in an old stellar population must therefore have formed long after the system as a whole.
- The IIAP researchers have found why a blue straggler is more massive, and energetic, than it is expected to be.
- They have shown evidence that the straggler draws matter from the giant companion star and grows more massive, hot and blue, and the red giant to end up as a normal or smaller white dwarf.

Reference

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Hermes StarLiner

Israel becomes the first-ever country to allow drones in civilian airspace.

- The Israeli Civil Aviation Authority (CAA) has issued certification to the Hermes Starliner drones.
- This is Israel's first certification for unmanned aircraft vehicles (UAVs) to operate in civilian airspace for the benefit of agriculture, environment, fight against crime, the people and the economy.
- Hermes Starliner was manufactured and developed by Elbit Systems, an Israeli defense electronics company.
- It can fly for up to 36 hours at an altitude of around 7600 m, and can carry an additional 450 kg of thermal, electro-optical, radar and other payloads.
- **Uses** - Hermes Starliner will also be able to
    1. Participate in anti-terror and border security operations,
    2. Perform maritime rescue and search,
    3. Take part in securing public events, and
    4. Take part in environmental inspection and commercial aviation missions.
- There are two variants - Hermes 450 and Hermes 900.
- For safety reasons, international aviation regulations prohibit uncertified aircraft from flying in civilian airspace, limiting the operation of UAVs to unsegregated airspace.

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Pyramid Schemes and MLM Model

The Enforcement Directorate (ED) attached ₹757.77 crore worth of assets of direct-selling company Amway India Enterprises Private Limited, accusing it of running a Multi-level Marketing (MLM) pyramid scam.

Pyramid Scheme

- A pyramid scheme is an unsustainable business model in which original investors make money by recruiting others rather than by selling actual products or services.
- In a pyramid scheme, an entity promises participants payment or services primarily for enrolling other people into the scheme, rather than supplying a product or service to the public.
- As the new participants rope in fresh recruits, money keeps flowing up the chain eventually making an ever-increasing pyramid or hierarchy.
- These are also called money circulation schemes.

- This scheme becomes unsustainable after a sizable number of people have been roped in, as profits minimise when the acquired money is being circulated amongst the group.

MLM Model

- There is a thin line between a pyramid scheme and an MLM model.
- MLMs are similar in nature to pyramid schemes but differ in that they involve the **sale of tangible goods**.
- The focus on the sale of more products as a **compensation model** rather than commissions for recruiting more members is what differentiates an MLM model from a pyramid scheme.
- Unlike indirect sales companies that use a network of wholesalers, distributors, and retailers to sell their products, MLM companies **rope in members of the public to directly sell their products**.
- These members, while not being employees of the company, recruit more people to join the product selling network, thus putting in place a mechanism that expands this web and revenue.

Laws governing these schemes in India

- In 2021, the Centre released new guidelines for direct selling companies like Tupperware, Amway, and Oriflame, banning them from promoting pyramid or money circulation schemes.
- With the **Consumer Protection (Direct Selling) Rules, 2021**, direct selling companies were for the first time brought under the ambit of the Consumer Protection Act.
- The new Rules were introduced to make these companies liable for the grievances arising out of the sale of goods or services by its direct sellers.
- The rules said that direct selling entities and direct sellers would be prohibited from
    1. Promoting a pyramid scheme or
    2. Enrolling any person on such scheme or
    3. Participating in such arrangement in any manner whatsoever in the garb of doing direct selling business.
- Another legislation banning such activities is the **Prize Chits and Money Circulation Schemes (Banning) Act, 1978**.
- This bans prize chits and money circulation schemes or enrolment as members or participation therein.

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Desert National Park

A green agriculture project, funded by the Food FAO's Global Environment Facility, will act as a lifeline for the Desert National Park (DNP) Rajasthan with the conservation of critical biodiversity and forest landscapes.

- Desert National Park is an excellent example of the Thar desert's ecosystem.
- It is situated on the western border of India within Jaisalmer & Barmer in Rajasthan.
- It is only place where Rajasthan State Bird (Great Indian Bustard), State animal (Chinkara) and State tree (Khejri) and State flower (Rohida) are found naturally.

- Desert monitors, deadly vipers, spiny-tailed lizards, Krait, and sandfish are the prominent members of the wildlife family.
- In winter, the park hosts an incredible variety of **migratory raptors** such Himalayan and Eurasian Griffon Vultures, Eastern Imperial Eagle, and the Saker Falcon.
- The Desert National Park also has a collection of fossils of animals and plants of 180 million years old.
- The Park is formed of undulating sand dunes, jagged rocks, dense salt lake bottoms and intermedial areas.
- Desert National Park (DNP) Timeline:
    1. 1980 - UNESCO World Heritage Site
    2. 1992 - National Park

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