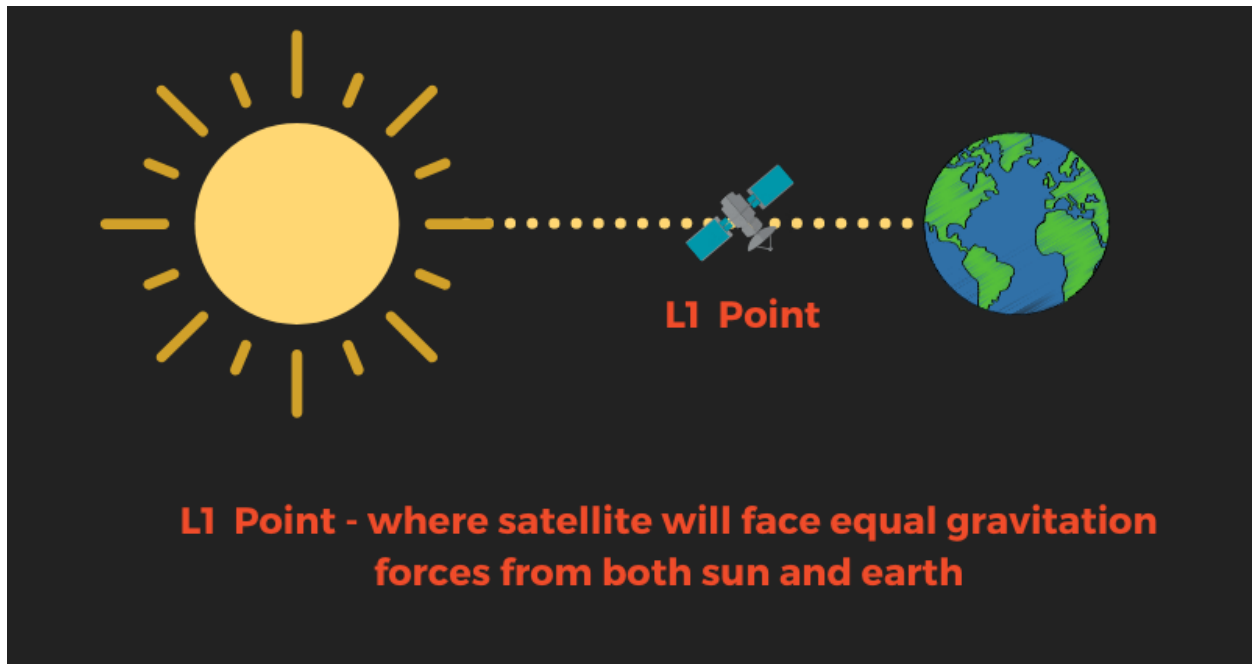


1. Aditya-L1, India's first solar mission

Topic: Science and Technology



In News: ISRO is expected to launch Aditya-L1, the country's first solar mission after several years of development.

More on the Topic:

- Aditya-L1 is **India's first space-based Indian mission to study the Sun.**
- The spacecraft will be placed in a **halo orbit around the first Lagrange (L1) point of the Sun-Earth system**, which is about 1.5-million-km from Earth.
- A satellite placed in the halo orbit around the L1 point has the **major advantage of continuously viewing the Sun without any occultation/eclipses.**
- This will provide a **greater advantage of observing the solar activities and its effect on space weather in real time.**

Mission-Objectives :

- The major science objectives of the mission are **to study the solar upper atmospheric (chromosphere and corona) dynamics;**
- chromospheric and coronal heating, physics of the partially ionised plasma, initiation of the coronal mass ejections, and flares;
- **observe in-situ particle and plasma environment** providing data for the study of particle dynamics from the Sun;
- physics of solar corona and its heating mechanism;
- diagnostics of the coronal and coronal loops plasma: Temperature, velocity and density Development, dynamics and origin of CMEs (**coronal mass ejections**);

- identify sequence of processes that occur at multiple layers (chromosphere, base and extended corona) which eventually leads to solar eruptive events;
- **magnetic field topology and magnetic field measurements** in the solar corona and drivers for space weather (origin, composition and dynamics of solar wind).

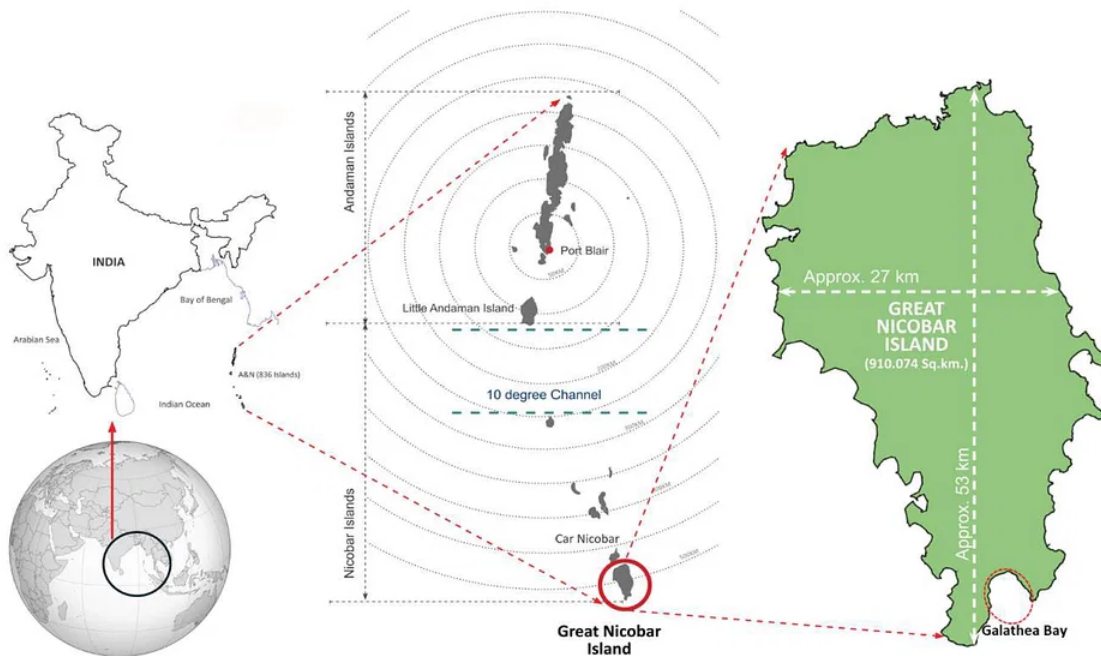
What Payloads Aditya-L1 Will Carry?

- The Aditya-L1 spacecraft will carry **seven payloads to observe the photosphere, chromosphere and the outermost layers of the Sun (the corona)** using electromagnetic and particle and magnetic field detectors.
- Using the special vantage point — L1 — **four payloads directly view the Sun and the remaining three payloads carry out in-situ studies of particles and fields at L1**, thus providing important scientific studies of the propagator effect of solar dynamics in the interplanetary medium.

Source: Indian Express

2. International Container Transshipment Port in Great Nicobar Island

Topic: Economy



In News: As part of the holistic development of Great Nicobar Island, the Ministry of Ports, Shipping, and Waterways is working towards the development of the Mega International Container Transshipment Port (ICTP) at Galathea Bay.



More on the Topic:

- The holistic development of the Great Nicobar Island aims to improve the economic opportunity for the rapid increase in the size of all types of vessels from feeders to large inter-continental carriers.
- The development also helps to bridge the infrastructural gaps of the island.
- The other development projects planned around the transshipment port include an airport, township, and power plant.
- With the development of the International Transshipment Port at Great Nicobar Island, there is a huge potential for the creation of around 1,700-4,000 jobs.

Salient Features of the Port:

- The transshipment project is of immense importance because of its:
 - (a) Strategic location in terms of **proximity (40 nautical miles from Malacca Strait)** to the International Trade Route with existing transshipment terminals like Singapore, Klang, and Colombo,
 - (b) **Availability of natural water depth of more than 20 meters**, and
 - (c) **Potential to capture transshipment cargo** from all the ports in the proximity including domestic one.

Significance:

- It becomes **necessary for India to have a transshipment hub** that can save revenue loss, reduce logistics inefficiencies, and can create an opportunity to become a large hub for Asia-Africa, Asia-US/Europe container traffic trade.
- At present, **about 75 percent of the nation's transhipped cargo is handled at ports outside the country.**
- The development of the Galathea Bay port project **will save US dollars 200-220 million a year on transshipment cargo.**
- The port is expected **to handle 16 million containers per year and in the first phase will handle above 4 million Containers.**

About Great Nicobar Island:

- Great Nicobar Island is the southernmost of the Andaman and Nicobar Islands.
- It is the largest of the Nicobar group of islands.
- Indira Point on the southern tip of this Island is India's southernmost point.
- The Great Nicobar Island has tropical wet evergreen forests, mountain ranges reaching almost 650 m above sea level, and coastal plains.
- It hosts a wide variety of species including endangered specie.
- The leatherback sea turtle is the island's flagship species.

Source: Hindu

3. M-Sand Projects

Topic: Science and Technology



In News: Coal India Ltd will be launching M-Sand Projects soon.

More on the Topic:

- Sand Mining Framework (2018) prepared by **Ministry of Mines envisages alternative sources of sand in the form of Manufactured Sand (M-Sand)** from crushed rock fines (crusher dust), sand from Overburden (OB) of coal mines.
- During Opencast mining the overlying soil and rocks are removed as waste to extract coal and the fragmented rock (Overburden or OB) is heaped in dumps.
- Most of the waste is disposed off at the surface which occupies considerable land area and requires extensive planning and control to minimize the environmental impact of mining.
- Coal India Ltd (CIL) has envisaged to process the overburden rocks for sand production in mines where OB material contain about 60% sandstone by volume which is harnessed through crushing and processing of Overburden.

Significance of M-Sand:

- **Cost-effectiveness:** Using manufactured sand can be more cost-effective than using natural sand, as it can be produced in large quantities at a lower cost.
- **Consistency:** Manufactured sand can have a consistent grain size and shape, which can be beneficial for construction projects that require a specific type of sand.
- **Environmental benefits:** Using manufactured sand can help **to reduce the need for mining natural sand**, which can have negative environmental impacts. Additionally, using the overburden from coal mines can help to repurpose materials that would otherwise be considered waste.
- **Reduced water consumption:** Using manufactured sand can help to reduce the amount of water required for construction projects, as it does not require washing before use.
- **Better workability:** Manufactured sand is more angular and has a rougher surface, which makes it more workable for construction projects.
- Land occupied by OB dumps can be freed for alternative useful purposes



- Recovery of sand from waste overburden is the best out of waste product
- Commercial sale of produced sand can generate **additional revenue for coal companies**
- Apart from commercial use, sand produced shall also be consumed for sand stowing in Underground Mines enhancing safety & conservation
- Lesser Sand extraction from river will reduce erosion of channel bed & banks and protect water habitat
- Help maintaining water table.

Source: Hindu

4. Biologicals

Topic: Science and Technology

Table 1: Overview of the main differences between chemical and biological drugs

Chemical	Biological
Produced by chemical synthesis	Produced by living cell cultures
Low molecular weight	High molecular weight
Well-defined structure	Complex, heterogeneous structure
Mostly process-independent	Strongly process-dependent
Completely characterised	Impossible to fully characterise the molecular composition and heterogeneity
Stable	Unstable, sensitive to external conditions
Mostly non-immunogenic	Immunogenic

In News: Health Minister has inaugurated National Summit on Quality of Biologicals:

More on the Topic:

- Biological therapeutics, also referred to as Biologicals, are those class of medicines which **are grown and then purified from large-scale cell cultures of bacteria or yeast, or plant or animal cells.**

- Biologicals are a **diverse group of medicines which includes vaccines, growth factors, immune modulators, monoclonal antibodies**, as well as products derived from human blood and plasma.
- What distinguishes biologicals from other medicines is that **these are generally proteins purified from living culture systems or from blood**, whereas other medicines are considered as 'small molecules' and are either made synthetically or purified from plants.
- Due to the differences in their nature and how they are produced, **biological therapeutics are regulated, tested, and controlled differently than other medicines**.
- To help ensure their quality, safety, and efficacy, each batch of a biological therapeutic product **must be tested extensively at each stage of production in order to ensure consistency with prior batches**.

Source: Hindu

5.Kashmir Pashmina

Topic: Science and Technology



In News: Kashmir Pashmina Shawl was used as canvas for contemporary art at a French exhibition.

More on the Topic:

- Pashmina is Geographical Indication (GI) labelled wool that originates in Kashmir.
- The word "Pashmina" derives from the Persian word "Pashm," which refers to a weaveable fibre, specifically wool.

More on the Topic:

- Lake Victoria is one of the African Great Lakes.
- With a surface area of approximately 60000 km², **Lake Victoria is Africa's largest lake by area, the world's largest tropical lake, and the world's second-largest fresh water lake** by surface area after Lake Superior in North America.
- Lake Victoria is largest lake in Africa and chief reservoir of Nile.
- It is shared by three countries, **Tanzania, Uganda and Kenya.**

Source: Indian Express

7. Padma Awards

Topic: Awards in News



Bharat Ratna

PADMA AWARDS



Padma Vibhushan



Padma Bhushan



Padma Shri

In News: Ministry of Home Affairs has announced winners of Padma Awards recently.

More on the Topic:

- The Padma Awards are one of the **highest civilian** honours of India.
- The Awards are given in three categories: **Padma Vibhushan (for exceptional and distinguished service)**, **Padma Bhushan (distinguished service of higher order)** and **Padma Shri (distinguished service)**.
- The award seeks to recognize achievements in all fields of activities or disciplines where an element of public service is involved.



- The Padma Awards are conferred on the recommendations made by **the Padma Awards Committee, which is constituted by the Prime Minister every year.**
- The nomination process is open to the public. Even self-nomination can be made.
- Padma Awards, which were instituted in the year 1954, is announced every year on the occasion of Republic Day **except for brief interruption(s) during the years 1978 and 1979 and 1993 to 1997.**

Related News - Bharat Ratna:

- Bharat Ratna is the highest civilian award of the country. It is awarded in recognition of exceptional service/performance of the highest order in any field of human endeavour.
- It is treated on a different footing from Padma Award. The recommendations for Bharat Ratna are made by the Prime Minister to the President of India.
- No formal recommendations for Bharat Ratna are necessary. The number of Bharat Ratna Awards is restricted to a maximum of three in a particular year.

Source: Business Standard
