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# CURRENT AFFAIRS

**SCIENCE & TECHNOLOGY**

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## **1. Anti-Satellite (ASAT) Missile**

### **Why in News?**

- India showcased its Anti-Satellite (ASAT) missile capability to the world on the Rajpath during the 71<sup>st</sup> Republic Day parade on 26<sup>th</sup> January, 2020.
- The Missile is developed by the Defence Research and Development Organisation (DRDO) under **Mission Shakti**.

### **Mission Shakti**

- India tested the Anti-Satellite System (ASAT) from Dr APJ Abdul Kalam Island, Odisha in March 2019.
  - This test was named as Mission Shakti.
- It destroyed a live satellite in the Low Earth Orbit (an altitude of 300 km).
- Mission Shakti seeks to defend India's space assets and thus aims at strengthening India's overall security.
- India is the fourth country to conduct this test after the USA, Russia and China.

### **ASAT Missile**

- It is an **indigenously developed missile system** which attacks moving satellites.
- It enables **to destroy an enemy satellite** by directly colliding it with pinpoint accuracy.
- It allows for attacks on enemy satellites, that is, blinding them or disrupting their communications.
- ASAT Missile is based on the DRDO's Ballistic Missile Defence interceptor technology.
- It can be launched from the air, sea or land.

## **2. India's Neutrino Observatory Opposed by Gram Sabhas**

### **Why in News?**

Gram Sabhas in different parts of Tamil Nadu have passed resolutions against the **India-based Neutrino Observatory (INO)** and **hydrocarbon exploration**.

### **Concerns**

- The project may have harmful effects on the fertility of the land in the region and adversely affect the agricultural community, farm labourers and others dependent on the profession.
- Massive scale of construction underground and controlled blasts, the vibrations from the explosions can badly affect the ecologically fragile Western Ghats.
- Other concerns voiced range from radiation, structural damage to the mountain to the emission of hazardous chemicals.

### India-based Neutrino Observatory (INO)

- INO is being constructed in the Bodi West Hills (Theni district) of Tamil Nadu.
- The site is near the **Kerala-Tamil Nadu border** and is close to the **Mathikettan Shola National Park**.
- The INO is aimed at building a world-class underground laboratory with a rock cover to conduct basic research on the neutrino.
  - The observatory will be located underground so as to provide adequate shielding to the neutrino detector from cosmic background radiation.
- The INO will study atmospheric neutrinos only. Solar neutrinos have much lower energy than the detector can detect.
- The **Tata Institute of Fundamental Research** is the nodal institution. The observatory is to be built jointly with the **Department of Atomic Energy** and the **Department of Science and Technology**.
- It is not a weapons laboratory and will have no strategic or defence applications.

### Neutrino

- Proton, neutron, and electrons are tiny particles that make up atoms.
- The neutrino is also a **tiny elementary particle**, but it is **not part of the atom**.
- Neutrino has a **very tiny mass and no charge**.
- It interacts very weakly with other matter particles.
- Neutrinos come from the sun (solar neutrinos) and other stars, cosmic rays that come from beyond the solar system, and from the Big Bang from which the Universe originated.

### 3. Pneumococcal Conjugate Vaccine

#### Why in News?

The government is planning for the nationwide rollout of Pneumococcal Conjugate Vaccine (PCV) under Universal Immunisation Programme (UIP).

- PCV was first brought into the UIP basket in 2017 but cost concerns have been among the reasons for its **still-partial rollout**.

#### Pneumococcal Conjugate Vaccine

- Pneumococcal Conjugate Vaccine (PCV) prevents pneumococcal disease.
- The vaccine is a mix of several bacteria of the pneumococci family, which are known to cause pneumonia — hence ‘conjugate’ is included in the name of the vaccine.
- Conjugate vaccines are made using a combination of two different components.
- **Pneumococcal Disease**

- Pneumococcal disease refers to any illness caused by pneumococcal bacteria.
- **Symptoms:** These bacteria can cause many types of illnesses, including pneumonia, which is an infection of the lungs. Pneumococcal bacteria are one of the most common causes of pneumonia.
- **Vulnerable Population:** Anyone can get pneumococcal disease, but children under 2 years of age, people with certain medical conditions, adults 65 years or older, and cigarette smokers are at the highest risk.
- The top five contributors to India's pneumococcal pneumonia burden in terms of the number of cases and deaths were:
  - Uttar Pradesh
  - Bihar
  - Madhya Pradesh
  - Rajasthan
  - Jharkhand

### Concerns

- PCV is the costliest vaccine in the UIP basket that currently covers only about 50% of the 26 million birth cohort in Himachal Pradesh, Madhya Pradesh, Haryana, Bihar, Uttar Pradesh, and Rajasthan.
- According to government estimates, a countrywide rollout of PCV would require about 50% of the budget of UIP.
- The cost challenge for India's immunisation programme is set to mount further as **Global Alliance for Vaccines and Immunizations (GAVI)** is set to withdraw its support for India from 2022.
  - GAVI is an international organisation which brings together public and private sectors to create equal access to vaccines for children.

## 4. Bhuvan Panchayat Version 3.0

### Why in News?

ISRO (Indian Space Research Organization) has recently launched an upgraded geo imaging web portal upgraded Bhuvan Panchayat version 3.0.

- The launch is part of the advanced **Space-based Information Support for Decentralised Planning (SISDP) project**.
  - The SISDP was launched in 2011 and its first phase of making databases was completed in 2017.

### Key Points

- The portal uses high-resolution data from recent earth observation satellites and offers detailed information to **panchayats** about their key assets.

- For the first time, the thematic maps of 1: 10,000 scale have been generated based on high-resolution data given by **Indian Space Research Organisation's (ISRO)** new earth observation satellites.
- It is jointly implemented by the Ministry of Panchayati Raj and Department of Space, ISRO.

### **Bhuvan Portal**

- **Bhuvan (Sanskrit for Earth)** is a Geoportal of ISRO, allowing a host of services covering visualization, free data download, thematic map display and analysis, timely information on disaster and project specific GIS applications.
- The portal was **launched in 2009** and is available in English, Hindi, Tamil and Telugu.
- Bhuvan, as a platform, is open and can be used by a diverse user community such as Central and State Governments Departments, Academia and Industry.

### **5. Coronavirus declared Global Health Emergency by WHO** **Why in News?**

The new coronavirus has been declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization.

- The main reason for this declaration is the concern that it could spread to countries with weaker health systems.

### **About Public Health Emergency of International Concern (PHEIC)**

- PHEIC is declared when the disease **constitutes a public health risk to other States through the international spread of disease** and potentially requires a coordinated international response.
- **Implications:**
  - It would lead to boost in public health measures, funding and resources to prevent and reduce global spread.
  - It could include recommendations on trade and travel, although the WHO generally tries to avoid disruptive trade restrictions.
- WHO has previously declared five global public health emergencies:
  - Swine flu, 2009
  - Polio, 2014
  - Zika, 2016
  - Ebola, 2014 and 2019

### **6. Mesothelioma** **Why in News?**

There have been allegations against Johnson & Johnson that its Baby Powder

(talcum powder) contains asbestos which can cause Mesothelioma, a type of rare cancer.

- Talc or talcum is a **naturally occurring clay mineral** mined from the earth which is used in baby powder because of its ability to absorb moisture.
- Mines that collect talc also **contain asbestos** that has been linked to health risks like **mesothelioma and asbestosis**.

### Key Points

- Asbestos refers to six naturally occurring silicate minerals.
- Asbestos are long & thin fibrous crystals, being **strong and resistant to heat**, making them useful in a wide variety of applications, such as in:
  - Insulation
  - Brakes
  - Shingles
  - flooring and many other products
- During the mining process or removal of asbestos insulation, **asbestos dust** is created, which settles in the lungs or in the stomach if inhaled or swallowed. They can cause irritation that may lead to mesothelioma and **asbestosis**.
  - **Malignant mesothelioma** is a form of cancer that occurs in the thin layer of tissue that covers the majority of internal organs (mesothelium).
  - Lining of the lungs and chest are the most commonly affected areas.
  - It can take 20 to 60 years or more for mesothelioma to develop after asbestos exposure.
  - However, the exact process of this is still not understood.
  - **Asbestosis** is a **chronic, inflammatory lung disease**, but it is **benign**. Its sole cause is asbestos exposure.
- Most people with asbestos exposure never develop mesothelioma indicating that other factors like inheriting a predisposition to cancer may be involved in determining whether someone gets mesothelioma.

### 7. Yellow Rust

#### Why in News?

- Recently the yellow rust disease has been detected in the wheat crop in sub-mountainous parts of Punjab and Haryana.
- Yellow rust is a fungal disease which turns the crop's leaves into a yellowish colour and stops photosynthesis activity, which eventually could result in a drop of wheat crop productivity.
- The recent rains coupled with a slight increase in temperature and humid conditions are favorable for yellow rust.



- It is a major disease of the North-Western plain zone and the Northern Hill Zone of India.

### **Yellow Rust Management**

- Breeding resistant varieties is the most cost-effective method to control this rust.
- These resistance genes, however, have become ineffective due to the acquisition of virulence to that particular resistance gene rendering the variety susceptible.

### **Wheat**

- It is the main food crop, in the north and north-western part of the country.
- This rabi crop requires a cool growing season and bright sunshine at the time of ripening.
- It requires 50 to 75 cm of annual rainfall evenly distributed over the growing season.
- There are two important wheat-growing zones in the country – the Ganga-Satluj plains in the northwest and black soil region of the Deccan.
- Major Wheat-producing states -Uttar Pradesh, Punjab, Haryana, Madhya Pradesh.

### **8. Spitzer Space Telescope**

#### **Why in News?**

NASA's Spitzer Space Telescope's mission has come to an end after more than 16 years.

- It has been decommissioned because it was low on fuel and had drifting away from Earth for a few years now.

#### **Spitzer Space Telescope**

- It was launched on August 25, 2003.
- Spitzer was one of NASA's four Great Observatories.
- It was deployed to study the early universe in infrared light.
- Spitzer was initially scheduled for a minimum 2.5-year primary mission, but the space telescope has lasted far beyond its expected lifetime.
- Spitzer was the first telescope to see light from a planet outside our solar system.

#### **Key achievements:**

- Spitzer has also made important discoveries about comets, stars, exoplanets and distant galaxies.
- Spitzer has logged over 106,000 hours of observation time in the past 15 years.

- It has illuminated some of the oldest galaxies in the universe, revealed a new ring around Saturn, and peered through shrouds of dust to study newborn stars and black holes.
- The telescope also assisted in the discovery of planets beyond our solar system, including the detection of seven Earth-size planets orbiting the star **TRAPPIST-1**, among other accomplishments.

### **The Great Observatories program**

- The Great Observatories program demonstrated the power of using different wavelengths of light to create a fuller picture of the universe.
- It includes
  - The Hubble Space Telescope
  - The Chandra X-ray Observatory
  - The Compton Gamma Ray Observatory
  - The Spitzer Space Telescope

### **9. SAMPRITI - IX**

#### **Why in News?**

- A joint **military** training exercise between **India and Bangladesh** ‘**SAMPRITI-IX**’ will be conducted at Umroi, **Meghalaya** from 3rd-16th february, 2020.
- The exercise aims to build, strengthen and promote positive relations between the Armies of India and Bangladesh.
- The exercise is **hosted alternately by both countries**.
- The **eighth edition** of the exercise was conducted at **Tangail, Bangladesh**.

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