Current Affairs (2023): Space At a Glance

- **XPoSat Mission–** XPoSat stands for X-ray Polarimeter Satellite. It is India's pioneering polarimetry mission aims to **study X-ray polarization and its cosmic sources**, like Black holes, Neutron stars, and Magnetars. It is world's 2nd polarimetry mission using X-Ray after NASA's Imaging X-ray Polarimetry Explorer (IXPE) that was launched in 2021.
- **NASA-ISRO Synthetic Aperture Radar–** The NISAR, a collaborative mission between NASA and ISRO, is a dual-frequency synthetic aperture radar satellite designed for remote sensing, providing insights into various Earth systems including ecosystems, ice mass, vegetation biomass, and natural hazards. Planned to launch on January 2024.
- **Mangalyaan-2 (MOM 2)–** Mangalyaan-2, or Mars Orbiter Mission 2 (MOM 2), is ISRO's ambitious sequel to its successful Mars mission. It aimed at studying the **surface, atmosphere, and climatic conditions of Mars** are expected to be launched by mid-2024
- **Shukrayaan-1–** Under the Venus Orbiter Mission, ISRO plans to launch Shukrayaan-1, a spacecraft destined to orbit Venus for five years. It aims to study the **atmosphere of Venus,** marking India's first foray into exploring the mysteries of the second planet from the Sun.
- **Night Sky Sanctuary–** Government of India announced the upcoming establishment of South East Asia's first Night Sky Sanctuary in **Ladakh** as a part of Changthang Wildlife Sanctuary. It is being set up with the help of Indian Institute of Astrophysics Bengaluru.
- **Agnibaan Sub Orbital Technological Demonstrator (SOrTeD)–** AgniKul Cosmos, a space tech start-up based in Chennai, set to launch their groundbreaking Agnibaan Sub Orbital Technological Demonstrator (SOrTeD), the world's first **3D-printed rocket into space.**
- **Radio Thermoelectric Generators–** ISRO along with the BARC has embarked on the joint development of Radio thermoelectric generators (RTGs), an innovative approach aimed at surpassing the constraints of conventional chemical engines for interplanetary voyages.
- **STARFIRE Algorithm–** Raman Research Institute (RRI), an autonomous institute of the Department of Science and Technology has developed an algorithm names STARFIRE to tackle unwanted Radio Frequency Interference (RFI) in space, **enriching data obtained from space-based Astronomy Missions.**
- **Vyommitra–** The second phase of the Gaganyaan mission will witness the launch of 'Vyommitra, 'a humanoid robot resembling a space-faring entity in female attire. It is designed to **simulate various tasks that humans would perform in a space environment.**
- **Indian Space Policy 2023–** Indian Space Research Organization (ISRO) released the Indian Space Policy 2023 with the 'Vision' is to **"enable, encourage and develop a flourishing commercial presence in space".**
- **PSLV C55 and TeLEOS-2 Satellite–** ISRO has successfully launched the PSLV -C55/TeLEOS-2 mission from the Satish Dhawan Space Centre, Sriharikota in Andhra Pradesh. TeLEOS-2 is an Earth Observation Satellite (EOS) and will be the primary satellite being carried by the rocket.
- **Reusable Launch Vehicle-Technology–** ISRO and its partners successfully demonstrated a **precise landing experiment** for a Reusable Launch Vehicle (RLV) at the Aeronautical Test Range (ATR), at Chitradurga, Karnataka.
- **One Web India-2 Mission–** ISRO's commercial arm NSIL had signed a contract with One Web to launch 72 satellites in two phases. The first set of 36 satellites was launched in LVM3-M2/One Web India-1 mission on October 23, 2022 while other 36 was launched on March 2023.
- **Megha-Tropiques-1 (MT-1) Satellite–** ISRO has successfully carried out the controlled Re-Entry experiment for the decommissioned Megha-Tropiques-1 (MT-1) Satellite as a collaborative effort between ISRO and the French space agency.
- **Test on Crew Escape System–** Indian Space Research Organization (ISRO) carried out the first of a series of tests of systems and procedures called the Flight Test Vehicle Abort Mission-1 (TV-D1) with the aim to ultimately **fulfill the objectives of Gaganyaan Mission** perhaps by 2025.
- **India Joins Artemis Accords–** India's decision to join the Artemis Accords during the visit to the United States. It is for setting common principles to govern civil exploration and use of other space, the moon, Mars, comets, and asteroids, for peaceful purposes.
- **Solar Ultraviolet Imaging Telescope–** Solar Ultraviolet Imaging Telescope (SUIT), developed by Pune's Inter-University Center for Astronomy and Astrophysics (IUCAA), has been delivered to the ISRO. This unique space telescope has been integrated with ISRO's ADITYA-L1 mission.
- **Coronal Mass Ejections–** They are large-scale eruptions of charged particles (plasma) and magnetic fields from the solar atmosphere into space. They can **disrupt a range of ground- and space-based technologies and satellites on Earth**
- **GAGAN Satellite Technology–** GAGAN, which stands for GPS Aided GEO Augmented Navigation, is a space-based augmentation system jointly developed by the Indian Space Research Organization (ISRO) and the Airports Authority of India (AAI).
- **Electromagnetic Ion Cyclotron Waves–** Scientists have identified Electromagnetic Ion Cyclotron (EMIC) waves, a form of plasma waves in the Indian Antarctic station, Maitri. The EMIC waves are the discreet electromagnetic emissions observed in the Earth's magnetosphere.
- **Sky Canvas Project–** Aims to give people all over the world **"the opportunity to view the world's first live human-made meteor shower".** Japanese company, ALE, plans to launch satellites that will trigger an artificial meteor shower, called Sky Canvas in 2025.
- **Zero Shadow Day–** Bengaluru experienced a unique phenomenon called Zero Shadow Day on 25th April 2023 at precisely 12:17 pm, vertical objects such as buildings and trees appeared to have no shadows. This **occurred because the sun was directly overhead,** at its zenith, causing the shadow to be directly beneath the object.
- **Jupiter becomes planet with most moons–** The latest discovery revealed Jupiter has 12 more moons which lead the count of Jupiter's moons increased to 92 and 82 moons have been discovered around Saturn so far.
- **AI-Driven Martian Oxygen–** Researchers have devised a groundbreaking method using AI-driven chemistry to produce oxygen from Martian meteorites. A capacity to produce oxygen under simulated Martian conditions, marking a crucial leap towards self-sustaining Martian exploration.
- **Peregrine Mission One–** United States first attempt to land on the Moon in over 50 years after the Apollo program.
- **Square Kilometer Array Observatory (SKAO)–** It is world's largest radio telescope project called the Square Kilometer Array Observatory. The Government of India's approval for joining the project, with a financial sanction of Rs 1,250 Crore, is the first step towards the ratification after India joined SKAO.
- **GSAT-20 (GSAT-N2), to be launched by SpaceX's Falcon-9–** The commercial arm of the Indian Space Research Organization (ISRO), New Space India Limited (NSIL) is set to launch GSAT-20 (GSAT-N2), aboard SpaceX's Falcon-9 in 2024.