Venus Orbiter Mission

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Why in news?

The Cabinet approved the **Venus Orbiter Mission**, with a **budget of Rs 1,236 crore**, of which Rs 824 crore will be spent on the spacecraft.

- VOM, scheduled for **launch in March 2028**, aims to e***xplore Venus' surface, subsurface, and atmosphere*** to understand the planet's evolution.
- ISRO will develop and launch the spacecraft, and the mission will provide valuable insights into the evolution of Venus and Earth.

About Venus Orbiter Mission:

- It is envisaged to**orbit a scientific spacecraft**in the orbit of planet Venus.
- **Objectives**
- It is for better understanding of the**Venusian surface and subsurface**, **atmospheric processes** and **influence of the Sun on Venusian** atmosphere.
- The study of the underlying**causes of the transformation of Venus**, which is whispered to be once habitable and quite similar to Earth would be an invaluable aid in understanding the **evolution of the sister planets, both Venus and Earth**.
- The Indian Venus mission is expected to answer some of the outstanding scientific questions resulting in various scientific outcomes.
- **India Space Research Organisation (ISRO)**will be responsible for the development of spacecraft and its launch.
- The mission is expected to be accomplished on the opportunity**available during March 2028.**The realization of the spacecraft and launch vehicle is through various industries.
- **Funding:**The total fund approved for the **VOM is Rs.1236 Cr** out of which Rs 824.00 Crore will be spent on the spacecraft.
- The cost includes development and realization of the spacecraft including its specific payloads and technology elements, global ground station support cost for navigation and network as well as the cost of launch vehicle.
- **Significance:Venus, the closest planet to Earth** and believed to have **formed in conditions similar to Earth,** offers a unique opportunity to understand how planetary environments can evolve very differently.

Bharatiya Antariksh Station (BAS)

India is set to establish its own space station, the BAS, with the launch of its first module planned for 2028.

Technological and Economic Impact

- **Microgravity Research**: BAS will serve as a platform for**microgravity-based scientific research** and **technology development**, leading to**technological spin-offs**and innovations.
- **Increased Industrial Participation**: The programme will encourage**industrial collaboration** in**niche high-technology areas**, boosting**employment**in the**space and allied sectors**.
- **National Technological Capabilities**: The development of BAS will enhance India's capabilities in**human space missions to Low Earth Orbit (LEO)**.
- The programme will inspire young talent to pursue careers in space technology and scientific research.
- The**technological spin-offs** from space research will have broader applications that benefit society, including advancements in**healthcare**,**telecommunications**, and**materials science**.

Feature	International Space Station (ISS)	Mir	Tiangong	Skylab	Salyut
Country	International (USA, Russia, ESA, Japan, Canada)	Russia	China	USA	Russia
Operational Period	1998 – present	1986 – 2001	2021 – present (Tiangong)	1973 – 1979	1971 – 1986
Primary Purpose	Research in space science, technology	Long-term habitation and research	Scientific research, technology testing	Research on space adaptation	Early space science research
Size	~109 meters (length)	~19 meters (length)	~22 meters (length)	~25 meters (length)	~15 meters (length)
Crew Capacity	Up to 6 (permanent crew)	Up to 6	Up to 3	Up to 3	Up to 3
Unique Features	Largest artificial object in space, multinational collaboration	First modular space station	Modular design, new technology for long-term stays	First US space station	First space station program