

SPACE

❖ **ISRO proposes Space Tourism**

• **CONTEXT: ISRO's 'space tourism module' to be functional by 2030**

- Indian Space Research Organisation (ISRO) is developing a space tourism module which will allow enthusiasts to take a trip to space.
- The estimated cost of the trip is slated to be Rs 6 crore, and enthusiasts will be able to take a trip to space by 2030.
- At present, it has not been announced whether the module will include sub-orbital space travel or orbital space travel.
- Space tourism is a relatively new concept that involves traveling to space for recreational purposes while ensuring that it is both safe and reusable.
- **Major highlights of the proposal:**
- Price: The per ticket price is estimated to be around Rs 6 crore and People who take the trip will also be able to call themselves astronauts.
- Type of Space Travel: The module is likely to feature sub-orbital space travel which generally involves spending 15 minutes at the edge of space, experiencing a few minutes in a low-gravity environment before the spaceflight descends back to Earth.
- Partnership with Private Firms: ISRO is likely to partner with private firms for the development of the space travel module via the Indian National Space Promotion and Authorisation Centre (IN-SPACe).
- Safety Measures: ISRO will also be using the Reusable Launch Vehicle—Technology Demonstrator (RLV-TD) to gain more knowledge about the safety of the spaceflights as space experiences are being brought to the common people.
- **Major challenges of space tourism are:**
- Cost: Space tourism is currently very expensive, and only a small number of people can afford it which is a major obstacle for most people.
- Safety: Space tourism involves a high degree of risk, and safety will be a major concern for both tourists besides operators and the Spacecraft and launch vehicles must be reliable, and emergency procedures must be in place in case of any contingencies.
- Medical issues: Space tourism can pose significant medical challenges to tourists, such as changes in gravity, radiation exposure, and other physiological and psychological effects.
- Regulations: There is currently no international regulatory framework for space tourism, and governments will need to work together to establish standards and regulations to ensure the safety and sustainability of the industry.
- Environmental impact: Space tourism can have a significant environmental impact, including increased emissions, waste, and damage to the atmosphere and the ozone layer.
- **Importance of space tourism:**
- Economic benefits: Space tourism can contribute to the growth of the space industry and generate revenue for space companies besides creating jobs, stimulate innovation, and attract investment in related industries such as hospitality and entertainment.
- Promoting space exploration: It can increase public interest in space exploration and encourage more people to learn about the universe, astronomy, and space technology leading to more funding for space research and development.
- Advances in technology: The development of space tourism requires the advancement of space technology and infrastructure, such as spacecraft, launch vehicles, and space habitats which can have positive spillover effects on other sectors, such as transportation, energy, and communication.
- Environmental benefits: Space tourism can potentially help reduce the environmental impact of tourism on Earth by providing an alternative destination for travelers which could help reduce the strain on natural resources and ecosystems.
- **Other countries with Space Tourism modules:**
- United States: It is a leader in space tourism, with several private companies such as SpaceX, Blue Origin, and Virgin Galactic which has already completed several test flights, and plans to launch commercial flights in the near future.
- Russia: It has been involved in space tourism since 2001, and has sent several paying tourists to the International Space Station (ISS) on its Soyuz spacecraft.
- China: It is a relatively new player in the space tourism industry, but has ambitious plans to build its own space station and potentially offer space tourism in the future.
- United Arab Emirates: The UAE recently sent its first astronaut to the ISS, and has expressed interest in developing space tourism as part of its efforts to diversify its economy.

- Japan: It has sent several astronauts to the ISS, and is involved in the development of space tourism through private companies such as PD Aerospace.
- **Conclusion**
- ISRO's space tourism module, which is both safe and reusable is a significant step towards advancing India's space exploration programs and providing the public with an opportunity to experience space travel.
- As technology continues to advance, space tourism could become more accessible and affordable, in future and thus allowing more people to experience the wonder and excitement of space exploration.
- **Mission GAGANYAN**
- Gaganyaan is India's first human spaceflight mission, aimed at sending three astronauts into space by 2022.
- The mission is being developed by the Indian Space Research Organization (ISRO) and aims to demonstrate India's capabilities to send humans into space and return them safely.
- The spacecraft will consist of an Orbital Module and a Crew Module, which will be launched by the Geosynchronous Satellite Launch Vehicle Mark III (GSLV-Mk III) rocket.
- The spacecraft will orbit the Earth at an altitude of 400 km for a period of 5-7 days.
- The crew will be trained in Russia's Yuri Gagarin Cosmonaut Training Center in Moscow.
- The crew module will have an emergency escape system to ensure the safety of the astronauts in case of any failure during launch or ascent.
- The mission will have significant scientific, technological, and socio-economic benefits for India, including the development of new technologies and capabilities, inspiration for future generations, and international collaboration.

PRELIMS

1. PM MITRA scheme

- **CONTEXT:** The Centre has selected sites in Tamil Nadu, Telangana, Karnataka, Gujarat, Maharashtra, Madhya Pradesh and Uttar Pradesh to set up new textile parks, a year and a half after the PM Mega Integrated Textile Regions and Apparel (PM MITRA) scheme was announced.
- About
- States are identified through the challenge route and the PM MITRA parks will provide the best ecosystem for the textile industry to be collectively present in one location, with plug-and-play infrastructure, and improve the competitiveness of the textile value chain.
- The vision for 2030 is to achieve an economic value of \$250 billion in production and \$100 billion in export of textiles, apparel, and related products and this is achievable even though the industry faced a small setback in the current year.
- **About PM MITRA**
- The PM MITRA scheme is inspired by the 5F vision - Farm to Fibre to Factory to Fashion to Foreign.
- It aspires to fulfil the vision of building an Aatmanirbhar Bharat and to position India strongly on the Global textiles map.
- **PM MITRA Parks**
- PM MITRA Parks offer an opportunity to create an integrated textiles value chain right from spinning, weaving, processing/dyeing and printing to garment manufacturing at 1 location.
- These parks are envisaged to be located at sites which have inherent strengths for the textile industry to flourish and have the necessary linkages to succeed. The scheme envisages to leverage the Public Private Partnership model for fast-paced implementation in a time-bound manner.
- Integrated Textile Value chain at 1 location will reduce logistics cost of Industry.
- Intended to generate ~1 lakh direct and 2 lakh indirect employment per park.
- Sites for PM MITRA Parks will be selected by a Challenge Method based on objective criteria.

2. Indian Institute of Astrophysics researchers develop low-cost star sensor

All-in-one parks

The PM Mega Integrated Textile Regions and Apparel (PM MITRA) scheme was announced in October 2021

■ The parks will come up by 2026-27

■ The total outlay for the project is ₹4,445 crore, though the initial allocation in the 2023-24 Budget is only ₹200 crore

■ States have offered to provide at least 1,000 acres, says Minister Goyal

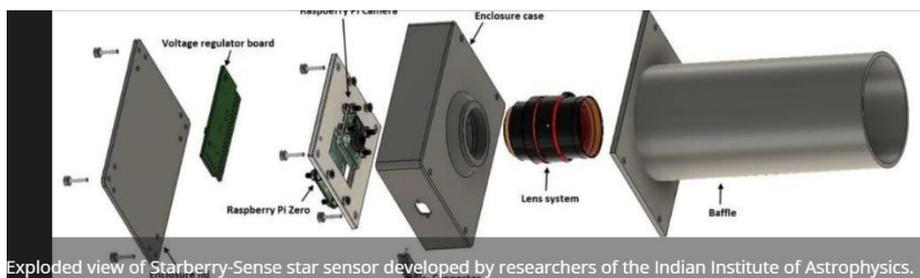


■ Spinning, weaving, processing/dyeing, printing and garment manufacturing will be done at one location

■ Effort is to reduce logistics cost of textile industry and make it globally competitive

- **CONTEXT:** Researchers at the Indian Institute of Astrophysics (IIA) have developed a low-cost star sensor for astronomy and small CubeSat class satellite missions.

- The star sensor named Starberry-Sense can help small CubeSat class satellite missions find their orientation in space.



Exploded view of Starberry-Sense star sensor developed by researchers of the Indian Institute of Astrophysics.

- According to The Department of Science and Technology (DST) the Starberry-Sense is ready for launch on the PS4-Orbital Platform by ISRO and can be used for CubeSats and other small satellite missions in the future.

- Based on commercial/off-the-shelf components, this star sensor costs less than 10% of those available in the market. The brain of the instrument is a single-board Linux computer called Raspberry Pi, which is widely used among electronics hobby enthusiasts.

- Scientists coupled some highly optimised algorithms with a Raspberry Pi and turned it into a potent star sensor, named StarBerry-Sense. And they could demonstrate that instruments built from easily available components can be qualified for space.

• Star sensor

- Any satellite needs to know where it is pointed in space, and the instrument used for this purpose is called a star sensor.

- The position of stars in the sky is fixed relative to each other and can be used as a stable reference frame to calculate the orientation of a satellite in orbit.

- This is done by correctly identifying the stars in the sky towards which the star sensor is pointed. The star sensor is essentially a celestial compass.

3. Horseshoe Crabs

- **CONTEXT:** Horseshoe crabs, one of the oldest living creatures on earth and medicinally priceless, appear to be disappearing from their familiar spawning grounds along Chandipur and Balaramgadi coast in Odisha's Balasore district.

- Scientists have urged Odisha government to come up with a robust protection mechanism before the living fossil becomes extinct due to destructive fishing practices.

- Dr. Anil Chatterjee first discovered horseshoe crabs along Balasore coast and brought the species to the State's notice in 1987.

➤ About:

- It is a marine chelicerate arthropod living in shallow coastal waters on soft sandy or muddy bottom and spawns (release or deposit eggs) mostly on intertidal beaches at summer spring high tides.
 - ✓ Subphylum Chelicerata is a division within the Phylum Arthropoda containing animals such as spiders, scorpions, harvestmen, mites and ticks. Like all arthropods, they have a segmented body and segmented limbs and a thick chitinous cuticle called an exoskeleton.
 - ✓ Other than the marine horseshoe crabs, the Chelicerata are found primarily in terrestrial environments worldwide.

- It is regarded as a marine 'living fossil'.

- There are four extant horseshoe crab species:

- ✓ The American horseshoe crab (*Limulus polyphemus*) along the eastern coast of the USA and in the Gulf of Mexico.
- ✓ The tri-spine horseshoe crab (*Tachypleus tridentatus*)
- ✓ The coastal horseshoe crab (*Tachypleus gigas*)
- ✓ The mangrove horseshoe crab (*Carcinoscorpius rotundicauda*)
 - ✚ The last three are Indo-pacific species found in the coastal waters of India, southeast Asia, China and Japan.
 - ✚ Odisha is their largest habitat in India.



➤ Importance:

- They have existed since the time of the dinosaurs and are important ecosystem engineers and predators of small organisms.
- Their ecological function is to lay millions of eggs on beaches to feed shorebirds, fish and other wildlife.

- Their large hard shell serves as a microhabitat for many other species such as sponges, mud crabs, mussels and snails.
- They are a critical link to world health, biodiversity and hold cultural importance across the globe.
- **Medicinal value**
- The blood of this crab is very important for the preparation of rapid diagnostic reagents. All injectable medicines are tested on them. A molecule has been developed from a reagent of horseshoe crab to help treat pre-eclampsia.
- Scientists are surprised to find strong immune system in animal that helped it survive millions of years.
- **Threats**
- Overharvesting for use as food, bait and biomedical testing.
- Habitat Destruction: Habitat loss from coastal reclamation and development. Shoreline alterations that are engineered to protect beaches from erosion and sea level rise due to climate change also affect their spawning habitats.
- Poachers kill them for their meat which is popularly believed to have aphrodisiac qualities.
- Trade in horseshoe crabs is rampant in many Indian states as it is believed that consumption of horseshoe crab meat can lengthen a person's lifespan, even though there is no scientific evidence to support this.
- Its carapace (hard upper shell) is crushed and mixed with water to prepare a paste, which is applied onto scars.
- **Conservation:**
- It is in the Schedule IV of the Wildlife Protection Act 1972, under which the catching and killing of a horseshoe crab is an offence.
- IUCN Status:
 - ✓ American horseshoe crab: Vulnerable.
 - ✓ Tri-spine horseshoe crab: Endangered.
 - ✓ The two other species are not listed yet.
- The crackdown on horseshoe crab poachers requires superior, inter-state coordination among police and wildlife authorities of Odisha, Bihar, Jharkhand and other states.
- The Zoological Survey of India has suggested declaring the habitat of horseshoe crabs as Eco-Sensitive Zones for their conservation and proper management.
- 4. Integrated Mobile Camouflage Systems**
- **CONTEXT: To reduce thermal and radar signatures the Indian Army has placed its first order for Integrated Mobile Camouflage Systems (IMCS) for Mechanised Forces with an Indian start-up Hyper Stealth Technologies Private Limited.**
- This is the first ever procurement order of an Innovations for Defence Excellence (iDEX) project by the Indian Army.
- The order is for an indigenously developed 'Integrated Mobile Camouflage System (IMCS)' for Mechanised Forces.
- **About:**
- The IMCS comprises low emissivity and/or CAM-IIR coatings and mobile camouflage system materials that enable armoured fighting vehicles (AFVs) to blend in with their terrain background, significantly enhancing capability in stealth for AFVs.
- This niche technology is expected to considerably boost indigenous stealth technology, facilitating Aatmanirbharta in line with the Government of India's (GoI) vision.
- The awarding of the procurement order to Hyper Stealth Technologies Private Limited is a testament to the Indian Army's commitment to promoting innovation and technological development in defence and aerospace, and it is a significant achievement for the start-up community.
- It is a positive step towards achieving the government's vision of Aatmanirbharta and promoting indigenous stealth technology.
- **About iDEX:**
- Managed by the Defence Innovation Organisation (DIO) under the Ministry of Defence (MoD) (DDP), iDEX has emerged as a front-runner in establishing the right contact with start-ups and innovators and has gained substantial traction in the defence start-up community.
- Currently, there are a total of 48 projects of the Indian Army as part of the Defence India Start-up Challenge (DISC), Open Challenges, iDEX4 Fauji and iDEX PRIME scheme, involving handholding of 41 start-ups for the development of the latest state-of-the-art solutions for the challenges posed by the Indian Army.

ANSWER WRITING

Q. What are the constitutional provisions with respect to the parliamentary privileges? Do you think that the absence of a law to codify parliamentary privileges has led to their misuse? Give reasons.

4

Parliament, as an institution, and its members, in an individual capacity, enjoy certain rights and immunities which enable them to perform their parliamentary duties “efficiently and effectively” without any hindrance. These immunities are called parliamentary privilege. Articles 105 and 194 of the constitution deal with these powers, privileges and immunities.

Article 105 mainly has four clauses and provides for the following:

- Freedom of speech in Parliament is subject to the provisions of the Constitution and the rules regulating the procedure of the Houses.
- A member is exempt from legal action for anything said or a vote given in Parliament or one of its committees. The member is also not liable for any publication of a report, paper, vote, or proceedings.
- Powers, privileges and immunities of each House of Parliament and that of its members and committees are required to be defined by Parliament by law. Until so defined, it shall be those of that House and its members and committees immediately before the coming into force of Section 15 of the Constitution (Forty-fourth Amendment) Act 1978.
- The fourth clause states that provisions that apply to MPs also extend to non-members, i.e., those who have the right to speak and take part in proceedings or parliament committees, by virtue of the Constitution.
- Similarly, Article 194 outlines corresponding powers, privileges and immunities of State legislatures and their members and committees.
- Other than the constitution, parliamentary privileges also emanate from various laws made by Parliament, rules of both the Houses, parliamentary conventions and judicial interpretations.

Absence of law to codify privilege has led to their misuse:

- Absolute power of parliament: The Parliament enjoys mostly all the supreme powers while making laws and exercise its power to the best possible extent because of the absolute nature of its powers and privileges.
- Against the principle of constitutionalism: The powers of the legislators are too wide, such as they decide their own privileges, include points which can breach the laid down privileges, and also decide the punishment for that breach. This clearly impinges on constitutionalism, the idea of limited government.
- Cases of Misuse.
 - In 2003, a speaker of the Tamil Nadu’s Legislative Assembly ordered to arrest the editors of ‘the Hindu, as they published in their article the expressions ‘incensed’, ‘fumed’ and ‘high pitched tone’ for the conduct of the member in the session of the assembly, stating that it was considered being a breach of his privilege.
 - In 2019, the Speaker of Maharashtra Legislative Assembly ordered the action of arrest against a man for creating a parody video of the speech made by one of the members of the Assembly.

Need for codifying the parliamentary privileges.

- Borrowing the privileges of British MPs was a temporary measure: While framing the Constitution it was elucidated that the parliamentary privileges would remain similar to those of the British House of commons but can also be changed and introduced if the legislators want so, but the legislators have maintained a status quo on this issue.
- For strengthening fundamental rights of citizens: Constructive criticism and dissent are the essentials of democracy. Thus, restraining the citizens from exercising their fundamental rights of freedom of speech and expression would be amounting to infringement of their fundamental rights.
- Increased accountability: If parliamentary privileges are codified, the accountability and the administration of the members would increase, thereby benefiting the democracy.
- National Commission to Review the Constitution recommended that the time has come to define and delimit privileges deemed to be necessary for the free and independent functioning of Parliament.

Although privileges help in effective working of the parliament, there have been many cases of its misuse by the members. Hence, there must be a balance between the fundamental rights of the citizens and between the parliamentary privileges. It is said that “power corrupts, and absolute power corrupts absolutely”. For this to not happen, the parliamentary privileges should be codified. This will help strengthen Indian democracy and will also boost public confidence in the parliament.

MCQs

1. Consider the following statements regarding PM MITRA Parks.
 1. The scheme is to develop integrated large-scale industrial infrastructure facility for entire value-chain of the textile industry.
 2. These parks will be setup at Greenfield / Brownfield sites located in different states.
 3. These parks will be developed by a Special Purpose Vehicle which will be owned by the Central and State Government and in a Public Private Partnership (PPP) Mode.

Which of the above statements is/are correct?

- a) 1, 2 only b) 1, 3 only c) 2, 3 only **d) 1, 2, 3**

2. With reference to Horse shoe crabs consider the following
1. It is regarded as a marine 'living fossil'.
 2. Like olive ridley sea turtles, these crabs are basically deep-sea animals.
 3. The blood of this crab is very important for the preparation of rapid diagnostic reagents.
- Which of the above statement/s is/are correct?
- a) 1 and 2 only b) 2 and 3 only c) 1 and 3 only **d) 1,2 and 3**
3. Choose the correct statement with reference to recently developed low-cost star sensor for astronomy and small CubeSat class satellite missions.
1. Star sensors are sensors used by satellites to orient themselves.
 2. This orientation done by correctly identifying the stars in the sky towards which the star sensor is pointed.
 3. The sensors named Starberry-Sense will launch on PS4-Orbital Platform by ISRO and can be used for CubeSats and other small satellite missions in the future.
- Which of the above statement/s is/are correct?
- a) 1 and 2 only b) 2 and 3 only c) 1 and 3 only **d) 1,2 and 3**
4. With reference to Integrated Mobile Camouflage System (IMCS) consider the following
1. The IMCS camouflage properties defeats hostile sensors and target acquisition system in all phases of the mission.
 2. The Multi Spectral Signature management properties of the IMCS lowers a vehicle's internal temperature, extending the endurance of personnel and electronic Equipment.
- Which of the above statement/s is/are not correct?
- a) 1 only b) 2 only c) Both 1 and 2 **d) Neither 1 nor 2**
5. Which of the following state recently introduced first of its kind "Cow Cess"?
- a) Maharashtra b) Gujarat c) Uttar Pradesh **d) Himachal Pradesh**
6. Recently central government has been referred to the Law Commission for further examination on issue of holding simultaneous elections to the Lok Sabha and the State Assemblies. With reference to this news which of the following Article/s of Constitution of India would require amendment to hold simultaneous election in India.
1. Article 83
 2. Article 85
 3. Article 172
 4. Article 174
 5. Article 365
- Choose the correct answer using the codes given below?
- a) 1 and 2 only b) 2,3 and 5 only c) 1,3 and 5 only **d) 1,2,3,4 and 5**
7. Namdapha National Park recently seen in news is located in which of the following state?
- a) Assam
b) Meghalaya
c) Arunachal Pradesh
d) Manipur
8. Unnathi programme recently seen in news is related to which of the following?
- a) Self-help group networks
b) Youth belonging to SC and ST communities.
c) Textiles industry
d) Manual Scavenging
9. The International Criminal Court (ICC) recently announced it had issued an arrest warrant against Russian President Vladimir Putin for the "unlawful deportation" of Ukrainian children, With reference to the International Criminal Court (ICC), consider the following statements:
1. It is a permanent judicial body based at The Hague in the Netherlands.
 2. Unlike the International Court of Justice (ICJ), the ICC is not part of the United Nations system.
 3. India signed the States Parties to the Rome Statute and recognise the ICC's authority.
- Select the correct statement using the codes given below
- a) 1 and 2 only** b) 2 and 3 only c) 1 and 3 only d) All of the above
10. GSOMIA is a bilateral security agreement recently seen in news is between which of the following countries?
- a) South Korea and Japan** b) North Korea and USA
c) India and Israel d) North Korea and Japan