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Bio-derived Foam

Researchers at the Indian Institute of Science (IISc) in Bengaluru have developed an innovative, eco-friendly bio-derived foam recently.

- It is a bio-derived foam that offers a sustainable alternative to plastic materials used in traditional Fast-Moving Consumer Goods (FMCG) packaging.
- The foam is made from bio-based epoxy resins, made from non-edible oils approved by the US Food and Drug Administration (FDA) and hardeners derived from tea leaves.
- It is an alternative to conventional expanded polystyrene (EPS) and polyurethane (PU) foams.
- It disintegrates in landfills ***without contaminating groundwater,*** offering a sustainable alternative to traditional plastic foams.
- These bio-foams can disintegrate within ***3 hours*** when exposed to eco-friendly solvents at ***80°C.***
- The foams contain chemical bonds that can be broken and reformed in response to external stimuli.
- This allows the material to be mechanically reprocessed or dissolved in eco-friendly solvents within hours.
- It is sustainable packaging solutions, offering industries an environmentally responsible.

Each year, around 2.3 million tonnes of plastic foam are produced worldwide, but less than 1% of it is recycled.

- **Significance -** Researchers said the production of 10,000 traditional plastic foam cups results in approximately 308 kg of greenhouse gas emissions.
- The Indian foam market, valued at USD 7.9 billion in 2023, is expected to grow to USD 11.1 billion by 2032, with a compound annual growth rate (CAGR) of 3.85%.

References

1. Deccan Herald | Bio-derived Foam
2. Times of India | Biodegradable foam

International Chess Federation (FIDE)

An Indian prodigy, Anish Sarkar, has become the world's youngest chess player to be ranked by the International Chess Federation all at the age of three.

- The International Chess Federation (FIDE) is the ***governing body for international chess competitions*** and the organization that connects national chess federations.
- FIDE regulates all international chess competitions and is responsible for organizing chess and its championships at the global and continental levels.
- **Founded in -** Paris, France on July 20, 1924.
- Its original name in French is Fédération Internationale des Échecs, which is where the acronym FIDE comes from.
- **Headquarters -** Lausanne.
- **Motto -** FIDE's motto is Gens una sumus, which is Latin for "We are one Family".
- **Member federations** - 201 member federations.
- The ***International Olympic Committee (IOC)*** recognized FIDE as a Global Sporting Organization in 1999.
- FIDE also keeps records of players' ratings.

FIDE Rating system

- According to the FIDE Qualification Commission, players get official ratings by participating in FIDE-rated tournaments.
- The FIDE Rating system is a numerical system in which fractional scores are converted to rating differences and vice versa.
- Its function is to produce measurement information of the best statistical quality.
- **Eligibility -** To become a FIDE-recognized tournament, certain regulations on time limits for a game, a minimum rating for players and other criteria must be met.
- Also, to be included in the rating list, a player must be registered through a national chess federation which is a member of FIDE, unless otherwise approved by FIDE Council.
- The federation must not be temporarily or permanently excluded from membership at the time.
- **Types of rating -** Standard, Rapid and Blitz, which reflect different game lengths.
- In order to get a Standard rating, you will need to play at least 5 games against players who are already rated, and score at least ½ point (a draw) in those games.
- Currently, FIDE awards ***chess's highest honor*** to a player who is able to achieve a FIDE Classical or Standard rating of 2,500, plus 3 Grandmaster norms.
- These norms are defined by a set of complex and rigorous rules regarding tournaments, games, and players, set out in the FIDE Title Regulations.

Reference

The Indian Express | International Chess Federation or FIDE

Antariksha Abhyas, 2024

Antariksha Abhyas, 2024, a tri-service three day Exercise hosted by Defence Space Agency begins in New Delhi.

- It is the ***1st Ever Space Exercise*** to help secure national strategic objectives in space.

- It is a first of its kind exercise being conducted and is expected to integrate India's space capability in military operations.
- **Aim -** To war-game the growing threats from and to Space Based Assets and Services.
- **Conducted by -** The Defence Space Agency of Headquarters Integrated Defence Staff.
- **Participants -** Specialist branches under Headquarters Integrated Defence Staff namely Defence Cyber Agency, Defence Intelligence Agency and Strategic Forces Command.
- In addition, the exercise intends to identify vulnerabilities in conduct of operations in the event of denial or disruptions of space-based services.

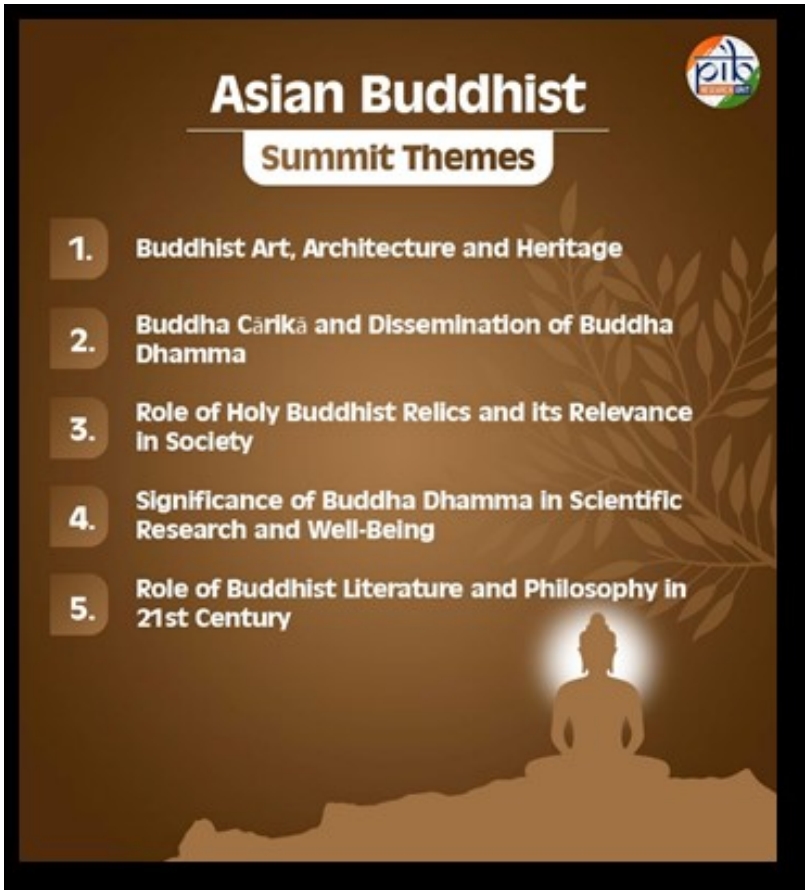
References

1. PIB | 'Antariksha Abhyas – 2024'
2. Deccan Herald | 'Antariksha Abhyas'

First Asian Buddhist Summit, 2024

Recently, the Ministry of Culture and the International Buddhist Confederation (IBC), organized the First Asian Buddhist Summit.

- **Theme -** *'Role of Buddha Dhamma in Strengthening Asia'.*
- **Participants-** 32 countries with over 160 international participants of 'Sangha' leaders, scholars, experts and practitioners from various traditions across Asia.
- **The Delhi Declaration** – The summit adopted the declaration at the conclusion of the event.
    - Strengthening bonds between Asian countries based on the principles of Buddha Dhamma.
    - Working upon Buddhist literature, especially Pali.
    - Fostering and sharing the historical journey of Buddhist art and heritage (including architecture).
    - Connect Asian Buddhist Circuit through Buddhist Pilgrimage and Living Heritage.
    - Recognize the relevance of scientific and medical aspects of Buddha Dhamma (religion).



- **Significance of Buddhist Summit-** Focuses on the foundational teachings of the Buddha and their modern-day applications.
- Explores the ways in which Buddhist principles can contribute to sustainable development, social harmony, and international cooperation.
- Mainly concerned with the religious aspects and its associated discourse.
- Threw up many innovative ideas emanating from the ancient philosophy and science of Dhamma.
- Dhamma as a guiding framework for ethical governance compassionate action, and sustainable development.
- Aligns with India's Act East Policy and Neighborhood First Policy, focusing on collective, inclusive, and spiritual development in Asia.

International Buddhist Confederation

- It is a Buddhist umbrella body with its base in New Delhi.
- It serves as a common platform for Buddhists worldwide.
- It was established under the patronage of the supreme Buddhist religious hierarchy.
- **Membership -** More than 320 organizations, both monastic and lay, in 39 countries.

Reference

The Hindu| First Asian Buddhist Summit 2024

Microplastics

Recently, the researchers founded that microplastics could be affecting weather and climate by producing clouds.

- **Microplastics -** They are fragments of any type of plastic less than 5 mm (0.20 in) in length.
- They can originate from larger plastic waste as it breaks down, Resin pellets, Microbeads, Tires, Synthetic clothing.
- The problem with microplastics is that like plastic items of any size they do not readily break down into harmless molecules.
- On beaches, microplastics are visible as tiny multicolored plastic bits in sand.
- In the oceans, microplastic pollution is often consumed by marine animals.
- **Types of Microplastics -** Primary microplastics and Secondary microplastics.
    - **Primary microplastics -** Any plastic fragments that are already 5.0 mm in size or less.
    - **Secondary microplastics** – They are arise from the degradation (breakdown) of larger plastic products through natural weathering processes.
- **Research findings –** They act as ice-nucleating particles that produce clouds in conditions where they would not form.
- They are suspended in small droplets of water and slowly cooling these droplets to observe how the microplastics affected ice formation.
- The average temperature at which the droplets froze was 5-10 degrees warmer than droplets without microplastics.
- They are insoluble as a defect into a droplet, it can nucleate ice at warmer temperatures.
- They are interacting with the climate system and the process of cloud formation is triggered by microplastics.

- **Clouds effect on weather and climate** – If microplastics are present, they could cause ice crystals to form, potentially increasing rain or snowfall.
- They reflect incoming sunlight away from the Earth's surface, which has a cooling effect.
- They absorb some radiation that is emitted from Earth’s surface, which has a warming effect.
- If microplastics increase the presence of ice particles in clouds compared with liquid water droplets, this shifting ratio could change clouds’ effect on Earth’s energy balance.

The world is producing 57 million tons of plastic pollution per year.

References

1. The NDTV World| Microplastics in the Atmosphere
2. The PBS Organisation| Microplastics in the Atmosphere



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