



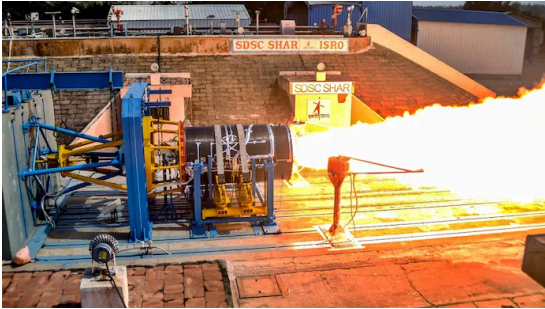
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2 April 2024

National & International News

Kalam-250



Context:

- The recent successful **test firing of Stage-2, named Kalam-250, of the Vikram-1 space launch vehicle by Skyroot Aerospace marks a significant advancement in India's space industry.**
- **Importance:** Stage 2 is crucial in propelling the launch vehicle from the atmospheric phase to the deep vacuum of outer space, playing a pivotal role in achieving the desired trajectory.

Key points:

- **Kalam-250 is a high-strength carbon composite rocket motor using solid fuel.**
- It features a **high-performance Ethylene-Propylene-Diene terpolymers (EPDM) Thermal Protection System (TPS).**
- The Stage includes a carbon ablative flex nozzle and high-precision electro-mechanical actuators for thrust vector control, ensuring **precise trajectory adjustments.**
- The solid propellant for Kalam-Solar Industries processed **250 at their Nagpur facility.**
- The successful test firing brings Skyroot Aerospace **closer to the upcoming orbital launch of the Vikram-1-1 rocket.**

Vikram I Details

- Vikram I is the **first rocket in the series, featuring three solid-fuel-powered stages and a final stage equipped with Raman engines.**
- The Raman engines, powered by MMH and NTO liquid fuels, are used for final orbit adjustments.
- Vikram I is designed to lift payloads of up to 290 kg to a 500 km Sun-synchronous polar orbit (SSPO) or **480 kg to a 500 km low Earth orbit (LEO) with a 45° inclination.**

Asteroid 2015 MB54

Context:

- NASA has been tracking a massive **170-foot asteroid(Asteroid 2015 MB54) that is moving towards Earth at a speed of 13,798 kilometers per hour.**
- On March 29, NASA's Jet Propulsion Laboratory predicted the passage of **four asteroids near Earth.**
- **Monitoring celestial objects is crucial to protect Earth from potential impacts and damage.**



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### Key points:

- NASA reassures that Asteroid 2015 MB54 poses no threat to Earth due to its relatively small stature.
- According to **NASA's criteria**, only asteroids **approaching within 4.6 million miles** and measuring larger than approximately 150 meters are considered **potentially hazardous**.

### Asteroids:

- Asteroids, also known as **minor planets**, are **rocky remnants from the early stages** of the solar system's formation around **4.6 billion years ago**.
- These space rocks are primarily located in the **main asteroid belt, a region between Mars and Jupiter, and their total count exceeds 1,351,400**.
- These celestial objects vary **greatly in size**, with the largest asteroid, **Vesta, measuring about 329 miles (530 kilometers) in diameter**, while the smallest are less than 33 feet (10 meters) across. Their shapes range from nearly spherical to irregular double-lobed peanut shapes.
- Asteroids **follow highly elliptical orbits around the Sun**, often rotating unpredictably and tumbling through space.
- Despite their abundance, the combined mass of all asteroids is less than that of **Earth's Moon**. Interestingly, many large asteroids have small moons orbiting them.

### USSD

### Context:

- The **Department of Telecom (DoT)** has issued a directive to telecom operators regarding the deactivation of **USSD-based call forwarding services, effective from April 15, to prevent fraud and online crimes**.

### Key points:

- **USSD (Unstructured Supplementary Service Data)** is a protocol GSM cellular telephones use to communicate with service provider computers.
- It allows users to interact with various services using shortcodes, initiating a session between the user's phone and the service provider's system.

### Reasoning and Impact:

- The directive aims to prevent fraud and enhance security for subscribers by suspending USSD-based call forwarding services.
- Telecom operators can mitigate risks associated with fraudulent activities.



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### Plastic Waste Management Amendment Rules 2024

#### Context:

- The **Union Environment Ministry** has recently introduced **stricter rules to regulate "biodegradable" plastics** in response to the growing concern over microplastic pollution.
- These rules aim to ensure that the environmental impact of disposable plastic ware is accurately communicated through labelling.

#### Key points:

- **Biodegradable plastics were initially seen as a solution to plastic waste**, as they were expected to decompose naturally after use, **reducing plastic accumulation in landfills and the environment.**
- However, previous regulations in India lacked clear definitions for **"biodegradable,"** leading to incomplete breakdowns and the potential for microplastics to remain.
- The new rules **require complete biodegradation, with no microplastics left behind, representing a significant step towards preventing further plastic waste pollution.**

#### Microplastics:

- Microplastics are **small plastic pieces less than five millimeters long** which can be harmful to our ocean and aquatic life.

### India's Defence Exports Reach Record High

#### Context:

- **India's defence exports exceeded ₹21,000 crores for the first time.**

#### Key points:

- The Defence Ministry reported a 31-fold increase in exports over the past decade compared to FY 2013-14.
- Mr. Singh expressed his delight, highlighting the GSM cellular telephones use's defence exports.
- The exports reached ₹21,083 crore in FY 2023-24, marking a remarkable 32.5% growth from the previous fiscal year.

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