

SHORTNEWS:

1.VERA C RUBIN OBSERVATORY

Context: The **Vera C Rubin Observatory in Chile** has released its first breathtaking images, showcasing the power of its 3,200-megapixel digital camera—the largest ever built.

About Vera C. Rubin Observatory

- It is designed to conduct the **Legacy Survey of Space and Time (LSST)**, a 10-year survey of the southern sky.
- **Named after Vera Rubin**, the astronomer who provided key evidence for dark matter.
- The Vera C. Rubin Observatory is a next-generation **astronomical facility**.
- **Aim:** To explore cosmic mysteries including dark matter, dark energy, and asteroid threats.
- **Location:** Cerro Pachón, Chilean Andes (8,684 feet above sea level)
- **Development:** National Science Foundation (NSF) and U.S. Department of Energy (DOE).

Key Features

The centrepiece of the observatory is the **Simonyi Survey Telescope**. This device is unique for the following reasons:

- **Wide Field of View:** Captures an area equivalent to **40 full Moons** in one image—far surpassing Hubble and James Webb in sky coverage—using a three-mirror design for efficient light collection.
- **World's Largest Digital Camera:** Equipped with a **3,200-megapixel camera** (the size of a small car), it can detect objects **100 million times dimmer than visible to the naked eye**, using six filters spanning ultraviolet to infrared.
- **Rapid Repositioning and Imaging:** The world's fastest repositioning telescope, it slews and settles in just **5 seconds**, capturing up to **1,000 images nightly** and scanning the entire visible sky every 72 hours.
- **Automated Detection Software:** Continuously compares current and past images to detect changes, generating 10 million alerts per night; in testing, it identified over 2,100 new asteroids in just 10 hours, including 7 near-Earth objects.
- **Massive Data Handling:** Gathers 20 terabytes of data each night and is expected to catalogue over 5 million asteroids and 100,000 near-Earth objects in a decade, with real-time data processing for rapid scientific response.

Significance of the Observatory

- **Revealing Dark Matter and Dark Energy:** Will create the most detailed 3D map of the universe, enabling scientists to study the gravitational effects of invisible matter and understand the universe's accelerating expansion.
- **Early Threat Detection:** Enhances global preparedness by tracking potentially hazardous asteroids, contributing to international planetary defence efforts.
- **Scientific Breakthroughs:** Offers potential to confirm or reshape existing theories on galaxy formation and cosmic evolution, while providing a dynamic, real-time map of the night sky for both researchers and the public.

2.REPUBLIC OF NAMIBIA

Context: Prime Minister Modi received **Namibia's highest civilian award 'Order of the Most Ancient Welwitschia Mirabilis'** during his first visit to Namibia as part of India's ongoing diplomatic and economic outreach in Africa.

- The award has been named after the **Welwitschia Mirabilis**, a unique and ancient **plant native to the Namib Desert**.

About Namibia

- Namibia is officially known as the **Republic of Namibia**, with **Windhoek** as its capital and largest city, located near the **Auas Mountains**.
- **Location:** Namibia is situated on the **southwestern coast of Africa**, lying in the **Southern and Eastern Hemispheres**.
- **Borders:** It shares land borders with **Angola and Zambia** to the north, **Botswana** to the east, **South Africa** to the south and east, and a narrow border with **Zimbabwe** separated by the Zambezi River.
 - The Atlantic Ocean forms its **western boundary**.

Geographical Features of Namibia

- **Namib Desert:** A narrow, coastal desert with both rocky and sandy terrain, it runs along the **Atlantic coast** and features some of the world's highest sand dunes, especially in the **Sossusvlei region**.
 - The **Skeleton Coast** is infamous for **shipwrecks due to thick fog**.
- **Central Plateau :** Lies inland and features elevations between 975 and 1,980 m. This region supports most of Namibia's agriculture and **includes savannas, scrublands, and woodlands**.
- **Kalahari Desert:** Located to the east, this desert region is **more vegetated than the Namib** and merges with **Botswana's Kalahari**.
- **Highest:** Namibia's highest point is **Mount Brandberg** at 2,573 meters, located on the western edge of the plateau.
- **Rivers:** Major rivers include the **Kunene, Okavango, Orange, Swakop, Kuiseb, and Fish Rivers**.

3.MALE CLASS DRONES

Context: India has accelerated the procurement of **87 Medium Altitude Long Endurance (MALE)** drones from **local manufacturers**.

About MALE Class Drones

- MALE drones are unmanned aerial vehicles designed for **medium altitude (up to 35,000 feet) and long-duration flights** of 30 hrs.
- **Strategic Importance:** These drones provide the Indian military with **superior surveillance and intelligence-gathering capabilities**, especially along sensitive borders like those with China and Pakistan.
- **Defense Upgrades:** The drones are equipped with **precision strike capabilities**, enhancing India's deterrent power in the region.
 - India has developed indigenous MALE drones like the DRDO's '**Rustom**,' which are expected to complement imported drones for a diversified defense strategy.

- **Global Competition:** The MALE drone market is highly competitive, with countries like the USA, China, and Israel leading in technology and development.
- **MQ-9 Reaper (US)** and the **Wing Loong series (China)** are examples of MALE Drones.

4. BLUETOOTH MESH NETWORKS

Context: : Twitter co-founder **Jack Dorsey** is developing **Bitchat**, a messaging app using **Bluetooth mesh networking** to enable **offline communication** without the internet.

About Bitchat

- **Refers:** Bitchat is a **peer-to-peer messaging app**.
- **Connectivity:** It allows **offline communication** without relying on **servers, internet, or mobile networks**.
- **Objective:** Aims to provide **resilient, private, and decentralized communication**.

About Bluetooth Mesh Networking

- **Technology:** **Bluetooth Low Energy (BLE) Mesh Networking** enables devices to form a **multi-hop, many-to-many** communication system.
- **Functioning:** Devices within range act as **nodes** that **relay messages** through the network.
- **Resilience:** This structure ensures that even if one device fails, the network remains functional.
- **Data Handling:** **No central server** is involved—messages are **stored locally** and **auto-deleted** after a short time.
- **Example:** A message from Person A reaches Person D via B and C — even if D is out of A's direct range.

Key Features of Bitchat

- **Offline messaging** range of over **300 meters** through mesh relays.
- **End-to-end encryption** ensures complete message privacy.
- **No registration or accounts** required—no email or phone number needed.
- **No data collection**—enhancing user anonymity.
- **Support for:**
 - **Topic-based rooms**
 - **Password-protected chat rooms**
 - **Mentions and favourites**
- **Minimalist user interface (UI)** with an interface resembling coding or Internet Relay Chat (IRC).

Advantages of Bluetooth Mesh in Bitchat

- **Privacy-first:** Messages do **not leave the mesh network**.
- **Network resilience:** Works even if some nodes fail.
 - Data is **not stored on a central database**.

- **Low energy usage:** Ideal for mobile and IoT environments.
- **Anonymity:** No user identity is tied to the app.

Key Limitations

- **High latency** due to multi-hop message routing.
- **Low data transfer rates.**
- **Complex network management** as the number of nodes increases.

5.AI FOR GOOD GLOBAL SUMMIT

Context: Recently, the AI for Good Global Summit was held in **Geneva**, Switzerland.

- It was focused on leveraging artificial intelligence to advance the **UN Sustainable Development Goals (SDGs)**.

About AI for Good Global Summit

- The summit, organized by the **International Telecommunication Union (ITU)** in partnership with over **40 UN agencies**, **co-convened by the Swiss Confederation**, brings together experts, policymakers, and industry leaders.
- **Aim:** To identify **practical applications of AI** to accelerate progress towards the **SDGs** and **connect AI innovators** with **public and private sector decision-makers** to scale AI solutions globally
- **Focus areas:**
 - **AI applications** across sectors such as **healthcare** (disease diagnosis and treatment), **environmental sustainability** (climate modeling), and **education** (personalized learning).
 - It also focuses on the **ethical use of AI**, emphasizing issues like data privacy, algorithmic bias, and the potential for AI to exacerbate inequalities.
 - The event **encourages collaboration** between governments, the private sector, and civil society to create policies and frameworks for responsible AI deployment.

About International Telecommunication Union (ITU)

- ITU is one of the oldest international organizations and a **specialized agency of the United Nations** focused on information and communication technologies (ICT).
 - It was established in 1865.
- **Objective:** To **bridge the digital divide** by enhancing ICT access and capacity in **developing countries**.
- **Headquarters:** Geneva, Switzerland.
- **Membership:** Comprises **194 member states**, along with private companies, academic bodies, and international organizations as sector members and associates.

6.NISTAR

Context: Recently, India delivered its first indigenously built **Diving Support Vessel (DSV)** 'Nistar' to the Navy.

About Nistar

- ‘Nistar’ means liberation/rescue in Sanskrit and is designed for **complex underwater rescue and diving operations**.
- **Developed By:** The vessel was designed and constructed by **Hindustan Shipyard Limited (HSL)** under **Indian Register of Shipping (IRS)** classification norms.

Key Features Of NISTAR

- **Rescue Support:** Acts as a **Mother Ship** for the **Deep Submergence Rescue Vessel (DSRV)**.
- **Advanced Equipment:** Includes **Remotely Operated Vehicles (ROVs)** for monitoring and salvage operations up to **1000 meters depth**.

Significance

- Enhances India’s **underwater rescue and salvage capability**, a feature **limited to few navies globally**.
- Supports submariner safety during emergencies and strengthens **strategic maritime preparedness**.
- It has nearly **75% indigenous content**, boosting self-reliance in defence manufacturing aligning with the **Aatmanirbhar Bharat** and **Make in India** initiatives.