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Hurricane Beryl

Recently, the Indian cricket team is stranded in Barbados due to Hurricane Beryl.

- **About-** Hurricane Beryl is the earliest ***Category 4 Atlantic hurricane*** which poses a severe threat to the ***Windward Islands.***

  The Windward Islands are a group of islands in the West Indies that make up the southern part of the Lesser Antilles, located in the eastern Caribbean Sea.

- It is currently surging through the Windward Islands, the southern part of the Lesser Antilles, which form part of the West Indies and comprise Barbados, Grenada and Trinidad and Tobago.
- **Wind speed-** 130 miles per hour.

Tropical Cyclones

- Tropical cyclones are intense, rotating storms that form over warm tropical or subtropical waters.
- Tropical cyclones are the second-most dangerous natural hazards, after earthquakes.
- Tropical cyclones are referred to by different names depending on where they originate in the world.

Hurricanes	Tropical cyclones that form over the Atlantic Ocean or the eastern Pacific Ocean.
Typhoons	Tropical cyclones that form in the Northwest Pacific.
Cyclones	Tropical storms that form in the Bay of Bengal or the Arabian Sea.

Characteristics of cyclones

- **Low pressure**

    - They are ***warm-core low pressure*** systems without fronts.
- **Organized circulation**
    - They are rotating systems of clouds and thunderstorms with closed, low-level circulation.
- **Favorable conditions**
    - They typically form when atmospheric conditions are favorable and the sea surface temperature is ***above 26.5 °C***
- **Spin**
    - They spin ***clockwise in the southern hemisphere*** and ***anticlockwise in the northern hemisphere*** due to the Coriolis Effect.

References

1. The Indian Express | Hurricane Beryl
2. BBC | Hurricane Beryl

Minami-Torishima Island

Japanese researchers have recently discovered a trove of magnesium deposits essential for electric car batteries around the Minami-Torishima Island

- It is also known as ***Marcus Island***, is an isolated Japanese coral atoll in the north western Pacific Ocean.

  Atoll is a ring-shaped reef including rim which is present around a lagoon.

- The shape of the island is close to an equilateral triangle.
- **Location-** Minami-Torishima is situated about 1,848 kilometers ***southeast of Tokyo, Japan.***
- **Latitude -** Its latitude is about the same as that of Ishigaki and Iriomote Islands, and the longitude is slightly east of Sydney's.
- **Topography-** It's located on the ***Marcus-Necker Ridge***, and the only land of it in Japan on the Pacific Plate.
- The Island is relatively flat and low-lying, with its highest point being only a few meters above sea level.



- **Climate-** Located in the transitional zone between tropical and subtropical climates, it has an oceanic climate with an average annual temperature of around 25.6°C.
- **Exclusive Economic Zone (EEZ) -** The exclusive economic zone based on the baseline of the Minami torishima Island is larger than Japan's land area.

  EEZ is an area of the ocean, generally extending 200 nautical miles (230 miles) beyond a nation's territorial sea, within which a coastal nation has jurisdiction over both living and nonliving resources.

- **Current Status-** The island is administered by Japan as part of the ***Tokyo Metropolis.***

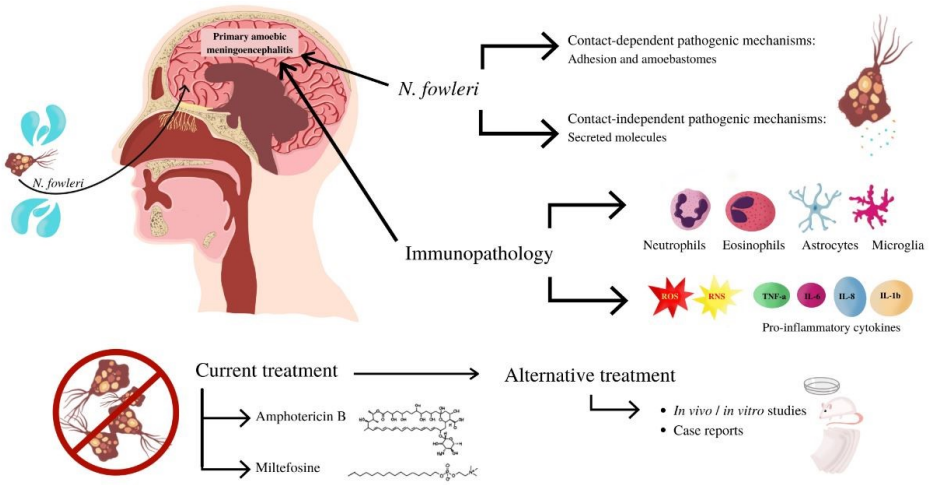
References

1. UNILAD | Minami Torishima island
2. Britannica | Minamitori Island

Amoebic Meningoencephalitis (PAM)

Recent amoebic meningitis deaths have raised concerns among the public and the health department of Kerala.

- **About-** Amoebic meningoencephalitis (PAM) is a ***non-communicable, rare and fatal infection*** of the brain and its surrounding tissues.
- **Caused by -** ***Naegleria fowleri*** also known as the "brain-eating amoeba."
- **Transmission -** Naegleria fowleri is a free-living amoeba or a single-celled living organism.
- The amoeba can be found in warm freshwater, such as lakes and rivers, swimming pools, splash pads, surf parks that are poorly maintained or minimally chlorinated and soil around the world.
- It infects people when it enters the body through the nose.
- Higher temperatures of up to ***115°F (46°C)*** are conducive to its growth and it can survive for short periods in warm environments.
- **Pathogenesis-** Once inside the nasal passages, the amoeba travels along the ***olfactory nerve fibers to the brain***, where it causes a severe and usually fatal infection.
- It rapidly multiplies and causes extensive inflammation and destruction of brain tissue.
- The amoeba feeds on nerve cells and glial cells, leading to necrosis (cell death) and hemorrhage.
- **Symptoms-** Headache, fever, nausea, vomiting, and stiff neck.
- **Treatment-** Antifungal and antimicrobial drugs are typically used, but prognosis remains poor.



Reference

[The New Indian Express | Amoebic Meningoencephalitis]

Snowblind malware

A new Android-targeting banking malware named 'Snowblind' is stealing banking credentials.

- It is a new Android malware that uses a built-in Android security feature to ***bypass anti-tamper mechanisms and steal banking credentials.***
- It is a type of ***Trojan malware*** that cover-ups as legitimate software to infiltrate Android devices.

A Trojan Horse Virus is a type of malware that downloads onto a computer disguised as a legitimate program.

- **Discovered by-** Promon (Cybersecurity firm).
- **Operating procedure-** People usually get this virus by downloading a malicious app that looks legitimate. The malware repackages an app to avoid detection and misuses accessibility features to steal sensitive information and control the app remotely.
- Once installed, it remains dormant until triggered by specific actions or commands.
- **Working -** Snowblind bypasses Android's built-in security by exploiting a feature called ***"seccomp"*** in the Linux kernel, which is supposed to check for tampering.
- Snowblind injects code before seccomp activates, allowing it to bypass security checks and use accessibility services to monitor your screen.

The Linux kernel is the kernel used by Linux-based operating systems and the interface between the hardware and the computer processes.

- It can also ***disable biometric and two-factor authentication (2FA)***, the security features commonly used by banking apps to thwart unauthorised access.
- The malware works quietly in the background, so users might not even realise it is on the device.

Other Trojan horse virus attacks

Rakhni Trojan	• It delivers ransomware or a cryptojacker tool, enables an attacker to use a device to mine cryptocurrency to infect devices.
Tiny Banker	• Tiny Banker enables hackers to steal users' financial details. • It was discovered when it infected at least 20 U.S. banks.
Zeus or Zbot	• It is a toolkit that targets financial services and enables hackers to build their own Trojan malware. • The source code uses techniques like form grabbing and keystroke logging to steal user credentials and financial details.

References

1. The Indian Express | Snowblind malware
2. Fortinet | Trojan Horse Virus

LOw-Frequency Array (LOFAR)

Recently, Astronomers discover new radio galaxy, J0011+3217 using LOw-Frequency ARray (LOFAR).

- LOFAR (LOw Frequency ARray) is currently ***the largest radio telescope*** operating at the ***lowest frequencies (30–300 kHz)*** that can be observed from Earth.
- **Developed by -** Dutch Institute for Radio Astronomy (ASTRON) in 2012.
- **Location-** The radio telescope network located mainly in the ***Netherlands.***
  - It consists of thousands of small antennas spread across Europe, with the core located in the Netherlands.
- **Directions -** It is the 1st telescope that consists of a vast array of ***omnidirectional antennas,*** can observe in several directions simultaneously.
- **Utility-** LOFAR is used for various astronomical studies, including
  - The observation of ***cosmic rays***,
  - The mapping of the universe's ***large-scale structure***, and
  - The study of ***transient astronomical phenomena***.
- It is a powerful tool for exploring the early universe and the formation of galaxies, stars, and black holes.

- **Recent Findings-** The research revealed that the newfound galaxy, showcases peculiar features, including a one-sided secondary lobe.
- The finding noted that radio galaxy cores emit significant radio waves due to black holes accreting gas and dust, producing high-energy jets that accelerate charged particles, visible in radio wavelengths.

Radio galaxy
• Radio galaxies are a type of active galaxy that emit more radio waves than visible light. They are also known as radio-luminous or radio-loud galaxies. • Radio galaxies are powered by jets from supermassive black holes at the center of the galaxy, which interact with charged particles and strong magnetic fields to create radio emissions. • These emissions form giant regions called radio lobes that extend beyond the visible structure of the galaxy, often in pairs. • The lobes can be up to 15 million light-years across. • Radio galaxies are much larger than most other galaxies and are almost always large elliptical galaxies. • The first radio galaxy to be discovered, and still the brightest, is called ***Cygnus A.*** • **Examples** - **Cygnus A -**One of the brightest radio galaxies in the sky, known for its large and powerful radio lobes. - **Centaurus A -**A nearby radio galaxy that is also a source of X-rays and gamma rays.

References

1. Wionews | LOw-Frequency ARray (LOFAR)
2. Eoportal | LOFAR (Low-Frequency Array)

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