

Current Affairs search results for tag: science-and-technology

1. New species of bent-toed gecko found at Agasthyamalai (Aug. 22, 2022)

A group of researchers has discovered a new species of bent-toed gecko from Agasthyamalai hills in the Western Ghats recently.

IMPORTANT FACTS -

About the new Species :

- Scientific name - *Cyrtodactylus aravindi*
- The species has been given the common name Aravind's ground gecko after noted malacologist (a branch of zoology that deals with molluscs) N A Aravind.
- It has been described on the basis of variation and its specificity in molecular DNA data.
- It has so far been found only at two locations, Muppandal and Thuckalay, in Kanyakumari district within the Agasthyamalai biosphere reserve in Tamil Nadu.
- This new species has been described in the journal *Vertebrate Zoology*.

About Gecko :

- Geckos are reptiles and are found on all continents except Antarctica.
- These are colorful lizards adapted to habitats ranging from rainforests, deserts to cold mountain slopes.
- Most geckos are nocturnal, they are active at night.

Agasthyamalai Biosphere Reserve :

- **It was established in 2001.**
- It straddles the border of Kollam and Thiruvananthapuram Districts in Kerala and Tirunelveli and Kanyakumari Districts in Tamil Nadu, South India at the southern end of the Western Ghats.
- It consists mostly of tropical forests.

2. Researchers develop 3D printed artificial cornea (Aug. 16, 2022)

A team of researchers from Hyderabad have successfully 3D-printed an artificial cornea and transplanted it into a rabbit eye for the first time in the country.

Important facts

- This 3D printed cornea has been made by scientists from LV Prasad Eye Institute (LVPEI), IIT Hyderabad (IITH) and Centre for Cellular and Molecular Biology (CCMB).
- This cornea is made from the corneal tissue of the human eye.
- This cornea has been completely made by the country's scientists with indigenous technology.
- It does not contain any synthetic components and can be applied to patients as well.

How was the 3D cornea made?

- Scientists have created a biomimetic hydrogel by extracting decellularized corneal tissue and stem cells from the human eye.
- Scientists have said that this 3D printed cornea has been prepared from the corneal tissue of the human eye, so it is completely biocompatible and natural.
- This will be helpful in treating diseases like corneal scarring (in which the cornea becomes opaque) and keratoconus (in which the cornea becomes thin).
- Many times the cornea of army soldiers gets damaged due to injury, in such a situation the light of those soldiers can be brought back with 3D printed cornea.

What is Cornea?

- The cornea is the transparent part of the eye that covers the front of the eye.
- It covers the pupil (the centre of the eye), iris (the colored part of the eye), and anterior chamber (the fluid-filled inside of the eye).
- The main function of the cornea is to refract or bend light.
- The cornea is responsible for focusing most of the light that enters the eye.

What is 3D Printing?

- 3D printing uses computer aided design (CAD) to create three-dimensional objects through the layering method.
- The model to be printed with the help of software is first developed by the computer, which then instructs the 3D printer.

3. Union Minister Dr Jitendra Singh unveils India's first Saline Water Lantern (Aug. 13, 2022)

Union Minister of State (Independent Charge) Science & Technology, Dr Jitendra Singh on 13 August launched India's first Saline Water Lantern.

About Saline Water Lantern

- It uses the sea water as the electrolyte between specially designed electrodes to power the LED lamps.
- It is the first-of-its kind lantern named “**Roshni**”.
- The Roshni Lamp has been invented by the National Institute of Ocean Technology (NIOT), Chennai.
- This technique can also be used in areas where sea water is not available, as any saltwater or normal water mixed with common salt can be used to power lanterns.

Significance

- It will bring "ease of living" to the poor and needy, especially the fishing community living along India's 7500 km long coastline.
- It will also give a boost to and complement Prime Minister Narendra Modi's UJALA scheme launched in 2015 for the distribution of LED bulbs across the country.
- It is not only cost-effective, but very easy to operate.

4. PM Modi dedicate to nation 2nd Generation Ethanol Plant at Panipat in Haryana (Aug. 10, 2022)

Prime Minister Narendra Modi dedicated to the nation the 2nd Generation (2G) Ethanol Plant at Panipat in Haryana on 10 August.

Important facts

- This is part of a long series of steps taken by the government over the years to promote the production and use of biofuels in the country.
- This is in line with the Prime Minister's efforts to make the energy sector more affordable, accessible, efficient and sustainable.

About the Plant

- It has been built at an estimated cost of over Rs 900 crore by Indian Oil Corporation Ltd (IOCL).
- It is located close to the Panipat Refinery.
- The project will use about two lakh tonnes of rice straw (straw) annually to generate about 30 million litres of ethanol annually.
- Farmers will be empowered for better use of agro-crop residues and additional income generation opportunities will be provided to them.
- The project will have zero liquid discharge.
- Reduction in burning of rice straw (stubble) will reduce carbon dioxide emissions by about 3 lakh tonnes per year and reduce greenhouse gases.

About ethanol

- Ethanol is a kind of alcohol, it is also called ethyl alcohol.
- It can be used as fuel in vehicles by mixing it with petrol.
- After sugarcane, the central government is now focusing on preparing ethanol from rice.
- By producing ethanol, farmers can make their economic condition better by earning good profits.
- Ethanol is mainly produced from the sugarcane crop, but it can also be prepared from different types of sugar crops.

Ethanol blending programme (EBP) in India

- Under this programme 5 per cent ethanol-blended petrol will be supplied to retail outlets.
- It aims to popularize 5 per cent ethanol-blended petrol in 9 states and 4 union territories.
- Its aim is to reduce the country's dependence on crude oil imports, cutting carbon emissions and boosting farmers' incomes.

5. Indian army launches “him- drone-a-thon” (Aug. 8, 2022)

Indian Army in collaboration with Drone Federation of India has launched 'Him Drone-a-thon' program on 8 Aug 22.

What is the 'Him Drone-a-thon' programme?

- It is a pan-India continuous interaction between all stakeholders including industry, academia, software developers and drone product manufacturers.
- It will be conducted in different phases with quantitative parameters (like height, weight, range, stability etc.), which will be progressively enhanced based on the demonstrated abilities.
- The wide range of activities planned under this include interactions and ideas among users, development agencies, academicians etc., seeking industry feedback, visits to operational locations by development agencies.

Development in the following categories are included under this programme

- Logistics/ Load carrying Drone in High Altitude Areas
- Autonomous Surveillance/ Search & Rescue Drone
- Micro/ Nano Drones for Fighting in Built Up Areas

What is a drone?

- Drones are also known as unmanned aerial vehicles (UAVs) or unmanned aircraft.
- A drone is a flying robot that can be controlled remotely or can fly independently using software-controlled flight technology in its embedded systems.
- It works in conjunction with onboard sensors and a global positioning system (GPS).
- Drones first came to the market in the 1990 and were developed by the military.
- Drones can be used for surveillance, situational analysis, crime control, VVIP security, disaster management, etc.
- It offers benefits to almost every sector of the economy, including national defence, agriculture, law enforcement, and mapping, among others.
- The Central Government has approved the Production Linked Incentive (PLI) Scheme of Drones and Drone Components.

6. ISRO's first SSLV mission fails, satellites placed in wrong orbit (Aug. 8, 2022)

The Indian Space Research Organization (ISRO) on 7 August placed its first Small Satellite Launch Vehicle (SSLV) satellites in the wrong orbit.

Important facts

- After this the earth observation satellite and AzadiSat satellite are “no longer usable”.
- SSLV has placed the satellites on an elliptical orbit instead of a circular one.
- When satellites are placed in such an orbit, they cannot stay there for long and come down.
- SSLV-D1 placed the satellites into 356 km x 76 km elliptical orbit instead of 356 km circular orbit.
- The space agency said a committee would analyze why it failed and ISRO would soon be back with SSLV-D2.
- SSLV had suffered 'data loss' in its terminal phase, after performing "as expected" in all phases.

EOS-02

- Earth observation satellite EOS-02 and co-passenger student satellite AzadiSat are important payloads for SSLV.
- EOS-02 is an experimental optical remote sensing satellite and has high spatial resolution.
- It aims to realize and fly an experimental imaging satellite with a short turnaround time and demonstrate launch-on-demand capability.

EOS-02 belongs to the family of microsatellite series of spacecraft.

AzaadiSAT

- It is a 8U CubeSat weighing around 8 kilograms.
- It carries 75 different types of payloads each weighing around 50 grams.
- The Guidance for manufacturing these payloads was provided to girl students from rural areas of India.
- The payload has been integrated by the student team of 'Space Kidz India'.
- The ground system developed by 'Space Kids India' will be used to receive data from this satellite.

What is SSLV?

- The Small Satellite Launch Vehicle (SSLV) is 34 metres long, which is about 10 metres less than PSLV.
- Its vehicle diameter is two metres as compared to PSLV's 2.8 metres.

Objectives of SSLV

- To provide inputs on thermal anomalies for ancillary applications in the fields of geo-environmental studies, forestry, hydrology, agriculture, soil and coastal studies etc.
- To create greater synergy between the government space sector and private Indian industries and institutions.

7. Nallathambi Kalaiseelvi became the first woman Director General of CSIR (Aug. 8, 2022)

Senior electrochemical scientist Nallathamby Kalaiselvi has become the first woman director general of the Council of Scientific and Industrial Research (CSIR).

Important facts

- She will succeed Shekhar Mande, who retired in April.
- After Mande's retirement, Rajesh Gokhale, Secretary, the Department of Biotechnology, was given additional charge of CSIR.
- Known for her work in the field of Li-ion batteries, Kalaiseelvi is the Director of CSIR-Central Electrochemical Research Institute in Karaikudi, Tamil Nadu.
- She will also take over as the Secretary, Department of Scientific and Industrial Research.
- Kalaiseelvi begins her job at CSIR and built a good reputation at the institute and became the first woman to head CSIR-CECRI in February 2019.

- Kalaiselvi's research work for more than 25 years has focused primarily on the development of electrochemical power systems, especially electrodes.
- She is currently working on the development of sodium-ion/lithium-sulphur batteries and supercapacitors.
- Hailing from the town of Ambasamudram in Tirunelveli district in Tamil Nadu, Kalaiseelvi did her schooling in Tamil medium.

What are Lithium Ion Batteries?

- It is also called as Li-ion battery is a type of rechargeable battery.
- These are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications.
- It is also used in handy consumer electronics goods such as mobile phones, laptops, cameras and many other portable consumer gadgets apart from industrial applications and aerospace.
- China dominates the Li-ion battery market.
- The majority of current domestic demand is met by imported batteries from China, South Korea and Taiwan.

Council of Scientific and Industrial Research (CSIR)

- It is the largest research and development organisation in India in the field of science and technology.
- It has a dynamic network of 37 national laboratories, 39 outreach centres, 3 innovation complexes and 5 units.
- It is ranked 37th out of 1587 government institutions around the world.
- The Chairman (ex-officio) of CSIR is the Prime Minister and the Union Minister of Science and Technology is the Vice President (ex-officio).
- It is funded by the Ministry of Science and Technology.
- Established - September 1942
- Located - New Delhi

8. ISRO to launch its smallest rocket to unfurl Tricolour in Space (Aug. 5, 2022)

Indian Space Research Organisation (ISRO) will launch its smallest commercial rocket on 7 August to unfurl Tricolour in space.

Important facts

- The launch will be done from Satish Dhawan Space Center in Sriharikota.

- It will drive India's dreams of breaking into the lucrative and booming small satellite launch market.
- On August 15, 2018, Prime Minister Narendra Modi announced that the tricolor would be unfurled in space during India's 75th year of independence.
- To mark the celebration of the country's 'Azadi Ka Amrit Mahotsav', the SSLV will carry a co-passenger satellite named 'Azadisat', which will carry 75 payloads built by 750 young girl students from 75 rural government schools across India.
- The project was conceptualized especially for the 75th Independence Day celebrations to encourage scientific temper and to create opportunities for young girls to choose space research as their career.

9. DRDO successfully test-fires indigenously developed laser-guided Anti-Tank Guided Missiles (Aug. 5, 2022)

India on 4 August successfully test fired the indigenously developed laser-guided anti-tank guided missiles (ATGM) at Ahmednagar in Maharashtra.

Important facts

- The ATGM was test-fired from Main Battle Tank (MBT) Arjuna by DRDO and Indian Army in collaboration with Armored Corps Center and School (ACC&S) at KK Range.
- The missiles struck with precision and successfully destroyed targets at two different ranges.
- The telemetry system has recorded satisfactory flight performance of the missiles.
- The ATGM has been developed with multi-platform launch capability and is currently undergoing technical trials with the 120 mm rifled gun of MBT Arjun.
- This indigenous anti-tank guided missile is fitted with a Tandem High Explosive Anti-Tank (HEAT) weapon, which is capable of destroying armoured vehicles with state-of-the-art Explosive Reactive Armour (ERA).
- Earlier in June, the DRDO and the Indian Army successfully test-fired an indigenously built tank destroyer missile at the KK range in Ahmednagar, Maharashtra.

Defence Research and Development Organisation (DRDO)

- It is a premier defence research and development agency under the Ministry of Defence, Government of India.
- It aims to make India self-reliant in critical defence technology and systems.
- It was set up in 1958.
- Headquarters - New Delhi
- Chairman - G. Satheesh Reddy

10. Hellfire R9X missile used to kill Ayman al-Zawahiri (Aug. 3, 2022)

The US Central Intelligence Agency (CIA) used its 'secret weapon' — the Hellfire R9X missile to kill Al Qaeda chief Ayman al-Zawahiri on the balcony of a safehouse in Kabul.

What is the Hellfire R9X missile?

- It is basically a modified version of the renowned Hellfire missile which was an anti-tank weapon developed in the 1980s.
- It was modified several times to specifically target individuals after the 9/11 attacks.
- It is an American-origin missile developed to target individuals and cause minimal collateral damage.
- This missile has no warhead, it deploys razor-sharp blades in the final phase of the attack.
- It also helps it break through thicker steel sheets and lowers the target by using the kinetic energy of its propulsion.
- The blades eject from the missile and hit the intended target without causing massive damage to the surroundings.

Why was the Hellfire R9X missile developed?

- The main reason for the development of the Hellfire R9X missile was to reduce civilian casualties.
- The missile was also developed to eliminate doubts about the structural robustness of a building such as the mud and thatched huts that terrorists commonly use as a hideout.
- In January 2019, this missile was used to kill Jamal al-Badawi while Ahmed Hassan Abu Khair al-Masri was killed in February 2017.