

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

1. ICMR-VCRC develops special female mosquitoes to control Dengue, Chikungunya (July 11, 2022)

ICMR-Vector Control Research Centre has developed special female mosquitoes to control Dengue and Chikungunya.

- **Important facts**

- These female mosquitoes will mate with males and produce larvae that do not contain the virus.
- Two colonies of *Aedes aegypti* have been developed by ICMR-VCRC, Puducherry. who are infected with wMel and wAlbB Wolbachia strains to reduce the spread of viral disease.
- These are called *Aedes aegypti* (Pud).
- After getting permission from the government, these female mosquitoes will be released outside so that they will form larvae that are free from the viruses of these diseases.

- **Mosquito-borne diseases**

- **Malaria** - This disease is caused by the bite of a female *Anopheles* mosquito.
- Malaria fever is caused by a virus called *Plasmodium vivax*.
- **Dengue** - Dengue virus is transmitted to humans through the bite of an infected *Aedes* mosquito.
- According to the World Health Organisation (WHO), dengue is the most widely spread disease by mosquitoes worldwide.
- **Chikungunya** - Chikungunya, like dengue, is caused by the bite of the *Aedes* mosquito.
- **Yellow Fever** - This disease is caused by the bite of a human from the *Aedes* mosquito, especially *Aedes aegypti*.
- Yellow fever is caused by flavivirus.

2. India's first Autonomous Navigation facility, TiHAN launched at the IIT Hyderabad (July 11, 2022)

The Union Minister of State for Science and Technology, Jitendra Singh inaugurated India's first autonomous navigation facility, called TiHAN, on the campus of IIT Hyderabad.

- **Important facts**

- The navigation facility has been developed by the Union Ministry of Science and Technology with an outlay of Rs 130 crore.

- **What is Tihan?**

- It is a multi-disciplinary initiative that aims to make India a global player in 'smart mobility' technology for the future and the next generation.
- The platform will facilitate high quality research between industry, academia and R&D laboratories locally and globally.
- TiHAN stands for "Technology Innovation Hub on Autonomous Navigation".
- **Importance**
- TiHAN Test Bed strives to make India a global leader in autonomous navigation technologies.
- TiHAN-IITH will help in precise testing of next generation autonomous navigation technologies.

3. IISc researchers develop an analog chipset named ARYABHAT-1 (July 9, 2022)

Researchers at IISc Bengaluru have recently developed a prototype of an analog chipset named "Aryabhata-1".

- **Important facts**
- The team has created a design framework for developing the next generation of analog computing chipsets.
- These chipsets can work fast. It will use less power than the digital processors used in various electronic gadgets.
- It has been designed by Prateek Kumar, a PhD student at IISc.
- **Aryabhata-1**
- Aryabhata-1 stands for "Analog Reconfigurable Technology and Bias-scalable Hardware for AI Tasks".
- These chipsets could be beneficial for applications based on artificial intelligence (AI) such as object or speech recognition apps, including Alexa.
- It is able to be configured with multiple machine learning architectures such that its ability to perform robustly over different temperature ranges enables it to work with digital CPUs.
- **About Indian Institute of Science (IISc)**
- IISc was established in the year 1909 at Bangalore, Karnataka State with the active support of Jamsetji Tata.
- Hence it is also known as 'Tata Institute'.
- It is a public research university for higher education and research in science, engineering, design and management.
- IISc was granted deemed university status in 1958 and Institute of Eminence in 2018.

4. Three new Exotic subatomic particles discovered with the Large Hadron Collider (July 6, 2022)

The Large Hadron Collider beauty (LHCb) experiment has discovered three never-before-seen particles.

- **What is the discovery?**

- CERN, (European Organization for Nuclear Research) was investigating the slight differences between matter and antimatter by studying a type of particle called the “beauty quark”, or “b quark”.
- The three “exotic” particles, a new kind of “pentaquark” and the first-ever pair of “tetraquarks” were found.
- These are a kind of new hadrons.
- The discovery will help physicists understand how quarks bind together in these composite particles.

- **What are Quarks?**

- Quark is a fundamental component of matter and is defined as an elementary particle.
- These quarks combine to produce composite particles called hadrons.
- They usually combine together in groups of twos and threes to form hadrons.
- The most stable of these are neutrons and protons which are components of the atomic nucleus.
- They can also combine into four-quark and five-quark particles, called tetraquarks and pentaquarks.
- These exotic hadrons were predicted by theorists nearly six decades ago.

- **Tetraquarks and Pentaquarks**

- Atoms contain smaller particles called neutrons and protons, which are made up of three quarks each.
- Most of the exotic hadrons discovered in the past two decades are tetraquarks or pentaquarks.
- They contain a charm quark and a charm antiquark.

5. Ukrainian mathematician becomes second woman to win Fields Medal (July 6, 2022)

On July 5, a jury of the International Mathematical Union awarded the prestigious Fields Medal to four mathematicians, including Ukraine's Marya Viazovska.

- **Marya Vyazovska**

- Wiazowska is the head of number theory at the Swiss Federal Institute of Technology Lausanne.
- Wiazowska is the second woman to win the award in its 80-year history.
- She is known to be an expert in solving spherical packing problems.
- She was awarded the prize for solving a version of a centuries-old mathematical problem where she proved the densest packing of equal regions in eight dimensions.
- Wiazowska was born in 1984 in Ukraine, which was part of the Soviet Union, and has been a professor at the cole Polytechnique Federale de Lausanne in Switzerland since 2017.

- **The other three winners are -**

1. **James Maynard** - number theorist at the University of Oxford, UK
2. **June Huh** - specialist in combinatorics at Princeton University in New Jersey
3. **Hugo Duminil Copin** - studies statistical physics at the Institute of Advanced Scientific Studies (IHES) near Paris.

- 35-year-old James Maynard was presented this award for his contribution to "**analytical number theory**".
- June Huh, 39, was awarded the prize for "**changing**" the field of geometric combinatorics.
- Duminil-Coppin was awarded for solving "**long-standing problems in the probabilistic theory of phase transitions**".

- **First women winner**

- The first woman to win the prize was Mariam Mirzakhani in 2014, an Iranian-born mathematician who died of cancer three years later in 2017.

- **Indian-origin winners**

- Two of the winners are of Indian origin.
- Akshay Venkatesh of the Institute for Advanced Study at Princeton – was awarded the award in 2018.
- Manjul Bhargava of the Department of Mathematics at Princeton University was honored in 2014.

- **About Fields Medal**

- Fields Medal is often described as the Nobel Prize in mathematics.
- This highest honours in mathematics is conventionally awarded to people aged under 40.

- The medal, along with \$15,000 Canadian dollars (\$11,600), is awarded every four years to between two to four candidates for "outstanding mathematical achievement".
- Of the 60 mathematicians who won the Fields Medal earlier this year, 59 were men.
- The prizes are normally announced at the opening of the International Congress of Mathematicians (ICM).
- This year's congress was scheduled to begin on 6 July in St. Petersburg, Russia, but the plan was scrapped following Russia's invasion of Ukraine.
- The award ceremony was held in Helsinki and the Congress concluded as a virtual event.
- **International Mathematical Union**
 - It is an international non-governmental and non-profit scientific organization.
 - Its purpose is to promote international cooperation in mathematics.
 - It is a member of the International Science Council (ISC).
 - founded - in 1920 and has existed in its current form since 1951
 - Location - Berlin, Germany
 - President - Carlos E. Kenig

6. "Hermit" - A new spyware (July 2, 2022)

Lookout, a cloud-based security company, recently discovered a new spyware called "Hermit".

- **Important facts**
 - Hermit spyware is capable of affecting Android and iOS devices.
 - As TechCrunch reports, security researchers from Lookout have reported that national governments have used the Android version of Hermit spyware in "targeted attacks" in Kazakhstan and Italy.
- **Hermit spyware**
 - Hermit is a commercial spyware and has been used by governments in northern Syria, Kazakhstan and Italy.
 - It was first detected in Kazakhstan in April 2022, when the government violently suppressed protests against its policies.
 - It was also deployed in Syria's north-eastern Kurdish region and by Italian authorities for anti-corruption investigations.
- **How does Hermit work?**
 - According to the report, the Hermit Android app is distributed via text message.
 - The message seems to be coming from a legitimate source.

- The malware can impersonate telecommunications companies and other apps developed by manufacturers such as Oppo and Samsung.

- **Malware Effects on Android and iOS Devices**

- The Hermit Android malware is modular because it allows spyware to download additional components that are required for the malware to run.
- Like other spyware, Hermit malware also uses various modules to record audio as well as collect call logs, messages, photos, emails.
- It can redirect phone calls and reveal the exact location of the device.

- **Spyware**

- Spyware is a type of malware that is installed on a computer and collects information about users in the non-knowledge of them.
- The presence of spyware is usually hidden from users.
- Spyware is secretly installed on users' personal computers.
- Spyware collects a variety of personal information, such as Internet surfing habits and the sites that are visited.

7. DRDO carries out maiden flight of unmanned combat aircraft (July 2, 2022)

The Defense Research and Development Organization (DRDO) successfully carried out the maiden flight of the Autonomous Flying Wing Technology Demonstrator from the Aeronautical Test Range in Chitradurga, Karnataka on July 1.

- The aircraft performed a complete flight, including take-off, way point navigation and touchdown.
- The flight was conducted in a fully autonomous mode.
- It is designed and developed by the Bengaluru-based Aeronautical Development Establishment (ADE), a premier research laboratory under the DRDO.
- The unmanned fighter aircraft is powered by a small, turbofan engine.
- The vehicle's airframe, as well as its undercarriage, flight control and avionics systems, were indigenously developed.
- The program is associated with the development of India's fifth generation stealth fighter Advanced Medium Combat Aircraft or AMCA.

- **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

8. ISRO launched three Singaporean satellites (July 1, 2022)

The Indian Space Research Organisation (ISRO) on 30 June successfully launched three Singaporean satellites in a commercial mission of the New Space India Limited.

- It was launched in precise orbit through the PSLV Orbital Experimental Module or 'POEM'.
- This was the second launch of the year by ISRO, which put the Indian earth observation satellite into orbit in February.
- **What are the three Singaporean satellites?**

1. DS-EO, a Singaporean Earth Observation Satellite
2. NeuSAR, Singapore's first small commercial satellite carrying a SAR (Search and Rescue) payload
3. SCOOB-I satellite from the Nanyang Technological University (NTU)

- **What is POEM?**

- It is a platform that will help perform in-orbit experiments using the final or discarded, stage of ISRO's workhorse rocket, the Polar Satellite Launch Vehicle (PSLV).
- The PSLV is a four-stage rocket where the first three stages fall back into the ocean, and the final stage (PS4) — after launching the satellite into orbit — ends up as space junk.
- In PSLV-C53 mission, the final stage will be utilised as a "stabilised platform" to perform experiments.
- POEM is carrying six payloads, including two from Indian space startup Digantara and Dhruv Space.

- **Indian Space Research Organisation (ISRO)**

- ISRO was set up on 15 August 1969
- Chairman of ISRO: S Somnath
- Headquarters of ISRO : Bengaluru, Karnataka
- Space Station from where ISRO launches rockets
- Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota, Andhra Pradesh

9. NASA launched its capstone spacecraft (June 30, 2022)

The US space agency NASA launched its capstone spacecraft from New Zealand's Mahia Peninsula.

- This microwave oven-sized spacecraft is 25 kg.
- The spacecraft will orbit the Moon for six months and test the stability of the orbit before using NASA's Lunar Gateway.
- It has been launched from the electron booster rocket of the American company Rocket Lab.
- The Lunar Gateway will be launched in 2024 and will serve as a staging area to land humans on the Moon for the first time in 50 years.
- The Lunar Gateway will be a space station revolving around the Moon.
- The capstone will orbit the moon in the shape of a halo. That is, it will not rotate completely round considering the moon as the centre.
- It will orbit 1600 km closest to the moon and 70,000 km farthest. It will make one round of the moon in seven days.
- **About NASA -**
 - NASA was formed under the National Aeronautics and Space Act on July 19, 1948, in place of its predecessor, the National Advisory Committee for Aeronautics (NACA).
 - NASA - National Aeronautics and Space Administration
 - Headquarters- Washington D.C.
 - Administrator - Bill Nelson

10. Russia to give Iskander-M missile system to Belarus (June 29, 2022)

Russia has announced the transfer of the "Iskander-M missile system" to Belarus.

- **Iskander-M missile system**
 - This missile system can use ballistic or cruise missiles in its nuclear and conventional versions.
 - The Iskander-M missile system is codenamed as "SS-26 Stone" by NATO.
 - Russia uses the term Iskander-M to define the transporter-erector launch system as well as the short-range ballistic missile (SRBM) it fired.
 - The system can be used to fire ground-launched cruise missiles (GLCMs) such as the SSC-7 and SSC-8.

- It was first successfully launched in 1996.
- The Iskander-M missile has a range of 500 km.
- It is capable of carrying a payload of up to 700 kg.
- The Iskander system was incorporated by Russia in 2006.
- It was developed in the late 1980s after the "Oka" SRBM (Short Range Ballistic Missile) or OTR-23 was banned in accordance with the Intermediate Nuclear Forces Treaty.
- **About Belarus -**
- Belarus is a landlocked country in Eastern Europe.
- Capital - Minsk
- President- Alexander Lukashenko
- Prime Minister- Roman Golovchenko
- Currency- Belarusian ruble