2021 Science & Technology

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2021 Science & Technology - January

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
wood-based space satellite	Japan	Japan's Sumitomo Forestry company and Kyoto University of Japan is all set to launch the world's first wood-based space satellite by 2023 to combat the problem of space junk. In this regard, several wooden materials are being tested by the research team to find a suitable one for space missions. According to the European Space Agency (ESA) statistical model, there are more than 130 million pieces of anthropogenic space debris due to human activities. ESA is also planning to launch a mission to collect space debris in 2025.
Falcon 9	United States of America	SpaceX successfully created a New World Record by launching 143 Satellites in a single mission. The satellites were launched using the Falcon 9 Reusable rockets from the Cape Canaveral Space Force Station in Florida, United States of America. With this, SpaceX bettered Indian Space Research Organization's (ISRO) record of deploying 104 satellites in a single mission in February 2017. The Launch is also the first dedicated mission for SpaceX under SmallSat 'Rideshare' program called Transporter-1.
Sri Shakti Sat	ISRO	Indian Space Research Organisation (ISRO) is planning to launch 'Sri Shakti Sat' a satellite that was developed by 12 college students with inputs from ISRO. This satellite will be launched into outer space by Polar Satellite Launch Vehicle (PSLV)-C51 on February 28, 2021. It was developed by students of Sri Shakthi Institute of Engineering and Technology at a cost of Rs. 2.5 Crores.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Ramesh Pokhriyal lays Foundation stone of 'TiHAN Foundation'

Union Minister for Education, Ramesh Pokhriyal 'Nishank' virtually laid the Foundation stone for 'TiHAN Foundation' – Technology Innovation Hub at the IIT Hyderabad (IITH). It will be India's 1st Testing hub for Autonomous Navigation & Data Acquisition Systems (Terrestrial and Aerial). Department of Science & Technology, Government of India sanctioned INR 135 Crore to IIT Hyderabad under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) to establish 'TiHAN-IIT Hyderabad'.

Overview of ISRO's Plan for the Decade 2021-30

Sivan, Secretary of Department of Space (DoS) & Chairman of Indian Space Research Organisation (ISRO) have chalked out the plan for the Decade 2021-30. It has listed both Short-term vision & Long-term visions.The plan envisions the development of heavy-lift rockets, reusable satellite launch vehicles & semi-cryogenic engines. In the short term, ISRO has plans to execute diverse missions which are First Developmental Flight of the Small Satellite Launch Vehicle (SSLV) planned to be launched in March, 2021.

India to get 1st Indigenous Diverter Stent & Device for Healing Hole in Heart:DST

Department of Science & Technology (DST) has stated that India will soon get access to India's 1st Indigenous flow diverter stent for diverting blood away from Ballooning of Arteries in the brain & another device which will promote the better healing of the hole in the heart. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, Kerala an autonomous institute of DST has entered into Technology Transfer Agreements with Biorad Medisystem, Pune for the procurement of an Atrial Septal Defect Occluder and an Intracranial Flow Diverter Stents which have been developed in association with National Aerospace Laboratories, Bangalore (CSIR-NAL).

MoTA Minister Arjun Munda Virtually Launched "Shramshakti" Digital Data Solution for Migrant Workers

On January 22, 2021, Union Minister Arjun Munda, Ministry of Tribal Affairs (MoTA) virtually launched a National Migration Support Portal namely "Shramshakti" from New Delhi. Originally, the launch programme was held at Panjim(Panaji), Goa. The focus of the portal is the smooth formulation of state and national level programs for migrant workers. He also released a booklet titled 'Margadarshika'. Goa is the first destination state of India to set up a dedicated migration cell to address the issues of migrant workers who come from different States to Goa.

Govt of India Uses RAS platform of MeitY for Processing Feedback on COVID-19 Vaccination

Govt of India uses Rapid Assessment System (RAS) under the COVID Vaccination drive, the world's biggest vaccination drive to get feedback from those who get COVID-19 Vaccination. RAS was developed by National e-Governance Division(NeGD), a division of Ministry of Electronics & Information Technology (MeitY). RAS platform enables to get online instant feedback for e-services (online as well as offline through counters) that are offered by the Government of India and State Governments.

CSIR-CMERI Developed 1st Ever WasteWater Treatment Technology Model, Aqua Rejuvenation Plant' for Irrigation

Council for Scientific and Industrial Research (CSIR)-Central Mechanical Engineering Research Institute(CMERI) developed 1st ever Waste Water Treatment Technology Model, 'Aqua Rejuvenation Plant(ARP)', which was inaugurated by Prof. (Dr.) Harish Hirani, Director, CSIR-CMERI along with Subhendu Basu at CSIR-CMERI, Durgapur, West Bengal. Integrated Waste Water Rejuvenation Model, ARP purifies wastewater for Irrigation/Farming purposes.

Ravi Shankar Prasad Launches TEJAS – Visual Intelligence Tool & WAW Portal at Silver Jubilee event of NICSI

National Informatics Centre Services Incorporated (NICSI), a PSU under National Informatics Centre (NIC), Ministry of Electronics & Information Technology (MeitY) celebrated 25 Years of its inception. Ravi Shankar Prasad, Union Minister for MeitY who attended the event as Chief Guest released the TEJAS – A Visual Intelligence Tool,e-Auction India, Work from AnyWhere Portal (WAW),and NIC Products Portfolio which includes several products to increase the branding of Digital India initiative of Government.

2021 Science & Technology - February

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
Stardust 1.0	United States (US) based Startup bluShift Aerospace	United States (US) based Startup bluShift Aerospace launched 'Stardust 1.0' from Loring Commerce Centre in Maine, US. It is the World's 1st Commercial Rocket launch powered by Biofuel. The solid biofuels used in the launch is non-toxic, Carbon Neutral & can be sourced from America. bluShift Aerospace's Rocket Engine is a hybrid of solid and liquid propellant called 'Modular Adaptable Rocket Engine for Vehicle Launch (MAREVL)'.
Amazonia-1	Brazil	Indian Space Research Organisation (ISRO) is set to launch Brazil's Amazonia-1 through India's Polar Satellite Launch Vehicle (PSLV)- C51 on February 28, 2021. This also marks ISRO's 1st space mission in 2021. The mission includes Amazonia-1 as the primary payload along with 20 other satellites (Including 3 developed by Indian grown organisations). Launch Site- Satish Dhawan Space Centre (SDSC)-SHAR, Sriharikota.It is PSLV-C51 is the 53rd mission of PSLV.
60 Starlink satellites	United States of America	On February 15, 2021 SpaceX launched 60 Starlink satellites from Space Launch Complex 40 (SLC-40) at Cape Canaveral Space Force Station in Florida, United States of America. The satellites were launched using a two-stage rocket, otherwise known as the Falcon 9 booster. This was the 6th launch of this Falcon 9 booster. This launch is part of the 19th Starlink mission. The rocket's first stage did not land on SpaceX's drone ship 'Of Course I Still Love You' in the Atlantic Ocean as planned.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Bellatrix Aerospace is building a 'space taxi' for satellites

In a reforming development, the Bengaluru, Karnataka based Bellatrix Aerospace is building an Orbital Transfer Vehicle (OTV) that will work as a "taxi in space" to ferry small satellites into multiple orbits. It will be big development for global operators to reduce time and costs. The space startup's vehicle is expected to launch to low earth orbit in 2023 on the Vikram rocket of Skyroot Aerospace, a Hyderabad-based rocket startup by former Indian Space Research Organisation (ISRO) scientists.

Dharmendra Pradhan Launches Investment Corner on MoPNG's Revamped Website

On February 9, 2021, Dharmendra Pradhan, Union Minister of Petroleum and Natural Gas & Steel launched Investment Corner under Project Development Cell (PDC) on the upgraded website of the Ministry of Petroleum and Natural Gas (MoPNG). The section will help the investor community to reach out to the MoPNG.

Aarogya Setu App Integrated with CoWIN Portal

India has integrated its COVID-19 Tracing App 'Aarogya Setu' & COVID-19 Vaccine Registration platform 'Co-WIN portal (COVID Vaccine Intelligence Network)'. The integration will enable Users to download Vaccination certificates after they have received at least one dose of COVID-19 Vaccination.

HAL to Develop 1st of its Kind Unmanned Pseudo Satellite "CATS"

In a first of its kind in the world, the Hindustan Aeronautics Limited (HAL) is developing a futuristic high altitude unmanned pseudo satellite namely Combined Air Teaming System (CATS) with a start-up company.Once developed the pseudo-satellite will be capable of taking information flying unmanned around 70,000 ft for 2-3 months.

Labour Minister Santosh Gangwar Launched Software Applications for 5 Pan-India Surveys

Santosh Kumar Gangwar Minister of State (Independent Charge(IC)) of Labour and Employment launched the software application for 5 pan-India surveys which are being conducted by the Labour Bureau.Government has already constituted an Expert Group under the chairmanship and co-chairmanship of Dr. S. P. Mukherjee and Dr. Amitabh Kundu respectively with leading economists and statisticians as members to guide Labour Bureau for conducting these surveys.

INTERNATIONAL

SpaceX announced World's First All Civilian Mission to Space

SpaceX announced its plan for the World's first all civilian mission to space, the mission is named Inspiration4 in recognition of the 4-person crew to support St. Jude Children's Research Hospital. The mission commanded by Jared Isaacman, a 37-year-old entrepreneur the founder and CEO of Shift4 Payments and accomplished pilot will be launched from NASA's Kennedy Space Center in Florida.

Square Kilometre Array – World's Largest Radio Telescope

On February 5, 2021, Square Kilometre Array Observatory (SKAO) Council held its Maiden Meeting during the meeting they approved the establishment of World's Largest Radio Telescope namely 'Square Kilometre Array'. The telescope will consist of a vast number of radio receivers which will be positioned in South Africa and Australia.

China's Tianwen-1 enters Mars Orbit, Joining UAE's Hope Probe

On February 10, 2021, Chinese Spacecraft 'Tianwen-1' (Means "Quest for Heavenly Truth") entered the Mars Orbit. It became the World's second one in two days after United Arab Emirates' 'Hope' Space Probe entered the Mars Orbit on February 9, 2021. The Chinese Spacecraft will probe for signs of ancient life on Mars. USA's National Aeronautics and Space Administration rover called 'Perseverance' is aiming for a landing on Mars on February 18, 2021.

NASA Launched Space Station Supply Ship to ISS Named After S.S. Katherine Johnson

National Aeronautics and Space Administration (NASA) launched the Space Station Supply Ship, Northrop Grumman's Cygnus capsule named after S.S. Katherine Johnson, to the International Space Station (ISS). The launch of this 4-ton shipment for NASA from Wallops Island, Virginia marks the 59th anniversary of John Glenn's historic launch.

Indian-American scientist Swati Mohan leads NASA's Mars mission

National Aeronautics and Space Administration's (NASA) Perseverance rover of Mars 2020 mission successfully landed on the surface of Mars.Notably, its Guidance, Navigation, and Controls Operations (GN&C) were handled by Indian-American Swati Mohan. She is responsible for the training of the GN&C

team, scheduling the mission control staffing for GN&C, as well as the policies/procedures the GN&C uses in the mission control room.

UAE published the image of mars north pole Olympus Mons

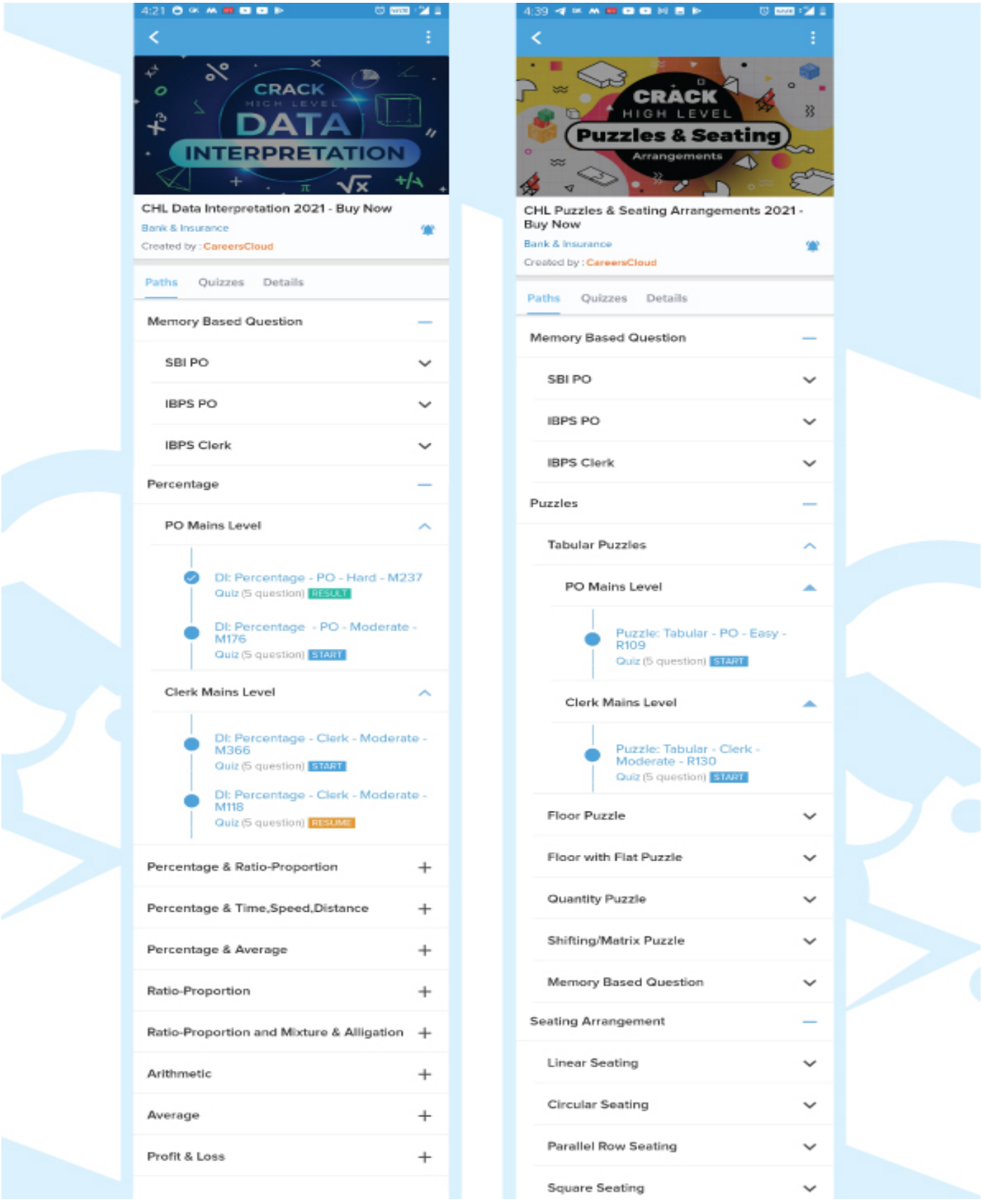
The United Arab Emirates published the first image from its Mars probe “Amal,” or “Hope,” which circling the red planet. the image shows Mars’ largest volcano, Olympus Mons and mars north pole.

Launched 2 New Paid Courses !!!!!!

New Course names :- 1.Crack High level Puzzle & Seating arrangement and 2.Crack High level Data interpretation

We are pleased to serve with part of your preparation so we have activated the above mentioned 2 paid courses will be added to our subscribers who have already purchased the "Crack Current Affairs 2021" plan from January 2021.

To check the 2 additional free paid courses in your plan – Go to 'My Course' under Bank & Insurance preference in CareersCloud App.



2021 Science & Technology - March

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
'Amazonia-1' & 18 co-passenger satellites	Indian Space Research Organisation (ISRO)	On February 28, 2021, Indian Space Research Organisation (ISRO) successfully launched 1 primary satellite 'Amazonia-1' & 18 co-passenger satellites from India (5) & USA (13) from the Satish Dhawan Space Centre SHAR (SDSC-SHAR), Sriharikota, Andhra Pradesh. The satellites were launched using Polar Satellite Launch Vehicle-C51 (PSLV-DL Variant). This is ISRO's 1st Launch of 2021. It has launched 14 Missions in 2021.
Arktika-M	Russia	Russia launched the 'Arktika-M', 1st satellite to monitor climate change in the Arctic Region. The satellite was launched from a Soyuz-2.1b carrier rocket from the Baikonur Cosmodrome, Kazakhstan. Arktika is the First of two satellites launched by Russia for creating a Hydrometeorological & climate monitoring system to monitor the climate & environment in the Arctic. The second Arktika Satellite is set for launch in 2023.
NISAR	ISRO	Indian Space Research Organisation (ISRO) has completed the development of an Synthetic Aperture Radar (SAR) called 'NISAR' (NASA-ISRO SAR) which is capable of producing high-resolution images. It will be used for the Joint Earth Observation Satellite Mission of ISRO & NASA (National Aeronautics & Space Administration), USA. NISAR is the 1st satellite mission to use 2 different radar frequencies (L-band & S-band) to measure changes in our planet's surface.
Sounding Rocket RH-560	SDSC, Sriharikota Range (SHAR), Andhra Pradesh	On 12th March 2021, Indian Space Research Organisation (ISRO) launched a new Sounding rocket from its Rohini Series, RH-560 from Satish Dhawan Space Centre (SDSC), Sriharikota Range (SHAR), Andhra Pradesh. This Sounding rocket will help in carrying out studies in the upper Atmospheric regions, on Altitude Variations in the Neutral Winds and Plasma Dynamics. RH-560 is a 2-stage rocket that can reach a maximum launch altitude of 548 Kms. Here in RH-560, RH stands for 'Rohini' and the number 560 represents the diameter of the Rocket in mm.
Soyuz-2.1a Rocket	Russian Space Agency (Roscosmos)	On March 22, 2021, Russian Space Agency (Roscosmos) launched 38 Satellites from 18 Countries into orbit onboard its Soyuz-2.1a Rocket. The rocket was launched from Baikonur Cosmodrome, Kazakhstan.The satellites belong to 18 countries including South Korea, Japan, Canada, Saudi Arabia, Germany, Italy and Brazil. Apart from Astroscale, Recently ClearSpace SA, is aiming to launch the world's first active debris removal mission in

		collaboration with European Space Agency(ESA) by 2025.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Indian and Japan Space Agencies review cooperation on LUPEX Mission

On 11th March 2021, The Indian Space Research Organization (ISRO) & Japan Aerospace Exploration Agency (JAXA) virtually reviewed the progress made under the Joint Lunar Polar Exploration (LUPEX) mission. LUPEX is a robotic Lunar mission that aims to send a lander and rover to the Moon's south pole in the year 2024. The two sides also reviewed the on-going cooperation in earth observation, lunar cooperation & satellite navigation.

CSIR-NIO to Launch 90-day Cruise Missile to map Genomes in Indian Ocean

CSIR-NIO (Council of Scientific & Industrial Research-National Institute of Oceanography) is set to launch a 90-day Scientific Cruise Mission to conduct genome & proteome mapping (nutrients) present inside single-cell organisms in the Indian ocean. It will be the 1st project to map genomes in Indian Ocean.It aims to strengthen India's research into commercial biotechnology applications including anticancer treatments.

Indian School students discover 18 New Asteroids under International Asteroid Discovery Project

The International Astronomical Union (IAU) confirmed the discovery of 18 new Asteroids by Indian students as part of the International Asteroid Discovery Project conducted by STEM & Space, an organization which works towards learning of astronomy and space science in India.The programme was conducted by STEM & Space along with International Astronomical Search Collaboration (IASC) as part of NASA (National Aeronautics and Space Administration) Citizen Science project.

ISRO's SEED program to help Indian space tech startups use agency's resources, facilities

Indian Space Research Organisation(ISRO) is on formulating an exclusive space start-up programme "Space Entrepreneurship & Enterprise Development (SEED)" to take start-ups in the space sector to a higher orbit with a string of initiatives to help them realise their business potential.

IIT Madras Start-up Pi Beam Launches Electric Two-wheeler called 'PiMo'

IIT Madras-incubated startup Pi Beam has launched an Electric Two-wheeler called 'PiMo' which can charge faster than a smartphone & has a range of 50 Kms. Nearly 90% of PiMo's product components are manufactured in India to embody the 'Make in India' spirit.

Data Patterns delivers 'Indigenous Checkout system' to ISRO for its 'Gaganyaan' Mission

On March 17, 2021, Data Patterns India Pvt Ltd handed over the Indigenously developed 'Checkout System' to the Indian Space Research Organisation (ISRO) for its 'Gaganyaan' Mission (India's 1st Human Space Flight Programme) at Chennai. A checkout system is used for performing health checks on all cable harness assemblies used in the crew module of 'Gaganyaan' Mission. ISRO's 'Gaganyaan' mission is scheduled for launch in 2022-23. HSFC (Human Space Flight Centre) is responsible for the implementation of the Gaganyaan project.

India & France working on 3rd Joint Satellite Mission

K Sivan, the Chairman of Indian Space Research Organisation(ISRO) stated that India and France are working on the third joint satellite mission, as a bilateral space collaboration is entering into multiple domains like space exploration and human spaceflight programmes. France is the biggest partner of

India in space.ISRO and French space agency Centre National d'Études Spatiales (CNES) have already undertaken two joint missions "Megha Tropiques" launched in 2011 and "SARAL Altika" launched in 2013.

ISRO partners with IIST to undertake Joint Research Activities

Indian Space Research Organization (ISRO) has partnered with Indian Institute of Space Science and Technology (IIST) to undertake Joint Research Activities. The partnership model will be similar to the JPL-Caltech model followed by US Space Agency NASA. Under the initiative 'New, advanced, futuristic projects' which have not been undertaken so far by ISRO will be taken up for development.

ISRO demonstrates Quantum Communication over a distance of 300 Metres for the 1st Time

For the 1st time in India, Indian Space Research Organisation (ISRO) successfully demonstrated free-space Quantum Communication over a distance of 300 Metres. The free-space QKD (Quantum Key Distribution) was demonstrated at Space Applications Centre (SAC), Ahmedabad, Gujarat. It is a major milestone achievement for unconditionally secured satellite data communication using quantum technologies. QKD is the technology behind Quantum Communication Technology.

ITI and Thalamus Irwine Developed Blockchain Technology in Healthcare Ecosystem

ITI Limited(ITI), the Indian telecom products manufacturing arm and Thalamus Irwine, Delhi based AI (Artificial Intelligence) Firm, have developed a first of its kind technology called Garuda Blockchain Platform for storing medical data on the blockchain. On March 25, 2021, they have demonstrated a working proof of concept (PoC) for the technology with 300 patients.The healthcare platform Garuda will accelerate the roll-out of the "One Nation, One Health Card" vision of Prime Minister Narendra Modi.

Cochin Shipyard Ltd delivers 'MV Sindhu' Passenger-cum-Cargo Vessel to A&N Island Administration

Cochin Shipyard Ltd (CSL) delivered the indigenously built 'MV Sindhu', a 150 MT Cargo Vessel to the Andaman & Nicobar (A&N) Island Administration. It is capable of carrying 500 passengers and can cruise at 16 Knots. CSL will also provide full life cycle support for the Ship's efficient operation.

INTERNATIONAL

JPMorgan & GomSpace successfully test World's First Bank-led Blockchain Transaction in Space

Denmark based GomSpace and US-based JPMorgan Chase & Co have successfully tested the World's First Bank-led Blockchain Transaction in Space (IOD – in-orbit demonstration) using Danish space firm GomSpace's GOMX-4 Satellites. The Transactions were executive through smart contracts on a blockchain network, established between satellites orbiting the earth.

World's Most Powerful Supercomputer "Fugaku" by Japan, Now Fully Operational

"Fugaku" the Japanese supercomputer that topped the Top500 list for 2 consecutive years is now fully operational. The supercomputer that was developed for 6 years by Japanese scientific research institute RIKEN and Fujitsu was used in projects to combat COVID-19 pandemic. Japan's Research Organization for Information Science and Technology (RIST) has selected 74 projects that will use the supercomputer in FY2021. This will work towards the Japanese government's vision of an ultra-smart Society 5.0.

HP Launched World First PCs with Plastic Waste in Ocean

HP(Hewlett-Packard) has made the World's first PC using plastic waste from the ocean.
To build on HP's sustainability commitment, The HP Pavilion line-up (HP Pavilion 13, HP Pavilion 14, and HP Pavilion 15 laptops) uses the post-consumer recycled and plastic waste in Ocean in the construction of speaker housing.The Pavilion series is set to keep around 92000 plastic bottles out of the ocean and landfills.The outer boxes and fibre cushions used for the packaging of the new PCs are 100% sustainably sourced and recyclable.

Nokia partners with Microsoft, Amazon Web Services & Google to develop a cloud-based 5G radio solution

On 15th March 2021, Finnish telecom manufacturer, 'Nokia' announced partnership with Microsoft, Amazon Web Service and Google to develop a new cloud-based 5G radio solution with Nokia's Radio Access Network (RAN) Technology. Nokia's 5G RAN will be developed with high level innovative inputs from Google's Cloud Anthos platform, Microsoft Azure & Amazon Elastic Compute Cloud (Amazon EC2), Amazon Elastic Kubernetes Service (Amazon EKS) and AWS Local Zones.

2021 Science & Technology - April

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
Soyuz MS-18 Yu. A. Gagarin Rocket	Russia	Russia's Soyuz MS-18 Yu. A. Gagarin Rocket (named after Yuri Gagarin the 1st human being to travel to space) successfully launched a 3-member crew (2 Russian Cosmonauts & 1 American Astronaut) to the International Space Station (ISS). The rocket was launched from Baikonur Cosmodrome, Kazakhstan.The rocket has been named after Societ Cosmonaut Yuri Gagarin to commemorate the 60th Anniversary of his travel to space aboard Vostok 1 (On April 12, 1961).
Rashid	United Arab Emirates	United Arab Emirates (UAE) Space Centre is planning to send its rover 'Rashid' to the moon on an unmanned spacecraft by 2022. The rover will be deployed on the Moon using Japan based ispace company's Lunar lander. The rover is named after Dubai's ruling family(Current Ruler-Sheikh Mohammed bin Rashid).
36 satellites of OneWeb	Russia	The 36 satellites of OneWeb, a Low Earth Orbit (LEO) satellite communications operator were launched into orbit by a Arianespace Soyuz Rocket from Vostochny Cosmodrome in Russia.The launch of the 36 LEO satellites will enable OneWeb to offer Broadband services across the UK, Alaska, Northern Europe, Greenland, Iceland, the Arctic seas and Canada. OneWeb is aiming to launch fast broadband services in India by June 2022. Recently, Nettle Infrastructure Investments, a wholly-owned subsidiary of Bharti Airtel acquired 100% stake (10, 000 shares) in OneWeb India Communications Pvt Ltd.
NROL-82	United States	United States (US) spy satellite, NROL-82 launched into space from Vandenberg Air Force Base, California. The

		United Launch Alliance(ULA) Delta IV Heavy carried the NROL-82 satellite for the National Reconnaissance Office(NRO).This launch of NROL-82, a classified national security mission, marks the first launch of 2021 for ULA. This launch also marks the 13th flight of the Delta IV Henry rocket since its debut in 2004.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Ministry of Jal Shakti to deploy IoT devices for Monitoring Rural Drinking Water Supply Systems

Ministry of Jal Shakti is set to deploy sensor-based IoT (Internet of Things) devices to monitor the implementation of Jal Jeevan Mission (JJM) in more than six lakh villages. With this, it aims to monitor the rural drinking water supply systems in villages.For this purpose, The National Jal Jeevan Mission (NJJM) undertook pilot projects in villages of 5 states – Uttarakhand, Rajasthan, Gujarat, Maharashtra & Himachal Pradesh.

ARIES Solar Physicists develop New Algorithm for Tracking Solar Eruptions

Solar Physicists of ARIES (Aryabhatta Research Institute of Observational Sciences), Nainital, Uttarakhand have developed a New Algorithm called 'CIISCO' (CMEs Identification in Inner Solar Corona) for detecting & tracking the accelerating solar eruption in the lower/inner corona of the Sun. The algorithm will be used in India's 1st Solar Mission – Aditya – L1 (set to be launched in 2022).The ejections from the sun are technically called Coronal Mass Ejections (CMEs).

DRDO Developed Lightweight Bullet-proof Jacket for Armed Forces

The Defence Research and Development Organisation (DRDO) has developed a lightweight Bullet-Proof Jacket(BPJ) for the armed forces. The BPJ, weighing around 9 kg, meets the qualitative requirements of the Indian Army. The BPJ was developed by Defence Materials and Stores Research and Development Establishment (DMSRDE), Kanpur.Front Hard Armour Panel (FHAP) jacket was tested at the Terminal Ballistics Research Laboratory (TBRL), Chandigarh and met the relevant Bureau of Indian Standards(BIS) standards.

DRDO develops Advanced Chaff Technology to safeguard Naval Ships from Missile Attack

Defence Laboratory Jodhpur (DLJ), a DRDO Laboratory (Defence Research and Development Organization) has indigenously developed an Advanced Chaff Technology to safeguard Indian naval ships from Missile Attack. 3 variants of Chaff technology have been developed. They are Short Range Chaff Rocket (SRCR), Medium Range Chaff Rocket (MRCR) and Long Range Chaff Rocket (LRCR).

Harsh Vardhan launches Integrated Health Information Platform

Union Minister of Health & Family Welfare, Dr Harsh Vardhan virtually launched the Integrated Health Information Platform (IHIP), an integrated Digital Platform for Disease Surveillance in India. With the launch, India became the 1st Country in the World to adopt an Advanced Digital Disease Surveillance System. National Centre for Disease Control (NCDC), World Health Organization (WHO) were associated with the development of the platform.

Ramesh Pokhriyal Launches 'NanoSniffer' World's 1st Microsensor based Explosive Trace Detector (ETD)

Union Education Minister, Ramesh Pokhriyal 'Nishank' launched 'NanoSniffer' – World's 1st Microsensor (or MEMS, Micro-Electro Mechanical Systems) based Explosive Trace Detector (ETD)

developed by NanoSniff Technologies, an IIT Bombay incubated Startup.The ETD is capable of detecting explosives in less than 10 seconds, it can also identify and categorize explosives into different classes. The ETD is 100% Made in India.

NITI Aayog launches India Energy Dashboards Version 2.0

National Institution for Transforming India (NITI) Aayog launched the 2nd Version of India Energy Dashboards (IED) to strengthen India's Central Energy database. IED is a single-window portal for India's Energy data, it provides comprehensive data on sector wise energy supply & demand.

India and Sri Lanka Conduct Joint Scientific Research on Nine Projects

As per the Indian Ministry of Science and Technology, the Government of India and Sri Lanka have decided to provide bilateral support with the two countries' scientists for the joint research on nine projects and 3 workshops in various fields. The decision was taken based on the scientific strength of project coordinators, availability of national priorities, and budget between the two countries.

India's 40th Scientific Expedition to Antarctica returns to Capetown

40th Indian Scientific Expedition to Antarctica (40-ISEA) hosted by the Ministry of Earth Science successfully returned to Cape Town, South Africa, after completing a journey of 12,000 nautical miles in 94 days, including stop overs.The 40-ISEA was on board the MV Vasiliy Golovnin, a chartered ice-class vessel and began their journey from the Mormugao Port of Goa to Antarctica on 7 January, 2021.

Students Discovered New 'Super-Earth' Orbiting a Red Dwarf Star, GJ 740

A student of the Canary Islands' Instituto de Astrofisica de Canarias discovered a new 'Super Earth' orbiting GJ 740, red dwarf star.The Super Earth is located at 36 light-years from Earth.Super Earth takes 2 days, 9 hours, and 30 minutes to round around its star. (Whereas, Earth takes 365.24 days). It is a class of planets that are twice the size of Earth yet lighter than Neptune and Uranus; can be made of gas, rock, or a combination of both.

Ashok Leyland delivers 1st set of Light Bulletproof Vehicles to IAF

Hinduja Group owned Ashok Leyland delivered the first batch of Light BulletProof Vehicles (LBPV) to the Indian Air Force (IAF). The LBPVs have been developed using 'Transfer of Technology' from Lockheed Martin to Ashok Leyland.The vehicles are completely indigenised and developed in India. They are an adapted version of Lockheed Martin's CVNG (Common Vehicle Next-Generation).They are capable of providing protection to crew members from both ballistic and blast threats.

SpO2 based Supplemental Oxygen Delivery System developed by DRDO

A SpO2(Blood Oxygen Saturation) based supplemental oxygen delivery system for soldiers serving in extremely high altitude areas & COVID-19 patients has been developed by Defence Bio-Engineering and ElectroMedical Laboratory (DEBEL) located in Bengaluru. It operates under Defence Research and Development Organisation(DRDO). The system delivers supplementary oxygen based on the Blood Saturation levels. This will help soldiers from sinking into a state of Hypoxia.

DRDO develops Single Crystal Blades Technology for helicopter engine application

Defence Research and Development Organisation (DRDO) has developed Single Crystal blades technology for helicopter engine application. Using this technology, it has produced 60 blades and supplied them to Hindustan Aeronautics Limited (HAL). The technology will help in the production of blades that are capable of withstanding high temperatures of operation, which are vital for helicopters for their performance in extreme conditions.

Aditya-L1 Support Cell to Bring Data from Aditya L1 India's First Solar Space Mission

Aditya-L1 Support Cell (AL1SC), the Community service centre, was established at the Aryabhatta Research Institute of Observational Sciences (ARIES) transit campus in Haldwani, Uttarakhand,as a part of the efforts of Indian Researchers to create a skilled community of solar scientists to bring & Store the data from the Aditya L1, the first Solar Mission of India.

Foundation Stone laid for Integrated Solar Dryer and Pyrolysis Pilot Plant in CSIR-CLRI, Chennai

Dr K J Sreeram, Director of Council of Scientific & Industrial Research-Central Leather Research Institute (CSIR-CLRI) laid the Foundation Stone of the Integrated Solar Dryer and Pyrolysis Pilot Plant in CSIR-CLRI, Chennai, Tamil Nadu during the 74th Foundation Day of CLRI (23rd April). The project was allocated to CSIR-CLRI under the Indo-German Project titled 'Pyrasol'. The project was awarded to CSIR-CLRI by the Indo-German Science & Technology Centre (IGSTC) through its flagship program '2+2 Projects'.

INTERNATIONAL

Russia registers world's first Covid-19 vaccine for animals: Carnivac-Cov

Russia has registered the world's first vaccine for animals Carnivac-Cov against COVID-19, by agricultural regulator Rosselkhoznadzor. Russia already has three coronavirus vaccines for humans, Sputnik, EpiVacCorona and CoviVac.

Russia Testing new 'Super Torpedo' that can cause 'Radioactive Tsunamis'

Russia is Testing a new 'Super Torpedo' namely Poseidon 2M39 Torpedo in the Arctic region. The Super Torpedo is capable of producing Radioactive Tsunamis.The Unmanned Stealth Torpedo is powered by a nuclear reactor and has a range of 10, 000 km. Russia is also testing a Hyper-sonic missile called 'Tsirkon', which is capable of flying at speeds of up to Mach 6-7.

SpaceX Announced 4 Member Crew for "Inspiration4", World's 1st all-civilian Earth Orbiter Mission

SpaceX announced the 4-member crew for the World's 1st all-civilian Earth Orbiter Mission, "Inspiration4". Christopher Sembroski, Dr. Sian Proctor, Jared Isaacman and Hayley Arceneaux were the 1st batch of civilians aboard the Crew Dragon Resilence spacecraft to be launched into orbit by SpaceX's Falcon 9 rocket by September 15, 2021.

China opens 5G Signal base at Ganbala radar station, World's Highest Radar Station

China opened its 5G Signal base at the World's Highest Radar Station, "Ganbala radar station" which is located at a height of 5,374 meters, in the remote Himalayas of China's Tibet autonomous region.Stable high-speed 5G connectivity can be accessed by Soldiers of Chinese army, which will help them to be in-touch with the global information society.

NASA Aims to Land 1st Woman, Person of Colour on Moon by 2024

National Aeronautics and Space Administration (NASA) aims to land the first woman and first person of colour to the surface of the Moon by 2024 as a part of its international spaceflight programme, 'Artemis' & it will create sustainable missions to the earth's natural satellite by 2028.

Iran Launched Advanced IR-6 Uranium Enrichment Centrifuges

Iran launched IR-6 Uranium Enrichment centrifuges in Natanz as a part of its National Day of Nuclear Technology (10th April 2021) event held in Tehran and other nuclear sites of Iran. Hassan Rouhani,

President of Iran inaugurated the 3 cascades of 164 IR-6 semi-industrial centrifuges, 30 IR-6S centrifuges and 30 IR-6 devices at the uranium enrichment plant in Natanz, Iran.

NASA's 'Ingenuity' Becomes 1st Helicopter to take Controlled Flight on Mars

'Ingenuity', the experimental Mars helicopter of the National Aeronautics and Space Administration(NASA) became the first helicopter to take powered, controlled flight on another planet(Mars).This is hailed as a Wright Brother Moment. NASA has invested around 85 million USD to build the ingenuity, a 19 inch(48 cm) tall copter with carbon fiber blades.

Roscosmos, Russia's Space Agency to Launch its Own Space Station in 2025

Roscosmos, the Space Agency of Russia is set to launch its own Space Station in 2025. Roscosmos's work on the first module of the new space station is in progress. The space module is being assembled by the Energia corporation with the cost estimation of 5 billion USD.This is associated with Moscow's consideration of withdrawing from the International Space Station(ISS)programme as its agreement with the international partners expires in 2024.

SpaceX launches 4 astronauts on NASA's mission to ISS; NASA launched SHIELDS Mission

SpaceX through its Falcon 9 rocket sent 4-astronauts to the International Space Station (ISS) on a NASA commercial crew mission, "Crew-2 mission" from the Kennedy Space Center in Florida, USA. The Mission includes the 1st representative from Europe, Thomas Pesquet of France. European Space Agency (ESA) has named the mission "Alpha" after the star system Alpha Centauri. NASA launched the Spatial Heterodyne Interferometric Emission Line Dynamics Spectrometer (SHIELDS) mission from the White Sands Missile Range in New Mexico.

China's first Mars rover named 'Zhurong'

China has named its first Mars rover as Zhurong after a traditional fire god. The name signifies igniting the flame of Planetary Explorations of China. Zhurong is on board the Tianwen-1 Space probe. The main aim of Tianwen-1 is to analyse and map the Martian surface and look for water ice and study the climate and surface environment. China will become the third country after Soviet Union and USA to achieve soft landing and put a rover on Mars.

UK to get World's Most Powerful Weather Climate Forecasting Supercomputer by 2022

Microsoft and the United Kingdom(UK)'s Met Office are collaborating to build the world's most powerful weather and climate forecasting supercomputer in the UK. It is likely to be operational in 2022. This state of the art supercomputer will be developed at a cost of 1.2 billion pounds(~ ₹12,400 crore).This is a part of the UK Government's commitment towards achieving Net Zero by 2050.

China Launches Core Module for Permanent Space Station & Robot Prototype for Space Cleaning

China National Space Administration (CNSA) launched the Core Module named 'Tianhe or Heavenly Harmony' for its new permanent space station called 'Tiangong Space Station'.
It was launched on a Long March 5B rocket from Wenchang Launch Center, Hainan, China.
It is the 1st of 11 missions needed for constructing the New space station of China. The Module contains living quarters for crew members of 'Tiangong'

2021 Science & Technology - May

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
60 Starlink Internet satellites	USA	SpaceX launched another batch of 60 Starlink Internet satellites into Orbit from NASA's Kennedy Space Center in Florida, USA. The satellites were launched aboard the Falcon 9 Rocket. It was the 13th Launch of 2021 for SpaceX. So far in 2021, SpaceX has launched 610 Starlink Satellites into space.
Yaogan-34 remote sensing satellite	China	China has successfully launched **Yaogan-34 remote sensing satellite** by the Long March 4C rocket which took off from the Jiuquan launch base in the Gobi Desert of northwestern China. This will provide support for the implementation of major national strategies and the modernization of national defense.
DOGE-1	USA	SpaceX is set to launch the '**DOGE-1'** Satellite to the Moon in 2022. It will be launched aboard a SpaceX Falcon9 rocket. ❖ Satellite is being developed by Geometric Energy Corporation (**GEC**), a Canada based intellectual property, manufacturing and logistics firm. SpaceX will accept the cryptocurrency 'Dogecoin' as full payment for the mission. It will be the 1st ever commercial lunar payload in history to be paid entirely with a Cryptocurrency.
Yaogan-30 (08) remote sensing satellites	China	**Satellite name** - Yaogan-30 (08) remote sensing satellites **Location** - Xichang Satellite Launch Center, China. It was China's 13th launch of 2021 & 369th mission of the Long March rocket series. **'Tianqi-12'** – a small satellite for Internet of Things (IoT) data connectivity built by Beijing based firm 'Guodian Gaoke' was also launched. **The debris** from China's Long March-5B Y2 rocket, fell in the Indian Ocean near Maldives.
Haiyang-2D (HY-2D)	China	**Satellite name** - 'Haiyang-2D (HY-2D)' Ocean Observation Satellite China launched the above Ocean Observation Satellite into the Orbit. It was launched by a Long March-4B rocket from the Jiuquan Satellite Launch Centre, Gobi Desert, China. The satellite has been developed by the

		China Academy of Space Technology.It was the 370th launch by the Long March rocket series.
SBIRS Geo-5	United Launch Alliance (ULA), an American spacecraft launch service	**Satellite name** - Space-Based Infrared System Geosynchronous Earth Orbit Flight 5 (**SBIRS Geo-5**) **Launched by** - United Launch Alliance (ULA), an American spacecraft launch service **Objective** – It is a missile warning satellite built by Lockheed Martin or the United States Space Force (USSF). It will help the US to prepare for any threatening missile attacks. The satellite was launched aboard the Atlas V rocket from Cape Canaveral Space Force Station, Florida, USA.
60 more Starlink Broadband Satellites	USA	SpaceX launched 60 more Starlink Broadband Satellites into orbit. The satellites were launched on a Falcon 9 Rocket from Space Launch Complex 40 (SLC-40) at Cape Canaveral Space Force Station, Florida, USA. It was SpaceX's 16th launch of 2021, and the 2nd flight for the particular Falcon 9 reusable rocket.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Indian Scientists developed High-yielding and pest-resistant variety of soybean

- **MACS 1407**, a high-yielding and pest-resistant variety of soybean using the method of conventional cross breeding.
- **Developed by** – Indian scientists of MACS (Maharashtra Association for the Cultivation of Science Research Institute)-Agharkar Research Institute, Pune, in collaboration with Indian Council of Agricultural Research (ICAR), New Delhi.
- The new variety MACS 1407 gives 39 quintals per hectare.

Scientists Discovered Smallest Blackhole in Milky Way Galaxy named "The Unicorn"

Scientists have discovered the smallest known black hole in the Milky Way Galaxy and the closest black hole to the solar system. This black hole has been nicknamed **"the Unicorn".**

- The black hole is around 3 times the mass of the Sun, is located around 1500 light-years from earth.
- The black hole is a part of the binary star system named **V723 Mon** in which a star called Red Giant orbits the black hole.

HAL's ALH Dhruv MkIII Undergone Deck Operation Trials

Hindustan Aeronautics Limited's(HAL) Advanced Light Helicopter (ALH), Dhruv MK III Maritime Variant (MR) 2.5t helicopter has successfully demonstrated its deck-operations capabilities and flight operation trials aboard an Indian Coast Guard ship (ICGS) Sujay at Chennai Coast, Tamil Nadu.

- The helicopters are equipped with Shakti engines and an advanced glass cockpit.
- These helicopters have Automatic Identification System (AIS), High-Intensity Search Light (HISL), Integrated Architecture Display System (IADS), Surveillance Radar, Electro-Optic Infra-Red (EO-IR) system, and 12.7 mm Cabin Mounted Gun, etc.

Facebook Launched in App Vaccine Finder Tool in India

Facebook and Government of India to launch the Vaccine Finder Tool on the mobile application – **Facebook** – in India.

The app available in 17 languages, will enable the public to locate the nearby place to get vaccinated.

Facebook has also announced a 10 million USD grant to India for COVID-19 rescue.

Chennai-based CIBA developed India's 1st vaccine, "CIBA-Nodavac-R" for VNN diseases in fish

Chennai-based Central Institute of Brackish water Aquaculture **(CIBA)** has developed India's first vaccine, **"CIBA-Nodavac-R"** for the viral nervous necrosis (VNN) disease.It caused by the nervous necrosis virus (NNV) which affecting various species of fish.

- The VNN diseases affect various brackishwater and freshwater fish causing up to 100% mortality in larval and early juvenile stages.
- Red-spotted grouper nervous necrosis virus (RGNNV) is a common genotype in India.

'VINCOV-19' - to treat COVID-19 cleared for clinical trials

The Drugs Controller General of India, the apex body for clinical trials in India, has given approval to Hyderabad-based immunological company **VINS Bioproducts** to test its Covid-19 antibody product **VINCOV-19.**

- **VINCOV-19** is an antibody product obtained after immunization of horses with inactivated SARS-CoV-2 virus in combination with adjuvants.

This product is a collaborative effort of the University of Hyderabad (UoH), CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) and Vins Bioproducts Ltd,Hyderabad.

World's First AI Ship to Navigate across The Atlantic

World's First Artificial Intelligence(AI) Ship named **"Mayflower 400".**

- It is set to Navigate Across Atlantic Ocean.It is an Unmanned Vessel & was built by the marine research organization ProMare in collaboration with IBM.

Mayflower 400 is a completely autonomous ship. It is a 15-m-long trimaran that weighs 9 tons.

DRDO's CAIR Developed AI Tool for COVID-19 Detection

Name of AI Tool - ATMAN AI.

Defence Research and Development Organisation (DRDO)'s Centre for Artificial Intelligence and Robotics (CAIR) in association with 5C Network & HCG Academics has developed this Artificial Intelligence tool for COVID-19 detection from chest X-rays.

Reliance Jio constructing Largest International Submarine Cable System in India

Reliance Jio Infocomm Ltd (Jio), a subsidiary of Jio Platforms Ltd is constructing the largest international submarine cable system in India and it becomes the center of the submarine cable system. It is the 1st time in history of Fiber optic submarine telecommunications that India will be at the center of the International network map.

DRDO's 1st batch of Anti-COVID-19 drug '2-DG' has been released

Union Minister for Defence Rajnath Singh released the 1st batch of **Anti-COVID-19 therapeutic drug '2-DG (2-deoxy-D-glucose)**'. It is the 1st indigenous therapeutic drug developed by India to fight COVID-19.

Drug Developed by - The Institute of Nuclear Medicine and Allied Sciences (INMAS), a lab of Defence Research & Development Organization (DRDO) in collaboration with Dr. Reddy's Laboratories (DRL), Hyderabad, Telangana.

Supreme Court Launches App for Journalists

Supreme Court came up with a mobile app to enable journalists to report virtual proceedings without having to visit court premises due to COVID-19.

Launched by - Chief Justice of India NV Ramana

CJI also launched a new feature in the Supreme Court's official website called '**Indicative Notes'**, aimed at providing concise summaries of landmark judgments in an easy-to-understand format.

DRDO develops 'DIPCOVAN' – COVID-19 Antibody Detection Kit

DIPCOVAN (DIPAS-VDx COVID-19 lgG Antibody Microwell ELISA), an Indigenous COVID-19 Antibody detection-based kit was developed by Defence Institute of Physiology and Allied Sciences (**DIPAS**), a unit under the Defence Research and Development Organisation (**DRDO**).

- ✓ It is set to be used for Sero-surveillance. Sero surveillance is conducted to ascertain the spread of COVID-19 in an area & also gauging a person's previous exposure to the virus.

Microsoft Announced the retirement of Internet Explorer in 2022

Microsoft has announced that its Internet Explorer 11 desktop application will retire and go out of support on 15th June 2022 for certain versions of Windows 10. Internet Explorer, which was launched in 1995, holds only a 3.8% share of the desktop browser space which is dominated by Google's Chrome with 70% share.

DRDO develops Isothermal Forging Technology for Aero Engines

Defence Metallurgical Research Laboratory (**DMRL**), a lab of Defence Research and Development Organisation **(DRDO**) has developed an Indigenous Isothermal Forging Technology for manufacturing critical components like discs, shafts and blisks etc of Adour engine (which powers Jaguar Attack Aircraft) & Kaveri engine. With this, India joins a league of limited global engine developers which have the manufacturing capability of such critical aero engine components.

Mylab Coviself :India's First Home Covid Test Kit By Mylab Discovery Solutions

Pune-based company **MyLab Discovery Solutions** has developed **India's first self-use Rapid Antigen Test Kit** for Covid-19 called Mylab CoviSelf.It has been approved by the Indian Council of Medical Research (ICMR).As per the ICMR's guidelines,the self-use test kit can be used by symptomatic individuals and immediate contacts of confirmed cases.

Bengaluru based Space Transportation Tests India's 1st Privately built Hall-effect Thruster

India's 1st Privately Build Hall-effect Thruster, a highly efficient electric propulsion system for microsatellites has been successfully tested by **Bellatrix Aerospace**, a Bengaluru based Space Transportation.

Tested Location – Spacecraft Propulsion Research Laboratory set up by Bellatrix at Society for Innovation and Development-Indian Institute of Science (SID-IISc), Bengaluru, Karnataka. Bellatrix Aerospace is an IISc incubated startup established in 2015.

IIT Ropar & Monash University develop unique detector 'FakeBuster'

FakeBuster' , a unique detector developed by **Indian Institute of Technology (IIT) Ropar, Punjab along with Monash University, Australia** using DeepFake detection technology to detect imposters attending a virtual conference without anybody's knowledge. It helps to find out faces manipulated on social media to defame or make joke of someone.

INTERNATIONAL

Oxygen Produced from Mars for the 1st Time: NASA

- NASA's (National Aeronautics and Space Administration) Rover **'Perseverance'** landed on Mars in February, 2021.
- **'MOXIE'** - Mars Oxygen In-Situ Resource Utilization Experiment, an instrument produced Oxygen from Mars.
- It is the 1st time that Oxygen is being produced on another planet. The atmosphere on Mars is about 95% carbon dioxide.

World's Largest Aeroplane built by Stratolaunch

World's Largest Aeroplane codenamed 'Roc' successfully completed its 2nd Test Flight.

Built by - Stratolaunch, an US based Aerospace Company

Testing location - Mojave Air and Space Port in California, US.

SpaceX Returns 4 Astronauts to Earth from ISS

SpaceX Crew Dragon capsule, **'Resilience'** carrying 4 astronauts returned from the International Space Station(**ISS)** and splashdown into the Gulf of Mexico off the coast of Panama City, Florida, USA after a six-and-a-half-hour flight.

- Apollo 8—NASA's first flight to the moon with astronauts ended with a predawn splashdown in the Pacific near Hawaii on Dec. 27, 1968.
- 4 Astronauts - Victor Glover, Mike Hopkins and Shannon Walker (3 Americans) and Soichi Noguchi (Japanese).
- The 167-day mission was the longest for a crew capsule launching from the U.S.

Lightest form of Uranium called Uranium-214 Created

Scientists have created the new uranium isotope called Uranium-214.

Location - Heavy Ion Research Facility in Lanzhou, China.

This is the lightest ever known and is much lighter than more common uranium isotopes.

This discovery helps to reveal more about an alpha particle that gets ejected from certain radioactive elements as they decay.

GSR's Patania II – Mining Robot Stranded on Pacific Ocean during Trial

Global Sea Mineral Resources (GSR)'s Patania II, a deep-sea mining prototype robot, was stranded on the Pacific Ocean floor following a malfunction during a deep-sea mining trial.

- During the final dive in the GSR area, a lifting point separated and the robot was stranded on the seafloor.
- The Patania II, a 25-tonne mining robot prototype, was developed to explore and collect the rocks rich in cobalt and nickel from the floor of the Pacific Ocean at a depth of more than 13000 feet (4 km).

SpaceX's Starship Rocket Prototype achieves 1st Successful Landing

SpaceX successfully completed the high-altitude ascent & landing of Starship Rocket Prototype 'SN15' for the 1st time. It was launched from Boca Chica, Texas, US.

- SN15's successful landing came on the 60th anniversary of the flight of Alan Shepard, 1st American in space.

- US Space Agency NASA (National Aeronautics and Space Administration) has awarded a USD 2.9 Billion contract to SpaceX to take astronauts from lunar orbit to the surface of the moon. The contract is part of the Artemis program.

NASA's Parker Solar Probe detected radio signal from Venus

NASA Spacecraft Parker Solar Probe has discovered a natural radio signal from Venus when the space probe flew over the upper atmosphere of Venus.

- According to the findings of Parker Solar Probe, just like the earth, planet Venus also has an electrically charged layer of gas in its upper atmosphere called the ionosphere.
- The space probe has also confirmed that the upper Venus atmosphere undergoes changes over a solar cycle.

World's first 2 nanometer chip technology unveiled by IBM

International Business Machines (IBM) unveils the world's first 2 nanometer chip technology that promises to speed up access to the Internet, longer battery life and faster processing time in applications.

It is projected to achieve 45 percent higher performance, or 75 percent lower energy use, than today's most advanced 7 nm node chip.

NASA Spacecraft OSIRIS-REx Heads for Earth With Sample of Asteroid Bennu

National Aeronautics and Space Administration(NASA)'s Spacecraft Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx), started its 2-year long journey towards earth with the samples- rocks and dust -collected from the Asteroid Bennu. The Spacecraft will orbit the sun twice before delivering the samples to the Earth in September 2023.

Google partners with SpaceX to provide Starlink Internet Service

Google Cloud is set to partner with SpaceX to provide Cloud services to help deliver high speed internet through **SpaceX's Starlink satellites**. As part of the partnership, SpaceX will install Starlink terminals (ground stations) at Google data centers across the world.

China's 1st Mars Rover Lands on the Utopia Planitia, Mars

Chinese Spacecraft **Tianwen 1 carrying rover Zhurong** landed on Utopia Planitia region, Mars successfully.This makes China only the second country after the US to send a rover to the surface of the Red Planet.

Jeff Bezos's Blue Origin Sets 1st Space Tourism Flight in July 2021

Amazon founder Jeff Bezos's rocket company, Blue Origin, announced the first flight that aboard its New Shepard rocket, and crew capsule which is designed to carry up to 6 tourists per flight, beyond an invisible line, known as the Karman line, which
separates Earth from space.The first flight is scheduled to take place in July 20,2021.

Europe's Jupiter Spacecraft 'JUICE' enters Testing Phase

Jupiter Icy Moons Explorer **(JUICE**), an interplanetary spacecraft being developed by European Space Agency (ESA) has entered into a crucial testing phase. It is being tested at ESA's European Space Research and Technology Centre (ESTEC) in the Netherlands.

NASA's Giant Webb Telescope Successfully Completes Pre-Launch Test

World's largest and most powerful space science telescope, James Webb Space Telescope, Successfully Completed its Pre-Launch Test by opening its iconic primary mirror for the last time it is on earth. In the Final Test,the 6.5-meter mirror was commanded to fully expand and lock itself into place, to ensure that it will survive its million-mile (1.6 million kilometer) journey and is ready to discover the origins of the Universe.

Iran Launched its Most Powerful Supercomputer

Iran has launched its most powerful supercomputer '**Simorgh**' which was designed by the Amirkabir University of Technology (AUT) at a cost of 1 trillion Iranian rials (around Rs 173 crore).
Simorgh is named after the mythical **Phoenix-like bird Simorgh or Simurgh**.The system is located at the Iranian High-Performance Computing Research Center (IHPCRC) at AUT.

NASA's 1st Mobile Robot 'VIPER' To Launch On Moon in 2023

National Aeronautics and Space Administration (NASA) has announced the plan to send its first mobile robot Volatiles Investigating Polar Exploration Rover (VIPER) to the Moon in 2023.This is a part of the Artemis program. It will map and explore the moon's resources on and under the lunar surface, particularly water-ice.

IAU approves 8 Features on Moon with Chinese names

International Astronomical Union (IAU)'s Working Group for Planetary System Nomenclature (**WGPSN**) gave approval for naming 8 features in the Moon with Chinese names around the location where China's Chang'e-5 Spacecraft landed in December 2020.

- ✓ Chang'e-5 brought back fresh Lunar samples to Earth, which was previously bought 40-years back by the USA's 1969 Apollo 11 Mission.

World's First Global, Satellite-Based Reef-Monitoring System Launched By Scientists

First global, satellite-based reef surveillance tool to monitor the coral bleaching issue has been launched by scientists working with the **Allen Coral Atlas,a research initiative** developed by Arizona State University (ASU), the University of Queensland, the National Geographic Society, Planet, and Vulcan.

2021 Science & Technology - June

SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
Tianzhou-2 or Heavenly Vessel	China	China Launched cargo spacecraft, **"Tianzhou-2" or "Heavenly Vessel"** through Long March-7 Y3 rocket from the Wenchang Space Launch Center on the southern island of Hainan. The spacecraft is carrying supplies, equipment and propellant, docked with the space station's key module Tianhe. The spacecraft "Tianzhou-2" successfully docked with the Tiangong space station.
Fengyun-4B	China	China National Space Administration (CNSA) successfully launched "Fengyun-4B" (FY-4B) Meteorological satellite to Earth's Geostationary Orbit. FY-4B is the 1st of China's New-Generation Meteorological Satellites, which has an improved measurement resolution of 250 meters to scan Earth.

		China plans to send 3 male Astronauts to its newly launched Tianzhou-2 Space Station.
4 satellites	China	China launched 4 satellites into planned orbits aboard the Long March-2D rocket from the Taiyuan Satellite Launch Center in Northern Shanxi Province. The satellites will be used for ecological environment monitoring, asteroid resource exploration, disaster prevention and mitigation among others. The 4 satellites are Beijing-3 (BJ-3), HISEA-2 (HS-2), Yangwang-1 (YW-1) and Tianjin (TJ).
WISA Woodsat	Finland	**European Space Agency (ESA)** will launch the world's first wooden satellite, **WISA Woodsat**, designed and built in Finland, on Earth's orbit by the end of 2021. It will be launched on a Rocket Lab's Electron rocket from the Mahia Peninsula launch complex in New Zealand. ✓ It is a brainchild of Jari Makinen, co-founder of Arctic Astronautics, a satellite replica making company.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

NSA Ajit Doval Commissioned OPV Sajag into Indian Coast Guard

National Security Advisor (NSA), Ajit Doval virtually commissioned Offshore Patrol Vessel **(OPV) Sajag** into Indian Coast Guard (ICG). OPV Sajag was built by Goa Shipyard Limited (GSL) with State-of-Art technology.

- ✓ OPV Sajag will be a part of guarding India's 7500 km long coast and will be involved in overseas missions along the Indo-Pacific region.

Agri Services E-Marketplace Launched by CSC SPV

Portal - "www.cscagri.in" , Agri Services Portal was released by Common Services Centres (CSC) E-Governance India Ltd to empower small and marginal farmers, who constitute 86 per cent of India's farming community.

- ✓ **Purpose –** It will act as a one-stop destination and marketplace for small farmers and marginal farmers, who do not have easy access to the digital world can avail essential Agri services.

India's first IoT device to record temperature for cold chain management

"AmbiTag", India's first IoT(Internet of Things) device developed to record the real-time temperature of perishable products like food and dairy, vaccines, and body organs and blood during transportation.

- ✓ **Developed by** - Indian Institute of Technology, Ropar **(IIT Ropar), Punjab** under the Technology Innovation Hub- **AWaDH (Agriculture and Water Technology Development Hub)** and its Startup ScratchNest.

IIT Hyderabad develops Oral Amphotericin B(AmB)

Indian Institute of Technology(IIT)-Hyderabad has developed nano-fibre based oral tablets of Amphotericin B (AmB) to treat post-Covid fungal infections. At present, AmB is an injectable drug.Currently, Kala Azar (visceral leishmaniasis) treatment is being used for black fungus and other fungus in the country.

India's 1st CAR-T cell therapy was conducted at ACTREC, TMC in Mumbai

India's first Chimeric Antigen Receptor T-cell (CAR-T) therapy was conducted at the Bone Marrow Transplant unit at ACTREC, Tata Memorial Center(TMC) in Mumbai, Maharashtra. The clinical trial is the joint effort of the Indian Institute of Technology(IIT) Bombay and Tata Memorial Centre.

- ✓ The clinical trial of CAR-T was supported by the Department of Biotechnology(DBT) through the National Biopharma Mission(NBM)-Biotechnology Industry Research Assistance Council (BIRAC).

ISRO Developed 3 Types of Ventilators for Clinical Usage

Indian Space Research Organisation(ISRO) has developed 3 types of ventilators: PRANA , VaU and SVASTA. ISRO is set to transfer the technology to the industry for clinical usage during the 2nd wave of COVID-19 pandemic.

- ✓ **"PRANA" Programmable Respiratory Assistance** for the Needy Aid a low-cost and portable critical care ventilator based on the automated compression of an AMBU (Artificial Manual Breathing Unit) bag.

I-STEM Portal to provide Free Access to COMSOL Multiphysics software suite

Indian Science Technology and Engineering facilities **Map (I-STEM**), the national portal for sharing R&D facilities, and the COMSOL group have entered into partnership for Indian academic users to access the COMSOL Multiphysics software suite using the I-STEM portal. It is the first of its kind in India.

NII Gets Trademark For India's First Indigenous Tumor Antigen SPAG9

A New Delhi-based National Institute of Immunology (NII), an Autonomous Institute of Department of Biotechnology (DBT) has received the ASPAGNIITM trademark for India's First Indigenous Tumor Antigen SPAG9.

- ✓ In 1998,The SPAG9 antigen was discovered by Dr Anil Suri who heads the Cancer Research Programme at the NII.

HAL-Manufactured 3 ALH Mk-III Helicopters Inducted into ICG

- ✓ On June 12, 2021, Defence Secretary Dr Ajay Kumar inducted **the first 3 of 16 Indigenous Advanced Light Helicopters (ALHs) MK III** into Indian Coast Guard (ICG) to assist in coastal surveillance, rescue operations, and further enhance coastal security. ALHs MK III were the state-of-the-art helicopters that are indigenously designed and manufactured by Hindustan Aeronautics Limited (HAL).

IIT Ropar developed "Jivan Vayu", India's first power free CPAP device

Indian Institute of Technology(IIT) Ropar(Punjab) developed a device named "**Jivan Vayu", India's first Continuous Positive Airway Pressure (CPAP) device** that can function without electricity.

- ✓ Jivan Vayu can be used as a substitute for the CPAP machine.

Govt Launched Trusted Telecom Portal under NSDTS to List Trusted Network Sources

Government(govt) launched the Trusted Telecom Portal as a part of the national security directive on the telecommunications sector under the National Security Directive on Telecommunication Sector (NSDTS) to declare a list of trusted sources and products for installation in the country's telecom networks.

- ✓ The portal was developed and implemented by CDoT (Centre for Development of Telematics), an R&D (Research and development) unit of the Government along with RailTel and the National Security Council Secretariat (NSCS).

IIT-K & YIC Developed Technique to Detect Cyclones before Weather Satellites

Researchers at the Indian Institute of Technology (IIT), Kharagpur (West Bengal) and Yantai Institute of Coastal Zone Research (YIC) in China have developed a technique to detect the formation of cyclones in the North Indian Ocean region at least 90 hours before the weather satellites.The study is published in the journal Atmospheric Research.

PASIPHAE, an International Collaborative Sky Survey Led by an Indian Astronomer

Polar-Areas Stellar-Imaging in Polarisation High-Accuracy Experiment (PASIPHAE) is an instrument used in sky surveys to study the polarisation in the light coming from millions of stars and is being led by an Indian astronomer.

- ✓ The project has been funded with $1 million (Rs.7.39crore) each by Infosys Foundation, India,

Stavros Niarchos Foundation, Greece and USA's National Science Foundation combined with contributions from the European Research Council and the National Research Foundation in South Africa.

Indo-French Researchers Developed New Way of Imaging Through Fog

A team of Indo-French researchers from various Indian institutions including Raman Research Institute (RRI – Bengaluru) and ISRO's Space Applications Center (**SAC)** in Ahmedabad, and Université Paris-Saclay, Centre National de la Recherche Scientifique(CNRS), France has developed a new improved imaging method to make a clear image of objects in foggy weather conditions.

- ✓ This work was partially funded by the Department of Science and Technology (DST) and the Indo-French Centre for the Promotion of Advanced Research.

ARDE & HEMRL develop CSS for safe ejection of Pilots in distress

2 Labs of the **Defence Research and Development Organisation (DRDO)** namely Armament Research and Development Establishment (ARDE), Pune & High Energy Material Research Laboratory (HEMRL) have developed a Modern Canopy Severance System (CSS) for India's Indigenous Fighter Aircraft Light Combat Aircraft (LCA) Tejas & Trainer Aircrafts like HJT-36 Aircraft & HTT-40 Aircraft. The CSS of a fighter aircraft is a life saving device that helps in safe ejection of a pilot in distress.

Thawaarchand Gehlot Launches Website for Nasha Mukt Bharat Abhiyaan

On occasion of the International Day Against Drug Abuse and Illicit Trafficking (26th June), Union Minister for Social Justice & Empowerment Thawaarchand Gehlot launched a website for the **Nasha Mukt Bharat Abhiyaan (NMBA)** scheme.To commemorate the International Day Against Drug Abuse and Illicit Trafficking, MoSJE organized a 6-day Nasha Mukt Bharat Summit from June 21-26, 2021.

"Enforcing Contracts Portal" launched by Department of Justice

Barun Mitra, Secretary at Department of Justice launched the "Enforcing Contracts Portal" that is aimed at improving the Ease of Doing Business (EoDB) in India. Department of Justice under the Ministry of Law and Justice, is the nodal agency responsible for all policy reforms on "Enforcing Contracts" for improving the EoDB in India.

INTERNATIONAL

Bharti-backed OneWeb Launched 36 New LEO Satellites

OneWeb, a Low Earth Orbit (LEO) satellite communications operator, co-owned by Bharti Global and the UK government, launched another batch of 36 satellites on 28 May 2021, which was carried out by European satellite launch company, Arianespace, from the Russian spaceport, Vostochny Cosmodrome.

- ✓ The satellites are built under a joint venture between OneWeb and the aerospace company, Airbus.

NASA Plans Two New Missions to Venus

National Aeronautics and Space Administration (NASA) plans to implement two new missions DAVINCI+ and VERITAS to Venus, Earth's nearest also called sister planet. NASA will spend $500 million for each mission. Both missions will be expected to launch between 2028-2030.

- ✓ **DAVINCI+** (short for Deep Atmosphere Venus Investigation of Noble Gases, Chemistry and Imaging)
- ✓ **VERITAS** (an acronym for Venus Emissivity, Radio Science, InSAR, Topography and Spectroscopy)

New Zealand Made a Space Agreement With NASA

New Zealand becomes the latest country to sign a space agreement with NASA.New Zealand became the eleventh signatory to the Artemis Agreement, a blueprint for space cooperation and supporting the U.S. space agency's plans to return humans to the moon by 2024 and to launch a historic human mission to Mars.

SpaceX's Dragon Capsule carries Squids, Microorganisms to ISS

As part of mission **CRS-22, SpaceX's Dragon Capsule** was launched aboard the Falcon 9 rocket from Florida, USA. The Capsule contained supplies for the International Space Station **(ISS)** scientific instruments such as new high-tech solar panels and living organisms such as Squids & a microorganism called Tardigrades.

China's 'Artificial Sun' Sets New World Record By Running at 120 Million Degrees Celsius

China's '**Experimental Advanced Superconducting Tokamak (EAST)**' project or known as '**Artificial Sun'** set a new record by running at 216 million degrees Fahrenheit or 120 million degrees Celsius for 101 seconds.

- ✓ For another 20 seconds, the 'artificial sun' also achieved a peak temperature of 288 million degrees Fahrenheit (160 million degrees Celsius), which is over 10 times hotter than the sun.
- ✓ The experiment was conducted at the Institute of Plasma Physics of the Chinese Academy of Sciences (ASIPP), in Hefei, China.

TOI-1231 b : A Cooler Exoplanet with Water Clouds Discovered

A Team of **International Astronomers, discovered an exoplanet located 90 light-years** away from Earth which has a Cooler atmosphere (57 Celsius) and has the possibility of having water clouds. The exoplanet called "TOI-1231 b", orbits an M-type, dwarf star in 24 days. This is with almost the size of Neptune, was discovered using NASA's (National Aeronautics and Space Administration) Transiting Exoplanet Survey Satellite (TESS).

Firmina – World's Longest undersea cable built by Google

Google announced its plan of connecting the United States of America (USA) with South American countries by constructing an Open subsea cable. The subsea cable was named as "Firmina" honouring Brazil's 1st poet 'Maria Firmina dos Reis'.

European Space Agency's EnVision mission to Venus in 2030

European Space Agency (ESA) has announced the launching of its probe called **'EnVision'** to study Venus planet's atmosphere and surface, monitor trace gases in the atmosphere and analyse its surface composition. It will probably be launched in early 2030.

Shenzhou-12: China to launch first human spaceflight since 2016

China is all set to blast off its first human spaceflight since 2016 namely 'Shenzhou-12' which means 'Divine Vessel'. It will be launched from Gobi Desert on a Long March rocket in the coming days with three men onboard. This launch is also considered as a gift to the 100th anniversary of the founding of the Communist Party of China.

Rocket Lab to Design 2 Photon Spacecraft for NASA's ESCAPADE Mars mission

Rocket Lab was awarded a contract to design 2 of its Photon spacecrafts for the National Aeronautics and Space Administration's (**NASA**) potential – Escape and Plasma Acceleration and Dynamics Explorers (**ESCAPADE**) mission to Mars in 2024.

- ✓ ESCAPADE mission is a part of NASA's Small Innovative Missions for Planetary Exploration (SIMPLEx) program. The spacecraft will orbit around Mars to understand the structure, composition, variability, and dynamics of Mars' unique hybrid magnetosphere.

China launches Shenzhou-12 Human Space Mission with 3-Astronauts

China launched its newest Human Space Mission through the **'Shenzhou 12'** spacecraft using the Long March 2F rocket. The 3-member space mission is set to assemble 'Tianhe', the core module of China's newest Space Station – "Tiangong". The mission headed by Nie Haisheng will study various aspects of the upcoming Chinese space station.

- ✓ The three men to be inducted in the mission are Nie Haisheng, Liu Boming and Tang Hongbo.

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SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
36 Broadband Satellites	Launched by OneWeb	36 Broadband Satellites of OneWeb (a venture backed by Bharti Airtel) were launched into orbit by a Soyuz rocket from Vostochny Cosmodrome in Siberia, Russia. The launch of the satellites will enable it to provide commercial internet services in areas of the Northern Hemisphere (areas north of 50th Degree Latitude) by the end of 2021. This mission was the OneWeb 8, the eighth OneWeb launch since the first satellites launched in 2019.
7 satellites	Launched by Virgin Orbit	Richard Charles Nicholas Branson's rocket company, Virgin Orbit delivered 7 satellites from 3 countries viz, United States(US), Netherlands, and Poland into space using its modified Boeing 747 aircraft, making it the company's 1st commercial launch. LauncherOne, the 70-foot-long (21-meter) two-stage rocket was carried by the aircraft and dropped from its left wing. It is the company's 2nd successful rocket launch from a plane.
Fengyun-3E (FY-3E)	China	China National Space Administration (CNSA) launched a new meteorological satellite **'Fengyun-3E (FY-3E)'** aboard a Long March-4C carrier rocket from Jiuquan Satellite Launch Center in China. Called the **'dawn satellite'**, FY-3E is the world's 1st meteorological satellite for civil service in a dawn-dusk orbit. The satellite is equipped with 11 advanced remote sensing payloads and has a lifespan of 8 years.
Geo Imaging Satellite-1 (GISAT-1)	ISRO	Indian Space Research Organisation (**ISRO**) is all set to launch its **Geo Imaging Satellite-1 (GISAT-1),** weighing about 2,268-kg, onboard Geosynchronous Satellite Launch Vehicle-F10 (**GSLV-F10**) rocket on August 12, 2021 from Satish Dhawan Space Centre (SDSC), Sriharikota in Nellore district of Andhra Pradesh. ✓ It is the **first state-of-the-art agile Earth observation satellite** which will be placed in a Geosynchronous Transfer Orbit by GSLV-F10 and, subsequently, positioned in the final geostationary orbit, about 36,000 km above earth's equator.
'EOS-3' (also known as GISAT-1)	ISRO	Indian Space Research Organisation (**ISRO**) is set to launch its most advanced Geo-Imaging Satellite '**EOS-3' (also known as GISAT-1)** on August 12, 2021. It will be capable of near-real time monitoring of natural disasters like Floods & Cyclones. It will be launched into the Geosynchronous orbit by GSLV-F10 Rocket from Satish

		Dhawan Space Centre (SDSC), Sriharikota, Andhra Pradesh.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Microsoft Officially Launched 'Windows 11'

Microsoft officially launched its new Windows operating system 'Windows 11' on June 24, 2021. It is being called the "**next generation**" of Windows.The release comes nearly six years after the current latest Windows Operating System 'Windows 10' was launched in July 2015.

3-new Asteroids discovered by Indian Teacher-Student duo in IASC Citizen Science Programme

3-new asteroids were discovered by Bala Bharathi, Principal of Bharathi Matriculation Higher Secondary School, and G. Aazhimukilan, B.Sc. Physics student from St. Joseph's College from Trichy, Tamil Nadu. The 3 asteroids were temporarily named as BBM2101, BBM2102, and BBM2103.

- ✓ The discovery was a part of the International Astronomical Search Collaboration (IASC) Citizen Science Programme, organised by National Aeronautics and Space Administration (NASA).

Indrajaal: Grene Robotics developed India's 1st Indigenous Drone Defence Dome

India's first indigenous Autonomous **Drone Defence Dome (AD3**) namely **'Indrajaal'** has been developed by Grene Robotics, a Hyderabad (Telangana) based company into building autonomous technologies. This Anti-Drone Dome provides a 24*7 protection to a large area / city of 1,000-2,000 sq km against threats such as Unmanned Aerial Vehicles (UAVs), incoming weapons (missiles), loitering munitions and Low-Radar Cross Section (RCS) targets autonomously.

6 Technology Innovation Platforms launched by Ministry of Heavy Industries

Ministry of Heavy Industries and Public Enterprises launched **6-Technology Innovation platforms** for exchange of knowledge for research & development of technologies that are manufactured in India with globally competitive standards and other technical researches.

- ✓ The aim is to one platform for all Indian Industries & field experts, allowing them to identify problems faced by various industries and resolve it through crowd sourcing solutions.

Tech Mahindra & StaTwig partners to implement Global Vaccine Tracker – 'VaccineLedger'

Indian IT major Tech Mahindra partnered with StaTwig – a digital supply chain provider to implement **"VaccineLedger",** a global vaccine tracker platform.

- ✓ VaccineLedger is set to collaborate with countries across the world to facilitate transparency in the Vaccine supply chain and predict failure of cold storage facilities, thereby eliminating wastage of life saving drugs.

Giriraj Singh Launches 'Matsya Setu' for Aqua Farmers

Union Minister for Fisheries, Animal Husbandry and Dairying, Giriraj Singh launched an **Online Course Mobile App 'Matsya Setu'** to spread latest freshwater aquaculture technologies to aqua farmers of India.

- ✓ The app has been developed by **ICAR-CIFA (Indian Council of Agricultural Research-Central Institute of Freshwater Aquaculture)** with funding support from the National Fisheries Development Board (NFDB), Hyderabad.

dbGENVOC: World's 1st database of Genomic Variants of Oral Cancer created by DBT-NIBMG

National Institute of Biomedical Genomics (**NIBMG**) located in Kalyani, West Bengal has created a world's first of its kind browsable online database namely '**dbGENVOC- database of GENomic Variants of Oral Cancer'**. This database is a repository that can be accessed by the public at free of cost.

- ✓ It will be updated annually with variation data from new oral cancer patients from different regions of India and Southeast Asia.
- ✓ NIBMG is funded by the Department of Biotechnology.

MoD implemented Web-based SPARSH for Sanction & Disbursement of Defence Pension

Ministry of Defence (**MoD)** headed by **Union Minister Rajnath Singh** implemented SPARSH, an acronym for System for Pension Administration (**Raksha**), for automation of sanction and disbursement of defence pension.

- ✓ This web-based integrated system will remove the need of an external intermediary and directly processes pension claims and credits pension directly into the bank accounts of defence pensioners.

FAA develops New Tool to Limit Disruptions Caused by Space Operations

USA's Federal Aviation Administration (**FAA**) has developed a new tool called **'Space Data Integrator (SDI)'** which will help in better tracking of rocket launches and space vehicles returning to Earth, it will help in shortening the time that airspaces are closed. During space operations, airspaces around the area of space operation are closed due to safety reasons.

- ✓ The new tool addresses this problem by automating the near-instant delivery of data about a space vehicle's flight path (**Telemetry data**) to the USA's Air Traffic Control System.

Indian Researchers Spot Rare Super Luminous Supernova

A Team of Indian Researchers spotted the very rare **Super Luminous Supernova (SLSNe)** using the special arrangements at **India's Devasthal Optical Telescope (DOT-3.6 m),** Nainital, Uttarakhand along with 2 other Indian telescopes – Sampurnanand Telescope **(1.04 m),** Nainital & Himalayan Chandra Telescope (**2.0 m**) in Ladakh.

- ✓ The study was led by Amit Kumar, a Ph.D. student working under Dr. S.B. Pandey. It has been published in the monthly notices of the UK-based Royal Astronomical Society.

Virgin Galactic's Unity 22 Human Space Mission : Indian Origin Sirisha Bandla Joins

US based private Spaceflight company '**Virgin Galactic'** announced the 6-member crew of its human commercial space mission **"Unity 22".** The crew includes **Richard Branson – the founder of Virgin Galactic** as one of its passengers. Indian origin **Sirisha Bandla** will be the 4th crew member of the space mission.

- ✓ **Unit 22 Mission:**To act as a pre-run for all of its future commercial space trips, that will allow passengers to witness the curvature of Earth from space.

IISc Scientists discover 2 Species of FEBs in Superfluid Helium

Scientists at the Indian Institute of Science (IISc), Bengaluru, Karnataka have discovered the existence of 2 species of **Few Electron Bubbles (FEBs)** in superfluid Helium for the 1st time. The study has been published in Science Advances.

The Team of Scientists was led by **Professor Ambarish Ghosh** at Centre for Nano Science and Engineering (CeNSE), IISc. Neha Yadav, a former PhD student at the Department of Physics; Prosenjit Sen, Associate Professor at CeNSE were the other scientists in the team.

40th Anniversary of APPLE Satellite – organized by Chandigarh University

Chandigarh University organised the 40th anniversary celebration of India's 1st Communication satellite – APPLE Satellite. On the occasion, Prof. RM Vasagam, Director of Project APPLE, was awarded 'Lifetime Achievement Award' by Chandigarh University.

- ✓ **Ariane Passenger PayLoad Experiment (APPLE),** satellite program launched in 1981. APPLE played a foundational role in development of ISRO's INSAT and other communication satellites.

ISRO conducts 3rd Long Duration Hot Test of Vikas Engine for Gaganyaan Program

Indian Space Research Organisation (ISRO) successfully conducted the 3rd Long duration Hot test of the Liquid propellant Vikas Engine for the core L110 liquid stage of human rated GSLV MkIII vehicle, as part of the engine qualification requirement for the Gaganyaan Programme (India's 1st Human Space flight programme).

- ✓ The engine was tested for 240 seconds at the engine test facility of **ISRO Propulsion Complex (IPRC**), Mahendragiri, Tamil Nadu.

Digital Platform 'Kisan Sarathi' launched to help Farmers

The digital platform **'Kisan Sarathi'** was jointly launched by Union Minister for Agriculture & Farmers Welfare, Narendra Singh Tomar and Union Minister for Electronics & Information Technology, Ashwini Vaishnaw to help farmers get 'right information at the right time' in their desired language.

- ✓ The portal was launched virtually on the occasion of 93rd Indian Council of Agricultural Research (ICAR) Foundation Day i.e 16th July, 2021.
- ✓ The portal is powered by Interactive Information Dissemination System (IIDS), Digital India Corporation (DIC), Ministry of Electronics and Information Technology (MeitY).

BrahMos Extended Range Version fails during Test-firing off the coast of Odisha

The **extended range version of BrahMos supersonic cruise missile** failed during a test firing being carried out off the coast of Odisha and fell shortly after takeoff. BrahMos supersonic cruise missile earlier was used for range upto 290-Km but this version is capable of hitting targets up to 450 kilometres. It is expected that the missile failed due to issues with the propulsion system but the exact cause will be assessed by the joint team of scientists from the Defence Research and Development Organisation (DRDO) and BrahMos Aerospace Corporation.

ICCR launches 'Kala Vishwa' Virtual Platform for Traditional & Folk Artists

Indian Council for Cultural Relations (ICCR) launched a new Virtual Platform called **'Kala Vishwa'** to reach out to traditional folk artists, local artists/artisans. It was launched from ICCR's Mumbai Centre.The 'Kala Vishwa' campaign aims to give artists coming from rural areas a virtual platform to perform during the challenging time of COVID-19.

CJI NV Ramana launched FASTER to Securely and Electronically transmit Bail and other orders

Chief Justice of India (CJI) Nuthalapati Venkata Ramana led bench has initiated a secure electronic transmission mechanism namely **FASTER (Fast and Secure Transmission of Electronic Records)** that will fast forward the process of bail i.e. instantaneous delivery of Supreme Court (SC) orders to concerned prisons, District Courts, High Courts through a secure communication channel in order to save time and efforts.

The bench also had Justices Lavu Nageswara Rao and Ajjikuttira Somaiah (AS) Bopanna.

DRDO develops Indigenous Titanium Alloy for Aerospace Industry

Defence Metallurgical Research Laboratory (DMRL), a lab of Defence Research and Development Organisation (DRDO) has developed an Indigenous High Strength Metastable Beta Titanium Alloy.

- ✓ It will be useful in manufacturing intricate components for aerospace applications. The beta titanium alloy has higher strength, ductility, fatigue, and fracture toughness – making them increasingly attractive for aircraft structural applications.

IIT-M Researchers Developed AI Tool NBDriver to Study Cancer-Causing Mutation

Researchers from the Robert Bosch Centre for Data Science and Artificial Intelligence (**RBCDSAI**), Indian Institute of Technology Madras (**IIT-M**) has developed the mathematical model based on Artificial Intelligence (AI), called **NBDriver (neighbourhood driver)** to study the cancer-causing mutations in cells. By looking at the neighbourhood or context of a mutation in the genome, the tool can be used to differentiate the harmful 'driver' mutation from the neutral 'passenger' mutation.

BDL flags off 1st MRSAM Missile for Delivery to IAF

Bharat Dynamic Ltd (BDL) officially started the delivery of the 1st Missile of the 1st Firing unit of **Medium Range Surface to Air Missile (MRSAM**) for delivery to the **Indian Air Force (IAF).** It was flagged off by MSR Prasad, Director General (Missiles & Strategic Systems) of BDL.' MRSAM is a high response, quick reaction, vertically launched supersonic missile.

- ✓ It has been jointly developed by Defence Research & Development Organisation (DRDO) & Israel Aerospace Industries (IAI). MRSAM is manufactured by Bharat Dynamics Ltd (BDL).

Blue Origin's 'New Shepard' Completes 1st Human Passenger Flight

'New Shepard' Rocket System built by **Blue Origin (a Company owned by Amazon's Founder, Jeff Bezos)** successfully completed its 1st human spaceflight with 4 people on board. It was launched from a private launch site near Van Horn, Texas.

- ✓ The 4 members in the spaceflight were Jeff Bezos, Mark Bezos, Wally Funk (82 years, oldest to ever fly in space) & Oliver Daemen (18 years, youngest ever to fly in space).
- ✓ Indian born engineer Sanjal Gavande is part of the Blue Origin team that built the New Shepard Rocket. She hails from Kalyan, Maharashtra.

Tata Boeing Aerospace delivers 100th Fuselage for the AH-64 Apache Helicopter to Boeing

Tata Boeing Aerospace Limited (TBAL) delivered the 100th fuselage for AH-64 Apache combat helicopter to Boeing's AH-64 Apache manufacturing facility at Arizona, USA. These fuselages developed in Hyderabad under Make in India policy will be used by Boeing in its Global production of the state-of-art AH-64 combat helicopters.

- ✓ **TBAL is Boeing's 1st Joint Venture Company** in India, that was set up in Hyderabad, Telangana as a result of the 2015 agreement between Tata Advanced Systems and Boeing.

IIT Ropar develops 1st of its kind Oxygen Rationing Device 'AMLEX'

Researchers at IIT, Ropar have developed **'AMLEX', a 1st of its kind device** that is capable of regulating the flow of medical oxygen from a cylinder during inhalation and exhalation by a patient. It significantly reduces oxygen wastage.

- ✓ It has been developed specifically for oxygen cylinders and is capable of operating on both portable power supply (battery) as well as line supply (220V-50Hz).

IIT-K's 'C3iHub' launched 1st cohort of Startups & R&D investigators for Cyber Security Solutions

The technology innovation hub on cyber security at the Indian Institute of Technology, **Kanpur (IIT-K)** namely **'C3iHub'** launched the first cohort comprising 13 start-ups for incubation and 25 R&D (Research & Development) principal investigators research programs to develop services and products for cyber security domains.

- ✓ The launch was made during an event which was attended by Professor Ashutosh Sharma, secretary, Department of science and technology, Ministry of Science and Technology.

Scientists from India, Russia, Brazil, South Africa will collaborate to develop Covid-19 drug

Collaboration will be made between the scientists from **India, Russia, Brazil and South Africa** to develop or repurpose drugs against Covid-19. This partnership will comprise experts from bioinformatics, organic chemistry, medicinal chemistry, drug screening and parasitologists.

- ✓ The research to be done under this partnership will be supported by the Department of Science and Technology (DST), Ministry of Science and Technology (MoST).

NSDL e-Governance developing World's 1st Cab-Hailing Platform

NSDL e-Governance Infrastructure Ltd is developing the World's 1st cab-hailing platform enabled by Open-Source specifications. It will allow enterprises, cab companies, and individual players to access the platform on their own pacts using open-source technologies.

- ✓ NSDL is using the open protocol **'Beckn'** for building the platform. The protocol will enable local commerce across industries to be discovered and engage in business.

Central Govt launched Secured Logistics Document Exchange & Calculator for GHG Emissions

As a part of efforts for improving the ease of doing business, the Central Government launched the **'Secured Logistics Document Exchange (SLDE)' and 'Calculator for Green House Gas (GHG) Emissions'**.While SDLE is to replace the manual process of logistics documents with a digitized, secure and seamless document exchange system, the GHG emission calculator will choose sustainable and right mode of transport for freight movement.

- ✓ These launches are on the lines of Logistics Division mandate of 'Integrated Development of the Logistics Sector'.

Cochin Shipyard Ltd launches 5 Vessels; IAF Inducts Rafalae into Eastern Air Command

Cochin Shipyard Ltd (CSL) launched 5 vessels – 3 Floating Border Outpost Vessels (FBOP) for Border Security Force (BSF) & 2 Mini General Cargo Ships for JSW Group from its dock in Cochin, Kerala.The 3 FBOPs designed & built indigenously by CSL for BSF will act as Strategic base stations at the borders. They will be deployed on the Eastern & Western borders and will strengthen BSF's water wing.

INTERNATIONAL

Israel unveiled 5th Gen Maritime & Land-based Long-Range Attack Weapon System

Israeli defence major **Rafael Advanced Defense Systems (RADS)** Ltd. unveiled an all-weather missile **Sea Breaker**, a 5th generation long range, autonomous, precision-guided missile system to address an operational gap in maritime and artillery strike systems through a single platform. Sea Breaker can be fired both from sea and surface with stand-off ranges of up to 300 km.

France Tests 'HELMA-P' Laser-Powered Anti-Drone System

French Armed Forces used **'HELMA-P (High-energy Laser for Multiple Application – Power)'**, a Laser-Powered Anti-Drone System to destroy a drone during a test of technology conducted near the Atlantic coast in Southwestern part of France.

- ✓ **HELMA-P** which is manufactured by a French startup 'CILAS' is capable of detecting lightweight commercial drones from a distance of up to 3 Km (1.8 miles).

China Started Construction of World's 1st Commercial SMR: Linglong One

China National Nuclear Corporation (CNNC) has announced the official beginning of the construction of the world's 1st commercial Small Modular Reactor (SMR) named **'Linglong One'** at the Changjiang

Nuclear Power Plant in China's Hainan Province.Originally CNNC aimed to start building the project in 2017 but it was delayed due to regulatory issues.

China Unveils New Maglev Train – World's Fastest Ground Vehicle

China has unveiled a new Maglev transportation system, which is capable of achieving a maximum speed of 600 kph or 372 mph, in Qingdao, the coastal city in Shandong province of China. The **Maglev train developed by China** and manufactured in Qingdao is reported to be the world's fastest ground vehicle available.

- ✓ This is China's latest scientific and technological achievement in the field of rail transit.

NASA's new Spacecraft NEA Scout to launch in November 2021 as a part of Artemis I

National Aeronautics and Space Administration's (NASA) new spacecraft, named Near-Earth Asteroid Scout (NEA Scout), is one of several payloads of the Artemis I program, which is expected to be launched in November 2021.

It has completed all required tests and has been safely tucked inside the Space Launch System (SLS) rocket.

Russia Launches 'Nauka' Lab Module to ISS

Russia's Space Agency Roscosmos successfully launched **'Nauka' (also called Multipurpose Laboratory Module)** to the International Space Station (ISS) onboard Proton-M booster rocket. The rocket was launched from Russia's space facility in Baikonur, Kazakhstan.

Nauka's is Russia's largest space laboratory, it will provide more room for scientific experiments and space for the crew in ISS.

NASA selects SpaceX for Europa Clipper Mission

US Space Agency NASA has selected **Space Exploration Technologies Corporation (SpaceX)** for the Europa Clipper Mission. It will be Earth's 1st mission to conduct detailed investigations of Jupiter's moon Europa.The Europa Clipper mission will be launched in October 2024 aboard Falcon Heavy Rocket from NASA's Kennedy Space Center in Florida, USA.

- ✓ Total Contract award amount for launch services comes to around USD 178 million.

China plans to build the world's 1st 'Clean' commercial Nuclear Reactor

Chinese scientists have unveiled plans for **a first of its kind commercial nuclear reactor** which runs on liquid Thorium rather than uranium. This prototype reactor being developed by a team of scientists at the Shanghai Institute of Applied physics will be completed by August and the first tests will begin from September. A full-scale commercial reactor is expected to be ready by 2030.

Russia's Nauka Module launched to ISS

Recently **Russia's Space Agency 'Roscosmos'** launched its Largest Space Laboratory '**Nauka (meaning Science**)' to the International Space Station (ISS) from Baikonur, Kazakhstan.

- ✓ 'Nauka' will replace the Russian Module 'Pirs' on the ISS. Pirs arrived at the Space Station in 2001.
- ✓ It will serve as a research facility and is equipped with an oxygen generator, a spare bed, another toilet, and a robotic cargo crane built by the **European Space Agency (ESA).**
- ✓ Nauka was sent into orbit using a Proton rocket.

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SATELLITES LAUNCHES

SATELLITE NAME	COUNTRY	PURPOSE
Eutelsat Quantum	European Space Agency (ESA)	European Space Agency (ESA) launched **'Eutelsat Quantum'** – the world's 1st commercial reprogrammable satellite into space aboard Ariane 5 rocket from French Guiana. It is a fully flexible software-defined satellite. The satellite has been developed under a European Space Agency partnership project with satellite operator Eutelsat, Airbus & Surrey Satellite Technology.
'NASA-ISRO Synthetic Aperture Radar' (NISAR)	ISRO & NASA	Earth Sciences Minister Jitendra Singh stated about the proposed launch of 'NASA-ISRO Synthetic Aperture Radar' (NISAR) in early 2023.NISAR is a joint Earth-observation satellite mission between ISRO (Indian Space Research Organisation) and US space agency NASA (National Aeronautics and Space Administration) for global observations over all land masses including the Polar cryosphere and the Indian Ocean region.
Earth Observation Satellite (EOS-03) satellite (also known as GISAT-1)	ISRO	Indian Space Research Organisation's (**ISRO**) Largest Launch Vehicle Geosynchronous Satellite Launch Vehicle (GSLV) F-10 rocket failed to put Earth Observation Satellite (**EOS-03) satellite (also known as GISAT-1)** into the Geo-synchronous orbit. It was launched from Satish Dhawan Space Center (SDSC), Sriharikota in Andhra Pradesh. ✓ The mission failed due to a technical anomaly in the cryogenic upper stage ignition. The mission is the 1st flight of GSLV with Ogive Payload fairing which can accommodate larger payloads.
34 Satellites	OneWeb, United Kingdom	OneWeb, Satellite Communications Operator Co-owned by Bharti Airtel & United Kingdom (UK) Government has launched another batch of 34 Satellites into Low Earth Orbit (LEO) on August 22, 2021.The launch was carried out by Arianespace, European Satellite launch Company with the Soyuz, Russian Rocket from the Baikonur Cosmodrome, Kazakhstan. One Web will start full satellite broadband service in India by May 2022.

OTHER SCIENCE & TECHNOLOGY NEWS

NATIONAL

Ordnance factory Tiruchirappalli launched high-tech carbine 'TriCa'

Ordnance factory Tiruchirappalli (**OFT**) in Tamil Nadu launched a new high-tech and low sound weapon called TriCa (Trichy Carbine), a mini version of the Trichy Assault Rifle (TAR). It was unveiled by General Manager of OFT Sanjay Dwivedi, IOFS (Indian Ordnance Factories Service) during a function.

✓ It was developed by the in-house research and development unit of the Ordnance Factory.

SATNAV Policy 2021 drafted for Effective Development of India's satellite Navigation Sector

As a part of Department of Space's (DoS) space reforms, the draft Indian Satellite Navigation Policy – 2021 (SATNAV Policy 2021) was uploaded on DoS website seeking public consultation till August 29, 2021. The key objective of this policy is to achieve self-reliance in satellite-based navigation and augmentation services while assuring availability & quality, enhancing usage, and promoting research & development.

- ✓ Under this, DoS will also push global usage of Indian Navigation systems viz. NavIC (Navigation with Indian Constellation) on the lines of Atmanirbhar Bharat initiative.

Chandrayaan-2 Orbiter Detects Presence of Water Molecules on Moon

The Imaging Infrared Spectrometer (IIRS) instrument on the Chandrayaan-2 lunar orbiter has detected the presence of both Hydroxyl ions (OH) and Water Molecules (H2O) on the surface of the moon.The findings will be crucial for future planetary exploration for resource utilisation and have been published in the journal 'Current Science'.

- ✓ It is authored by Former ISRO Chairman AS Kiran Kumar.

Dr.Jitendra Singh launched India's 1st & World's largest Cattle Genomic Chip 'IndiGau'

Dr Jitendra Singh, Minister of State (MoS-Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences released 'IndiGau', India's first and world's largest Cattle Genomic Chip for the conservation of pure varieties of indigenous cattle breeds like, Gir, Kankrej, Sahiwal, Ongole etc.

The chip was developed by the scientists of **National Institute of Animal Biotechnology (NAIB), Hyderabad (Telangana).** It is an autonomous institution under the aegis of the Department of Biotechnology (DBT), Ministry of Science & Technology (MoST).

HAL's 1st ever Civil Aircraft, Hindustan-228 carries Ground Run and LSTT

Hindustan Aeronautics Limited's (HAL) 1st Civilian Aircraft Hindustan-228(VT-KNR) has carried out Ground Run and Low Speed Taxi Trials (LSTT) successfully at its facility in Kanpur, Uttar Pradesh. This is the 1st fixed wing Made in India civil Aircraft. The Ground run and LSTT was carried for DIrectorate General of Civil Aviation (DGCA) certification which will help HAL to get an international certification for the aircraft.

DST launches 3 Online Applications for geospatial data collection

Prof. Ashutosh Sharma, Secretary, Department of Science & Technology (DST), Government of India has launched 3 Online Applications such as Survey of India (SOI) GeoSpatial Data Dissemination Portal, SOI's Sarathi Web Geographical Information System (GIS) Application and Manchitran, the enterprise Geoportal of National Atlas & Thematic Mapping Organisation (NATMO) made for the 1st time geospatial data collected by the government freely and easily available to citizens and Organisations in India.

Virendra Kumar Social Justice Minister Launched TAPAS, To Offer Social Defence Courses

Dr. Virendra Kumar, Union Minister for Social Justice and Empowerment, launched an online portal **TAPAS (Training for Augmenting Productivity and Services)** to offer access to lectures, study materials and others, supplementing the physical classroom without compromising teaching quality.It was developed by the National Institute of Social Defence(NISD), Ministry of Social Justice and Empowerment.

IIT Madras Developed India's 1st Indigenous Motorised Wheelchair Vehicle

IIT (Indian Institute of Technology) Madras has developed India's 1st indigenous motorised wheelchair vehicle, NeoBolt, which could be used even on uneven terrains (land). NeoBolt was developed by a team led by Sujatha Srinivasan, Department of Mechanical Engineering, IIT Madras.

- ✓ A start-up called 'NeoMotion' has commercialised the NeoBolt.

GoI & BRICS partnered to setup SARS-CoV-2 NGS-BRICS consortium to study COVID-19 on TB patients

Department of Biotechnology, Ministry of Science and Technology, Government of India (GoI) and BRICS (Brazil, Russia, India, China, and South Africa) have collaborated to implement SARS-CoV-2 NGS-BRICS consortium and multi centric programme to study the impact of severe COVID-19 conditions on Tuberculosis (TB) patients.It will also Setup Network of Genomic Surveillance.

- ✓ SARS-CoV-2 NGS stands for severe acute respiratory syndrome-Coronavirus 2-Next-generation sequencing (NGS).

MeitY launches Quantum Computer Simulator Toolkit from New Delhi

Minister of State (MoS) Rajeev Chandrasekhar, Ministry of Electronics & Information Technology (MeitY) launched **'QSim – Quantum Computer Simulator Toolkit'** during a hybrid event from New Delhi to aid and enable cost effective research in Quantum Computing. It will be utilized by students and researchers. This project is among the first initiatives to address the challenge of advancing the Quantum Computing research frontiers in India.

INTERNATIONAL

US approves sale of Harpoon Joint Common Test Sets to India

United States has approved the sale of one Harpoon Joint Common Test Set (JCTS) and related equipment for an estimated cost of USD 82 million (~ INR 609 Crores) to India.The deal also includes Harpoon Intermediate Level maintenance station; spare and repair parts, support and test equipment.

- ✓ Harpoon is an anti-ship missile system developed and manufactured by Boeing Defence, Space & Security.

GA Questions Asked in Exams

- GA Questions asked in RRB PO Mains Exam 2021 – Jan 30
- GA Questions asked in SBI PO Mains 2021 – Jan 29
- SBI Clerk Mains 2020
- IBPS RRB Officer Scale II GBO Exam 2020
- RBI Assistant Mains 2020
- GA Questions Asked in IBPS Clerk Mains Exam 2020 – 90% Questions Covered by AC
- GA Questions asked in SBI PO 2019 Main Exam
- GA Questions asked in SBI Clerk Main Exam 2019
- GA Questions asked in IBPS PO Main Exam 2019
- GA Questions asked in RBI Grade B Prelims Exam 2019
- GA Questions asked in IBPS RRB Clerk Mains Exam 2019
- GA Questions asked in IBPS RRB PO Mains Exam 2019

All The Best for Your Exams!!!

Suggestions & Feedback are welcomed

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