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CONTENT

S.No.	TITLE	Page No.
DRDO News		1-10
COVID-19: DRDO's Contribution		1-3
1.	Chandigarh defence lab drone policing Covid-19 containment zones	1
2.	RCI develops AI-based attendance system	2
3.	Punjab's PPE makers look for export opportunities	2
DRDO Technology News		4-10
4.	Big day for IAF, HAL as new Tejas Squadron takes off today	4
5.	Take on India's fifth generation fighter aircraft: AMCA	7
6.	IAF's deadly 'Flying Bullets' to get operational! To be the new home for indigenous LCA	8
7.	IAF Chief RKS Bhadauria to operationalise second Tejas squadron in Sulur	9
8.	बिना खाये-पिये रहने वाले चुंदड़ी वाले माताजी नहीं रहे, वैज्ञानिकों के लिए थे रिसर्च का विषय	9
Defence News		11-17
Defence Strategic National/International		11-17
9.	PM Modi Chairs meeting with NSA, CDS and 3 Service Chiefs as China seeks to halt infra work along LAC	11
10.	HTT-40 inches closer to FOC, IAF set to place orders soon	12
11.	India, Australia to sign defence logistics pact during first virtual bilateral summit	13
12.	Russia starts work on stealth nuclear bomber PAK DA as Sukhoi Su-57 fighter enters service	14
13.	Is the Chinese JH-7 an answer to the Pakistan Air Force's deep strike needs?	15
Science & Technology News		17-26
14.	ISRO calendar to be delayed due to COVID-19: Chairman K. Sivan	17
15.	Pune-based start-up plans pan-India satellite broadband coverage	18
16.	Mohali institute develops new laser tech for making nano-structures	19
17.	Scientists claim new method can measure consciousness	20
COVID-19 Research News		21-26
18.	NRDC to promote technologies designed to fight COVID-19	21
19.	Merck advances Covid-19 vaccine candidates in research drive	22
20.	New Research: In gene linked to dementia, a correlation with severe Covid	24
21.	Coronavirus 'injures' placenta in infected pregnant women, study finds	25

THE TIMES OF INDIA

Wed, 27 May 2020

Chandigarh defence lab drone policing Covid-19 containment zones

By Shimoba Kanwar

Chandigarh: A drone developed at Terminal Ballistics Research Laboratory (TBRL) of Defence Research and Development Organisation (DRDO) will help the city police its Covid-19 containment zones of Bapu Dham and Sector 30B.

The unmanned aerial vehicle is designed for public address from 40-metre height to tell people to respect curfew. Sitting 3 kilometres far with a tablet computer, a team of cops can see live feed from the sky camera and operate the drone's loudspeaker.

The TBRL scientists make military drones usually but this is their first job for the men in khaki. The laboratory will loan two machines to Chandigarh Police. The scientists have trained a team of cops for the same. TBRL director Manjit Singh said: "This drone can enter tight lanes, manoeuvre, and relay live images to the operator's portable screen. The images help police spot quarantine breakers and switch on the aerial loudspeaker to give them orders to stay inside. The message is prerecorded."

Aerial patrolling helps police stay away from mob attack and infection. TBRL associate director Akhilesh Sharma said: "When this pandemic began, the city police approached us for a surveillance device, so we designed this drone. Its battery works for 45 minutes and flies it back home for recharge. Smart features allow it to abort mission in case of bird hit or storm."

The drone cop is a good innovation, since entering tight lanes can make cops sitting ducks for mob attack or Covid-19 infection. The camera fitted on the drone is high-definition.

The machine can fly as high as 800 metres but is kept at 30 to 40 metres in order to be audible and still stay clear of electricity poles and trees. The video feed is real-time. The software has built-in artificial intelligence.

<https://timesofindia.indiatimes.com/city/chandigarh/chandigarh-defence-lab-drone-policing-covid-19-containment-zones/articleshow/76006724.cms?from=mdr>



The TBRL drone, made in Chandigarh for police



Shot by the TBRL drone, aerial view of the Bapu Dham containment zone in Chandigarh

RCI develops AI-based attendance system

It is currently installed in ESIC Hospital in city

Hyderabad: The COVID-19 outbreak has made it unsafe to deploy contact-based biometric verification for attendance marking systems. To circumvent this problem, Research Centre Imarat (RCI), DRDO, has successfully developed AI-based Attendance Application (AINA) which allows non-contact based personnel verification using facial features of the person, captured with the help of a low-cost camera.

AINA can be deployed with minimal upgrade to the legacy attendance infrastructure with RFID readers. It can be installed on a desktop computer with a GPU-based display adapter, said an official spokesman.

Existing CCTV cameras can be utilised for capturing facial images. Facial features of several thousands of employees can be stored in the computer since for each employee the facial features are encoded in a small (less than 25 KB) file.

The system is fully scalable since the time for identification and verification for each person remains constant even as the number of registered personnel increases. It is fully secure as it works as a standalone system and does not require any connection to the internet. Since only the facial features are saved in an encoded form, the actual face images need not be saved, thereby ensuring privacy and security.

Confined database

Besides, the server storing the facial feature database is confined to the organisation premises. AINA has a light-weight installation process and comes with a very intuitive and user-friendly GUI with audio prompts which can be optionally disabled. It has been currently installed in ESIC Hospital, Hyderabad.

<https://www.thehindu.com/news/cities/Hyderabad/rci-develops-ai-based-attendance-system/article31681616.ece>

THE TIMES OF INDIA

Wed, 27 May 2020

Punjab's PPE makers look for export opportunities

By Vinod Kumar

Chandigarh: With bulk of units in Punjab manufacturing personal protection equipment (PPE) suits not getting orders, textile industry is looking towards the Union government for allowing export of protective gears to other countries to help them cash in on the business opportunity. Using their capacity for alternate use during curfew period, a large number of textile units installed machinery required for manufacturing PPE kits - full body cover suit with helmets, gloves and face shields - as per prescribed standards.

With assistance from the state department of industries and commerce, samples of about 61 units got approval from the national testing laboratories such as the South India Textile Research Association (SITRA) and the Defence Research and Development Organisation (DRDO).

The current production capacity of these approved units, of which majority are in Ludhiana, is about 2 lakh PPE suits per day



and 1 lakh meter of fabric per day. The industries department had initially facilitated about 13 units fetch order worth around Rs 216 crore through HLL Lifecare Limited, Thiruvananthapuram-based healthcare product manufacturing company, and also helped them get orders from other state government such as Andhra Pradesh, Arunachal Pradesh, Sikkim and Odisha.

The micro, small and medium enterprises (MSMEs) units in Punjab have suffered an estimated loss of Rs 4,169 crore since outbreak of Covid-19, which caused disruption of activities and fall in demand. Allowing export of PPE kits is one of the recommendations among the measures suggested by the state government to central government for revival of industry in Punjab.

Confederation of Indian Industry Punjab chairman Rahul Ahuja said there was lot of potential in export of safety gear to other countries. "It's a good business opportunity for units in the state during this lean period," said Ahuja. He, however, said ensuring quality of products would be a challenge for the units.

"There have been reports of few units compromising with the quality, which is totally unacceptable. There can be no compromise with quality as it is question of safety of frontline workers," stated Ahuja. He also requested the Union government to allow the units to export PPE kits.

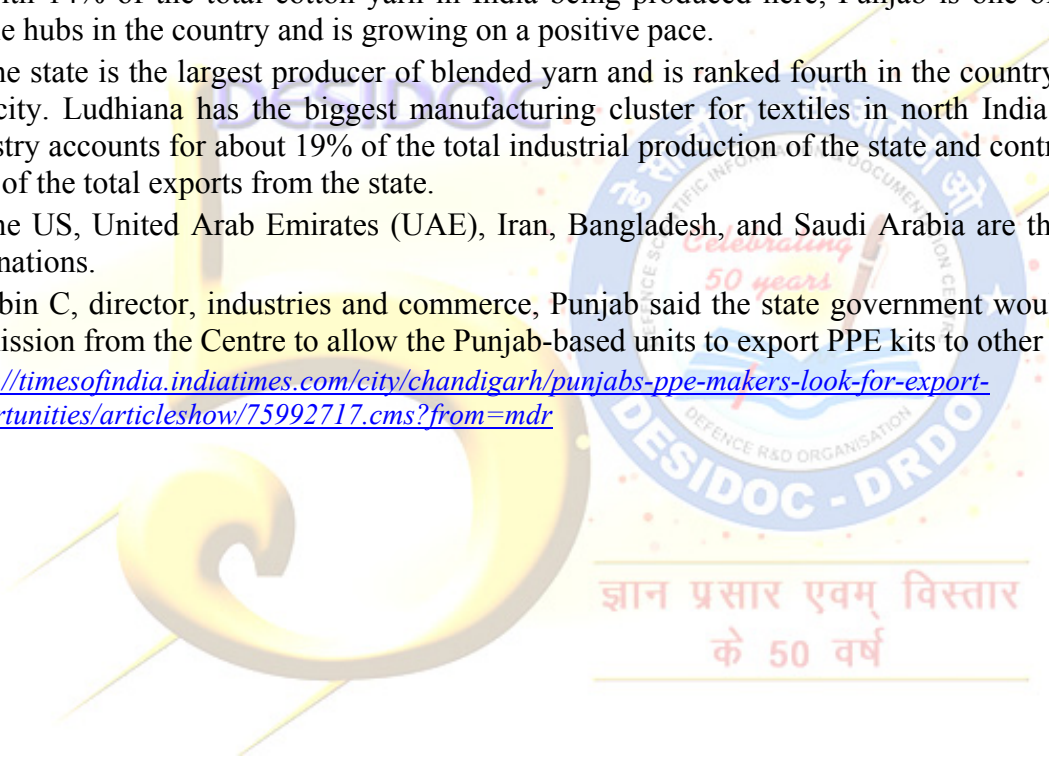
With 14% of the total cotton yarn in India being produced here, Punjab is one of the biggest textile hubs in the country and is growing on a positive pace.

The state is the largest producer of blended yarn and is ranked fourth in the country in spinning capacity. Ludhiana has the biggest manufacturing cluster for textiles in north India. The textile industry accounts for about 19% of the total industrial production of the state and contributes about 40% of the total exports from the state.

The US, United Arab Emirates (UAE), Iran, Bangladesh, and Saudi Arabia are the top export destinations.

Sibin C, director, industries and commerce, Punjab said the state government would soon seek permission from the Centre to allow the Punjab-based units to export PPE kits to other countries.

<https://timesofindia.indiatimes.com/city/chandigarh/punjabs-ppe-makers-look-for-export-opportunities/articleshow/75992717.cms?from=mdr>



ज्ञान प्रसार एवम् विस्तार
के 50 वर्ष

Big day for IAF, HAL as new Tejas Squadron takes off today

By Anantha Krishnan M

Bengaluru: Four years after the first squadron of Tejas was formed, the Indian Air Force (IAF) will operationalise the second one with the desi bird today.

To be based out of Air Force Station (AFS) Sullur, the No 18 Squadron Flying Bullets will see the first few Tejas fighters formally joining them in the presence of Chief of the Air Staff Air Chief Marshal Rakesh Kumar Singh Bhadauria on Wednesday.

Resurrected in April this year at AFS Sullur, the No 18 Squadron that flew the MiG27, was number plated in 2016. (In IAF parlance, a squadron getting number-plated means it is frozen without any assets. It can be resurrected later with new assets or equipment)

This will be the first major event for the IAF since the outbreak of COVID-19 pandemic.

As a testimony to IAF's support and confidence in the indigenous fighter and also to boost the morale of the young squadron, the CAS might fly the Tejas during the occasion.

He has been a long-standing supporter of the programme and knows the nuances of Tejas right from its early years. Ever since taking over as the CAS, he has been vocal about IAF's support for all indigenous programmes.

What IAF wants

In an interaction with Onmanorama, Air Chief Marshal Bhadauria said that time has come for Indian industries to rally around the indigenous programmes wholeheartedly.

He also said that the event at AFS Sullur is a pointer that IAF is getting back to business, despite several uncertainties prevailing owing to the pandemic.

"We are committed to the Tejas programme and all its variants. As I have reiterated to you earlier, the induction of the second squadron is sure to boost the operational utilisation of Tejas. To achieve our goals and to see the complete operational utility of Tejas, we will need these fighters in large numbers. And, this can be achieved only if the public and private industries take the lead," Air Chief Marshal Bhadauria said.

He said IAF has huge confidence in indigenous programmes and the industries will have to stick to the timelines ensuring that the fleet stays in a healthy condition.

"I am a firm believer in seeing what is being delivered rather than only talking about what can be done.



The brand new Tejas SP-22 fighter manufactured by HAL.
Photo: Onmanorama



The story of Tejas is undoubtedly an inspiring one in our efforts to scale self-reliance in defence. Now it is the turn for the public and private industries to celebrate this story and spread its essence to more areas.

It also essentially means to deliver the planes at a faster rate so that we are not kept waiting,” the IAF Chief added.

Modern Base

Ever since the first squadron of Tejas (Flying Daggers) moved in 2018, AFS Sullur has become one of the top bases of IAF.

“AFS Sullur is today one of the most technically well-equipped air bases in the country. It is a MAFI compliant (Modernisation of Airfield Infrastructure) airbase equipped with Category-II ILS (Instrument Landing System) and is home for many squadrons,” says a senior official of IAF.

Flying Bullets (No 18) will be the fifth squadron to make its home at AFS Sullur.

The Sarangs (151 HU), Mi-17 V5 Knights (109 HU), AN-32 (33 Sqn) Soaring Storks and Tejas (45 Sqn) Flying Daggers are other residents of this historic base.

The base also houses a Radio and Maintenance Unit, a Transportable Radar Unit and a Garud commando unit.

“No other airbases in India operate this mix of squadrons. The requirements of flying and the management of aircrew is so much vast at this base. The fighters operate in a very tightly-controlled environment, the transporters are very self-sufficient and the helicopters are very versatile. To maintain all the three at one base is an operational challenge,” says an official.

During a visit to the AFS Sullur in 2018 Onmanorama had witnessed the massive infrastructure build-up at the base with the first Tejas squadron moving in.

“Since 2018 there have been lots of additions to the base, be it the hangar space, accommodation facilities among others. The in-house second-line servicing facility too is in place so that IAF need not depend on the OEM (Original Equipment Manufacturer). We could undertake the servicing of our aircraft at the base itself be it after 250 hours or annually,” says the official.

Impact Plans

The thought process in IAF too seems to be taking a tectonic shift now regarding its over-dependence on Hindustan Aeronautics Ltd (HAL) for aircraft spares, overhaul and service.

“Given the record we have had with the HAL, it was important for us to put in a smart and impact plan to take care of our assets rather than waiting for someone to do our job. For an air warrior, the availability of assets as and when needed for a safe and successful mission matters,” he adds.

Meanwhile, efforts are also in place to streamline the flow of spares from HAL so that the operational need of the fighter fleet is not affected.

“As more fighters join, spare support becomes a crucial aspect. There will be a quantum jump in the flight activities and our efforts are to attain self-sufficiency in spare parts as well,” the official added.

Today, AFS Sullur has a full-edged Technical Training School for officers, airmen as well for the newly posted aircrew. IAF says a techno-logistics lab and servicing at the base will be a huge advantage for its operations.

“Soon a Tejas Full Mission Simulator will be in place at the base which will further aid the new aircrew. Tejas is a brilliant machine and we have seen all the pilots embracing its new flying qualities. To keep the morale high, we need to have continuous training activities and a great amount of planning goes into this,” says another official.

He cited the recent examples of Tejas fighters undertaking several detachments without much external support.

“Operational utilisation is the key. During Gagan Shakti, we had eight Tejas fighters available all the time. With two squadrons in place, we will have to ensure that the planes are available for the pilots. It’s a challenge, but we have a plan in place,” he added.

Experienced Team

The Flying Bullets will be commanded by Group Captain Manish Tolani, who was commissioned into the fighter stream of IAF in 2001.

He was earlier the Flight Commander of Flying Daggers and is a Cat-A Qualified Instructor and an Instrument Rating Instructor\Examiner with vast experience on MiG 29, MiG 21, Hawk MK 132A and now Tejas.

He will be assisted by Group Captain Dinesh Dhankhar as the Flight Commander of Flying Bullets. Interestingly, IAF also positioned Gp Capt Madhav Rangachari as the COO for AFS Sulur. Gp Capt Rangachari is the first CO of Flying Daggers and has close to six years of experience with the Tejas platform.

Sources say that he was the ‘best man available for the best job,’ to guide the young breed of pilots.

Road Ahead

For HAL, Tejas has become virtually become the face-saver for its fortunes with the additional orders of 83 Tejas MK1A orders anticipated soon.

Despite several challenges, the Tejas LCA Division in Bengaluru seems to have finally put in place several measures for the smooth production of the fighters and trainers.

As reported by Onmanorama recently, the at structure and efficient leadership grooming mechanism put in place by PG Yogindra, ED, LCA Division seem to be giving rich dividends for HAL now.

This is a fact acknowledged by IAF, despite its displeasure over delays in the delivery of Tejas fighters.

“There is energy at HAL’s LCA Division. Whenever our boys got to Bengaluru to ferry aircraft they give us positive feedback about the team spirit there. Good practices churn out good leaders and hope it continues,” says a top IAF official.

Yogindra is retiring this month end after serving HAL for over three decades.

The first Tejas aircraft from the Final Operational Clearance (FOC) series has been already ferried out from Bengaluru ahead of today’s event.

The FOC blocks of fighters are equipped with air-to-air (AAR) refueling capability, close combat gun, additional drop tanks and beyond visual range (BVR) missile capability. It also has the latest avionics and flight control software suite.

The FOC fighters also have a reduced pilot load and superior maintainability. It also boasts of reduced turn-around time and maintenance man-hours.

HAL now hopes to deliver the entire block of 16 FOC fighters to IAF by September 2022.

“We are currently extending post-delivery and warranty support for the Initial Operational Clearance (IOC) fleet. The Tejas MK1A delivery will commence in FY 2023-24 at a rate of 16 aircraft per year,” says an official.

HAL has already delivered 16 Tejas IOC variants till date to IAF. In the next two years, HAL will have to roll out 16 FOC Tejas fighters and eight trainers for the IAF.

The next two fighters Tejas SP-22 and Tejas SP-23 are expected to join Flying Bullets in the next one month.

<https://english.manoramaonline.com/news/kerala/2020/05/27/tejas-squadron-indian-air-force-sulur.html>



Wed, 27 May 2020

Take on India's fifth generation fighter aircraft: AMCA

When the Narendra Modi led Bharatiya Janata Party (BJP) came to power in 2014, there has been a shift in India's Defence policy. Talks were going on inside the military to become self-reliant in the defence sector and how the new Modi government will address the issue. The first tenure of the BJP government witnessed a deal inked between India and Russia for the procurement of S-400 Triumf advanced surface- to -air missile system which is capable of destroying enemy aircraft and ballistic missiles.

The ability to develop indigenous Fifth Generation Fighter Aircraft (FGFA) has been a goal of Indian Air force (IAF) for a long time. The task to build a homegrown Fifth Generation Fighter Aircraft (FGFA) is undertaken by the Aeronautical Development Agency (ADA), which comes under the Defence Research & Development Organisation (DRDO). India's FGFA is known as Advanced Medium Combat Aircraft (AMCA).



The design of AMCA has been finalised by ADA and the full-scale engineering development is at the desired pace. The design of India's FGFA will carry a feature called Diverterless Supersonic Inlet (DSI) which was not revealed earlier by ADA in previous defence exhibitions. The advantage of using Diverterless Supersonic Inlet (DSI) technology is that it provides more stealth to the aircraft from detection by the enemy which is an essential requirement for Fifth Generation Fighter Aircraft (FGFA).

As far as the flush air data sensing system is concerned, ADA's work on this has grown out of its contribution to ISRO's Re-Entry Launch Vehicle TD (RLV-TD) project. Flush air data sensor system uses surface pressure measurement from the nose cap of the vehicle for deriving air data parameters such as angle of attack, angle of side-slip, Mach number, etc. of the vehicle.

These parameters are used by the flight control and guidance systems, and also assist in the overall mission management. However, while the RLV-TD flies a predictable and pre-determined path, the flight envelope for the AMCA will be far more complex and a significant amount of work is being put in to achieve flush air data sensing system (FADS) hardware to cater to the same.

Specifications

According to ADA, AMCA will be a single-seat true multi-role twin-engine fifth-generation stealth aircraft which will weigh around 25 tonnes. It will incorporate some advanced technologies such as Advanced Sensors with Data Fusion, 360-degree enhanced situational awareness, Integrated Vehicle Stealth Management, Internal Bay Weapon, Active Electronically Scanned Arrays (AESA) radar and super-manoeuvrability.

Why Stealth Aircraft

The designed shape of AMCA is different from normal aircraft to achieve a high degree of stealth. When normal aircraft enters in enemy boundary, the early warning radar system sends radar beam signals to locate the aircraft and when the beam reflects the skin of the aircraft, the radar receiver will send the information to the on-board computer system and the surface-to-air-missile system will be used to shoot the aircraft.

<https://www.defenceaviationpost.com/2020/05/take-on-indias-fifth-generation-fighter-aircraft-amca/>

IAF's deadly 'Flying Bullets' to get operational! To be the new home for indigenous LCA

As was reported by the Financial Express Online, in March, the 'Flying Bullets' will home to the indigenous Light Combat Aircraft 'Tejas' and it will be the second the squadron which will fly the LCA

By Huma Siddiqui

The No. 18 Squadron 'Flying Bullets' of the Indian Air Force (IAF) is all set to be operationalised by Chief of Air Staff Air Chief Marshal RKS. Bhadauria on Wednesday at Sullur near Coimbatore. As was reported by the Financial Express Online, in March, the 'Flying Bullets' will home to the indigenous Light Combat Aircraft 'Tejas' and it will be the second the squadron which will fly the LCA.

More about No 18 Squadron

The squadron was formed on April 15, 1965.

The motto was 'Teevra aur Nirbhaya' – which means 'Swift and Fearless'.

Before getting number plated on April 15, 2016, it was flying MiG-27 aircraft.

It was resurrected on April 1 at Sullur.

The squadron has actively participated in the 1971 War with Pakistan.

It was decorated with the highest gallantry award 'Param Vir Chakra'.

And this was awarded to Flying Officer Nirmal Jit Singh Sekhon posthumously.

This Squadron has earned the sobriquet of 'Defenders of Kashmir Valley' by being the first to land and operate from Srinagar.

It has been presented with President's Standard in November 2015.

The new home of Tejas

This is an indigenous four and a half-generation tailless compound delta-wing aircraft.

Its structure is made out of composite material and it has been equipped with, integrated digital avionics, multimode radar, and fly-by-wire flight control system.

Also these can be equipped with different types of weapons, bombs, and missiles.

Also, this made in India aircraft is considered to be the smallest and the lightest in its group of supersonic combat aircraft.

These aircraft can be upgraded later.

This aircraft has been designed by Aircraft Development Agency (ADA), along with the Defence Research and Development Organisation (DRDO) and is being manufactured by HAL.

Once inducted, will be the backbone of the IAF.

While the order has already been placed for 40 aircraft in Initial Operational Configuration (IOC), 83 more LCA will be ordered to meet the shortage of the number of fighter squadrons.

Now, the HAL is focussing on the LCA Mark-2 and the AMCA.

<https://www.financialexpress.com/defence/iafs-deadly-flying-bullets-to-get-operational-to-be-the-new-home-for-indigenous-lca/1971189/>



This is an indigenous four and a half-generation tailless compound delta-wing aircraft. (Photo source: HAL)

IAF Chief RKS Bhadauria to operationalise second Tejas squadron in Sullur

No. 18 Squadron 'Flying Bullets' will be the second IAF squadron to fly LCA Tejas

New Delhi: Indian Air Force (IAF) Chief Air Chief Marshal RKS Bhadauria will operationalise No. 18 Squadron 'Flying Bullets' at the Sullur airbase on Wednesday. The Squadron will be equipped with indigenously developed LCA Tejas FOC Aircraft.

No. 18 Squadron 'Flying Bullets' will be the second IAF squadron to fly LCA Tejas. The squadron was formed on April 15, 1965 and used to operate MIG-27 fighter jets.

"The squadron will be equipped with light combat aircraft Tejas aircraft and it will be the second IAF squadron to fly Tejas," an IAF spokesperson said.

The squadron participated in the 1971 War with Pakistan and 'Param Vir Chakra' was awarded to Flying Officer Nirmal Jit Singh Sekhon posthumously. The squadron was the first to land and operate from Srinagar.

The IAF has inducted 16 weaponised Tejas fighter jets into its combat fleet since June 2018.

The fourth-generation fighter aircraft is designed and developed by the Aeronautics Development Agency (ADA) of Defence Research and Development Organisation (DRDO). The LCAs are being manufactured by the defence behemoth Hindustan Aeronautics Ltd (HAL).

<https://www.timesnownews.com/india/article/tejas-squadron-in-sullur-in-tamil-nadu-iaf-chief-air-chief-marshal-rks-bhadauria-no-18-squadron-flying-bullets/597472>



IAF set to raise second LCA squadron in Sullur on May 27, 2020 | Photo Credit: ANI

NEWS 18

Wed, 27 May 2020

बिना खाये-पिये रहने वाले चुंदड़ी वाले माताजी नहीं रहे, वैज्ञानिकों के लिए थे रिसर्च का विषय

डीआरडीओ (DRDO) से लेकर अंतरराष्ट्रीय रिसर्च एजेंसियों (International Research Agencies) ने उन पर सालों तक रिसर्च किया कि वह कैसे जिंदा रहते हैं। लेकिन किसी नतीजे तक नहीं पहुंच सके।

जनक दवे

देश और दुनिया में चुंदड़ी वाले माताजी (Chundadi Wale Mataji) के नाम से प्रसिद्ध प्रहलाद जानी (Prahlaad Jani) का 91 साल की उम्र में निधन हो गया है। 91 साल के प्रहलाद जानी ने पिछले 80 साल से अन्न का एक दाना नहीं खाया था और न ही कोई तरल पदार्थ को पिया था।

डीआरडीओ (DRDO) से लेकर अंतरराष्ट्रीय रिसर्च एजेंसियों (International Research Agencies) ने उन पर सालों तक रिसर्च किया कि वह कैसे जिंदा रहते हैं। लेकिन किसी नतीजे तक नहीं पहुंच सके।

बिना खाये-पिये जिंदा रहने वाली पहेली माने जाते थे प्रहलाद जानी

प्रहलाद जानी की पहचान थी बिना खाये पिये जिंदा रहने वाली पहेली। प्रहलाद जानी 11 साल के थे तभी से उन्होंने खाना पीना छोड़ दिया था। पिछले 80 साल से उनके पेट में अन्न का एक दाना तक नहीं गया, नहीं पानी दूध या कोई तरल प्रवाह ही पिया। बावजूद वह जिंदा कैसे रहते थे यह एक बड़ी पहेली थी।

बचपन में ही हिमालय (Himalaya) की गोद में चले गए थे वहां कई साल योग अभ्यास में बिताए। कई साधु महात्माओं के संपर्क में आये। योग की एक ऐसी सीमा तक पहुंच गए थे प्रहलाद जानी की उन्हें जीने के लिए किसी खान-पान की जरूरत ही महसूस नहीं होती थी। उनके चर्चे जैसे-जैसे लोगों तक पहुंचे वैज्ञानिकों ने उन्हें चुनौती दी कि उनके सामने उनके तय मापदंडों में रहकर जी बताये।



डीआरडीओ ने किया था प्रहलाद जानी पर रिसर्च

देश की जानीमानी सैन्य रिसर्च संस्था डीआरडीओ (DRDO) ने एक पैनल बनाया, जिसे प्रहलाद जानी पर रिसर्च करना था। देश के जाने माने डॉक्टर्स, वैज्ञानिक इस में शामिल थे। बेहद कड़े प्रोटोकॉल बनाये गये। प्रहलाद जानी को ट्रांसपेरेंट कमरे में रखा गया।

24 घंटे सीसीटीवी से निगरानी रखी जाने लगी। कमरे में सोने के बिस्तर के अलावा कुछ भी नहीं था। प्रहलाद जानी को नहाने के लिए पानी दिया जाता था उसे भी नाप कर दिया जाता था। यहां तक कि नहाने के बाद कितना पानी बचा इसका भी आंकड़ा रखा जाता था। कुछ दिनों तक प्रहलाद जानी पर रिसर्च किया जाता रहा। आखिर डॉक्टर्स और वैज्ञानिकों ने माना कि विज्ञान के लिए यह शख्स एक पहेली है।

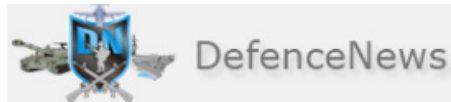
सैनिकों के फायदे के लिये रिसर्च कर रहा था DRDO

दरअसल डीआरडीओ इसलिए रिसर्च करना चाहता था चूंकि कठिन इलाकों में सैनिकों को बिना खाये पिये रखना और वहां सामग्री भेजने में सबसे ज्यादा वजन राशन पानी का होता है। उनका मानना था कि अगर इस शख्स के डीएनए निकालकर उनका इंप्लांट हो सके तो विज्ञान की दुनिया में एक बड़ी उपलब्धि होगी।

प्रहलाद जानी इतने विनम्र थे कि वह किसी भी तरह के रिसर्च के लिए तैयार हो जाते थे।

आध्यात्म में वह बहुत आगे बढ़ चुके थे। इसलिए उन्हें चुंदड़ी वाले माताजी के नाम से जाना जाता रहा है।

<https://hindi.news18.com/news/nation/chundadi-wale-mataji-prahlad-jani-living-without-drinking-died-hewas-a-subject-of-research-for-scientists-3134196.html>



Wed, 27 May 2020

PM Modi Chairs meeting with NSA, CDS and 3 Service Chiefs as China seeks to halt infra work along LAC

Prime Minister Narendra Modi on Tuesday headed a meeting with National Security Advisor (NSA) Ajit Doval, Chief of Defence Staff (CDS) General Bipin Rawat and the three Service Chiefs to discuss the ongoing border standoff with China in Ladakh. Modi separately met Foreign Secretary Harsh Vardhan Shringla to discuss the issue.

This took place shortly after Union Defence Minister Rajnath Singh held a long security review meeting with CDS General Rawat and the three Services Chiefs on the China issue.

The meetings are the latest in a series of such consultations held in the last two weeks as India weighs its options to respond to the latest provocation by China at the border.



Singh was briefed by Army Chief General MM Naravane about the situation at the Line of Actual Control (LAC), the de-facto border between the two countries, two days ago after his return from Leh to take stock of the matter. It is learnt that Singh asked questions on troop deployment and expressed his full support for the Army's response to Chinese aggression.

Six rounds of talks between Indian and Chinese troops since the first border skirmish on May 5 have failed to de-escalate tensions as the two sides have maintained aggressive posturing in the disputed border areas.

Sources say China has put forward the condition that India stop building infrastructure even on its own side of the LAC, a condition that will remain unacceptable to New Delhi. India, on the other hand, has asked Beijing to maintain status quo at the border, sources said. But the Chinese have refused to back off from India territory.

The People Liberation Army's main bone of contention has been the 255-km Darbuk-Shyok-DBO road that India last year built on its side of the border. It provides access to the Depsang area and Galwan Valley and ends near the Karakoram Pass. The infrastructure development has made it easier for patrols to operate and the frequency of patrolling can also be increased.

The series of meetings on Tuesday come a day before top Army commanders meet in Delhi for the three-day biannual army commanders' conference.

"The apex level leadership of Indian Army will brainstorm on current emerging security and administrative challenges and chart the future course for Indian Army," said a statement released by the Army.

While army sources have said the conference will focus on logistics and human resources, there is little doubt the situation unfolding at the border with China is going to dominate discussions.

The conference was originally scheduled to be held from April 13-18, but was postponed due to the coronavirus pandemic. It will now be held in two phase. The first phase will be from May 27-29 and the second one in the last week of June, said Army Spokesperson Colonel Aman Anand.

Tensions had erupted earlier this month when around 250 Indian and Chinese army personnel clashed with iron rods and sticks and even resorted to stone-pelting in the Pangong Tso lake area in Ladakh in which soldiers on both sides sustained injuries.

In a separate incident, nearly 150 Indian and Chinese military personnel were engaged in a face-off near Naku La Pass in the Sikkim sector on May 9. At least 10 soldiers from both sides sustained injuries.

After the violent clashes, both India and China have pumped in additional troops, built fortifications and pitched tents at a few stretches along the LAC in three areas in eastern Ladakh. The Indian Army has also increased its presence in Uttarakhand after reports of Chinese troop build-up on their side of the LAC. UAVs have been deployed for intelligence gathering and surveillance.

<https://www.defencenews.in/article/PM-Modi-Chairs-Meeting-with-NSA,-CDS-and-3-Service-Chiefs-as-China-Seeks-to-Halt-Infra-Work-along-LAC-840767>



Wed, 27 May 2020

HTT-40 inches closer to FOC, IAF set to place orders soon

By Raunak Kunde

The State-owned Hindustan Aeronautics Limited (HAL) after demonstration of critical six-turn spin test capability is now one step closer to the Final Operational Clearance (FOC) as testing of the aircraft post lockdown is in full swing and latest media reports confirm that Indian Air Force (IAF) and HAL are all set to ink a contract for 70 HTT-40 Basic Trainer Aircraft (BTA) soon.

IAF recently canceled the previous proposal to acquire follow on 36 Pilatus PC-7 MkII trainer aircraft from Pilatus Aircraft of Switzerland and instead might go with HAL HTT-40 BTA to boost Made in India aircraft orders down the line. Air Chief Marshal RKS Bhadauria recently has confirmed the air force's intention to acquire 70 HTT-40 BTA from HAL.



According to HAL, HTT-40 BTA has cleared all Air Staff Quantitative Requirements (ASQRs) as per IAF's requirements and successful spin tests allow IAF to put the aircraft into service and place orders for the same.

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<https://idrw.org/htt-40-inches-closer-to-foc-iaf-set-to-place-orders-soon/#more-228079>

India, Australia to sign defence logistics pact during first virtual bilateral summit

The summit between Prime Minister Narendra Modi and his Australian counterpart Scott Morrison, yet to be formally announced, will be held against the backdrop of heightened friction with China for both countries

By Rezaul H Laskar

New Delhi: In a diplomatic first, India and Australia are expected to sign an agreement for reciprocal access to military logistics facilities and other pacts aimed at developing alternative supply chains when the two sides hold their first virtual summit on June 4.

The summit between Prime Minister Narendra Modi and his Australian counterpart Scott Morrison, yet to be formally announced, will be held against the backdrop of heightened friction with China for both countries.



Prime Minister Narendra Modi with Australian PM Scott Morrison (PTI file photo)

It will be Modi's first virtual bilateral summit and the first time several bilateral agreements will be concluded virtually since the Covid-19 outbreak, two people familiar with the development said.

The Mutual Logistics Support Agreement (MLSA), finalised at the "2+2" or combined dialogue of the foreign and defence secretaries in New Delhi last December, was to be signed during Morrison's visit in January, which was called off due to the Australian bushfires.

With joint exercises and defence cooperation between India and Australia on the upswing, MLSA will remove the need for protracted negotiations for reciprocal access to logistics support every time a manoeuvre is organised, the people cited above said on condition of anonymity. It will also improve interoperability between the armed forces of the two sides.

Between 2016 and 2019, India has signed similar logistics exchange agreements with the US, Singapore, France and South Korea.

While the conclusion of MLSA is significant as the two sides have been negotiating it for some time, there is greater buzz about agreements to be signed in science and technology, research, pharmaceuticals and medical equipment, and rare earth metals and critical minerals which are aimed at creating supply chains in strategic areas that are less dependent on China, the people said.

Even before the Covid-19 crisis, the two sides had been exploring the possibility of cooperating on rare earth metals such as lithium, neodymium and dysprosium, of which Australia has the world's sixth largest reserves. More than 90% of India's imports of rare earth metals, worth \$3.4 million in 2016, come from China.

The two sides will also look at enhancing their partnership in education as part of measures to shift the focus of Australian universities on the Chinese market, the people said. Prior to the Covid-19 crisis, Australia was home to some 90,000 Indian students.

"We're also looking at agreements in the maritime sphere and water resources and negotiations are underway on some other issues. Research and collaboration on Covid-19 will also figure in the discussions," said one of the people cited above.

Morrison has described India as "a natural partner for Australia", and Australian high commissioner Barry O'Farrell has said the two sides have had regular discussions about how they can shape the post-Covid world order. In this context, O'Farrell said Australia supports India's call for reforming the World Health Organization (WHO) after overcoming the Covid-19 crisis.

On Tuesday, defence minister Rajnath Singh tweeted that he had spoken on telephone with his Australian counterpart Linda Reynolds and discussed the response of both sides to the Covid-19 pandemic and possible areas of cooperation.

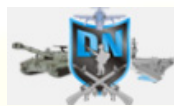
“India-Australia strategic partnership provides a good base for both the countries to work together in dealing with the post COVID challenges. We are committed to take forward the initiatives of bilateral defence and security cooperation under the Strategic Partnership framework,” Singh added.

While tensions between India and China are at a high following the standoff between their border troops in Ladakh, Australia’s relations with China too took a hit after Canberra called for an independent investigation into the origins of the Covid-19 pandemic.

Nitin Pai, director of the Takshashila Institution, said it made “absolute economic sense” for India and Australia to reduce the risk of their exposure to China even if the two countries weren’t grappling with tensions with China and the Covid-19 crisis.

“It makes a lot of sense to find a diversity of suppliers on one hand, and to find a diversity of customers for products on the other,” he said, adding the existing geo-political risks, the pandemic and travel restrictions make it vital not to put all eggs in one basket and to build a diversity of economic partnerships.

<https://www.hindustantimes.com/india-news/india-australia-to-sign-defence-logistics-pact-during-first-virtual-bilateral-summit/story-awvsFacFqmcM6HaqZvRNIP.html>



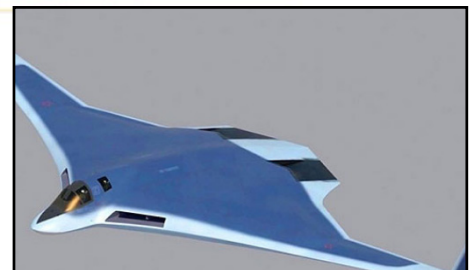
DefenceNews

Wed, 27 May 2020

Russia starts work on stealth nuclear bomber PAK DA as Sukhoi Su-57 fighter enters service

Russia is modernising its military at an extremely fast pace and has now started constructing its first strategic stealth bomber, capable of delivering nuclear weapons, under the Perspective Aviation Complex for Long-Range Aviation (PAK DA) programme. The strategic stealth bomber, the second 5th Generation combat aircraft from Russia after the Sukhoi Su-57 supersonic fighter, will eventually replace the current set of Tupolev Tu 22, Tu-95 and Tu-160 strategic bombers.

According to Russian news agency TASS, a senior military-industrial complex source confirmed about the construction of the bomber under the PAK DA programme designed as a flying wing. "The production of airframe elements will be handled by one of the United Aircraft Corporation (UAC)'s plants; development of working design documentation is complete, material shipping has commenced. The final assembly of the entire machine should be complete in 2021," TASS quoted the source as saying.



Russia's Deputy Defense Minister Alexey Krivoruchko had in December 2019 told the Krasnaya Zvezda newspaper that the PAK DA project had got the necessary clearance following which the Tupolev Design Bureau started the work on the future strategic bomber.

The PAK DA bomber will use the latest technologies and materials to reduce its radar signature, making it invisible to the enemy. However, the bomber will be subsonic but will be configured to carry all the air-launched cruise missiles (ALCM) currently in Russian arsenal as well as hypersonic missiles like Kh-47M Kinzhal and precision-guided bombs.

The first test flight of the PAK DA bomber is likely to take place in late 2021 or early 2022. The bomber is expected to join the Russian Aerospace Force only by 2028 or 2029 after rigorous testing and development.

While the PAK-FA programme was carried out by Sukhoi and finally culminated into Russia's first 5th Generation stealth fighter Su-57, the major PAK DA project is with Tupolev Design Bureau and so the bomber is likely to carry the Tu designation.

Russian Aerospace Force started taking the delivery of Sukhoi Su-57 fighters in late 2019 after ordering 76 fighters. The Su-57 was combat tested in Syria in 2018 and 2019.

<https://www.defencenews.in/article/Russia-starts-work-on-stealth-nuclear-bomber-PAK-DA-as-Sukhoi-Su-57-fighter-enters-service-840785>

THE | DIPLOMAT
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Wed, 27 May 2020

Is the Chinese JH-7 an answer to the Pakistan Air Force's deep strike needs?

Despite its potent display of combat capability during the Balakot standoff, the PAF requires additional platforms to balance against a much larger Indian Air Force

By Ammad Malik

Amidst sustained tensions between the two nuclear armed South Asian neighbors, the Indian Air Force is scheduled to receive the first batch of four state-of-the-art Rafale fighter jets by the end of July 2020. The 7.87 billion euro Rafale deal between France and New Delhi for a total order of 36 jets was finally inked in September 2016, after much controversy and delay. According to the delivery schedule, the Indian Air Force shall receive all jets by May 2022. Armed with Meteor missiles and a highly sophisticated electronic warfare suite, New Delhi's Rafale acquisition threatens to tilt the balance of power in South Asia in the IAF's favor.

The Pakistan Air Force (PAF) has been following the Indian Air Force's modernization program with keen interest, but budget constraints mean that Islamabad's chances of acquiring a fighter jet of similar capability are slim. Instead, Pakistan seems to be focusing on the latest variant of its indigenous JF-17 Thunder multi-role fighter.

A prototype of the new JF-17 Block 3 fighter first flew in December 2019 and the jet has since undergone a further period of testing. By inducting an AESA radar-capable Block 3 variant in numbers by 2025, the PAF is confident that it can deny the larger Indian Air Force victory in a future conflict. Numerous reports have also hinted that the Block 3 would be armed with the much vaunted Chinese PL-15 missiles, which out-range everything in the IAF's inventory, barring the Meteors. Furthermore, unlike the IAF's emphasis on induction of new platforms, the Pakistan Air Force has in recent years focused more on weapon systems and sensor upgrades to their existing fleet. This strategy paid dividends during the aerial engagement between the two air forces' on February 27, 2019, as the PAF successfully infiltrated Indian airspace in Kashmir and managed to shoot down an IAF MiG-21.

However, despite the PAF's well executed operation in February 2019, the Indian Air Force is equipped with aircraft that are both qualitatively and numerically superior to much of the PAF's inventory. These include the IAF's frontline air superiority fighter, the Sukhoi Su-30MKI, and the highly capable Mirage 2000 multirole aircraft. On the other hand, the PAF still relies largely on its limited fleet of F-16 Fighting Falcons as its primary air asset. The PAF has no more than 75 F-16 jets and a significant number of those are of the vintage Block A variant, delivered to Islamabad in the 1980s. Other aircraft include 100-plus JF-17s of the Block 1 and Block 2 variants, as well as a large operational fleet of the 1960s-era Mirage 3 fighter.

In the event of an all-out conventional war, the PAF's limited frontline air assets are at risk of getting overstretched. More worryingly for Islamabad, the Indian Navy operates a sizeable independent air arm, which can be utilized in a conflict scenario to target Pakistan's coastal industrial hub of Karachi. The much smaller Pakistan Navy does not operate fighter jets, instead relying on the PAF for aerial maritime strike operations.

This creates additional problems for the PAF, which is tasked with confronting the IAF along its long vulnerable eastern border as well as countering the Indian Navy's air arm on the southern coast. The PAF's problem of diverting much-needed air assets to the coast can be resolved by the acquisition of a cost-efficient aerial strike platform for the Pakistan Navy. Given Islamabad's intimate relationship with China and the economic problems currently gripping the country, acquiring the JH-7 heavy strike fighter can both provide its navy with much needed aerial strike capability as well as free up PAF's core assets to engage with the IAF for supremacy over the battlefields of Kashmir and Punjab.

The JH-7, while utilizing an old air frame, is a highly effective aircraft for deep strike operations. The jet first flew in 1988 and small numbers were delivered to the Chinese People's Liberation Army Air Force during the 1990s. An improved version of the JH-7 fighter-bomber, also known by the NATO designation Flounder, began to be inducted in large numbers after 2004, after the Chinese aviation industry was able to indigenously manufacture a derivative of the Rolls Royce Spey engine. The Spey engine was designed specifically by the British for development of a low flying naval strike aircraft to counter the Soviet Navy in the Cold War.

Faced with cuts in defense expenditure and decreasing global influence after World War II, Britain could no longer afford to operate a sizable navy to deter the Soviet threat. Instead, the British opted for developing naval strike aircraft, such as the Blackburn Buccaneer, to extract a heavy toll on large Soviet Navy cruisers in a future conflict. The Spey engines were later utilized on the Royal Air Force's fleet of F-4 Phantoms, giving the aircraft greater range and a shorter takeoff distance.

In addition to their low maintenance and impressive safety record, the Spey engine's utility lies in the fact that it is designed specifically for sustained low altitude flight below the radar horizon of enemy naval vessels. Despite significant advances in jet engine development since the Cold War, the majority of engines today are designed for mid-to-high altitude flight. Flying at low altitude to avoid radar detection for longer periods thus decreases much of the engines' range.

The JH-7 also complements the Pakistan Navy's combat doctrine, which is based on the anti-access/area denial (A2/AD) blueprint. The PN's three *Khalid*-class submarines form the linchpin of their A2/AD strategy, with the wartime objective of preventing an attempted blockade of the vital Karachi port by the Indian Navy. Acquisition of the JH -7 by Pakistan would provide Islamabad with lethal capability to considerably limit the maneuvering capacity of the Indian Navy in the proximity of Karachi port.

Also, the JH-7, with its longer combat range, heavy payload capacity, and ability to fly under enemy radar cover provides Islamabad with an offensive capacity targeted at India's protracted western coastline. Hence, acquisition of the JH-7 by Pakistan serves both defensive and offensive purposes. The improved JH-7A variant currently in service with the PLA Air Force is capable to carry over seven tonnes of armament, including four KD-88/YJ-83 anti-ship missiles.

The capability to carry long range anti-ship missiles, which can be launched more than 100 miles away from their targets, means that the JH-7 is able to utilize an asymmetric "hit and run" strategy before enemy air defenses can effectively engage with it. This doctrine was perhaps most aptly demonstrated by the Argentine Air Force during the 1982 Falklands War, as French Super Etendard strike aircraft armed with Exocet missiles sank two British warships.

One alternative to the JH-7 for Pakistan is its existing arsenal of cruise missiles, but this option has its own pitfalls. First, cruise missiles follow a predictable trajectory and are vulnerable to interception by India's air defense network and fighter aircraft such as the Sukhoi 30 MKI. Second, the use of cruise missiles, even in an all-out conflict, presents a significant leap in terms of

escalation. As such, a cruise missile attack by either New Delhi or Islamabad can lead to an eventual nuclear exchange.

Having extensive prior experience in operating and maintaining Chinese-built aircraft such as the H-5, J-6, and F-7, acquisition of the JH-7 by Pakistan and its effective combat use for the heavy strike role presents an ideal “stop-gap” solution for the PAF until sufficient numbers of the JF-17 Block 3 are inducted. The Chinese also appear eager to sell much of their JH-7 fleet, showcasing the fighter bomber for sale at air shows such as the China International Aviation and Aerospace Exhibition. As prospects of inducting foreign jets from Western countries appear bleak, the JH-7 appears to be the PAF’s only viable option to assert itself in a volatile region.

(Ammad Malik is a defense and security analyst based in Lahore, Pakistan. His work focuses on Pakistan’s relationship with the Middle East and issues concerning military strategy.)

<https://thediplomat.com/2020/05/is-the-chinese-jh-7-an-answer-to-the-pakistan-air-forces-deep-strike-needs/>

Science & Technology News

THEWEEK

Wed, 27 May 2020

ISRO calendar to be delayed due to COVID-19: Chairman K. Sivan

ISRO had a busy launch calendar this year, including first flight of Gaganyaan

By Rekha Dixit

The Indian Space Research Organisation's (ISRO) launch calendar will get impacted because of the Covid-19 pandemic, despite every effort to keep missions on schedule, chairman K. Sivan has said.

The national lockdown, imposed on March 25 in a bid to contain the pandemic, meant that everyone was working from home. This included ISRO. However, a lot of work was suspended, simply because it cannot be done from home. This includes trials, testing equipment, manufacturing hardware and components. "A lot of our manufacturing is done by public and private sector enterprises, and work was suspended there, too," Sivan said. He, however, did not specify the missions that would get delayed and by how long. "Our endeavour continues to be to stick to our deadlines," he said. It is only during Lockdown 4 that manufacturing has begun again, but the scenario is still not as it was before, with so many restrictions on movement.



A lot of our manufacturing is done by public and private sector enterprises, and work was suspended there, too, said ISRO Chairman K. Sivan | File

ISRO had a busy launch calendar this year, including several prestigious and important launches. The biggest of these is the first flight of Gaganyaan, India's human space flight mission. Gaganyaan comprises three flights, of which the first two are to be unmanned, and the last, scheduled for 2022—the 75th year of the country's independence—a manned one. Earlier this year, Sivan had announced the first Gaganyaan flight would take off this December. But given the current delay, will ISRO meet the schedule?

Meanwhile, the four Indian Air Force Test pilots, who were sent to Russia, have resumed their astronaut training. The officers had left in February, but within a few weeks, even Russia went under lockdown, and the training was suspended. The training resumed only on May 12. ISRO, meanwhile, declared an Announcement of Opportunity (AO) for national research and academic institutions to participate in the Human Space Programme. Through an announcement on April 17, it invited proposals for "developing affordable and indigenous cutting edge technologies for human survival in low earth orbits and beyond for space exploration." The proposals are invited for a number of technological development areas like space food, green propulsion, space bioengineering, debris management and harnessing and storing energy.

Two technology demonstration flights of the indigenously developed Small Space Launch Vehicle (SSLV) later this year are also important. The SSLV are even more cost effective than PSLVs for launching small satellites. With India having gained an expertise in small satellite launches, which it has been doing commercially for foreign clients, too, developing the SSLV is important for its stability.

In addition are routine launches of communication, earth observation and geo-imaging satellites, atop a variety of vehicles—PSLV, GSLV II and GSLV III.

Two big missions were scheduled for the beginning of next year—the probe to the sun's corona, Aditya, and the third moon mission, Chandrayaan 3.

ISRO has not had a launch from Sriharikota this year at all. It launched an important communication satellite, the GSAT-30 on January 17 from French Guiana. Another important launch, that of the geo-imaging satellite, or GISAT 1, India's first earth imaging satellite from a geostationary orbit, was scheduled for March 5, but was postponed shortly before launch. ISRO has been tightlipped about the postponement, citing just "technical reasons", but there has been a buzz that the US was not happy with this launch, since components of its sensors were sourced from foreign countries and were against America's strategic interests. The GISAT has powerful cameras that can track the movement of humans across the country's borders and can be a good surveillance asset, in addition to its use in monitoring natural disasters like fog movement, forest fires, and melting glaciers.

<https://www.theweek.in/news/sci-tech/2020/05/26/isro-calendar-to-be-delayed-due-to-covid-19-chairman-k-sivan.html>

THE HINDU
BusinessLine

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के 50 वर्ष

Wed, 27 May 2020

Pune-based start-up plans pan-India satellite broadband coverage

Mumbai: Pune-based Vestaspace Technology is attempting to launch a constellation of over 35 satellites to build 5G network connections across the country.

The company is set to release a beta version of the satellite constellations this September, and the launch of a fully operational constellation of satellites in early 2021. The company is installing eight ground stations and 31,000 data receptors all over India. All the constellations of satellites will be placed into the Leo and Geo orbits.

Arun Kumar Sureban, Founder and CEO, Vestaspace Technology, said: "We are on a mission to make space accessible to everyone who once thought satellites were rocket science. Not only this, through our secured connections a common person can also access to the satellites of their choice and to get immersed in the world of space."

Regulatory requirements

Sureban told *BusinessLine* that the company has taken all regulatory and required licences from the government. The services will be offered in Ku and Ka bands. To start with, the company plans to offer bandwidth to existing telecom operators and Internet service providers, but it has taken licence to offer services directly to customers at a later stage, Sureban said.

However, only ISRO has rights to provide satellite coverage over Indian space. It is not clear if Vestaspace Technology has any agreement with the Indian space agency. "We cannot name our partners," Sureban said, when asked if the company has any deal with ISRO. "We are closely working with various government departments and agencies to ensure we have all the permissions in place ahead of the launch," he added.

If Vestaspace succeeds, this will be the first-of-its-kind service in India. Similar attempts were made by other companies earlier, including Devas Multimedia, but regulatory hurdles scuttled these projects.

5G connections

The company has an ambitious plan to replace traditional fibre networks with all the satellite constellations and to provide high-speed 5G-network connections pan-India with its unmanned software data processing along with successful launches of orbiting satellites and understanding next-generation satellites data needs.

The solutions will prevent any fraud and illegitimate operations while uploading/downloading data from the satellites, there are 10 layers of security firewall put up, which assess data and possibly take immediate actions if any false data is found.

Initially, at the proprietary system, Vestaspace accomplished good results by pointing out the accurate antenna, tracking, seamless beam and satellite handovers. The outcome reflected in a live-streamed video of 1080p (Full HD) with less than 34 milliseconds latency with the speed of more than 400 Mbps.

Vestaspace Technologies was founded in 2018 and is a space-tech company which builds small satellite platforms for commercial and scientific applications. Recently, the company has secured \$10-million funding from US-based Next Capital LLC, an American investment and advisory firm. <https://www.thehindubusinessline.com/info-tech/pune-based-start-up-plans-pan-india-satellite-broadband-coverage/article31684303.ece#>

The Tribune

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Wed, 27 May 2020

Mohali institute develops new laser tech for making nano-structures

The technology can be used in conjugation with an antibody for spectroscopic detection of various biomarkers

By Vijay Mohan

Chandigarh: Researchers at the Institute of Nano Science and Technology (INST), Mohali, have found a unique route to fabricate precisely controlled nanostructures of the desired geometry through a rapid one-step low power laser writing process. This has a huge potential in the fields of catalysis, sensing, and opto-electronic devices.



This will open up avenues in the detection capability of analytes and help shed new light in

Institute of Nano Science and Technology. Photo credits: @INSTMohali

spectroscopy sensing of biological and chemical molecules. The technology can also be used in conjugation with an antibody for the spectroscopic detection of various biomarkers.

Present approaches to such fabrication involve the synthesis of complex morphologies, which limits their potential to be used for large area substrates. The INST is an autonomous institute under the Department of Science and Technology.

In order to overcome present limitations, the INST group developed a hybrid Surface Enhanced Raman Spectroscopy (SERS) platform using molybdenum disulfide nano-structures and gold nano-particles, where direct laser writing is used to engineer the artificial edges on the surface of the nano-structures.

This created localised hotspots with remarkable precision and control. SERS is a technique for molecular detection and characterisation that relies on the enhanced Raman scattering of molecules that are adsorbed on SERS-active surfaces, such as nano-structured gold or silver.

During the research, a focused laser beam of meagre power of a conventional Raman spectrometer was used for nano-structuring on 2D flakes of the desired size and geometry by just playing with the laser power and exposure time.

Producing SERS substrate of controllable hotspots distribution with the desired geometry and location is the main challenge. Several efforts have been made by researchers to attain the controllability over hotspots distribution via employing various synthesis procedures, hotspots engineering, defect engineering, etc. However, the random distribution of hotspots and precision over geometrical nanostructure has limited the progress in the field of SERS sensing.

The hybrid SERS platform developed by the INST group offers controlled formation of localised hotspots for ultra-sensitive and reproducible detection of analytes. Low power-focused laser irradiation technique was employed to create artificial edges on atomically thin 2D nano-structure sheet, which enables the superior deposition of gold nano-particles along the artificial edges. This enhances the local electromagnetic field leading to formation of hotspots.

<https://www.tribuneindia.com/news/business/mohali-institute-develops-new-laser-tech-for-making-nano-structures-90215>

NEOSCOPE

Wed, 27 May 2020

Scientists claim new method can measure consciousness

It works on fruit flies — and the team hopes it'll work on humans as well

By Dan Robitzski

A team of scientists says they've found a way to quantitatively measure consciousness, a discovery that could have huge implications for treating comatose patients.

“This is important because it suggests a reliable way to determine the level of conscious arousal by tapping into a small region of the brain, rather than many parts of the brain,” Monash physicist and lead researcher Kavan Modi said in a press release. “It also suggests that there is a clear marker of conscious arousal that does not depend on specific external stimuli.”

A team of Monash University scientists found distinct neurological signals in waking and anesthetized fruit flies, according to research published Friday in the journal *Physical Review Research*. The flies, which are commonly used in biological research, seemed to have different, quantifiable levels of consciousness that could be picked up in neural recordings.

Essentially, the complexity of the flies' neural signals was tied to their level of conscious arousal. Flies that were awake had more complicated brain activity than those that had been anesthetized — and those signals can provide a new baseline for future recordings.

Probing human consciousness is vastly more complex than a fruit fly's — the fly brain has 100,000 cells while the human brain has 86 billion — but the researchers hope their work will scale into human studies as well.

If the method works on humans, it could give doctors a new way to probe the minds of non-responsive patients in their care.

“This is a major problem in neuroscience,” Modi said in the release, “where it is crucial to differentiate between unresponsive vegetative patients and those suffering from a condition in which a patient is aware but cannot move or communicate verbally because of complete paralysis of nearly all voluntary muscles in the body.”

<https://futurism.com/neoscope/new-method-measure-consciousness>

COVID-19 Research News

THE HINDU

Wed, 27 May 2020

NRDC to promote technologies designed to fight COVID-19

‘Over 200 projects so far developed by various organisations’

By Rajulapudi Srinivas

Vijayawada: The National Research Development Corporation (NRDC) has prepared a compendium on the projects developed by various public-funded organisations, universities and start-ups across the country.

About 200 technologies have been developed by different laboratories, IITs, Micro, Small and Medium Enterprises (MSMEs) and other institutions in the last few months and the NRDC is trying to give publicity and encourage the young entrepreneurs, according to NRDC Chairman and Managing Director (C&MD) H. Purushotham.

The NRDC, a unit of the Department of Scientific and Industrial Research, Ministry of Science and Technology, will promote COVID-19 technologies in the areas such as pilot plant studies, registration of product with regulatory authorities, field trials and bridge the gap between the lab scale development and the industrial requirement.

Focus on 3Ts

“The aim of the NRDC is to give a boost and publicity to start-ups and commercialise the production to combat the viruses. As many as 38 laboratories under Council of Scientific and Industrial Research (CSIR) have developed a good number of technologies on COVID-19. Various departments under the Government of India (GoI) like DST, Department of Bio-Technology (DBT), Technology Development Board (TDB), Invest India and Principal Scientific Advisors’ Office have so far granted more than ₹500 crore for the projects,” Dr. Purushotham told *The Hindu*.

“We are focusing on ‘Tracking, Testing and Treatment’ (3Ts) to fight coronavirus. Organisations like Council of Scientific and Industrial Research (CSIR), Defence Research and Development Organisation (DRDO), Department of Science and Technology (DST), Indian Institute of Chemical Technology (IICT) and Bio-Technology Industry and Research Council (BIRAC) were among those which developed the technologies, and the products got cleared by Indian Council of Medical Research (ICMR), which is a regulatory body, for mass production,” the NRDC C&MD said.

The NRDC has recently launched a funding scheme to promote the projects developed by various laboratories and invited proposals for maturing lab scale COVID-19 technologies.

Under the scheme, ₹2 lakh would be granted under techno-commercial support and ₹10 lakh for some priority projects. "We have so far received about 100 proposals," he said.

"The response from various universities, IITs and a few individuals is overwhelming. In deserving cases, the grant may be enhanced to above ₹10 lakh subject to the recommendation of the Technical Evaluation Committee (TEC). For more details, entrepreneurs, students, startups and organisations can visit www.nrdcindia.com," the Chairman added.

<https://www.thehindu.com/news/national/andhra-pradesh/nrdc-to-promote-technologies-designed-to-fight-covid-19/article31681727.ece>

live**mint**

Wed, 27 May 2020

Merck advances Covid-19 vaccine candidates in research drive

Merck bought rights to develop a promising antiviral discovered at Emory University and will work with partners to advance candidate vaccines based on the technology behind Ebola and measles immunizations

By Riley Griffin

Newyork: Merck & Co. moved to bolster the global fight against the coronavirus, unveiling development plans for a pill to the treat the infection and two vaccines to prevent it.

The US drugmaker bought rights to develop a promising antiviral discovered at Emory University and will work with partners to advance candidate vaccines based on the technology behind Ebola and measles immunizations, according to statements on Tuesday.

Chief Executive Office Kenneth Frazier said the pandemic and Merck's efforts to counter it have delayed planned leadership changes, but galvanized the Kenilworth, New Jersey-based company's commitment to global solidarity. Even as a rush to restart economies has prompted some nations to compete for vital pharmaceuticals, Merck won't be pressured to supply any one country, and will prioritize access for health-care workers and others at highest risk, he said.

"This is a global pandemic. No one country can solve it, and we can't put borders around any one country," Frazier, 65, said in a phone interview. "If we're successful, we want to ensure broad, supportable access for whoever needs it, wherever they are."

Merck shares rose 2.5% in premarket trading. They've fallen 16% so far this year.

The company, which over the past century has pioneered inoculations to stop diseases from diphtheria to Ebola, started researching ways to thwart Covid-19 after the pandemic-causing virus was discovered, and has evaluated hundreds of potential vaccines, Frazier said. Below are the highlights of news announced in separate emailed statements:

Collaboration with IAVI and funding from BARDA to develop a Covid vaccine using technology behind Merck's Ebola shot.

Acquisition of Themis to gain a Covid vaccine candidate that uses measles virus vector platform discovered by the Pasteur Institute.



Merck announced in April a research collaboration with the Institute for Systems Biology to investigate and define the molecular mechanisms of the virus and Covid-19

Rights to EIDD-2801, an orally available antiviral candidate in early clinical development, bought from Ridgeback Biotherapeutics LP and discovered at Emory University

Ebola inspiration

Merck's immunization against Ebola — the only one approved by the Food and Drug Administration — provided a reference point for a candidate Covid vaccine since it confers protection with a single shot and uses technology that's shown to be safe and effective, Frazier said.

A collaboration with International AIDS Vaccine Initiative Inc., a nonprofit scientific research organization, aims to develop a Covid vaccine by adapting the so-called recombinant vesicular stomatitis virus technology behind Merck's Ebola shot.

IAVI scientists in Brooklyn are researching the experimental shot, which is receiving funding from the Biomedical Advanced Research and Development Authority, or BARDA, and may enter human studies later this year.

"We start with a platform we understand," Frazier said. "We understand how it behaves, how to make it, how to scale it up, because we have experiencing with that platform."

Measles vector

Merck will buy Themis, a privately-held biotechnology company, for an undisclosed sum, gaining a Covid-19 vaccine candidate that uses the existing measles virus vector platform. Development of the shot has received support from the Coalition for Epidemic Preparedness Innovations. It's slated to start phase 1 clinical studies within weeks, Frazier said.

He said he's unable to say how much any successful immunization would cost, but that Merck is committed to supplying "affordable access." Also the company would need to find partners to manufacture them en masse to meet global demand. "We're prepared to do that," he said.

Covid-19 pill

Merck is also pressing ahead with potential treatments for Covid-19. It agreed to buy rights to EIDD-2801, an antiviral compound discovered at Emory University, from Ridgeback Biotherapeutics LP, a closely held biotechnology company.

An early stage clinical trial showed it was well-tolerated, while preclinical studies by scientists at Emory and the University of North Carolina at Chapel Hill found it induced mutations in a broad range of coronaviruses, causing them to make catastrophic errors when they replicate. Remdesivir, the antiviral infusion developed by Gilead Sciences Inc. works in a similar way and has been shown to improve outcomes in some patients, Frazier said.

"But importantly, this compound can be given in pill form, which would make it easier to use," he said.

EIDD-2801 may potentially arrest infections at an earlier stage, he said, adding that it also appears easier to synthesize and manufacture on a large scale.

Earlier efforts

Merck announced in April a research collaboration with the Institute for Systems Biology to investigate and define the molecular mechanisms of the virus and Covid-19, the disease it causes, and identify targets for medicines and vaccines.

That same month, Merck joined the US National Institutes of Health in an effort known as Activ, or Accelerating Covid-19 Therapeutic Interventions and Vaccines. The public-private partnership brought together government health agencies and 16 biopharmaceutical companies with the goal of expediting development and production.

Merck scientists spent time determining optimal research strategies, Frazier said. "They're asking, what kind of vaccine and therapeutic does the world need to deal not just with the pandemic, but the endemic phase."

He said the pandemic and the company's research and development efforts to fight it have disrupted plans to appoint his successor and a replacement for R&D leader Roger Perlmutter, a former president of the American Association of Immunologists who first joined Merck in 1997.

“We’ll get back to normal at some point,” Frazier said. “I’m totally confident in the high quality people who we have behind me and behind Roger Perlmutter.”

<https://www.livemint.com/news/india/merck-advances-covid-19-vaccine-candidates-in-research-drive-11590493035993.html>

The Indian **EXPRESS**

Wed, 27 May 2020

New Research: In gene linked to dementia, a correlation with severe Covid

Now, the research team has found that carrying these gene mutations doubles the risks of Covid-19 — even in people who had not developed these diseases

New Delhi: A new study has found a link between the severity of Covid-19 and a gene linked to dementia. Having a faulty gene linked to dementia doubles the risk of developing severe COVID-19, according to the large-scale study, published in in the Journal of Gerontology: Medical Sciences.

The gene is called APOE, and exists in a different forms, one of which is termed e4e4. Researchers at the University of Exeter Medical School and the University of Connecticut School of Medicine analysed data from the UK Biobank, which collects health and genetic data on 500,000 people. They found high risk of severe Covid-19 infection among European ancestry participants who carry two faulty copies of this gene. One in 36 people of European ancestry have two faulty copies of this gene, and this is known to increase risks of Alzheimer’s disease up to 14-fold and also increases risks of heart disease, the University of Exeter said in a statement.



Having a faulty gene linked to dementia doubles the risk of developing severe COVID-19, according to the large-scale study, published in in the Journal of Gerontology: Medical Sciences. (File)

Now, the research team has found that carrying these gene mutations doubles the risks of Covid-19 — even in people who had not developed these diseases. The same team has previously found that people with dementia are three times more likely to get severe Covid-19, the University said.

It said part of the increased risk may have been due to exposure to the high prevalence of the virus in care homes. However, the new study suggests that a genetic component may also be at play. The team found that people with the APOE e4e4 genotype were at double the risk of developing severe Covid-19, compared to those with the common e3e3 form of the APOE gene.

In this analysis, 2.36% (9,022) of 3.82 lakh participants with European ancestries had the APOE e4e4 faulty gene, but 5.13% (37) of 721 who tested positive for Covid-19 had this gene variant, suggesting the risk is doubled compared to e3e3 (410 per 100,000 versus 179 per 100,000).

Co-author Dr Chia-Ling Kuo, of the UConn School of Medicine, said in the University of Exeter statement: “... We might now be able to pinpoint how this faulty gene causes vulnerability to COVID-19. This could lead to new ideas for treatments.”

<https://indianexpress.com/article/explained/in-gene-linked-to-dementia-a-correlation-with-severe-covid-6428734/>

Coronavirus 'injures' placenta in infected pregnant women, study finds

Research on pregnancy and the coronavirus finds that moms infected with COVID-19 may experience damaged blood vessels and placenta as a result of the infection

By Maura Hohman

New research out of Northwestern University could be a first step to answering the many questions that persist about how contracting the coronavirus during pregnancy affect mother and baby.

The small study followed 16 women who tested positive for COVID-19 and gave birth between late March and early May at Northwestern's Memorial Hospital in Chicago. Looking at the placenta, it found that these mothers "were significantly more likely" to develop abnormal or injured blood vessels, according to the research published in the American Journal of Clinical Pathology.

That said, all of the full-term babies in the study tested negative for the coronavirus and were doing well when they left the hospital.

Injury to the placenta

"There are specialized arteries on the maternal side that give blood to the placenta, and what we're showing is that there are some problems with the way those vessels are shaped, and then we see injury to those blood vessels," Dr. Jeff Goldstein, a perinatal pathologist at Northwestern Medicine and co-author of the study, told TODAY. "It could cause there to be less blood flow into the placenta, which could conceivably decrease oxygen and nutrient delivery to the fetus."

Fellow study author and obstetrician Dr. Emily Miller added in a statement: "Not to paint a scary picture, but these findings worry me. I don't want to draw sweeping conclusions from a small study, but this preliminary glimpse into how COVID-19 might cause changes in the placenta carries some pretty significant implications for the health of a pregnancy."

Of the 16 mothers, 15 had live births, all 15 were infected during the third trimester. The remaining mother, who was asymptomatic, had a miscarriage at 16 weeks, but it's unclear if this was related to her COVID-19 diagnosis, Goldstein said. This study did not look at whether the stage of pregnancy during infection plays a role in severity of illness, and that question still remains unanswered.

The 15 mothers who gave birth were either asymptomatic or had relatively mild COVID-19 symptoms. Only two required oxygen, and none were in the ICU, Goldstein added.

Health of the babies, short and long-term

To judge the health of the 15 newborns, researchers recorded their Apgar scores, which use a scale from 0 to 9 to assess a baby's health based on factors like coloring, heart rate, independent movement and crying. The babies all had either an 8 or 9 one minute after birth and a 9 by five minutes after birth.

"The kids seem to have done in the short-term, at least this group of kids, very well," Goldstein said.

Still, Goldstein believes there could be a lifelong impact on these children, but he doesn't know for sure.

"There's been a series of studies looking at people who were in utero during the peak of the 1918 flu pandemic, and those people have higher rates of cardiovascular disease throughout their lives and lower lifelong income," he explained. "What that says is we need to be following up on what's happening with these kids. Until they leave the hospital is not long enough."

Changing prenatal care

Miller said in a statement that the study "does validate the idea that women with COVID should be monitored more closely." But a spokesperson for the American College of Obstetricians and Gynecologists, Dr. Denise Jamieson, said this research alone is not enough to change the standard of care for moms-to-be.

"We need more information about COVID in pregnancy, all aspects," Jamieson, the chief of gynecology and obstetrics at Emory Healthcare in Atlanta, told TODAY. "Based on these preliminary findings, I don't have any specific concerns, but I do want to stress that we've continually been surprised by the effects of COVID."

Previous research on COVID-19 and pregnancy has attempted to decipher whether the virus can pass through the placenta to the baby, among other topics, but there are few clear-cut answers at this stage. The National Institutes of Health announced earlier this month that it's launching a study that will follow 21,000 women and assess how the pandemic affected their pregnancies.

The takeaway for pregnant women from this study, according to Jamieson, is that it provides another reason to take as many precautions as possible to prevent contracting the coronavirus. These include social distancing, wearing masks and regular hand hygiene.

For now, Goldstein emphasized that the recent research shouldn't prompt rampant "fear."

"If you are someone who's had the coronavirus and recovered or has it and is doing well, this doesn't mean 'Oh my gosh, you have to get that kid out of there immediately,'" he said.

<https://www.today.com/health/coronavirus-pregnancy-covid-19-damages-placenta-infected-pregnant-women-study-t182493#anchor-Healthofthebabiesshortandlongterm>

