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'Kavasam' Software developed by CVRDE to contain COVID-19 pandemic

The KAVASAM software developed by Combat Vehicles Research & Development Establishment (CVRDE), is a unique framework formulated for tracking and resource allocation thereby aiding to identify and suppress the COVID 19 pandemic in Avadi Corporation.

Chennai: The KAVASAM software developed by Combat Vehicles Research & Development Establishment (CVRDE), is a unique framework formulated for tracking and resource allocation thereby aiding to identify and suppress the COVID 19 pandemic in Avadi Corporation.

The Software has four level hierarchy of Super admin, Epicentre head, team leader and health worker are defined. The software framework consists of a web based application for centralized supervision and approval by the super admin and Epicentre heads.

The Super admin will be the overall responsible authority, he can create epicentres and allocate it to the concerned Epicentre heads. Reports can be created and the overall status can be visualized in the dashboard. Highlighting of the houses in map with different colours and legends is also provided to easily identify suspects.

Epicentre head/ health officer will be responsible for the Epicentre allotted and he has the privilege to create team leaders and streets and houses for survey within the radius automatically/manually to the also select 1.5km/3km/5km radius from Epicentre and assign the team leaders.

Android based app is developed for the Team leaders consisting of a set of doctors to create health workers and assign the streets manually or automatically to them based on the number of houses in a street for house to house surveillance and data using the same app the health workers can collect the relevant data from the collection and also the data collected by them can be approved.

The App is developed for geofencing of the home or institutionally quarantined/allotted houses and submits their recommendations to the team leader.

Another App developed to monitor the movement of quarantined persons. This App provides notification to Super admin, Epicentre Head and Team Leader/police if the quarantined person moves 100m away from their bi-directional approval and monitoring process is formulated and SMS notification at all stages is also provided to ensure authentication. Map views and generation of various reports required at different levels is also configured.

A resourceful database for the corporation is created with Geocoding of streets and number of houses in each street. This database will be automatically appended with the data collected by the health worker at allocated streets can be used for any resource allocation like vaccine for COVID



19 by the health department or distribution of other resources viz food, water, ration by the revenue departments at a later stage. Also, counselling of people and effective communication conducting surveys and also aid during disaster like flood etc.

The spin of strategies can be established. The software can be enhanced for benefits include creation of GIS map for house/population attributes due to systematic data collection across the area, a release from Defence PRO said.

<https://navjeevanexpress.com/kavasam-software-developed-by-cvrde-to-contain-covid-19-pandemic/>



Wed, 06 May 2020

New app to ease workload of frontline staff

City-based defence lab develops Kavasam app to track patients, resource allocation

By SV Krishna Chaitanya

Chennai: Though no medicine has been discovered to fully cure COVID-19, Kavasam, a new software could prove a panacea for strengthening the support system tackling the crisis. Developed by Chennai-based Combat Vehicles Research and Development Establishment (CVRDE), the software offers a unique framework for tracking patients and resource allocation. Unlike the application Arogya Setu, which is being widely promoted by the Central government, Kavasam is expected to ease the workload of frontline workers, street-level surveillance and aid in quick decision making by epicentre heads and other authorities.

CVRDE director V Balamurugan told Express that Kavasam was developed following a request from the Avadi Corporation. "Our team took two weeks to develop the software and android application for the end-users. We have used services of MapmyIndia to digitally view street-level details like number of households, etc. We are currently training Avadi Corporation staff to use the application, and Special Nodal Officer for Greater Chennai Corporation J Radhakrishnan has also sought a demonstration," he added.

The software facilitates geofencing of homes or institutionally quarantined persons, whose movement can be monitored. An automatic notification will be sent to super admin, epicentre head and team leader or police if the quarantined person moves 100 metres away from their bi-directional approved spot. Monitoring process is also formulated and an SMS notification will be provided at all stages to ensure authentication. Balamurugan further said that a resourceful database for the corporation is created with geocoding of streets and number of houses in each street. Different colour codes are used for authorities to know which streets have been surveyed.

For instance, if a health worker collects data from a particular street, the street will be shown as green in the applications. "There are a lot of spin-off benefits of the application. It can be used for allocation of any resource like vaccines by the health department or food, water or ration by the revenue department at a later stage," he said.

<https://www.newindianexpress.com/cities/chennai/2020/may/06/new-app-to-ease-workload-of-frontline-staff-2139771.html>

Chennai defence lab develops 'Kavasam' app to help COVID-19 warriors fight virus

V Balamurugan, Director, CVRDE, told The New Indian Express that 'Kavasam' was developed following a request from the Avadi Corporation

By SV Krishna Chaitanya

Chennai: The Chennai-based Combat Vehicles Research and Development Establishment (CVRDE) has developed an app called 'Kavasam' to contain the COVID-19 pandemic, which is wreaking havoc in the city.

Unlike currently available apps like Arogya Setu, which is being widely promoted by the Centre, Kavasam is meant to ease the work of frontline workers, enable street-level surveillance and aid quicker decision-making by those in charge.

V Balamurugan, Director, CVRDE, told *The New Indian Express* that 'Kavasam' was developed following a request from the Avadi Corporation. "Our team took two weeks to develop the software and Android app for end users. We have used the services of MapmyIndia to digitally view street-level information like number of households etc. We are currently training Avadi Corporation staff to use the application and have been contacted by the Special Nodal Officer for Greater Chennai Corporation J Radhakrishnan seeking a demonstration."

The app facilitates geofencing of homes of those under quarantine to monitor their movement. An automatic notification will be sent to the super admin, epicentre head and team leader/police if the person moves 100m away from the location.

Balamurugan said a database has been created for the corporation with geocoding of streets and number of houses in each street. Different colour codes are given for authorities to know which streets have been surveyed. For instance, if health workers finish collecting data from a particular street, it will be shown as green in the app.

"There are a lot of spin-off benefits of the app. It can also be used by the health department to allocate a vaccine for COVID-19 when it is developed or by the revenue department to distribute other resources like food, water and ration."

<https://www.newindianexpress.com/cities/chennai/2020/may/05/chennai-defence-lab-develops-kavasam-app-to-help-covid-19-warriors-fight-virus-2139504.html>



A health worker engaged in a Covid-19 ward, standing outside Omandurara Medical College in Chennai. Express / DEBADATTA MALLICK.

Coronavirus lockdown: Kochi airport set to receive evacuees from Middle East

Pilots and cabin crew of Air India's first batch of flights have been given training in infection control practices, apart from undergoing RT-PCR test

By Shaju Philip

With Indians stranded in the Middle East to be evacuated from Thursday, elaborate safety measures have been put in place at Cochin International Airport Limited (CIAL), where the first flight from Abu Dhabi is expected that night.

Pilots and cabin crew of Air India's first batch of flights have been given training in infection control practices, apart from undergoing RT-PCR test. Twelve Air India personnel, including four pilots, were trained by Kochi government medical college.

Medical college Resident Medical Officer Dr Ganesh Mohan said, "We trained them in using PPE suits and wearing face shield on board and handling health emergencies on flight. They were also trained in infection control practices. The demonstrations were held as per the protocol, and they were given PPE kits," he said.

Captain Partha Sarkar said the training helped boost confidence of the crew for the mission.

The first flight from Abu Dhabi will have 179 passengers, and the airport is fully prepared to receive them, a CIAL spokesperson said. The aircraft, which has been disinfected, will have a special parking bay and aerobridge. Passengers will be examined with thermal scanners and temperature guns before they enter the terminal. Symptomatic passengers will have a dedicated way to an ambulance for transport to hospital, while asymptomatic passengers will be taken to a health desk for basic examination.

Baggage will be handed over to passengers after disinfection. An ultraviolet disinfection system developed by DRDO is being installed at the airport. The baggage, after disinfection, will pass through two tunnels for exposure to ultraviolet rays.

<https://indianexpress.com/article/india/coronavirus-india-lockdown-kochi-airport-set-to-receive-evacuees-from-middle-east-6397462/>

THE NEW
INDIAN EXPRESS

Thu, 07 May 2020

Airport braces for influx of NRKs; protocols in place

Laser guns, thermal scanners for screening; UV disinfection for bags

Kochi: As the first international flight carrying Malayali expatriates from Abu Dhabi is expected to touch down at Cochin International Airport on Thursday, the airport authorities have put in place stringent measures to scan the passengers for possible Covid-19 and disinfect the luggage of the incoming passengers.

CIAL has gone for a tie-up with Defence Research Development Organisation (DRDO) for installing machines for disinfecting the luggage. As per the schedule, the Air India Express flight carrying 179 passengers from Abu Dhabi is expected to arrive at 9.40 pm on Thursday night. Special teams of officials from state health department, police, local bodies and CISF have been formed to implement various Covid protocol measures in the airport. After landing at the tarmac,

the flight will be parked at a special bay area and the passengers will be allowed to come out of the aircraft as per a specific protocol.

The passengers will be thoroughly screened for temperature using laser guns and thermal scanners before entering the terminal building. Those with symptoms will be shifted straight to ambulance while asymptomatic passengers will be taken to special health check-up counters for conducting detailed checks. Strict social distancing protocol will be followed in all areas inside the airport.

CIAL has also installed an ultraviolet system to disinfect the luggage of the passengers. The system has been developed by DRDO in association with NPOL and Government Medical College, Kalamassery. Airport staff who will be coming in close contact with the passengers will be wearing PPE. The airport premises will be disinfected continuously.

<https://www.newindianexpress.com/cities/kochi/2020/may/07/airport-braces-for-influx-of-nrks-protocols-in-place-2140082.html>



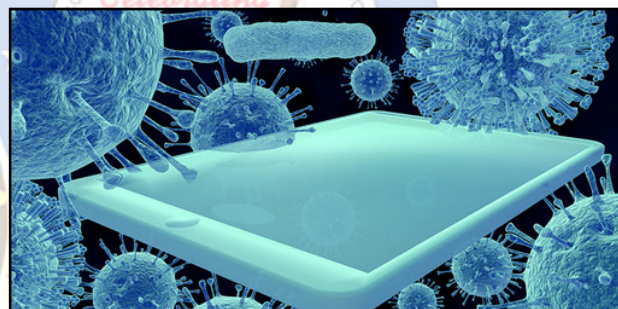
Thu, 07 May 2020

DRDO designs UV disinfection tower

The equipment named UV blaster is a UV based area sanitiser

Defence Research and Development Organisation (DRDO) has developed an Ultra Violet (UV) Disinfection Tower for rapid and chemical free disinfection of high infection prone areas.

The equipment named UV blaster is a UV based area sanitiser designed and developed by Laser Science & Technology Centre (LASTEC), the Delhi based premier laboratory of DRDO with the help of New Age Instruments and Materials Private Limited, Gurugram.



The UV Blaster is useful for high tech surfaces like electronic equipment, computers and other gadgets in laboratories and offices that are not suitable for disinfection with chemical methods. The product is also effective for areas with large flow of people such as airports, shopping malls, metros, hotels, factories, offices, etc.

The UV based area sanitiser may be used by remote operation through laptop/mobile phone using wifi link. The equipment has six lamps each with 43 watts of UV-C power at 254 nm wavelength for 360 degree illumination. For a room of about 12x12 feet dimension, the disinfection time is about 10 minutes and 30 minutes for 400 square feet area by positioning the equipment at different places within the room.

This sanitiser switches off on accidental opening of room or human intervention. One more salient safety feature of the product is the key to arm operation.

<https://www.biospectrumindia.com/news/77/16386/drdo-designs-uv-disinfection-tower.html>

Thu, 07 May 2020

Railways scales up PPE production

New Delhi: The Northern Railways has manufactured 17,000 coveralls for medical professionals till Sunday, producing a record number of 2,000 in a single day, a senior official said.

Last month, the Railways altogether prepared 41,000 such units, 12,000 of them contributed by the NR, said Arun Arora, Principal Chief Mechanical Engineer, Northern Railway.

"Further, during the first two days of May, the Indian Railways produced 6,000 coveralls and our contribution is 3,000 in it," the NR representative said.

It is expected that this month, Northern Railways workshops will be able to churn out more than 30,000 coveralls for immediate supply to doctors and paramedics who are the frontline fighters against COVID-19.

Arora said the cost of coveralls prepared by the NR is Rs 447 per unit as compared to prevailing market price of Rs 805.

The railways has set a target of one lakh such PPEs coveralls to be prepared by May 31.

Samples of Personal Protective Equipment (PPE) made at a Northern Railways workshop have been cleared by the DRDO for its ability to block blood or body fluid.

The test was conducted to check the resistance of the bio-protective covering material to penetration of blood or body fluid.

These coveralls will be worn by doctors in railway hospitals while treating COVID-19 patients, the Northern Railways said.

There is an acute shortage of PPEs for medical professionals in the country who are treating coronavirus patients.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)

<https://www.outlookindia.com/newscroll/railways-scales-up-ppe-production/1823606>



Thu, 07 May 2020

#Throwback: India's next generation missile boats will make Chinese aircraft obsolete

Indian Navy plans to induct six new next generation Missile Boats/Vessels under make in India program. The missile vessel primary mission indicated as surface warfare unlike most other missile boats perform only Anti shipping. previously Indian navy used the Russian missile boats that can bring down entire Karachi and did awesome work in the 1971 WAR. and get the Nickname Killer Squadron. Thus later replaced by the corvette's.

It seems navy didn't satisfied those Corvette's they need new generation missile Boats. but here the missile vessel have 8 VLS or Tubes for Surface attack this can be added with either Nirbhay LACM (Land Attack Cruise Missile) or Combination of Brahmos land attack and anti shipping cruise missiles. The Nirbhay can strike target far more than 1200 kilometers with impressive loitering capability. Also flies at low level and reduced RCS. so hard to be tracked by enemy air defence radars.



Mach 3 Capable Brahmos Cruise Missile is a fearsome Weapons system which evens a Captain of an Aircraft carrier will fear due to its kinetic punch coming from its 300kg warhead and its ability to sink largest of the warships with ease. With MTCR restriction gone 800km BrahMos MK4 will be formidable Surface to Surface weapon system too which can be used to attack port and Naval facilities when required

Missile boats will have reduced RCS. So it will be hard to be detected by enemy ships and along with lower acoustic signatures to make the ship hard to be detect by sonar's. Both of these specifications indicate the ship hull should be stealth in design and material.

These ship will be able accomodate some 100 Navy personells include 11 officers. so the ship size provide beds and other living features and stocks food.

<https://www.defenceaviationpost.com/2020/05/throwback-indias-next-generation-missile-boats-will-make-chinese-aircraft-obsolete/>

With Himalayas getting unusually higher snow in April, SASE extends avalanche warning period

By Vijay Mohan

Chandigarh: With several parts of the Himalayas experiencing unusually good snowfall during the month of April, the Snow and Avalanche Study Establishment (SASE) has extended the period during which avalanches can be experienced till mid-May.

“The snowfall over western and central Himalayas as a whole was 98.2 per cent of the long period average during the 2019-20 snow season,” Naresh Kumar, Director of SASE, said. “February is the peak period for snowfall and thereafter it starts decreasing from March to April. However, this year there was relatively higher snow in April due to western disturbances and because of that we are continuing to issue avalanche warnings which we normally do till April,” he added.



Good snowfall in the mountains will have a favourable impact on the availability of fresh water in the summers.

Avalanche warnings are issued everyday to the armed forces as well as state governments, identifying the likely areas to experience an avalanche and forecasting the level of danger, so that preventive and cautionary measures can be taken.

SASE is a laboratory under the Defence Research and Development Organisation (DRDO) that is engaged in mountain meteorology, avalanche forecasting, artificial triggering and structural control in snowbound areas. SASE has developed its own statistical model for seasonal winter precipitation forecast over western Himalayas.

Based on this model, the precipitation forecast for the winter season of 2019-20 was “good” for western Himalayas, with chances of less snowfall during mid of February to mid of March this year. In November 2019, Himalayas had received unprecedentedly high snowfall. The area has experienced 10 avalanches during the winters.

Good snowfall in the mountains will have a favourable impact on the availability of fresh water in the summers. Already, the Bhakra Beas Management Board, which manages two major reservoirs on the Sutlej and the Beas in Himachal, is expecting above-high inflows in the summers.

While the snowfall was in excess in the beginning of the winters, it became deficient in mid-winters, particularly in the month of February 2020 which otherwise is known as the month of highest snowfall in western and central Himalayas.

Observations show that Dhundi station near Rohtang Pass in Himachal Pradesh received the highest cumulative snowfall of 1,220 cm while Bahang, the headquarters of SASE near Manali, received the lowest snowfall of 225 cm during the entire winter season.

This year, SASE also initiated a series of training programs for quick reaction teams of various state agencies, including police, home guard and central armed police forces on the management and mitigation of avalanche hazards and carrying out rescue operations. SASE has already been imparting training to Army troops on avalanche safety, rescue and movement in avalanche-prone areas for the past many years.

<https://www.tribuneindia.com/news/nation/with-himalayas-getting-unusually-higher-snow-in-april-sase-extends-avalanche-warning-period-81200>

China thinks India's missile defenses are no big deal

But does this reflect a problem with India – or is China trying to discourage its rival from building defenses against Beijing's ballistic missiles?

By Michael Peck

Here's what you need to remember: China is indisputably more powerful, with a larger economy and a military that is rapidly procuring advanced conventional and nuclear weapons. But India also has nuclear weapons, and an Indian missile system that could intercept Chinese ballistic missiles would enhance India's deterrence capabilities versus China.

India isn't capable of building an effective missile defense system, according to Chinese media.

But does this reflect a problem with India – or is China trying to discourage its rival from building defenses against Beijing's ballistic missiles?

“Generally speaking, although India has made considerable progress in the independent R&D and deployment of ballistic missile defense system in recent years, it is still faced with a string of difficulties, such as inadequate capital, unsmooth R&D process, heavy reliance on other countries regarding key technology, and incomplete systems,” writes Fang Xiaozhi, a researcher at the BRI Institute of Strategy and International Security at Fudan University. “New Delhi has a long way to go before it can establish a truly effective ballistic missile defense system and fully exert its real combat force.”

The article appeared on chinamil.com, the Chinese military's English-language Web site. Though the article included a disclaimer that it did not necessarily reflect the views of the Web site, it seems unlikely that an official People's Liberation Army site would have run the story unless it was intended to convey a message.

India has become a new player in ballistic missile defense (BMD), developing both BMD interceptors as well as an anti-satellite weapon. Indian BMD is a two-tiered system similar to the U.S. Safeguard system of the 1960s: long-range Prithvi rockets (based in the Prithvi tactical ballistic missile) for exo-atmospheric intercepts in space, and the Advanced Area Defense missile for endo-atmospheric intercepts within the Earth's atmosphere, when the target warhead is descending through the atmosphere.

In January 2020, government officials told Indian media that BMD development and testing had been successfully completed, and that the system was ready for deployment.

“The Indian Air Force and the Defense Research and Development Organization (DRDO), the system developer, are seeking the approval to install and activate this system near the capital city of New Delhi, which is expected to take three or four years,” said Indian news site The Print.

However, the Chinese analyst dismissed Indian successes as invalid. “India has adopted the most conservative plan in all its anti-missile tests - only intercepting a target whose launching spot, flying velocity and direction, altitude or ballistic parameters are all known and there is no actively maneuvering and changing trajectory,” Fang said. “This testing approach of ‘hitting a fixed target’ doesn't comply with real combat situation, nor can it truly test the anti-missile system's stability and reliability, so the testing results are hardly reliable.”

Fang also asserted that India doesn't have the technological backbone for effective missile defense. “A missile defense system is a very complicated project that reflects a major country's overall strength, and it requires a thorough and solid technical foundation in terms of anti-missile early warning system, missile interception system and command and control system, in all of which India has nothing much to say for itself. Compared with Russia, the US, Israel and other

countries with strong anti-missile capabilities, India's technology is completely left behind and its R&D has had too many twists and turns. Besides, it has conducted too few tests, far from enough for it to fully understand the technology."

However, the problem with this analysis is that China isn't exactly a disinterested observer. China's rivalry with the U.S. over the Western Pacific tends to obscure China's rivalry with India. The two nations fought a brief war in 1962, in which China seized territory on India's northwest frontier.

China is indisputably more powerful, with a larger economy and a military that is rapidly procuring advanced conventional and nuclear weapons. But India also has nuclear weapons, and an Indian missile system that could intercept Chinese ballistic missiles would enhance India's deterrence capabilities versus China.

<https://nationalinterest.org/blog/buzz/china-thinks-indias-missile-defenses-are-no-big-deal-151031>

Defence Strategic: National/International

DEFENSE
WORLD.NET

Thu, 07 May 2020

Indian defense procurement hit as foreign suppliers defer deliveries

The Indian military's modernization projects have taken a backseat with foreign suppliers putting off deliveries to a much later date owing to the current COVID-19 situation.

Defense Ministry of India bought 36 Rafale jets (flyaway condition) for \$8.7 billion from Dassault Aviation in September 2016.

First four of these French birds were to be flown to India by May. The deliveries are now expected to be pushed further by 3-6 months. Shipment of another consignment of the 14 promised fighter jets is unlikely to be carried out by the scheduled date, February 2021.



"India's receipt of French Rafale fighter jets, which was expected by July this year, will be further postponed," defense sources were quoted as saying by Sputnik on Tuesday.

On April 8, Dassault resumed training of Indian Air Force (IAF) pilots after the novel coronavirus hit training schedule for several days. The French government on Saturday announced plans to extend the current health emergency.

With social distancing norms and air travel restrictions in place, the IAF pilots will reportedly need two months of training once the rules are eased.

As the number of positive COVID-19 cases in India inches towards the 50,000-mark, shipment of other military equipment are also bound to be hit: AH-64E Apaches (five were to enter service this year), M-777 ultra-light howitzers and CH-47 F(I) Chinook helicopters.

"The defense ministry has approached foreign equipment manufacturers to understand which programmes are likely to see delayed deliveries and the way forward would be to defer payments for late deliveries, without invoking the penalty clause," a source told India's Economic Times.

This year's initially allocated \$62.4 billion defense budget may receive 20-30% cut. "The deferment of supplies will save money, to the extent payments were due this year, provided that money was available in the budget," Amit Cowshish, former finance advisor to Indian defense ministry, told Sputnik.

The pandemic could be a nip in the bud for several other big projects in the pipeline such as procurement of 83 Light Combat Aircraft Tejas jets (INR 39,000 crore), two regiments of Akash air defense missiles (INR 6,000 crore), six regiments of Pinaka Multi Barrel Rocket Launchers (INR 4,500 crore), eight Fast Patrol Vessels (INR 800 crore) and six next-generation missile vessels (INR 12,000 crore).

Production of 50 K-9 South Korean 155mm self-propelled howitzers based on a tracked-armored chassis, will also be postponed because of the ongoing pandemic.

https://www.defenseworld.net/news/26914/Indian_Defense_Procurement_Hit_as_Foreign_Suppliers_Defer_Deliveries#.XrOOTx9czcc

THEWEEK

Thu, 07 May 2020

Operation Samudra Setu: Why the Indian Navy chose INS Jalashwa and INS Magar

Landing Platform Docks have proved invaluable for the Navy's humanitarian missions

By Pradip R Sagar

On Tuesday, two Indian Navy warships, *INS Jalashwa* and *INS Magar*, were dispatched to Male, capital of the Maldives, as part of Phase-I of the evacuation of stranded Indians under Operation Samudra Setu.

INS Jalashwa will take two days to reach Male, while *INS Magar* will reach the Maldives on May 10. The two ships are to help in evacuating around 1,000 Indians from the country starting May 8 (Friday), with the passengers to disembark in Kochi.

The Indian Navy has carried out similar non-combatant operations overseas on earlier occasions; Operation Sukoon in 2006 and

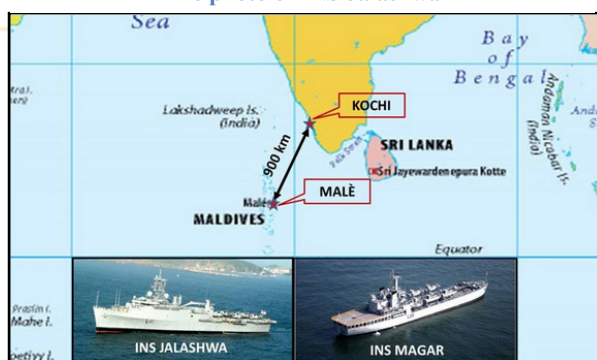
Operation Rahat in 2015. The choice of these two ships was done as they are both amphibious warfare vessels, designed to land and support ground forces.

The December 2004 tsunami exposed a critical capability gap in the Indian Navy's inventory to provide humanitarian assistance or disaster relief from undeveloped or semi-developed coastlines. A defence official explained that the launching of ground forces to sustain operations ashore in a hostile environment is an important task for the Indian Navy. While traditionally such capability has existed in the Navy through conventional amphibious vessels, in contemporary times such operations are best conducted by vessels capable of stand-off beaching—the capability to offload men and equipment without coming close to shore.

Such ships are called expeditionary operations platforms. Most ships carrying relief material have a small helicopter like the Chetak, as well as small boats with limited load-carrying



File photo of INS Jalashwa



An image released by the Press Information Bureau showing the mission and ships to be used for Operation Samudra Setu | Press Information Bureau

capability. Ships such as destroyers and frigates, though loaded with relief supplies and disaster relief bricks, required berths and jetty cranes which can be located at a considerable distance from the disembarking site, according to a naval officer.

"It was also observed that Landing Platform Dock (LPD) from the Singapore and US navies were very effective. The Indian Navy, therefore, scouted and shortlisted *USS Trenton*, LPD as the most suitable platform to fulfil intermediate capability till the Indian Navy builds its own LPD class of ships," an official said.



File photo of INS Jalashwa

The officer added that the six second-hand UH-3H Sea King helicopters offered to the Indian Navy had been turning out to be force multipliers for ships engaged in Humanitarian Assistance and Disaster Relief (HADR), out-of-area contingencies (OOAC) and evacuation operations.

Eventually, on 22 June 2007, *USS Trenton* was re-commissioned as *INS Jalashwa* at Norfolk, USA. After a 45-day voyage across the Atlantic, Mediterranean and Indian oceans, the ship arrived in India on September 13, 2007. A naval officer further said that since her commissioning in 2007, *INS Jalashwa* has proved to be an extremely valuable acquisition to the Navy's force levels.

"Her integration with the fleet has expanded the force architecture of the Navy and has been imparting valuable experience in running, deploying and maintaining an LPD. Her participation in exercises requiring amphibious capability, strategic sealift and HADR missions have expanded the window of exposure to the fleet and planners ashore," the official added.

INS Jalashwa has a full load displacement of 17,521 tonnes. The ship is 179m in length, has a width of 30.5m and can achieve a max speed of 21 knots. It has a complement of 330 personnel. She also has four Landing Craft Mechanised (LCM) for transporting troops ashore. The main weapon systems of the ship comprise of two CIWS AK-630 gun mounts and a 25 mm gun mount.

Similarly, *INS Magar*, which was commissioned by Admiral R.H. Tahiliani, Chief of the Naval Staff on 15 July 1987 at GRSE Yard, Calcutta, has been the lead ship of the *Magar*-class of amphibious warfare vessels of the Indian Navy. The ship has taken part in Operation Pawan, during which she was involved in the transfer of Army troops and vehicles from Chennai to Sri Lanka.

INS Magar has a displacement of 5,750 tonnes and the ship has a length of 120 metres and a beam of 17.5 metres. "Being an amphibious ship, the warship can carry tanks and Armoured Personnel Carriers (APCs) for transportation to target beaches. The ship can also carry a strength of 500 fully laden troops nearly 10 days, in addition to her own crew," a naval official said. He also said that the main weapon systems of the ship comprise of CRN 91 Guns, chaff launcher (KAVACH) and the WM-18A Rocket launcher. The ship also carries four landing craft vehicle personnel (LCVP) onboard which can be used for the landing of troops.

Explaining more about the warship, a naval official said that *INS Magar* has the capability to beach and discharge tanks, APCs and troops directly onto the target territory. The bow door of the ship opens after beaching to discharge the load embarked in the tank spaces. Other ships of the class include *Gharial*, *Shardul*, *Kesari* and *Airavat*.

The Indian Navy had carried out evacuation operations earlier also, notably during the 2006 Lebanon war. When military conflict broke out between Israel and Hezbollah broke out in July-August 2006, numerous foreign nationals visiting Lebanon were caught in the battle. The Government of India asked the Indian Armed Forces to help evacuate its citizens at risk from the conflict zone.

Operation Sukoon was launched by the Indian Navy to evacuate Indian, Sri Lankan and Nepalese nationals, as well as Lebanese nationals with Indian spouses, from the conflict zone during the war.

"Of the over 10,000 Indian nationals in Lebanon, almost 2,000 were at risk. Neighbouring Sri Lanka and Nepal, which lacked military resources, also requested the Indian government to help evacuate their citizens. Altogether, over 2,200 nationals of these countries were caught in the conflict zone," a senior official recalled.

Official added that Indian Navy Task Force, consisting of three warships and a fleet tanker, was returning to India from the Mediterranean following a goodwill visit and was just about to cross the Suez Canal. Following the hostilities, it was ordered to turn back to help evacuate Indian nationals from Lebanon.

The task force comprised the destroyer *INS Mumbai*, the frigates *INS Brahmaputra*, *INS Betwa* and the fleet tanker *INS Shakti*. The plan for the evacuation was for the warships were to take the evacuees to Cyprus, from where chartered Air India flights would fly them back to India.

"In the rescue mission, *INS Mumbai* evacuated 1,495 people to Cyprus, in three sorties on 20, 23 and 26 July. *INS Brahmaputra* and *INS Betwa* evacuated 188 and 254 people, respectively, during a sortie on 23 July. Altogether a total of 2,280 people including 1,764 Indians were evacuated. 112 Sri Lankans, 64 Nepalese and seven Lebanese nationals with Indian spouses were also among the evacuees," the officer said while adding that citizens of other friendly nations at risk were also evacuated as a courtesy.

Then came Operation Rahat in 2013. The Indian government had issued an advisory to Indian nationals to leave Yemen after the volatile security situation caused by the civil war. The Indian Navy undertook evacuation operations, taking Indian nationals from Yemen to Djibouti from where they were repatriated to India by air. Indian Naval ships *Sumitra*, *Mumbai*, *Tarkash* and passenger vessels *Kavaratti* and *Corals* participated in the operation.

"The operation lasted two weeks from 30 March to 17 April 2015 during which nine evacuation missions from Hodeidah, Aden and Ash Shi'hr ports in Yemen were undertaken. The operation resulted in the evacuation of 3074 personnel from Yemen, including 1,291 foreign nationals, including citizens of Bangladesh, Yemen, USA, UK, Egypt, Indonesia, Djibouti, Philippines, UAE," said an official.

<https://www.theweek.in/news/india/2020/05/06/operation-samudra-setu-why-the-indian-navy-chose-ins-jalashwa-and-ins-magar.html>

THE
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INTEREST

प्रसार एवम् विस्तार
के 50 वर्ष

Thu, 07 May 2020

India can defeat China in a war by following Beijing's Korean war strategy

Hit-and-run tactics in which Indian troops lurk in the Himalaya mountains, and then swooping down to surprise Chinese troops in the valleys below

By Michael Peck

Here's what you need to remember: India's options include more investment in offensive cyberwarfare, long-range precision weapons, hypersonic anti-ship missiles, maritime surveillance and anti-satellite technology. Rather than expensive surface ships like aircraft carriers, India should focus on submarines.

How can India defeat China in a war, even though China has a larger and more technologically advanced military?

By essentially using the same tactics that China successfully used to fight the United States in the Korean War in 1950-53. Hit-and-run tactics in which Indian troops lurk in the Himalaya mountains, and then swooping down to surprise Chinese troops in the valleys below.

That's the argument of an American defense expert who believes that India and America face parallel threats. While America is concerned about the security of the Western Pacific, India must worry about its disputed Himalayas border with China – over which the two nations fought in 1962 – as well as a growing Chinese presence in the Indian Ocean.

“Strategists and military force planners in India and the United States are grappling with a similar set of challenges posed by China’s military modernization and increasingly aggressive foreign policy,” writes Chris Dougherty, a former Pentagon strategist who is now a senior fellow at the Center for New American Security.

The problem for India what while the challenges for both nations are similar, their capabilities and resources are not. “Over the next ten years, the core difference between the United States and India regarding military competition with China is that the United States can feasibly pursue a strategy of fielding military forces superior to those of China—what defense planners sometimes refer to as a strategy of overmatch—while India cannot,” Dougherty writes. “Indian strategist and force planners must instead seek ways to offset their weaknesses and subvert Chinese strengths.”

Ironically, China faced a similar challenge in 1950, when it sent more than 300,000 ill-equipped peasant soldiers against a United Nations – mostly American – force that enjoyed vastly superior firepower, logistics, and air and naval supremacy. Yet by utilizing surprise and deception, and by using the cover of northern Korea’s mountains, the People’s Liberation Army was able to inflict a series of humiliating defeats on the U.S. Army in the winter of 1950-51, including the near-destruction of an American infantry division.

Dougherty faults India’s current defense strategy, which calls for defending India’s long, mountainous Himalayas border with China with light forces, and then counterattacking into the Chinese-occupied Tibetan plateau to seize key terrain and bring China to the peace table. “However, leaving the mountains to enter the plateau makes high-signature Indian forces vulnerable to the full capabilities of Chinese precision strikes and counter-maneuver,” Dougherty warns. “It would be foolhardy at best and potentially suicidal at worst....By attempting to defend the entire border, India will effectively defend none of the border.”

In an Indian Ocean naval war, in the short term, India would enjoy the advantage of concentrating its forces and operating near its bases, while Chinese forces would be split between the Indian and Pacific oceans. But in the long run, China would bring superior resources to bear.

“Given this rather dire assessment of India’s capacity for strategic competition with China, its position would seem to be hopeless, and yet it is not,” Dougherty argues. “India has several strategic advantages, most critically geography and a largely defensive strategic posture, which can allow its armed forces to be effective in countering China without massive increases in defense spending or major restructuring.”

For example, India can block chokepoints to keep Chinese ships out of the Indian Ocean. It can use cyberwarfare to disrupt Chinese operations.

“In both scenarios, India should exploit its defensive posture and geographical advantages to draw Chinese forces into disadvantageous encounters and stretch China’s lines of communication,” Dougherty argues. “Instead of traditional offensive maneuver, India should use unconventional forms of maneuver to attack the PLA’s critical systems, disrupt their operations, and impose costs on the Chinese regime.”

India's options include more investment in offensive cyberwarfare, long-range precision weapons, hypersonic anti-ship missiles, maritime surveillance and anti-satellite technology. Rather than expensive surface ships like aircraft carriers, India should focus on submarines. “While India’s preference for surface vessels over submarines may be supported by historical norms, it remains illogical in the face of Chinese naval superiority,” Dougherty writes. “A larger undersea fleet could allow India to impose considerable costs on the PLAN [People’s Liberation Army Navy] and potentially deny it from gaining maritime superiority in the Indian Ocean.”

India can also learn from U.S. experience in joint warfare to fix what Dougherty sees as a “badly stove-piped and sclerotic” Indian military command structure.

“India lacks a strong defense bureaucracy or a joint military body to oversee strategy,” he writes. “Instead, India’s military services dominate the discussion, with the Indian Army wielding by far the most power. The result, according to most observers of Indian defense issues, is a ground-centric military strategy and a budget that allocates too many resources toward Army personnel and not enough toward modernizing India’s badly outdated Air Force or undersized Navy.”

Dougherty admits that his analysis was inspired by China’s success in the Korean War. “I specifically thought about the PLA’s use of infiltration and counterattacks to impose costs on the United States in Korea,” he told the National Interest.

However, Korea is not the same as the Himalayas. “The major differences are two-fold. First, the Himalayan border is enormous width-wise relative to the Korean peninsula, so India will need better situational awareness and an ability move laterally across the front. Second, there was a flaw in the PRC’s strategy in that they took enormous casualties and the best outcome was a return to the status quo. They lacked a credible means of forcing the issue beyond the front line—their only recourse was to keep feeding forces into the theater. That’s where things like cyberwarfare can come into play and help give India a means to force conflict termination.”

<https://nationalinterest.org/blog/buzz/india-can-defeat-china-war-following-beijings-korean-war-strategy-150971>



Thu, 07 May 2020

HAL rebuilds mangled Jaguar strike jet from Omani airframe for IAF

By Raunak Kunde

Harsh Vardhan Thakur, Test Pilot with HAL has dropped hints that 2 ex Jaguar strike aircraft procured from Royal Air Force of Oman (RAFO) by India have been used to rebuild an existing IAF Jaguar strike aircraft which had a mangled airframe near front fuselage section and probably was put in storage due to lack of airframe structure since the production of the aircraft has been shut decades ago and retired now by all its former operators making India its lone operator in the world now.

Oman had retired its last four operational Sepecat Jaguars in 2014 and had purchased 12 in the mid-'70s and maintained the same level of fleet till 2014 when they were retired. Two airframes were procured by India to be used as spares for the existing fleet of 90 jets in the IAF. IAF also has plans to acquire 31 Ex-Jaguars from the French air force which were to be donated free of cost to India also to be used as spares.

IAF has plans to continue operating at least 40 upgraded Jaguar strike aircraft in Darin-III configuration till 2034 when they could have seen nearly 50 years of service but since jaguars were licensed build locally in India by HAL, the last four jaguars were supplied by HAL in 2008, which makes the youngest airframes only 12 years old.

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<https://idrw.org/hal-rebuilds-mangled-jaguar-strike-jet-from-omani-airframe-for-iaf/#more-226913>

Thu, 07 May 2020

Indian MoD signed a contract with Turkey's TAIS shipyards for 5 Fleet Support Vessels

By Martin Manaranche

The TAIS consortium, in partnership with HSL, won the Indian Ministry of Defence's tender to design and build five FSVs (also known as Fleet Support Ship – FSS) for the Indian Navy in May 2019, but the contract was significantly delayed for cost and political reasons, including the Indian authorities' dissatisfaction with Turkey's active military and technical cooperation with Pakistan. Prior to the selection of the Turkish TAIS project, HSL offered the Indian Navy to build FSVs in partnership with South Korea's Hyundai Heavy Industries (HHI), but eventually the HHI proposal was rejected by the Indian authorities for cost reasons.

The value of the contract signed back in February is 160 billion rupees (about \$2.1 billion). The supply vessels will be built by HSL with the assistance of Turkish shipyards. The TAIS consortium includes Turkish shipbuilding companies Anadolu Shipyard (ADiK, lead developer of the project), Istanbul Shipyard, Sedef Shipyard and Selah Shipyard. The construction of the first FSV is to begin at HSL in Visakhapatnam at the end of 2020 with the delivery to the Indian fleet in 2024, with the remaining four units to be delivered at 10-month intervals.

<https://www.navalnews.com/naval-news/2020/05/indian-mod-signed-a-contract-with-turkeys-tais-shipyards-for-5-fleet-support-vessels/>

Business Standard

Thu, 07 May 2020

Bharat Dynamics jumps on bagging order from IAF

Bharat Dynamics jumped 5% to Rs 224.85 after the company said it received a Rs 293.33-crore order from Indian Air Force.

Bharat Dynamics received an order to supply MRSAM missile sections for Indian Air Force deliverables. The order has to be executed in next 24 months. The announcement was made during trading hours today, 6 May 2020.

The stock has gained 7.38% in two trading sessions from its previous closing low of Rs 209.4 posted on 4 May 2020.

BDL's standalone net profit fell 71.8% to Rs 53.18 crore on a 49.6% decline in net sales to Rs 495.42 crore in Q3 December 2019 over Q3 December 2018.

Bharat Dynamics manufactures defense equipment. The company offers ammunitions, counter measures dispensing, infra red interference indicators, and missile systems. BDL serves military and aerospace industries in India.

(This story has not been edited by Business Standard staff and is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/news-cm/bharat-dynamics-jumps-on-bagging-order-from-iaf-120050600574_1.html

6 Insane vehicles used by the Indian armed forces that keep them combat-ready 24/7

Growing up, some of us have dreamt of joining the Indian Armed Forces for a number of reasons. For some, it was the gallantry, the disciplined lifestyle, the notions of patriotism, and self-sacrifice. In essence, it was the life of a hero that the army, the air force and the navy offered to us that drew us. For some of us though, it was certainly the tools and ‘toys’ that defence personnel get to work with, that had our fancy.

When it comes to the armoured vehicles that our armed forces use, man oh man, are they something to look at! Rugged, tough and capable of treading across any terrain, these vehicles make the toughest SUVs on the market that we plebs can buy, look like Lego toys. In essence, there is no mountain high enough nor a ford deep enough that would pose a challenge for these vehicles.

Here are 6 of the finest armoured vehicles that are in use across all branches of the Indian Armed Forces that send shivers down the spines of our enemies, and makes every one of us hold our heads high with pride.

Tata Merlin LSV

Ever since Tata won the contract for supplying some speciality vehicles for the Indian Army, they have been churning out some of the best armoured vehicles in the world. The Merlin, one of their finest creations, is an LSV or a Light Support Vehicle. It has been made as per the specifications used by NATO forces and boasts a protection level of STANAG 4569 Level-1, the highest grade for a vehicle of this size. Apart from carrying armed personnel and supplies, the standard Merlin comes equipped with a machine gun, and a grenade launcher, mounted on its roof. Furthermore, depending on the area where it is deployed, Tata can customise these fittings and create one heck of a beast.

Shri Lakshmi Defence Solutions Viper

Shri Lakshmi Defence Solutions is a relatively new defence supplier but some of the equipment that they have developed, and supplied has made them a force to be reckoned with. Their high offence tactile vehicle, the Viper is one its kind as far as India is concerned. Apart from being bullet-proof, the Viper is also impervious to grenades, landmines, and small IED blasts. Furthermore, it is designed to attack ferociously when being attacked meaning, if it is properly fitted with all the bells and whistles that it can carry, not only will it protect the 6 people operating it, it can also knock the teeth off attacking enemies.

Mahindra Marksman

Developed by Mahindra Defence Systems after the 26/11 attacks, the Marksman was specifically designed for areas where there isn't a lot of space, and where manoeuvrability is key. The Marksman has proven its mettle in areas of conflict including Jammu & Kashmir. While the vehicle is not as impervious to attacks like the previous two, it will do just fine against heavy bullet fire, and grenades. One of the few vehicles with our armed forces that have run-flat tech in its tyre. Just to put that in perspective, consider this – no matter what the condition, and whether they have a road or not, this beast can be driven flat out at its top speed of 120 kmph, everywhere, even with a flat tyre.

Mahindra Armoured MEVA Straton Plus

The Straton Plus is basically an armoured personnel carrier that is offered in two variants, both of which are equally capable of pretty much everything that can come up in conflicted areas, that has not turned into a warzone. The Stratons are designed to withstand heavy gunfire for a long

time, while allowing the 12 personnel riding inside the vehicle, to return fire, without compromising their safety. Furthermore, troops can mount a heavy machine gun, or a grenade launcher on the roof and rain hell, should things ever turn sour. Honestly, you have to be mental if you think that anyone would dare to take on this beast.

Renault Sherpa

The Renault Sherpa isn't designed to withstand gunfire for a long period, and neither has it been designed to withstand landmines. Instead, it is more of reconnaissance and patrolling vehicle. Which means that it has been bequeathed with speed and power. Whatever the condition is, whether they have anything that remotely resembles a road or not, the Sherpa can hit a top speed of 110 kmph, anywhere. Moreover, it can carry 4-5 people, along with 11 tonnes of supply. That's not it though. The Sherpa has a fuel tank with a capacity of 1000 litres. Your typical SUV has a fuel tank that's barely 1/10th the capacity, and that too if they have been generous with the size.

Mahindra MPV

Yet another armoured vehicle from the workshops at Mahindra. The MPV stands for Mine Protected Vehicle. This vehicle is impervious to the worst kinds of land mines, grenade attacks, and of course, the heaviest of gunfire. The MPV was designed to be used in counter-insurgency operations, and anti-Naxal operations. It is a proper 6X6 meaning that at the engine powers all the six wheels at all times. It protects its 18 occupants from about 14 kilograms of TNT when detonated right below the crew compartment. Plus, it can be equipped with a remote weapon system to deal with nearby threats.

Now imagine someone thinking of jacking these vehicles. Seriously, how idiotic do you have to be to even think of something like that.

<https://www.defencenews.in/article/6-Insane-Vehicles-Used-By-The-Indian-Armed-Forces-That-Keep-Them-Combat-Ready-24/7-830479>

Science & Technology

The Indian **EXPRESS**

ज्ञान प्रसार एवम् विस्तारं Thu, 07 May 2020

China on track to send astronauts to Moon; new rocket's test launch successful

Aboard the Long March 5 was a special prototype spacecraft that is somewhat akin to the deep-space Orion capsule NASA has been developing to people to the Moon and beyond

In a major development, China has launched a new rocket and a prototype deep-space spacecraft. The state media reported the launch successful which paves the way for the country's ambitions to operate a permanent space station and sending astronauts to Moon.

As per *Xinhua*, a Long March 5B rocket took off from the Wenchang launch site on the southern island of Hainan. The rocket is a massive vehicle with four strap-on boosters that provide extra thrust at liftoff. Aboard the Long March 5 was a special prototype spacecraft that is somewhat akin to the deep-space Orion capsule NASA has been developing to people to the Moon and beyond.



The Long March 5B carrier rocket takes off from Wenchang Space Launch Center in Wenchang, Hainan Province, China May 5, 2020. (Image: China Daily via REUTERS)

Eight minutes after the launch, the unmanned prototype spacecraft separated successfully and entered its planned orbit, *Xinhua* reported. A test version of a cargo return capsule also separated from the rocket successfully.

China hopes the craft will transport astronauts to a space station by 2022— and eventually to the Moon. The United States is so far the only country to have sent humans to the Moon but so far, China has also not only successfully sent satellites into orbit and astronauts into space but also landed a rover to the far side of the Moon last year.

The successful maiden flight of the 849 tonnes and 54-metre Long March 5B should pave way for its future plans. The next big mission for China is to land a probe on Mars that is expected to liftoff this year.

Also, the assembly of the Tiangong space station is expected to begin this year and finish in 2022. The name of the space station means Heavenly Palace and it will have three modules with living and working quarters and two annexes for scientific experiments.

China space exploration plans include sending an astronaut to the Moon in about a decade and build a base on the lunar surface. Meanwhile, its lunar rover on the far side has driven about 450 metres so far.

<https://indianexpress.com/article/technology/science/china-long-march-5b-astronaut-moon-launch-6396940/>



Thu, 07 May 2020

KIST develops large-scale stretchable and transparent electrodes

Wavy silver nanowire network on stretchable substrate were fabricated for large-scale stretchable and transparent electrodes. It can be potentially applicable to stretchable devices and future stretchable display applications

A Korean research team has developed a large-scale stretchable and transparent electrode for the stretchable display. The Korea Institute of Science and Technology (KIST) announced that a research team, led by Dr. Sang-Soo Lee and Dr. Jeong Gon Son at KIST's Photo-Electronic Hybrids Research Center, has developed a technology to fabricate a large-area (larger than an A4 sized paper) wavy silver nanowire network electrode that is structurally stretchable with a high degree of conductivity and transparency.

Transparent electrodes, through which electricity flows, are essential for solar cell- and touchscreen-based display devices. The indium tin oxide (ITO)-based transparent electrode is the one currently commercialized for use. The ITO-based transparent electrode is made of a thin layer of metallic oxides that have very low stretchability and is easy to fragile. Thus, the ITO electrode hard to be used for flexible and wearable devices, which are expected to quickly become mainstream products in the electronic device market. Therefore, it is necessary to develop a new transparent electrode with stretchability as one of its special features.

A silver nanowire is tens of nanometers in diameter, and the nano material itself is long and thin like a stick. The small size of the nanowire allows it to be bent when an external force is applied. Since it is made of silver, silver nanowire has excellent electrical conductivity and can be used in a random network of straight



IMAGE: A Korean research team has developed a large-scale stretchable and transparent electrode for the stretchable display. The Korea Institute of Science and Technology (KIST) announced that a research team has... [view more](#)

nanowires to fabricate a highly transparent and flexible electrode. However, despite the fact that silver nanowire is bendable and flexible, it cannot be used as a stretchable material.

Other research teams have studied stretchable electrodes using a method of placing silver nanowires on pre-stretched elastic substrates and relaxing the substrates so that they return to their original size, while in the process creating wavy or wrinkled silver nanowire structures with small radius of curvature. However, this method has one major problem: the nanowires are easily broken by the repeated stretching-relaxing cycles. This problem typically have been approached by increasing the number of nanowires to make a high-density nanowire network so that enough electrical links can still be maintained to use the elastic electrodes, even if the nanowires are partially broken. However, creating a high-density network considerably decreases transparency and makes it very challenging to fabricate a highly transparent electrode that can be stretched and transformed with both transparency and conductivity.

The KIST research team, led by Dr. Sang-Soo Lee and Dr. Jeong Gon Son, has developed a new process to form a structurally stretchable nanowire network by bringing the nanowire networks in contact with solvents to overcome the problem nanowire breakage and damage when relaxing the pre-stretched substrate. When the solvents are placed on the nanowire networks, they become wet, and there is less frictional resistance between the individual nanowires. In particular, each silver nanowire can be slid by water and rearranged into a curved nanowire structure with a large radius of curvature, so that a structure capable of stably stretching can be realized. Since the nanowires do not experience any unstable conditions, there are no nanowire network fractures or nanowire layer peeling.

By fabricating a silver nanowire network in this way, the research team was able to stretch the substrate and its nanowires by at least 50% of the initial length, stably maintaining transparency and conductivity for approximately 5,000 stretching-relaxing cycles. The team also found that this type of material could be produced using an inexpensive and environmentally-friendly process that uses ethanol and water as solvents.

The KIST research team used its newly developed process to form a wavy silver nanowire network film on a substrate the size of an A4 paper and succeeded in creating a stretchable and transparent display the size of an adult's hand. The created display maintained its constant luminescence efficiency despite the imposition of various mechanical deformations. Through testing, the team was able to prove the applicability of the new process to all displays that are transparent except for their electroluminescent layer.

Dr. Sang-Soo Lee at KIST said, "The stretchable and transparent electrodes made using wavy silver nanowire networks, developed through this research, have a high degree of electrical conductivity that is not changed by any deformation." KIST's Dr. Jeong Gon Son added, "Since the technology can be used for the mass production, it is expected to have a great impact on markets related to wearable electronic devices, such as high-performance smart wear, and the medical equipment field."

*(The research, backed by Korea's [Ministry of Science and ICT](#), was conducted as one of Institutional Research Program of the Korea Institute of Science and Technology, and as a key researcher support project of the National Research Foundation of Korea. An article explaining the results of this research was published in the latest issue of *Advanced Functional Materials*, a renowned international journal in the materials field (IF:15.621).)*

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https://www.eurekalert.org/pub_releases/2020-05/nrco-kdl050620.php

A technique to produce patterned transition metal ditelluride layers for 2-D devices

By Ingrid Fadelli

Researchers at Ulsan National Institute of Science and Technology (UNIST) in South Korea have recently introduced a method to produce thin and patterned transition metal ditelluride films to be integrated in 2-D metal semiconductors. Their synthesis technique, presented in a paper published in *Nature Electronics*, could mitigate the challenges associated with the high contact resistance of existing electronics based on 2-D materials.

Since the discovery of graphene, a material with highly desirable properties for the development of electronics, other 2-D layered materials with similar characteristics have attracted substantial attention. These materials include transition metal chalcogenides, such as tungsten ditelluride and molybdenum ditelluride (WTe_2 and MoTe_2).

These transition metal ditellurides are a class of transition metal chalcogenides that exhibits unique and extraordinary electrical and optical qualities. They have shown great promise for the development of several technologies, including quantum computers, transistors and phase-transition memories.

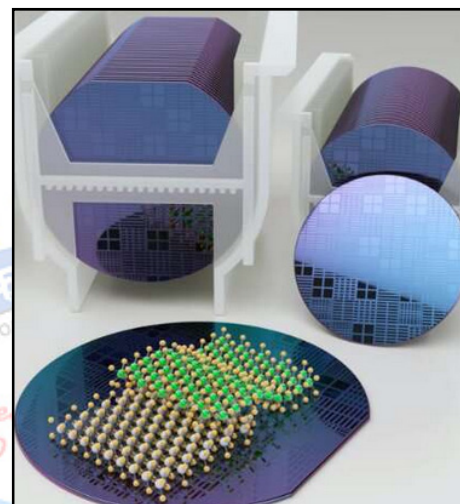
"Most studies using 2-D transition metal ditellurides have exclusively exploited the mechanical exfoliated flakes from the bulk single crystals, which hinders the practical applications of the materials," Prof. Soon-Yong Kwon, one of the researchers who carried out the study, told TechXplore. "What's more, the defects at the interface between metal and semiconductors can trigger the contact issues (including the Fermi-level pinning) which generally lower the carrier injection efficiency of the nano-electronic devices based on 2-D materials. We tried to solve these contact problems using the metallic 2-D transition metal ditellurides with low work function."

The new approach to synthesize transition metal ditellurides devised by Prof. Soon-Yong Kwon and his colleagues entails the use of a tellurium-rich eutectic alloy as a gas source that triggers nucleation and the growth of the crystals. Using this method, the researchers were able to grow 4-inch scale 2-D transition metal ditellurides over a short period of time (approximately 10 minutes), at a relatively low temperature of 450°C . Remarkably, the process can also be adapted to create wafer-scaled thin films with a variety of different structural patterns.

"We applied the 2-D transition metal ditellurides films as electrical contacts to inject carriers into 2-D semiconductors, such as molybdenum disulfide," Seunguk Song, one of the researchers who carried out the study, said. "We found that such electrical devices followed the ideal law for the carrier injection (i.e., Schottky-Mott theory), which had a substantial advantage in controlling the efficiency of the electrons' flow at the interface."

Prof. Kwon, Song and their colleagues used films synthesized via their method to build electrical contacts and integrated them into existing 2-D semiconductors. The resulting devices were found to outperform devices based on other analogous 2-D metallic materials, exhibiting a lower contact resistance and a higher performance.

"The key point of our production method is to provide the large amount of tellurium vapor constantly to the transition metal precursor in order to promote their chemical reaction." Song said. "This is particularly important because the chemical activity between W and Te is very low,



generally challenging in its successful growth. To mitigate this problem, the precursor of a Ni_xTe_y alloy film was selected as a Te source."

In the films synthesized by the researchers, the compound Ni_xTe_y continually provides and recaptures Te vapors, as Ni_xTe_y is in a liquid-like phase at a growth temperature that is higher than the alloy's melting point (aka eutectic point). This process ultimately averts the scarcity of Te frequently observed during powder-based chemical vapor deposition processes.

"By transferring 2-D MoS_2 crystals onto the 2-D patterned $(\text{W},\text{Mo})\text{Te}_2$ thin film, we could simply fabricate the vertically contacted heterostructures," Prof. Kwon said. "These 2-D/2-D metal-semiconductor junction transistors had tunable Schottky barrier heights that depended on the work functions of $(\text{W},\text{Mo})\text{Te}_2$ owing to the absence of interface issues. This enabled us to get the lowest Schottky barrier height for the transistor based on monolayer MoS_2 among the other reported studies using 3-D or 2-D metal contacts."

The study could have important implications for the future development of electronics based on 2-D materials. Most notably, the synthesis approach introduced by Prof. Kwon, Song and their colleagues could open up the possibility of controlling some types of polarity in 2-D semiconductors by enabling the production of new 2-D metals with different work functions.

"In nature, there are other variety of 2-D metals with interesting physical properties, but their high-quality, large-area growth is still rare," Song said. "Based on the synthetic approaches for these novel 2-D metals, we now plan to study 2-D/2-D heterostructures and device integrations."

<https://techxplore.com/news/2020-05-technique-patterned-transition-metal-ditelluride.html>

COVID-19 Research

ThePrint

Wed, 06 May 2020

Coronavirus has transformed how scientific research findings are communicated

Open access to scientific papers, AI mining research to get data insights faster, and a more-open review process — this could be the new future for science.

By Justin Fox

Last June, the Cold Spring Harbor Laboratory on Long Island, Yale University and The BMJ (formerly the British Medical Journal) started a new "preprint server" for medical research called MedRxiv. Preprint is one term of art for an academic paper that hasn't been peer reviewed or published yet. Working paper is another. They've been distributed at meetings and seminars as long as anyone can remember. In 1991, physicists began sharing theirs on the internet on a server that came to be called ArXiv (pronounced "archive"). Mathematicians, astronomers, economists and scholars in a few other disciplines soon followed suit — some on ArXiv, some on other sites.

Medical researchers did not. For one thing, peer-reviewed biomedical journals publish research findings faster than those in some other fields (average time to publication is half what it is in business and economics), so the need for a speedy alternative was less pronounced. For another, medical research often involves questions of life or death that presumably deserve more pre-publication scrutiny than, say, a theoretical physics paper. And given that publishing in prestigious journals is key to career advancement, and prestigious medical journals have long made a big deal about having exclusives on new research results, researchers had legitimate worries that releasing results earlier could hurt them.

Things started off unsurprisingly slowly for MedRxiv last summer, and there wasn't all that much sign of an acceleration over the course of 2019. Then a new coronavirus began infecting people in Wuhan, China, and, well, you can probably guess what happened next:



Page views to the MedRxiv site are [now averaging](#) 15 million a month, up from 1 million before the pandemic. Something significant has changed in medical research.

Many of the coronavirus-related papers being posted on MedRxiv are rushed and flawed, and some are terrible. But a lot report serious research findings, some of which will eventually find their way into prestigious journals, which have been softening their stance on previously released research. (“We encourage posting to preprint servers as a way to share information immediately,” emails Jennifer Zeis, director of communications at the New England Journal of Medicine.) In the meantime, the research is out there, being commented on and followed up on by other scientists, and reported on in the news media. The journals, which normally keep their content behind steep paywalls, are also offering coronavirus articles outside of it. New efforts to sort through the resulting bounty of available research are emerging, from a group of Johns Hopkins University scholars sifting manually through new Covid-19 papers to a 59,000-article machine-readable data set, requested by the White House Office of Science and Technology Policy and enabled by an assortment of tech corporations and academic and philanthropic organizations, that is meant to be mined for insights using artificial intelligence and other such means.

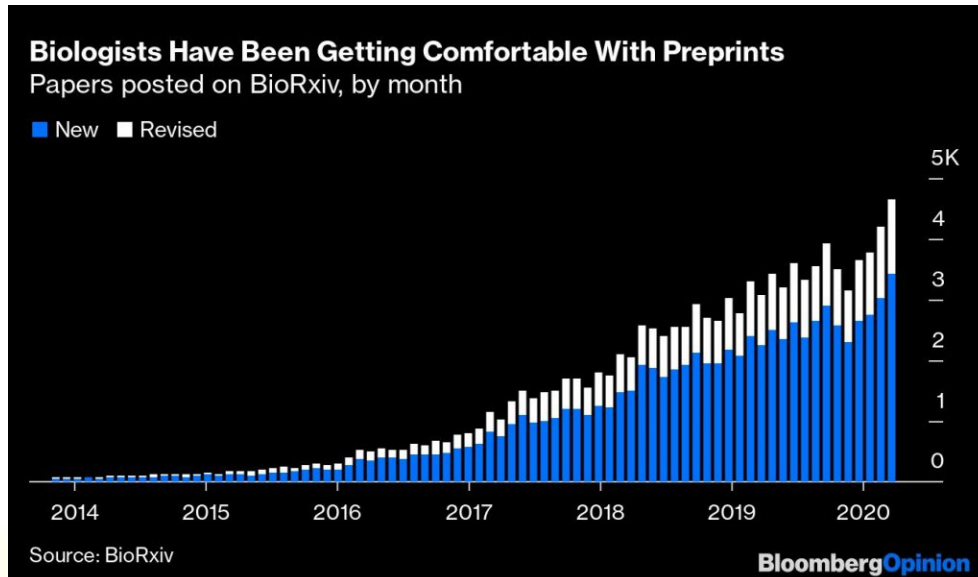
This is the future for scientific communication that has been predicted since the spread of the internet began to enable it in the early 1990s (and to some extent long before then), yet proved slow and fitful in its arrival. It involves more or less open access to scientific research and data, and a more-open review process with a much wider range of potential peers than the peer review offered by journals. For its most enthusiastic boosters, it is also an opportunity to break through disciplinary barriers, broaden and improve the standards for research success and generally just make science work better. To skeptics, it means abandoning high standards and a viable economic model for research publishing in favor of a chaotic, uncertain new approach.

I'm mostly on the side of the boosters here, but have learned during five years of writing on and off about academic publishing that the existing way of doing things is quite well entrenched, and that would-be innovators often misunderstand the challenges involved in displacing or replacing it. This moment does feel different, though. “It's going to really be fascinating to see if this will be the tipping point,” says Heather Joseph, executive director of the Scholarly Publishing and Academic Resources Coalition, an organization of academic libraries that has been pushing hard for a more open research infrastructure. “Because of the way distribution of scientific information is being piloted in a new way in the Covid crisis, my hope is that this will spill over to other areas in subsequent years,” adds Ijad Madisch, a German virologist who is founder and chief executive of ResearchGate, a social network for researchers that has seen a surge in activity and collaboration

around Covid-19. “It scares me that we as scientists might just go back to doing things as we did before.”

A ‘Scoop-Protection Device’

At MedRxiv, co-founder Richard Sever is pretty sure that medical researchers won’t be turning away from preprints after the crisis has passed. “Once a field starts doing this, they don’t stop,” he says. Sever is assistant director of the Cold Spring Harbor Laboratory Press and also co-founder of BioRxiv, MedRxiv’s sister preprint server, which he has watched catch on with one biology subfield after another (first genomics, then cell biology, most recently neuroscience) since its founding in 2013. BioRxiv has also seen a recent surge in submissions and readership, albeit less dramatic than MedRxiv’s given that it was starting from a much larger base.



A big part of the attraction of preprints for researchers studying a fast-moving phenomenon such as Covid-19 is that they rather than journal editors control the timing of the release of new research results. “It’s a scoop-protection device,” Sever says. Other major destinations for coronavirus-related preprints include Research Square, Preprints.org and the Center for Open Science’s OSF Preprints. Overall, there were at least 8,830 biomedical preprints posted in March, up 142% from March 2019, according to data compiled by Jessica Polka and Naomi Penfold of the nonprofit Accelerating Science and Publication in Biology (aka ASAPbio).

BioRxiv and MedRxiv don’t accept every submission. Pure opinion pieces aren’t allowed — there has to be actual research involved. Beyond that, says Sever, “if something goes up on BioRxiv it just means we don’t think it’s dangerous and it’s probably not crazy nonsense,” while for MedRxiv there’s heightened scrutiny of potentially dangerous claims plus a checklist of conditions that any clinical research paper must satisfy. Both servers also recently began declining papers that pointed to treatments for the coronavirus based purely on computer modeling. “We decided that somewhere on this spectrum was a point where peer review was needed,” Sever says.

This came as something of a shock to Albert-László Barabási, a prominent network scientist at Northeastern University in Boston who had a paper on a “Network Medicine Framework for Identifying Drug Repurposing Opportunities” rejected last month by BioRxiv. He eventually just posted it on ArXiv instead, but wondered on Twitter if it might make more sense for BioRxiv to create a scientists-only list for potentially sensitive Covid-19 research. ResearchGate’s Madisch also likes the idea of a setup “where the research community can give feedback before it’s released to the public,” but Sever said he worries that such an approach would just end up favoring an in-crowd of scientists at top universities.

So for now, at least, it’s all happening in public. One oft-heard complaint is that this allows unvetted research to be distributed to lay readers — as with the paper posted on BioRxiv in late January that found an “uncanny similarity” between several genetic sequences in the new coronavirus and those in the human immunodeficiency virus that causes AIDS, findings that as

BuzzFeed News science reporter Stephanie M. Lee described in an account of the paper's rise and fall were immediately latched onto online as evidence that the virus was man-made. After other researchers tweeted criticism that the findings were in fact probably the product of random chance, though, the authors retracted the paper.

Clearly, preprint servers can allow bad information to be presented to the public. But research findings published in peer-reviewed journals have to be retracted sometimes, too, and many more turn out to be wrong in the sense that they can't be replicated by subsequent studies. As Stanford Medical School's John Ioannidis argued in a 2005 paper so famous that it has its own Wikipedia page, "most published research findings are false."

That brings us to perhaps the most vigorously debated MedRxiv paper so far, "COVID-19 Antibody Seroprevalence in Santa Clara County, California," posted on the site April 17 by a multidisciplinary team of authors that included Ioannidis. The paper reported the results of testing for coronavirus antibodies among 3,300 county residents recruited by Facebook ads, 1.5% of whom tested positive. The authors then made a number of statistical adjustments that upped their estimate of the percentage of county residents who had been infected with the coronavirus to 2.49% to 4.16%, which was 50 to 80 times the number of confirmed cases at the time and implied a Covid-19 fatality rate of just 0.12 to 0.2% — not all that different from the rates usually reported for seasonal influenza (although the actual ratio of influenza fatalities to infections is probably lower).

Some infectious disease experts, whose estimates of Covid-19's infection fatality rate have mostly centered on a range of about 0.5% to 1%, took to Twitter to offer skeptical but reasonably polite critiques. (Disclosure: so did I.) But physicist-turned-virus-researcher Richard Neher of the University of Basel and statistics professors Will Fithian of University of California at Berkeley and Andrew Gelman of Columbia University all argued that the statistical adjustments in the paper were outright wrong, with Gelman concluding on his blog that the authors of the paper "owe us all an apology. We wasted time and effort discussing this paper whose main selling point was some numbers that were essentially the product of a statistical error."

No such apology has been forthcoming, but the authors did on Thursday replace the paper on MedRxiv with a revised version that changed their estimate of the percentage of county residents infected with the virus to a range of 1.3% to 4.7%, and generally did much more to show their work and stress the uncertainty inherent in their findings. They also expressed appreciation for the many criticisms the paper had received, concluding that, "We feel that our experience offers a great example on how preprints can be an excellent way of providing massive crowdsourcing of helpful comments and constructive feedback by the wider scientific community in real time for timely and important issues."

Other scientists weren't so sure the rough-and-tumble — and public — discussion around the paper was such a good thing. Two prominent medical school professors wrote an opinion piece for the science news site Stat decrying some of the criticisms as "ad hominem," while Neeraj Sood of the University of Southern California, lead author of a related study in Los Angeles County that hasn't been released as a preprint although preliminary results have been shared, told BuzzFeed's Lee that "I don't want 'crowd peer review' or whatever you want to call it. It's just too burdensome and I'd rather have a more formal peer review process."

But is a more formal peer review really better? "To me there's no doubt that more eyes on something mean that ultimately a better judgment can be made," says MedRxiv's Sever, a molecular biologist with long experience in editing scientific journals.

Journals send articles to two or three people, ask for comments in two weeks, and the reviewers never do it on time and you have to pester them. The chance you get a representative sample is not that great. Wouldn't it be great if there were a lot of other discussions that had already happened that journals could incorporate in their evaluation?

Who's going to pay for all of this?

This implies a world in which open research-distribution channels and peer-reviewed journals exist side by side, playing different roles — which is how things have worked for quite a while in some academic disciplines. “In the old days, journals were viewed as a means of disseminating ideas,” Yale economist Pinelopi Goldberg, then the editor in chief of the American Economic Review, said at a conference I attended four years ago. “The most important function that journals have these days is the certification of quality.” Or as the saying supposedly goes (according to Sever), “Nobody ever got a job by putting something on ArXiv.”

Academic journal publishing is dominated by a handful of for-profit publishers — the largest is Elsevier, a subsidiary of London-based RELX Plc — who sell digital access to their journals in large bundles to university libraries. Medical publishing is a bit different, with many leading journals controlled by nonprofit medical societies and distributed widely among practitioners, but they too rely heavily on subscription paywalls. Keeping scientific research that is funded by philanthropies, universities and government agencies behind such paywalls has been unpopular for a while, and has been coming under increasing pressure from those who pay for the research, especially in the European Union. Publishers and universities have been exploring new “read and publish” contracts in which universities pay both for access to the journals and paywall-free publication of articles by their faculty, but as the consequences of the coronavirus hammer budgets, sharp cutbacks in library spending on journals seem inevitable. “Those kinds of reckonings are coming very quickly,” says Joseph.

Then again, these reckonings could endanger newer forms of scientific communication as well. Although preprint servers don't cost nearly as much to run as academic journals — ArXiv has expenses of about \$2.7 million a year, while the American Association for the Advancement of Science, publisher of the interdisciplinary journal *Science*, reports journal-and-publishing-related expenses for 2018 of more than \$45 million — most have to rely on the generosity of philanthropists and universities to pay the bills, and will struggle to make ends meet in a time of higher-education cutbacks. As scientific-publishing veteran Kent Anderson wrote in his subscription newsletter last week:

Open science, which is essentially a basket of new expenses with no established funding models, isn't going to suddenly receive millions or billions from the EU or some consortia of universities. So, hit the “pause” button here.

One can imagine the pause button being hit for many aspects of scientific research in the coming months and years. There surely won't be a shortage of funding for those who study viruses, pandemics and the like, but many other fields could face tough times. In some disciplines this may push scholars toward more open, collaborative ways of doing research and communicating it; in others it may reduce experimentation and communication. The scientific community is not a monolith. But on the whole, it does seem to be moving in a new direction. -*Bloomberg*

<https://theprint.in/opinion/coronavirus-has-transformed-how-scientific-research-findings-are-communicated/415328/>

Israel develops key Covid antibody that ‘attacks and neutralises’ the virus in patient’s body

Israel Institute for Biological Research has isolated a monoclonal antibody that can neutralise Covid-19, but it is unclear if the vaccine has been tested on humans.

By Aneesha Bedi

New Delhi: Israel has isolated a key coronavirus antibody at its primary biological research centre, Defence Minister Naftali Bennett said Monday. He called it a “significant breakthrough” towards a possible treatment for Covid-19.

In an official statement, Bennet claimed that the “monoclonal neutralising antibody” developed by the Israel Institute for Biological Research (IIBR) “attacks the virus and neutralizes it” inside the virus carrier’s body.



A magnified coronavirus germ is displayed on a desktop computer monitor during coronavirus patient sample detection tests in the virology research labs (Representational Image) | Photographer: Geert Vanden Wijngaert | Bloomberg

A magnified coronavirus germ is displayed on a desktop computer monitor during coronavirus patient sample detection tests in the virology research labs (Representational Image) | Photographer: Geert Vanden Wijngaert | Bloomberg

Monoclonal antibodies, as the name suggests, are cloned from a single recovered cell. Thus, they are much easier to create and use, as opposed to polyclonal antibodies which will have to be derived from multiple cells.

In typical antibody vaccines, neutralisation occurs when the laboratory-developed antibodies mimic the body’s natural immune response and attack the virus when exposed to it.

IIBR completes development phase

According to the *Jerusalem Post*, IIBR has completed the development phase of the antibody formula and is now looking to manufacture it.

The statement quotes IIBR Director Shmuel Shapira as saying the antibody formula was being patented, after which an international manufacturer would be sought to mass-produce it.

The IIBR, a secretive research unit working directly under the office of Israel’s Prime Minister, has not released any further information about the vaccine itself. If effective, the development of an antibody is very promising, and this vaccine would join several other candidates that are already being touted as potential vaccines for Covid-19.

However, most potential vaccines are currently in human trials. Though Shapira said mass production is about to begin, it is unclear whether the vaccine has been tested for safety or efficacy on humans.

IIBR is a unit that works to counter biological threats against Israel and has been taking the lead in order to develop a treatment and vaccine for the coronavirus, including plasma collection that includes the testing of blood from those who recovered from Covid-19.

Israel was one of the first countries to close its borders and impose increasingly stringent restrictions on movement to arrest the spread of the novel coronavirus. It has reported 16,246 cases and 235 deaths due to Covid-19.

With inputs from Sandhya Ramesh

<https://theprint.in/world/israel-develops-key-covid-antibody-that-attacks-and-neutralises-the-virus-in-patients-body/414570/>

THE TIMES OF INDIA

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Italian researchers claim world's first Coronavirus vaccine: Report

Rome: Italian researchers have claimed that they have successfully developed a vaccine to contain coronavirus (Covid-19) which is likely to work on humans, a report said.

Luigi Aurisicchio, CEO of Takis, the firm developing the medication, said that a coronavirus candidate vaccine has neutralised the virus in human cells for the first time, the Arab News reported.

"This is the most advanced stage of testing of a candidate vaccine created in Italy. Human tests are expected after this summer," Aurisicchio was quoted as saying to Italian news agency ANSA.

"According to the Spallanzani Hospital, as far as we know we are the first in the world so far to have demonstrated neutralisation of the coronavirus by a vaccine. We expect this to happen in humans too," he added.

The researchers experimented with the vaccine on mice that had successfully developed antibodies that blocked the virus from infecting the cells. They further observed that the five vaccine candidates generated a large number of antibodies, and selected two with the best results.

All of the vaccine candidates currently being developed are based on the genetic material of DNA protein "spike", the molecular tip used by the coronavirus to enter human cells.

They are injected with the so-called "electroporation" technique, which consists of an intramuscular injection followed by a brief electrical impulse, helping the vaccine break into the cells and activating the immune system, the report said.

Researchers believe that this makes their vaccine particularly effective for generating functional antibodies against the "spike" protein, in particular in the lung cells, which are the most vulnerable to coronavirus.

"We are working hard for a vaccine coming from Italian research, with an all-Italian and innovative technology, tested in Italy and made available to everyone," Aurisicchio was quoted by the Arab News report.

"In order to reach this goal, we need the support of national and international institutions and partners who may help us speed up the process," he noted.

The total number of Covid-19 infections, fatalities and recoveries since the pandemic began has risen to 213,013 in the country.

<https://timesofindia.indiatimes.com/world/europe/italian-researchers-claim-worlds-first-covid-19-vaccine-report/articleshow/75579108.cms>