

June
2021

समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 46 अंक : 116 15 जून 2021

Vol.: 46 Issue : 116 15 June 2021



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-17
DRDO Technology News		1-4
1.	India behind China & Pakistan in nuclear-warheads but not worried	1
2.	India sets eyes on Russian Sprut light tanks to counter China, gets rare access to trials	3
COVID 19: DRDO's Contribution		5-17
3.	850 oxygen plants being set up in various districts of country: Secretary DRDO	5
4.	देश के विभिन्न जिलों में 850 ऑक्सीजन संयंत्र स्थापित किए जा रहे हैं: डीआरडीओ सचिव	6
5.	దేశంలోని వివిధ జిల్లాల్లో 850 ఆక్సిజన్ ప్లాంట్లు ఏర్పాటు చేస్తున్నట్లు ప్రకరించిన - డి.ఆర్.డి.ఓ. కార్యదర్శి	7
6.	Oxygen plants, modular hospitals, Project O2: India prepares for third wave of Covid-19	8
7.	About 850 oxygen plants being set up across the country: DRDO Chief	10
8.	पीएम-केयर्स फंड से विभिन्न जिलों में 850 ऑक्सीजन प्लांट: डीआरडीओ प्रमुख	11
9.	Hyderabad: DRDO's 2-DG shields from all variants, says Cellular and Molecular Biology	12
10.	Honeywell partners with DRDO, CSIR-IIP to ramp up oxygen production	13
11.	Honeywell partners with DRDO to ramp up oxygen production	14
12.	लखनऊ के DRDO अस्पताल में नॉन कोविड मरीजों की भी होगी भर्ती, स्वास्थ्य विभाग को भेजा प्रस्ताव	15
13.	510 oxygen beds, 125 ICU beds: DRDO's Kashmir COVID hospital can remain operational for three years	16
14.	श्रीनगर डीआरडीओ अस्पताल को तीन साल तक मिल सकता है विस्तार	17
Defence News		18-21
Defence Strategic: National/International		18-21
15.	A year since Galwan, IAF remains battle-ready in Ladakh with missiles, radars & fighter jets	18
16.	Pakistan dumps Chinese missile for new warships, chooses European weapon?	20
Science & Technology News		21-26
17.	Researchers create switchable mirrors from liquid metal	21
18.	Near-field routing of hyperbolic metamaterials	23
19.	Insulators turn up the heat on quantum bits	24
COVID-19 Research News		26-26
20.	New research finds compound that blocks Covid-19 virus and protects lung cells	26

THE TIMES OF INDIA

Tue, 15 June 2021

India behind China & Pakistan in nuclear-warheads but not worried

By Rajat Pandit

New Delhi: India is confident of its strategic deterrence capability, which will get a greater punch with the ongoing induction of Agni-V missiles and Rafale fighters as well the commissioning of nuclear submarine INS Arighat this year, though it still lags behind both China and Pakistan in the number of nuclear warheads.

China now possesses 350 nuclear warheads, while Pakistan has 165, as compared to 156 of India, as per the latest assessment of the Stockholm International Peace Institute (SIPRI) released on Monday.

The nine nuclear-armed countries together possess an estimated 13,080 nuclear weapons, with Russia (6,255 warheads) and the US (5,550) leagues ahead of the rest. The others are France (290), UK (225), Israel (90) and North Korea (40-50). These figures, of course, are not exact because countries by and large keep their nuclear weapons programmes shrouded in secrecy.

Apart from Russia and the US, all the other seven countries are also either developing or deploying new weapon systems. “China is in the middle of a significant modernisation and expansion of its nuclear weapons inventory, and India and Pakistan also appear to be expanding their nuclear arsenals,” said SIPRI.

The report comes at a time India and China remain locked in the military confrontation in eastern Ladakh, which erupted in May last year, with no signs of de-escalation as yet. But the fresh border ceasefire with Pakistan has held since February.

Indian officials say robust delivery systems like land-based ballistic missiles and nuclear-powered submarines with ballistic nuclear missiles (called SSBNs), with “assured second-strike capabilities”, have more strategic significance rather than the actual number of warheads.

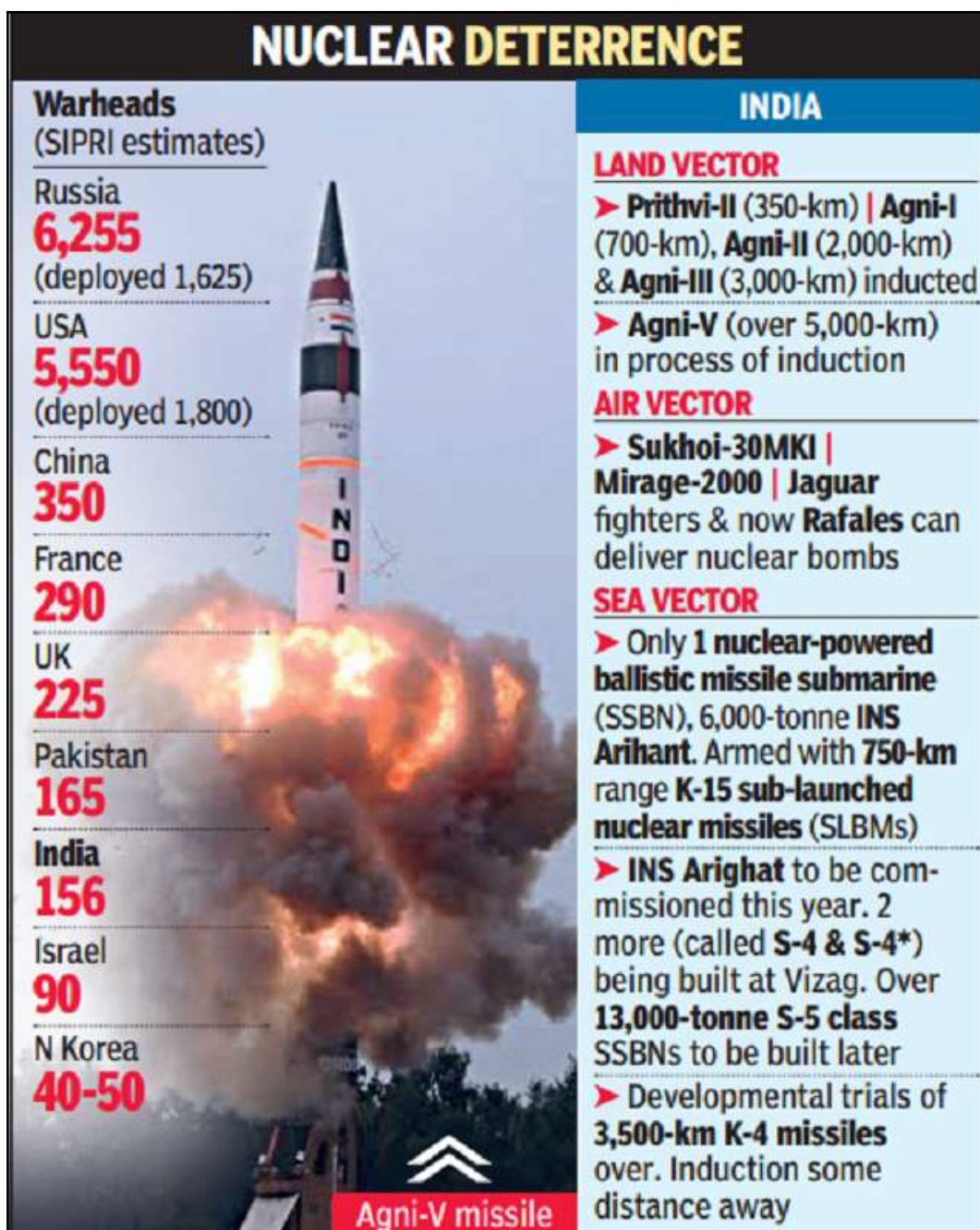
“Nuclear weapons are meant for deterrence, not war-fighting. Pakistan, of course, has benefitted from its nexus in nuclear and missile proliferation with China and North Korea. But India is doing fine with the development and modernisation of its indigenous credible minimum deterrence,” said an official.

The tri-Service Strategic Forces Command, for instance, is now inducting the over 5,000-km range Agni-V intercontinental ballistic missile, which brings the whole of Asia and China as well parts of Europe and Africa within its strike envelope, after shorter-range missiles.



Agni-V, India's most potent inter-continental ballistic missile (File Photo)

Similarly, the new Rafale jets have boosted the existing “air vector” for delivery of nuclear gravity bombs after some Sukhoi-30MKIs, Mirage-2000s and Jaguars were earlier modified for that role.



But the third leg of the “nuclear triad” is still far from being credible. India currently has only one SSBN in INS Arihant, with 750-km range K-15 nuclear missiles. Countries like the US, Russia and China have SSBNs with well over 5,000-km range missiles.

India has three more SSBNs under development, with INS Arighat slated for commissioning this year after some delay. The developmental trials of K-4 missiles, with a strike range of 3,500-km, in turn, have been completed but the induction is still some distance away, as was earlier reported by TOI.

Pakistan as yet does not have sea-based nukes, though it has tested the 450-km-range Babur-3 cruise missiles for deployment on conventional diesel-electric submarines. China, of course, is far ahead with its Type-094 or Jin-class submarines armed with the 7,400-km JL-2 missiles.

<https://timesofindia.indiatimes.com/india/india-behind-china-pakistan-in-nuclear-warheads-but-not-worried/articleshow/83524404.cms>

India sets eyes on Russian Sprut light tanks to counter China, gets rare access to trials

The 18-tonne amphibious Sprut-SDM1 is capable of being airlifted, parachuted with crew inside and can even disembark from a ship

By Snehash Alex Philip

New Delhi: India has set its eyes on procuring the Russian-made Sprut-SDM1 light tanks, to counter China in the mountainous terrain along the Line of Actual Control (LAC), and will also take part in the trials of the system starting late summer.

This will be a first for Russia because no other country has witnessed trials of a product that is under development.

According to sources in the security and defence establishment, India is keen on the 18-tonne Sprut because it shares the gun of the T-90 tank and fires the same kind of ammunition. India is currently operating T-90 and T-72 tanks, which are also Russian-origin, besides Arjun.

This will mean logistics and maintenance systems of the Sprut tanks will not have to be drastically different for the Armoured Corps.

While it is largely believed that the Russian forces have already inducted Sprut, sources said the tanks are still undergoing trials and are in the last stages of development.

Russia's approval to include India in the trials of the light tanks — which can be airlifted, parachuted with crew inside and can even disembark from a ship — came after Defence Minister Rajnath Singh spoke about India's need for light tanks during his visit to Russia in August 2020.

As reported by ThePrint then, Russia had offered India the light Sprut SDM1 tanks during Singh's visit. The move came as India had deployed the T-90 tanks, weighing about 46 tonnes, in Ladakh during the prolonged standoff with China.

This was besides the T-72 tanks, which weigh around 45 tonnes, deployed earlier. Conversely, China had deployed its new lightweight tanks, Type 15, besides other armoured elements.

After India's request, sources familiar with the matter said, discussions were held at various levels within the Russian establishment and a final go-ahead for inclusion in trials was given by the "very top".

Accordingly, a team of the Indian Army will visit Russia later this year, and witness the firing and mobility trials of the tank.

Meanwhile, India has also floated a Request for Information (RFI) for 350 light tanks, which should not weigh more than 25 tonnes. This weight criteria will rule out many of the light tanks currently available in the market.

Capabilities of Sprut-SDM1

Sprut-SDM1 is the only light amphibious fighting vehicle in the world that possesses the firepower of a main battle tank, a 125mm main gun. The other unique feature is the ability to fire a cannon afloat, sources said.

Other similar products are Chinese Type 15 light tank and the Turkish Kaplan MT medium tank. However, both these tanks have 105mm main guns unlike the Sprut's 125mm main gun.



Representational image. A file photo of light Sprut-SDM1 tank in Moscow. | Photo: Commons

Furthermore, only the Sprut-SDM1 can fire guided missiles and has a potent armament suite that includes a 125mm gun, a 7.62mm remote-controlled machine gun and a 7.62mm coaxial machine gun.

The tank's onboard guided missile weapon system can engage armoured targets, including explosive reactive armour (ERA)-equipped ones at ranges up to 5km, besides being able to engage low-flying helicopters by the roof-mounted machine-gun mount.

“The Sprut is a genuine light tank in terms of weight. The Chinese and Turkish tanks are heavier. Sprut should give greater mobility and combat edge over its rivals. The trials would show whether it lives up to the promise or not,” a source told ThePrint.

The Sprut can also travel over a distance of 500 km without refuelling and can be transported by military transport aircraft and landing ships besides being parachuted with a crew inside the vehicle.

Competition from the ‘desi’ light tank

While India has set its eyes on the Russian Sprut, the Defence Research and Development Organisation (DRDO) and Larson & Toubro are in talks with each other to possibly convert another tank — the K9 Vajra 155mm/52 calibre Tracked Self-Propelled Howitzer — into a light- or medium-weight tank that could be used in mountain regions like Ladakh.

DRDO and L&T are looking to reduce the tank's weight by replacing the heavy 155mm gun with a 105mm or 120mm gun.

This will also change the tank's turret design and the overall weight will reduce from its current 47 tonnes. More weight-reducing technology and material can also be used, which is expected to make the tank at least 10 tonnes lighter.

The aim is for the Vajra tank to actually weigh around 30 to 35 tonnes or somewhere close, which can be deployed in the mountains.

Armoured Corps first pitched for light tanks in 2009

The Armoured Directorate of the Army had first moved a proposal for light tanks in 2009. However, the Army's top brass shot down the proposal as they felt that light tanks were not needed.

“The proposal had been kept in cold storage since then. But the Ladakh tensions showed how light tanks can play a critical role in areas where traditional main battle tanks cannot operate,” noted a source.

“Why did China deploy light tanks besides its heavier variants. This is despite the fact that China has a flatter terrain along the LAC than India, which is more mountainous. The tanks in front provide the infantry with the biggest fire power and light tanks are needed for the mountains,” he told ThePrint.

India has had light tanks in the past, which were used during the 1947-48 Kashmir operations (M 5 Stuart tank weighing about 16 tonnes) and then the 1962 and 1971 wars (PT 76 tanks weighing around 15 tonnes).

However, these paved the way for heavier tanks as the focus has been fixed on Pakistan and the plains ever since.

<https://theprint.in/defence/india-sets-eyes-on-russian-sprut-light-tanks-to-counter-china-gets-rare-access-to-trials/676057/>

COVID 19: DRDO's Contribution



Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 14 June 2021 4:12PM

850 oxygen plants being set up in various districts of country: Secretary DRDO

A total of 850 oxygen plants are being set up in various districts of the country from PM Cares Fund for catering to the needs of the country to fight the pandemic COVID-19, Dr C Satish Reddy, Secretary, Defence Research & Development Organisation (DRDO), highlighted at the Department of Science & Technology (DST) Azadi Ka Amrit Mahotsav Discourse Series.

He added that DRDO was prepared to provide all kinds of support when the need arises, and more flying hospitals would be ready, as was provided by DRDO in the second wave of COVID-19, to help the people.

“We established temporary hospitals specific to COVID 19 in many cities. These are modular hospitals, we call it flying hospitals, and these have been made in a way that the virus does not go out of hospitals. If there is any third wave, all the hospitals will be taking the load, and the government is discussing these aspects with various stakeholders,” said Dr Reddy.

He also underlined how DRDO is primarily carrying out research in advanced technology in defence and also concentrating on developing high-quality technology that will be beneficial for the people, at lower cost to match international level

Dr. Reddy was speaking at the online discourse series New India @ 75, organised by National Council for Science & Technology Communication and Vigyan Prasara.

Prof Ashutosh Sharma, Secretary, DST talked about various steps taken by the Central Government and DST to fight the pandemic and how to keep vaccines safe and to ensure it reaches every nook and corner of the country. He also spoke about ways in which Artificial Intelligence (AI) could play a greater role in fighting the pandemic.

“Technologies have been developed for storing and transporting vaccines to every nook and corner of the country. New ways of storing vaccines have been developed as per the Indian conditions. Convergence of technologies is the future, and AI can play a great role in diagnostics, telemedicine and will have tremendous importance in remote monitoring, diagnostics and decision-making in fighting pandemic,” Prof Sharma said.

Speaking about the 50 years of DST, he pointed out that it has been a long journey, and foundational technology has been seeded, establishing DST as a nursery to help, nurture and grow young talents for the progress and development of the country.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726975>





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Mon, 14 June 2021 4:12PM

देश के विभिन्न जिलों में 850 ऑक्सीजन संयंत्र स्थापित किए जा रहे हैं: डीआरडीओ सचिव

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के सचिव डॉ. सी. सतीश रेड्डी ने कहा कि कोविड-19 के खिलाफ लड़ाई में देश की ऑक्सीजन की जरूरतों को पूरा करने के लिए पीएम केयर्स फंड से देश के विभिन्न जिलों में 850 ऑक्सीजन प्लांट स्थापित किए जा रहे हैं। वे विज्ञान एवं प्रौद्योगिकी विभाग के 'आजादी का अमृत महोत्सव' व्याख्यान श्रृंखला में बोल रहे थे।

उन्होंने कहा कि डीआरडीओ जरूरत पड़ने पर हर तरह की सहायता देने के लिए तैयार है, साथ ही कहा कि कोरोना की दूसरी लहर में लोगों की मदद के लिए डीआरडीओ द्वारा उपलब्ध कराए गए फ्लाइंग अस्पताल की तरह और भी अस्पताल तैयार होंगे।

डॉ. रेड्डी ने कहा "हमने कई शहरों में खास तौर से कोविड-19 के उपचार के लिए विशिष्ट अस्थायी अस्पताल स्थापित किए। ये मॉड्यूलर अस्पताल हैं, हम इसे फ्लाइंग अस्पताल कहते हैं, और इन्हें इस तरह से बनाया गया है कि वायरस अस्पतालों से बाहर न जाए। अगर कोई तीसरी लहर है, तो सभी अस्पताल इलाज का भार उठाएंगे, और सरकार विभिन्न हितधारकों के साथ इन पहलुओं पर चर्चा कर रही है।



उन्होंने यह भी रेखांकित किया कि कैसे डीआरडीओ मुख्य रूप से रक्षा क्षेत्र में उन्नत प्रौद्योगिकी में अनुसंधान कर रहा है और उच्च गुणवत्ता वाली तकनीक विकसित करने पर भी ध्यान केंद्रित कर रहा है। जो लोगों के लिए फायदेमंद होंगे। खास बात यह है कि यह अंतरराष्ट्रीय बाजार के मुकाबले कम लागत वाले हैं।

डॉ. रेड्डी नेशनल काउंसिल फॉर साइंस एंड टेक्नोलॉजी कम्युनिकेशन और विज्ञान प्रसार द्वारा आयोजित ऑनलाइन विचार-विमर्श श्रृंखला न्यू इंडिया @ 75 में बोल रहे थे।

डीएसटी सचिव प्रो. आशुतोष शर्मा ने कहा कि महामारी से लड़ने के लिए केंद्र सरकार और डीएसटी द्वारा उठाए गए विभिन्न कदमों और टीकों को सुरक्षित रखने और यह सुनिश्चित करने के लिए कि यह देश के कोने-कोने तक पहुंच जाए। उन्होंने उन तरीकों के बारे में भी बताया जिनसे आर्टिफिशियल इंटेलिजेंस (एआई) महामारी से लड़ने में बड़ी भूमिका निभा सकता है।

प्रोफेसर शर्मा ने कहा "देश के कोने-कोने पर टीकों के भंडारण और परिवहन के लिए तकनीक विकसित की गई है। भारतीय परिस्थितियों के अनुसार टीकों के भंडारण के नए तरीके विकसित किए गए हैं। प्रौद्योगिकियों का विकास ही भविष्य है और एआई डायग्नोस्टिक्स, टेलीमेडिसिन में एक महान भूमिका निभा सकता है और महामारी से लड़ने में दूरस्थ निगरानी, निदान और निर्णय लेने में इसका जबरदस्त महत्व होगा।"

डीएसटी के 50 वर्षों के सफर के बारे में बोलते हुए, उन्होंने कहा कि यह एक लंबी यात्रा रही है, और देश की प्रगति और विकास के लिए युवा प्रतिभाओं की मदद करने, उनका पोषण करने और विकसित करने के लिए डीएसटी को नर्सरी के रूप में स्थापित करने के लिए तकनीक को मूल रूप से अपनाया गया है।

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శాస్త్ర విజ్ఞాన- సాంకేతిక విజ్ఞాన మంత్రిత్వ శాఖ

Mon, 14 June 2021 4:12PM

దేశంలోని వివిధ జిల్లాల్లో 850 ఆక్సిజన్ ప్లాంట్లు ఏర్పాటు

చేస్తున్నట్లు ప్రకరించిన - డి.ఆర్.డి.ఓ. కార్యదర్శి

కోవిడ్-19 మహమ్మారికి వ్యతిరేకంగా పోరాడటానికి వీలుగా, దేశ అవసరాలను తీర్చడానికి, "పి.ఎం. కేర్స్ నిధి" తో, దేశంలోని వివిధ జిల్లాల్లో మొత్తం 850 ఆక్సిజన్ ప్లాంట్లను ఏర్పాటు చేయనున్నట్లు, శాస్త్ర, సాంకేతిక శాఖ (డి.వి.ఎస్.టి) నిర్వహిస్తున్న ఆజీదీ కా అమిత్ మహోత్సవ ప్రసంగాల పరంపరలో భాగంగా, రక్షణ పరిశోధన మరియు అభివృద్ధి సంస్థ (డి.ఆర్.డి.ఓ) కార్యదర్శి డాక్టర్ సి. సతీష్ రెడ్డి, మాట్లాడుతూ, తెలియజేశారు.

అవసరం వచ్చినప్పుడు అన్ని రకాలుగా సహాయం అందించడానికి డి.ఆర్.డి.ఓ. సిద్ధంగా ఉందని, ఆయన చెప్పారు. ప్రజలకు సహాయపడటానికి, కోవిడ్-19 రెండవ దశలో, డి.ఆర్.డి.ఓ. ఏర్పాటు చేసిన, మరిన్ని ఎగిరే ఆసుపత్రులు సిద్ధంగా ఉన్నాయని కూడా ఆయన తెలియజేశారు.

ఈ సందర్భంగా డాక్టర్ రెడ్డి మాట్లాడుతూ, "మేము చాలా నగరాల్లో కోవిడ్-19 కు ప్రత్యేకమైన తాత్కాలిక ఆసుపత్రులను ఏర్పాటు చేసాము. ఇవి మాడ్యులర్ ఆసుపత్రులు, వీటిని ఎగిరే ఆసుపత్రులు గా వ్యవహరిస్తున్నాము. వైరస్ బయటకు వ్యాప్తి చెందని విధంగా ఈ ఆసుపత్రులను తయారు చేయడం జరిగింది. ఒక వేళ, మూడవ దశ వచ్చే అవకాశం ఉంటే, అందుకు అవసరమైన సౌకర్యాలు అన్ని ఆసుపత్రుల్లో ఉన్నాయి. ప్రభుత్వం ఈ అంశాలపై వివిధ భాగస్వాములతో చర్చిస్తోంది", అని వివరించారు.

అధునాతన సాంకేతిక పరిజ్ఞానంతో, డి.ఆర్.డి.ఓ. రక్షణ రంగంలో, ప్రధానంగా చేస్తున్న పరిశోధనల గురించి ఆయన ఈ సందర్భంగా, వివరిస్తూ, అంతర్జాతీయ స్థాయికి సరిపోయేలా తక్కువ ఖర్చుతో ప్రజలకు ప్రయోజనకరంగా ఉండే అధిక-నాణ్యతతో కూడిన సాంకేతిక పరిజ్ఞానాన్ని అభివృద్ధి చేయడం పై కూడా దృష్టి పెడుతున్నట్లు పేర్కొన్నారు.

సైన్స్ & టెక్నాలజీ కమ్యూనికేషన్ జాతీయ మండలి మరియు విజ్ఞాన ప్రసార సంయుక్తంగా ఆన్-లైన్ ద్వారా నిర్వహిస్తున్న న్యూ ఇండియా@75 అనే ప్రసంగాల పరంపర కార్యక్రమంలో డాక్టర్ రెడ్డి ప్రసంగించారు.

మహమ్మారిపై పోరాడటానికి కేంద్ర ప్రభుత్వం మరియు డి.ఎస్.టి. చేపట్టిన వివిధ చర్యల గురించి, అదేవిధంగా, టీకాల ను ఎలా సురక్షితంగా ఉంచాలి, వాటిని దేశంలోని ప్రతి

మారుమూల ప్రాంతానికి ఏవిధంగా చేర్చాలి అనే విషయాల గురించి, డి.ఎస్.టి. కార్యదర్శి ప్రొఫెసర్ అశుతోష్ శర్మ తెలియజేశారు. మహమ్మారిని ఎదుర్కోవడంలో కృత్రిమ మేధస్సు (ఏ.ఐ) ఎక్కువ పాత్ర పోషించగల మార్గాల గురించి కూడా ఆయన మాట్లాడారు.

"దేశంలోని ప్రతి మారుమూల ప్రాంతానికి, టీకాలను రవాణా చేయడానికి, నిల్వ చేయడానికి వీలుగా అనువైన సాంకేతికతలు అభివృద్ధి చేయబడ్డాయి. భారతీయ పరిస్థితులకు అనుగుణంగా టీకాలను నిల్వ చేయడానికి కొత్త మార్గాలు అభివృద్ధి చేయబడ్డాయి. భవిష్యత్తులో సాంకేతికతల కలయిక కీలకం. వ్యాధి నిర్ధారణ, టెలిమెడిసిన్ రంగాలలో కృత్రిమ మేధస్సు గొప్ప పాత్ర పోషించనుంది. దూర ప్రాంతాల నుండి పర్యవేక్షణ, వ్యాధి నిర్ధారణ తో పాటు, మహమ్మారిని ఎదుర్కోడానికి తగిన నిర్ణయం తీసుకోవడంలో కూడా దీనికి అత్యంత ప్రాముఖ్యత ఉంటుంది." అని ప్రొఫెసర్ శర్మ ఈ సందర్భంగా తెలియజేశారు.

50 సంవత్సరాల డి.ఎస్.టి. సుదీర్ఘ ప్రయాణం గురించి, ఆయన వివరిస్తూ, సాంకేతిక పరిజ్ఞానం పునాదిగా, దేశ ప్రగతి, అభివృద్ధి కోసం యువ ప్రతిభకు సహకారం అందించి, ప్రోత్సహించి, పొందించడానికి, డి.ఎస్.టి. ని ఒక నర్సరీ గా ఏర్పాటు చేసినట్లు పేర్కొన్నారు.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1727091>

INDIA
TODAY

Tue, 15 June 2021

Oxygen plants, modular hospitals, Project O2: India prepares for third wave of Covid-19

Amid warnings of a possible third wave of Covid-19, India is laying the foundation to be able to deal with any such crisis in the future. Setting up of oxygen plants, modular hospitals and Project O2 are some steps in this direction

By Snehanshu Shekhar

New Delhi: As experts warn of a possible third wave of Covid-19, India has begun laying the foundation to be able to handle any such crisis in the future. Installing pressure swing adsorption (PSA) oxygen plants across different hospitals in India, setting up modular hospitals and 'Project O2' are some steps being taken by the Defence Research & Development Organisation (DRDO) and the health ministry.

As per DRDO, a total of 850 oxygen plants are being set up in various districts of the country from the PM Cares Fund to cater to the needs of the country in fighting the pandemic.

Dr G Satish Reddy, Secretary of DRDO, said at the Department of Science & Technology's Azadi Ka Amrit Mahotsav Discourse Series that DRDO is prepared to provide all kinds of support when the need arises.

"During the second wave, we established temporary hospitals specific to Covid-19 in many cities. These are modular hospitals, also called 'flying hospitals', and they have been made in such



India is setting up oxygen plants and modular hospitals to prepare for a possible third wave of Covid-19. (Photo: File)

a way that the virus does not go out of the hospitals. If there is a third wave, all hospitals will take the load and the government is discussing these aspects with various stakeholders,” said Dr Reddy.

Modular hospitals during second wave

As Covid-19 cases surged in different parts of the country during the second wave, the infrastructure in hospitals was under immense pressure. But innovative modular hospitals provided some relief in this situation.

Modular hospitals are an extension of hospital infrastructure and can be built adjacent to an existing hospital building. Project Extension Hospitals is one such initiative. The Centre identified the requirements of around 50 hospitals in states that were reporting the highest number of Covid cases.

MediCAB hospitals

Modulus Housing, a start-up incubated at Indian Institute of Technology, Madras (IIT-M), developed MediCAB hospitals. This enables the building of a 100-bedded extension facility in three weeks’ time.

MediCAB hospitals are designed with a dedicated zone of intensive care units that can accommodate life-support equipment and medical devices.

These portable hospitals have a durability of around 25 years and they can be shifted in the future to respond to any disaster in less than a week. These rapidly deployable hospitals can plug a major health infrastructure gap in India’s fight against Covid-19, especially in rural areas and smaller towns.

The office of the Principal Scientific Adviser has been actively working towards securing corporate social responsibility financial support to implement these projects in different areas across the nation.

Modulus Housing has started deploying MediCAB extension hospitals with the help of the American Indian Foundation, Mastercard, Texas Instruments, Zscaler, PNB Housing, Goldman Sachs, Lenovo and NASSCOM Foundation.

The first batch of 100-bedded hospitals was commissioned in Bilaspur, Amravati, Pune, Jalna, Mohali and a 20-bed hospital in Raipur. Bengaluru will have one each of 20-, 50-, and 100-beds in the first phase.

The Centre also collaborated with Tata Projects Ltd to deploy modular hospitals at multiple sites in Punjab and Chhattisgarh. They have initiated work on 48-bedded modular hospitals in Gurdaspur and Faridkot. Expansion of the ICU at multiple hospitals in Chhattisgarh is also underway.

Project O2

The second wave of Covid-19 also saw an increase in demand for medical oxygen in different parts of the country. Manufacturing medical oxygen has become essential to ensure we have adequate supply in the future.

Under Project O2 for India, a National Consortium of Oxygen is enabling national-level supply of critical raw materials such as zeolites, setting up of small oxygen plants, manufacturing compressors, concentrators and ventilators.

The consortium is not only planning to provide immediate relief but also working to strengthen the manufacturing ecosystem for long-term preparedness. A committee of experts has been evaluating critical equipment such as oxygen plants, concentrators, and ventilators from a pool of India-based manufacturers, start-ups, and MSMEs.

<https://www.indiatoday.in/coronavirus-outbreak/story/oxygen-plants-modular-hospitals-india-prepares-third-wave-covid-1814783-2021-06-14>

About 850 oxygen plants being set up across the country: DRDO Chief

Prof Ashutosh Sharma, Secretary, DST, spoke about how AI could play a more significant role in the pandemic fight

Chennai: As many as 850 oxygen plants are being set up in various districts of the country from PM Cares Fund, according to Dr G Satheesh Reddy, Secretary, Department of Defence R&D, and Chairman, Defence Research & Development Organisation (DRDO). He spoke at the online discourse series New India @ 75, organised by National Council for Science & Technology Communication and Vigyan Prasara.

“We have established temporary hospitals specific to Covid-19 in many cities. These are modular hospitals, we call it flying hospitals, and these have been made in a way that the virus does not go out of hospitals. If there is any third wave, all the hospitals will be taking the load, and the government is discussing these aspects with various stakeholders,” said Dr Reddy.

He also underlined how DRDO is primarily carrying out research in advanced technology in defence and concentrating on developing high-quality technology that will benefit the people, at a lower cost to match the international level.

Prof Ashutosh Sharma, Secretary, DST talked about various steps taken by the Central Government and DST to fight the pandemic and keep vaccines safe and ensure it reaches every nook and corner of the country. He also spoke about ways Artificial Intelligence (AI) could play a greater role in fighting the pandemic.

“Technologies have been developed for storing and transporting vaccines to every nook and corner of the country. New ways of storing vaccines have been developed as per the Indian conditions. Convergence of technologies is the future, and AI can play a great role in diagnostics, telemedicine and will have tremendous importance in remote monitoring, diagnostics and decision-making in fighting pandemic,” Prof Sharma said.

<https://www.thehindubusinessline.com/news/science/about-850-oxygen-plants-being-set-up-across-the-country-drdo-chief/article34813420.ece>



G Satheesh Reddy, Chief of the Defence Research and Development Organisation

पीएम-केयर्स फंड से विभिन्न जिलों में 850 ऑक्सीजन प्लांट: डीआरडीओ प्रमुख

डीआरडीओ के प्रमुख जी सतीश रेड्डी ने सोमवार को कहा कि पीएम-केयर्स फंड से विभिन्न जिलों में 850 ऑक्सीजन संयंत्र लगाए जा रहे हैं। कोविड-19 महामारी की दूसरी लहर के दौरान चिकित्सकीय ऑक्सीजन के संकट के मद्देनजर ये कदम उठाए जा रहे हैं।

नयी दिल्ली: डीआरडीओ के प्रमुख जी सतीश रेड्डी ने सोमवार को कहा कि पीएम-केयर्स फंड से विभिन्न जिलों में 850 ऑक्सीजन संयंत्र लगाए जा रहे हैं। कोविड-19 महामारी की दूसरी लहर के दौरान चिकित्सकीय ऑक्सीजन के संकट के मद्देनजर ये कदम उठाए जा रहे हैं।

रेड्डी ने विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) द्वारा आजादी का अमृत महोत्सव चर्चा श्रृंखला के दौरान रेखांकित किया कि रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) कोरोना वायरस से मुकाबले में जरूरत पड़ने पर और अधिक "उड़न अस्पतालों" सहित सभी प्रकार की सहायता प्रदान करने के लिए तैयार था।



डीआरडीओ के प्रमुख जी सतीश रेड्डी ने कहा कि पीएम-केयर्स फंड से 850 ऑक्सीजन संयंत्र लगाए जा रहे हैं . (फाइल फोटो)

उन्होंने कहा, "हमने (दूसरी लहर के दौरान) कई शहरों में कोविड-19 के मरीजों के लिए अस्थायी

अस्पतालों की स्थापना की। ये आधुनिक अस्पताल हैं, हमने इन्हें 'उड़न अस्पताल' नाम दिया है और इन्हें इस तरह से बनाया गया है कि वायरस इससे बाहर नहीं जा पाता है।" रेड्डी ने कहा, "अगर तीसरी लहर आती है तो ये सारे अस्पताल (मरीजों का) बोज़ उठाएंगे और सरकार इन पहलुओं पर विभिन्न हितधारकों के साथ चर्चा कर रही है।"

अप्रैल-मई में दूसरी लहर के जोर पकड़ने के दौरान देश के कई हिस्सों में अस्पतालों में चिकित्सकीय ऑक्सीजन की आपूर्ति का गंभीर संकट पैदा हो गया था। डीएसटी के एक बयान के मुताबिक रेड्डी ने कहा, "कोविड-19 महामारी से मुकाबला करने के लिए देश में जरूरत को पूरा करने को लेकर पीएम-केयर्स फंड से विभिन्न जिलों में कुल 850 ऑक्सीजन संयंत्र लगाए जा रहे हैं।"

उन्होंने डीआरडीओ द्वारा रक्षा क्षेत्र में आधुनिक प्रौद्योगिकी को लेकर किए जा रहे अनुसंधान का भी जिक्र किया और लोगों के फायदे के लिए किफायती लेकिन उच्च गुणवत्ता वाली प्रौद्योगिकी विकसित करने के बारे में भी बताया। डीएसटी सचिव आशुतोष शर्मा ने कोरोना वायरस महामारी से निपटने में केंद्र और डीएसटी द्वारा उठाए गए विभिन्न कदमों और देश के कोने-कोने तक पहुंचने के लिए किए गए प्रयासों का उल्लेख किया।

<https://hindi.news18.com/amp/news/nation/850-oxygen-plants-in-different-districts-from-pm-cares-fund-drdo-chief-3621602.html>

Hyderabad: DRDO's 2-DG shields from all variants, says Cellular and Molecular Biology

By Syed Akbar

Hyderabad: A research study by the city-based Centre for Cellular and Molecular Biology (CCMB) has found that the 2-deoxy-D-glucose (2-DG) prevents the metabolic reprogramming induced by the novel coronavirus infection and works against all variants of Covid-19.

The finding says that 2-DG not only inhibits the virus multiplication but also can be used as a treatment regimen for Covid-19 patients. This is the first research publication on the 'wonder drug' developed in India by the DRDO and tested for efficacy at the CCMB.

The researchers said, "Although the effect of 2-DG has been analysed on only two different variants (B.6 and B.1.1.7), its anti-viral property is suggested to be universal on all the variants. This is because 2-DG interferes with the metabolic requirement of virus infected host cells."

The researchers found that 2-DG, which is a glycolytic inhibitor, makes coronavirus multiplication in cells of the patient less effective and also weakens the infective potential of progeny virions (virus).

The team successfully demonstrated that 2-DG exhibits significant potential to be developed as a therapeutic drug to combat Covid-19. According to the research team, these experimental evidences and previous clinical trial experience of 2-DG made way for this molecule to reach clinical trials among Covid-19 patients in India.

Besides the CCMB, researchers from the Institute of Nuclear Medicine and Allied Sciences, Delhi, and Academy for Scientific and Innovative Research, Ghaziabad, were also part of the research work. The team comprised Anant Narayan Bhatt, Abhishek Kumar, Yogesh Rai, Neeraj Kumari, Dhiviya Vedagiri, Krishnan H Harshan, C Vijaya Kumar and Sudhir Chandna. The result was published in the pre-print online server 'BioRxiv' on June 13.

Research results showed that virus infection induces glucose influx and glycolysis resulting in selective high accumulation of fluorescent glucose/2-DG analogue in cells. According to the researchers, 2-DG treatment prevented the virus multiplication by 95%.

The progeny virions from 2-DG treated cells showed visibly reduced cytopathic effect at 48 hours post-infection. This result was further substantiated by nearly 80% reduced virus growth estimated by RT-PCR in cells infected with virions 2-DG treated cells. "This observation validates the hypothesis that 2-DG treatment leads to the formation of defective novel coronavirus virions with low infectivity potential," they said.



The researchers found that 2-DG, which is a glycolytic inhibitor, makes coronavirus multiplication in cells of the patient less effective and also weakens the infective potential of progeny virions (virus) (Representative image)

THE NEW POWER DRUG	
<ul style="list-style-type: none"> ● 2-DG prevents metabolic reprogramming induced by Covid-19, works against all variants of the virus 	
<ul style="list-style-type: none"> ● A glycolytic inhibitor, it makes virus multiplication in cells less effective and weakens the infective potential 	<ul style="list-style-type: none"> ● The CCMB team successfully demonstrated that 2-DG exhibits significant potential to be developed as a therapeutic drug to combat Covid-19
<ul style="list-style-type: none"> ● According to the researchers, 2-DG treatment prevented the virus multiplication by 95% 	



Emphasising the importance of development of new drugs, the research team said while a lot of efforts are being invested in vaccinating the population, there is also an emergent requirement to find potential therapeutics to effectively counter this fast mutating novel coronavirus induced pathogenicity.

<https://timesofindia.indiatimes.com/city/hyderabad/drdo-2-dg-shields-from-all-variants-cmb/articleshow/83524292.cms>

THE ECONOMIC TIMES

Tue, 15 June 2021

Honeywell partners with DRDO, CSIR-IIP to ramp up oxygen production

Synopsis

Honeywell, which makes aircraft parts for planes manufactured by Boeing Co and Canada's Bombardier Inc, said it will redirect supply of adsorbents to the country to accelerate setting up of medical oxygen plants while its researchers will collaborate with Indian scientists to test and validate suitability of adsorbents for oxygen production in India.

Honeywell on Monday said it is partnering with the Indian government's Defence Research Development Organisation (DRDO) and the Council of Scientific and Industrial Research-Indian Institute of Petroleum (CSIR-IIP) to ramp up oxygen production in the country.

Honeywell, which makes aircraft parts for planes manufactured by Boeing Co and Canada's Bombardier Inc, said it will redirect supply of adsorbents to the country to accelerate setting up of medical oxygen plants while its researchers will collaborate with Indian scientists to test and validate suitability of adsorbents for oxygen production in India.

The partnership with DRDO and CSIR-IIP is for supply of "molecular sieve adsorbents (zeolites) to accelerate setting up of Medical Oxygen Plants (MOP) in the country to address the ongoing pandemic," the company said in a statement.

Hospitals ran out of life saving oxygen during the devastating second wave of coronavirus in April and May and since then the government and private sector have ramped up efforts to increase availability. "Honeywell UOP has assured timely supply of adsorbents to enable the country to produce sufficient medical grade oxygen to meet the increased demand, and has partnered with DRDO and CSIR-IIP and their associates to identify and supply alternative adsorbents to optimise cost and streamline supply-related logistics without compromising output from plants," it said.

Honeywell has freed up an entire manufacturing line in Italy to prioritise supply to India.

Honeywell has instituted a cross-functional team to support DRDO and CSIR-IIP in this critical project. "Scientists from Honeywell UOP, DRDO and CSIR-IP are collaborating to establish the suitability of adsorbents for oxygen production in India," it said.

"Honeywell is committed to helping India address the current pandemic and is making every effort to find meaningful ways to engage with the Government of India in the fight to save lives," said Akshay Bellare, President, Honeywell India.

"We are redirecting our global supply of Honeywell UOP adsorbents from Italy to India to help the Government of India install life-saving oxygen plants across the country. Our technologists and scientists are collaborating with DRDO and CSIR-IIP scientists to solve India's needs," he added.

Honeywell UOP, a pioneer in the adsorbents industry, developed the first commercially viable adsorbent for medical oxygen applications more than 40 years ago. The technology enables adsorption of nitrogen from air using a pressure or vacuum swing system to obtain oxygen purity up to 95 per cent.

<https://economictimes.indiatimes.com/news/company/corporate-trends/honeywell-partners-with-drdo-csir-iip-to-ramp-up-oxygen-production/articleshow/83510718.cms>

Honeywell partners with DRDO to ramp up oxygen production

New Delhi: Industrial technology firm Honeywell on Monday said that it is partnering with Defence Research Development Organisation and with the Council of Scientific and Industrial Research–Indian Institute of Petroleum to supply molecular sieve adsorbents to accelerate setting up of medical oxygen plants (MOP) in the country amid the COVID-19 pandemic.

The company said that it has freed up an entire manufacturing line in Italy to prioritize supply to India. "Excellent cooperation is extended by Honeywell in application and supply of zeolite, an important constituent of Medical Oxygen Plants (MOP). This is helping industries to fabricate MOPs,"

Defence Research Development Organisation (DRDO) Chairman and secretary, Department of Defence R&D, G Satheesh Reddy said in a statement. Honeywell UOP has assured timely supply of adsorbents to enable the country to produce sufficient medical grade oxygen to meet the increased demand, and has partnered with DRDO and CSIR-IIP and their associates to identify and supply alternative adsorbents to optimize cost and streamline supply-related logistics without compromising output from plants.

The company said that it has instituted a cross-functional team to support DRDO and CSIR-IIP in this critical project. Scientists from Honeywell UOP, DRDO and CSIR-IP are collaborating to establish the suitability of adsorbents for oxygen production in India. Honeywell India President Akshay Bellare said that Honeywell is committed to helping India address the current pandemic and is making every effort to find meaningful ways to engage with the government in the fight to save lives.

"We are redirecting our global supply of Honeywell UOP adsorbents from Italy to India to help the Government of India install life-saving oxygen plants across the country. Our technologists and scientists are collaborating with DRDO and CSIR-IIP scientists to solve India's needs," Bellare said. Honeywell UOP developed the first commercially viable adsorbent for medical oxygen applications more than 40 years ago, the statement said. The technology enables adsorption of nitrogen from air using a pressure or vacuum swing system to obtain oxygen purity up to 95 per cent and the same is used for manufacturing oxygen concentrators as well.

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/honeywell-partners-with-drdo-to-ramp-up-oxygen-production/2101811>

लखनऊ के DRDO अस्पताल में नॉन कोविड मरीजों की भी होगी भर्ती, स्वास्थ्य विभाग को भेजा प्रस्ताव

कोरोना मरीजों की संख्या कम होने से डीआरडीओ अस्पताल में नॉन कोविड मरीजों की भर्ती की संभावनाएं खोजी जा रही हैं। अस्पताल प्रशासन ने स्वास्थ्य विभाग को पत्र लिखकर नॉन कोविड मरीजों की भी भर्ती करने का प्रस्ताव भेजा है।

By Anurag Gupta

लखनऊ: अवध शिल्प ग्राम में चल रहे डीआरडीओ कोविड अस्पताल के अस्तित्व को लेकर संकट बढ़ने लगा है। 505 बेड के इस अस्थायी अस्पताल में अब 10 से 12 कोरोना संक्रमित रोगी ही भर्ती हो रहे हैं। ऐसे में अस्पताल में नॉन कोविड मरीजों की भर्ती की संभावनाएं तलाशी जा रही हैं। अस्पताल प्रशासन ने स्वास्थ्य विभाग को पत्र लिखकर नॉन कोविड मरीजों की भी भर्ती करने का प्रस्ताव दिया है।

डीआरडीओ कोविड अस्पताल की शुरुआत बीती पांच मई को हुई थी। इसके लिए देशभर से 36 सैन्य डाक्टर, मिलिट्री नर्सिंग सर्विस व पैरामेडिकल स्टाफ के साथ 300 लोगों की तैनाती की गई थी। साथ ही 20 हजार लीटर वाले दो आक्सीजन टैंक भी लगाए गए हैं। अस्पताल में 150 बेड वाले दो आइसीयू वार्ड और 355 आक्सीजन बेड वाले दो जनरल वार्ड हैं। अब शहर में कोरोना का संक्रमण बहुत कम हो गया है। इस कारण कई डाक्टरों के अलावा मिलिट्री नर्सिंग सेवा के अधिकारी अपने बेस में वापस चले गए हैं।



चूंकि डीआरडीओ के इस अस्पताल की स्थापना छह माह के लिए की गई थी। ऐसे में सैन्य प्रशासन अब आने वाले दिनों में अस्पताल को सक्रिय रखने के लिए नॉन कोविड मरीजों को भी भर्ती करने की तैयारी कर रहा है। पिछले दिनों अस्पताल प्रशासन ने मुख्य चिकित्सा अधिकारी से इसे लेकर संपर्क भी किया था। ऐसे मरीज जिनको भर्ती करने की आवश्यकता पड़े और उनको डायलिसिस जैसे उपचार की जरूरत न हो, उनको अस्पताल में भर्ती कर उनका उपचार कराया जाएगा। हालांकि इन सबके बीच डीआरडीओ अस्पताल प्रशासन पीडियाट्रिक आइसीयू बनाने की भी तैयारी कर रहा है। इसके लिए कई बेस अस्पतालों के डाक्टरों को अलर्ट किया गया है। बहरहाल, इस अस्पताल में स्वास्थ्य विभाग द्वारा नान कोविड मरीजों को भर्ती करने आदेश दिया गया तो बहुत से मरीजों को सहूलियत होगी। वहीं, अन्य अस्पतालों में भी भीड़ कम हो सकेगी।

<https://www.jagran.com/uttar-pradesh/lucknow-city-non-covid-patients-also-set-to-be-admitted-to-drdo-hospital-in-lucknow-21737771.html>

510 oxygen beds, 125 ICU beds: DRDO's Kashmir COVID hospital can remain operational for three years

Srinagar: Defence Research and Development Organization (DRDO's) COVID hospital at Khonmoh in Srinagar will stay open for a year and can be extended for a period of three years.

On June 14, Jammu and Kashmir Lieutenant Governor Manoj Sinha inaugurated COVID-19 care hospital to help the Union Territory in its fight against the pandemic.

Medical Superintendent at the hospital Dr. Abdul Rashid Para said it is designated as a COVID facility for one year and can be extended up to three years, depending upon how the virus behaves.

“The Hospital has all requisite COVID care facilities. We have 510 oxygen-equipped beds. Out of which, 10 are for triage, 375 are ward beds and 125 are ICU beds,” Para said.



Besides, the hospital has a separate green area for donning and doffing of PPE protocol, a canteen facility and 24×7 availability of doctors. Additionally, it is getting regular Liquid Medical Oxygen (LMO) supply from Haryana.

“The LMO is supplied through tankers. We have a 56 kilo liter tank and 7-kilo liter stand-by tank,” he said.

It is equipped with a laboratory and an X-ray facility. “The CT facility is in the pipeline and will be put up soon at the hospital,” the official said.

The hospital has also taken the three departments—pediatrics, medicine, anesthesia onboard. “These three departments have come together to chalk out a protocol for admissions to the hospital. They will submit the report to the Principal GMC. We are ready in terms of infrastructure to take the patients,” a senior official at the hospital said.

He said, however, the hospital will not take care of medical management of patients requiring surgical care. “There are no operation theatres at the hospital,” he said.

Government Medical College Principal, Srinagar, Dr. Samia Rashid said the patient inflow has decreased.

“We have left instructions that if the patient doesn't need any critical care, he can be shifted there,” she said.

Earlier, the Lt Governor reiterated that the operationalization of DRDO's Hospitals in the twin cities of Jammu and Srinagar would strengthen the government's efforts against the COVID pandemic, in addition to significantly increasing COVID dedicated bed capacity and treatment in J&K.

<https://www.thekashmirmonitor.net/510-oxygen-beds-125-icu-beds-drdo-s-kashmir-covid-hospital-can-remain-operational-for-three-years/>

श्रीनगर डीआरडीओ अस्पताल को तीन साल तक मिल सकता है विस्तार

डा. परा ने बताया कि आक्सीजन की आपूर्ति के लिए 56 किलो लीटर का एक टैंक है। सात किलो लीटर एक टैंक किसी भी आपात स्थिति के लिए अलग से रखा है। अस्पताल में लेबोरेटरी एक्स-रे सिटी स्कैन समेत सभी तमाम सुविधाएं हैं।

By Rahul sharma

श्रीनगर: कोविड 19 की दूसरी लहर बेशक थमती नजर आ रही है, लेकिन रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) का खुनमोह में कोविड अस्पताल बंद नहीं होगा। वह अगले एक साल तक क्रियाशील रहेगा। आवश्यकतानुसार इसे तीन साल तक विस्तार दिया जा सकता है।

गौरतलब है कि जम्मू कश्मीर सरकार के आग्रह पर ही केंद्रीय गृहमंत्रालय के हस्ताक्षेप के आधार पर डीआरडीओ ने प्रदेश में 500-500 बिस्तरों के दो कोविड अस्पताल तैयार किए हैं। एक अस्पताल जम्मू के भगवती नगर और दूसरा यहां श्रीनगर के खुनमोह में बनाया गया है।

अस्पताल के मेडिकल सुपरिंटेंडेंट डा अब्दुल रशीद परा ने बताया कि यह कोविड अस्पताल एक साल तक ही क्रियाशील रहेगा। हां, अगर प्रशासन चाहे तो वह इसे तीन साल के लिए आगे विस्तार दे सकता है और वह भी कोरोना संक्रमण से पैदा हालात की समीक्षा के आधार पर। अस्पताल में कोविड मरीजों के लिए सभी आवश्यक चिकित्सा सुविधाएं और स्वास्थ्य सेवाएं उपलब्ध कराई हैं। इस अस्पताल में आक्सीजन गैस की सुविधा वाले 510 बिस्तरों में से 10 बिस्तर ट्राएज के लिए हैं।



आइस्यू के लिए 125 बिस्तरों की सुविधा है। शेष 375 बिस्तर विभिन्न वार्डों में उपलब्ध कराए जाने हैं। पीपीई प्रोटोकाल अपनाने के लिए अस्पताल में एक अलग से क्षेत्र निर्धारित किया है। डाक्टरों के लिए अस्पताल परिसर में 24 घंटे क्रियाशील रहने वाली कैंटीन सुविधा भी है। अस्पताल में कभी भी लिक्विड मेडिकल आक्सीजन का संकट न बने इसलिए हरियाणा से निरंतर लिक्विड आक्सीजन की अर्पित होती रहेगी। यह आक्सीजन टैंकों के जरिए आएगी।

डा. परा ने बताया कि आक्सीजन की अर्पित के लिए 56 किलो लीटर का एक टैंक है। सात किलो लीटर एक टैंक किसी भी आपात स्थिति के लिए अलग से रखा है। अस्पताल में लेबोरेटरी, एक्स-रे, सिटी स्कैन समेत सभी तमाम सुविधाएं हैं। शिशु रोग उपचार, मेडिसन और एनेस्थेसिया विभाग मिलकर अस्पताल में मरीजों की भर्ती का प्रोटोकाल तय करेंगे। इन विभागों के डाक्टरों की संयुक्त टीम जल्द रिपोर्ट जीएमसी के प्रिंसिपल को सौंपेगी। डीआरडीओ अस्पताल में उन मरीजों को भर्ती करने की फिलहाल कोई योजना नहीं है, जिनकी शल्य चिकित्सा होनी है। अस्पताल में कोई आपरेशन थियेटर नहीं है।

<https://www.jagran.com/jammu-and-kashmir/jammu-coronavirus-in-jammu-kashmir-srinagar-drdo-hospital-may-get-extension-for-three-years-21739007.html>

ThePrint

Tue, 15 June 2021

A year since Galwan, IAF remains battle-ready in Ladakh with missiles, radars & fighter jets

In weeks before Galwan Valley clash, IAF had helped deploy Army personnel and equipment to Ladakh, besides bringing in winter stocks for the additional soldiers posted there

By Snehesh Alex Philip, Edited by Sunanda Ranjan

New Delhi: Weeks after the India-China stand-off began in Ladakh last year, soldiers on the two sides faced off in the Galwan Valley as a disengagement attempt was derailed by the refusal of the Chinese to keep up their end of the deal. Twenty Indian soldiers, including Commanding Officer Col. B. Santosh Babu, were killed in action.

This was the first time since 1975 that Indian soldiers had died in a clash on the India-China border, and the episode marked a shift in the nature of the stand-off. That is when the Indian Air Force (IAF), which has a considerable advantage along the Line of Actual Control (LAC), was brought in for active combat deployment in the area.

In the weeks before, the IAF had been helping deploy Army personnel and equipment, including tanks and armoured personnel carriers, besides bringing in winter stocks for the additional soldiers posted in Ladakh.

A year on, the IAF remains operationally deployed against China, with fighter aircraft continuing with forward deployment along with new radars and surface-to-air missile sites close to the LAC.

“The IAF, which was deployed fully after the Galwan clash, continues to remain operationally deployed,” a senior government source told ThePrint.

As its role in Ladakh underwent a shift last year, the IAF put in place a full offensive and defensive deployment to counter China’s strategy of “Anti Access Area Denial (A2AD)”, sources in the defence establishment said.

This strategy involves restricting the enemy’s freedom of movement in the battlefield, and saw China deploy a wide range of surface-to-air missile (SAM) sites and long-range radars, apart from a large number of soldiers, artillery, rocket forces and armoured elements, the sources said.

The IAF, in turn, deployed assets of multiple commands against China. Unlike the Army and the Navy, the deployment of assets in the IAF is centrally controlled. In times of need, the IAF headquarters decides where the assets are to be deployed.

The assets deployed ranged from transport aircraft like AN32, C-130J and C-17, to helicopters, including Apaches and Chinooks, besides fighters, including Rafale. The deployment also included surface-to-air missiles, radars and increased surveillance duty, the sources said.



A Rafale fighter jet of the IAF seen flying in Leh last month | ANI

For ground staff and specialists in the IAF, this marked the first time they were deployed in extreme high-altitude areas along the LAC, close to the site of friction, the sources said.

“The 15 June Galwan clash changed everything. The casualties meant that there was every possibility of things going in a very different direction than what was anticipated initially,” said a source in the defence establishment.

“The IAF has considerable advantage along the LAC and a decision was taken to induct the force into active combat deployment.”

Chinese operations in Ladakh

While China has an edge over India in its air defence systems, the Indians have an advantage over the former in the high-altitude Ladakh sector from a pure air-to-air combat perspective.

One of the biggest disadvantages for China’s People’s Liberation Army Air Force (PLAAF) is that all their bases in the Tibet region are far away from the LAC and are at high altitudes, unlike India’s.

And because of high altitudes, the fighters cannot take off with full fuel or weapons packages. This means that the high altitude effectively saps the energy of the fighters.

China brought five of its ‘fifth-generation’ Chengdu J-20, also called the Mighty Dragon, in July, days before India got its first set of Rafale fighters earlier that month.

These fighters remained deployed till March this year. Sources said it was flexing of muscles by China ahead of the induction of the Rafale aircraft.

“Chinese had set up new SAM sites, which basically included HQ 9, 22 and 16 (types of SAM). The Chinese had also deployed Russian systems,” a source said.

“The Chinese broader thought process for defence is A2AD, which stands for Anti Access Area Denial. They do the same in the South China Sea also. They first deny access and then deny the area,” the source added.

Anti-access is limiting enemy military movement into an area of operations and involves the use of fighters, warships, and specialised ballistic and cruise missiles designed to strike key targets. Area denial is denying enemy freedom of action in areas under friendly control and employs more defensive means such as air and sea defence systems.

“Their entire deployment is based on this concept and they sought to do the same in Ladakh. Hence, there was a need for a combined response to Chinese aggression and that is exactly what was done,” the source said.

IAF deployment took place in hours

It is believed that the IAF had fine-tuned a fresh plan in mid-2019 on what all needs to be done in case tensions break out along the LAC.

After Galwan, within hours of the decision by the government, fighters from multiple locations flew off to ramp up presence in the airfields nearer to Ladakh. This included bases in Haryana, Punjab, and Jammu and Kashmir.

For example, the Mirage 2000s, which operate from Gwalior, moved to bases near Ladakh. While the IAF has capabilities of mid-air refuelling, the movement closer to Ladakh was to ensure that the fighters can reach the location in minutes if needed.

The IAF started off with aggressive combat air patrols (CAPs) near the LAC as ground support staff and equipment were deployed.

The IAF also extensively deployed its unmanned aerial vehicles to keep track of Chinese movement and deployment besides depending on satellite imagery.

How IAF filled gaps

When the tensions broke out, sources said, it was realised that there were certain gaps, specifically with ground air defence assets. To counter this, India started deploying its SAM assets in the region.

“We did not have too many radars along the LAC. The Chinese have a flatter terrain on their side of the LAC and hence it was easy for them to move in and set up radars and SAMs. In total, about 8-10 new SAM sites were established by the Chinese. We built up too,” another source said, refusing to get into the numbers.

Sources said IAF ground staff co-located themselves with both the Army and the ITBP, depending on who held what areas.

The deployment of equipment also meant that IAF specialists had to be deployed in the area. Many locations were very close to the scene of friction and this meant that IAF ground staff and specialists were deployed in certain forward locations for the first time, and, that too, right through the winter.

The IAF also went in for faster operationalising of the Rafale fighter jets soon after they came in July. It went in for the emergency procurement of the French HAMMER air-to-ground precision-guided weapon system as well to deploy the Rafale faster.

<https://theprint.in/defence/a-year-since-galwan-iaf-remains-battle-ready-in-ladakh-with-missiles-radars-fighter-jets/677656/>

THEWEEK

Tue, 15 June 2021

Pakistan dumps Chinese missile for new warships, chooses European weapon?

A shipyard in Istanbul is building two ships, the other 2 are being built in Karachi

In 2018, Turkey announced a deal to supply four warships to Pakistan valued at around \$1.5 billion. The contract was among the largest arms export deals signed by Turkey and involved the supply of a version of Ankara's indigenous MILGEM stealth corvette. Corvettes are small warships (displacing around 1,500 to 3,000 tonnes) and can carry anti-ship, anti-submarine and air defence weapons.

A shipyard in Istanbul is building two MILGEM warships for Pakistan, while the remaining two ships are being built in Karachi. The MILGEM variant being sold to Pakistan would be larger in displacement and longer in length than the ones in Turkish service. Initial media reports said the Pakistani Navy would use a Chinese surface-to-air missile, the HQ-16, on its MILGEM ships. The HQ-16 would be meant to shoot down anti-ship missiles and aircraft. Admiral Zafar Mahmood Abbasi, who retired as chief of Pakistan's Navy in 2020, had, reportedly, even acknowledged that the HQ-16 would be fired from a vertical launch system (VLS) in the warships' bow. Models of the MILGEM ships for Pakistan showed them having 16 VLS cells.



The Albatros NG missile | MBDA

On Saturday, *Defence Turkey*, a news outlet covering Turkish military developments, reported that the Pakistani Navy had opted to use a surface-to-air missile, the Albatros NG, developed by European defence behemoth MBDA, instead of the HQ-16.

The Albatros NG (next generation) missile was unveiled by MBDA in March this year. MBDA describes the Albatros NG as an "extended-range variant" of the Common Anti-air Modular Missile (CAMM), which is in service with the UK's Royal Navy. The Albatros NG was developed with funding from Italy.

The Albatros NG has a larger rocket booster than the CAMM to enable it to have a range of over 40km.

HQ-16 vs Albatros NG

Though the HQ-16 is estimated to have a range of around 70km, the Chinese missile is believed to have been designed on the basis of the Russian 'Shtil' naval air defence system, designed in the 1980s. Consequently, the HQ-16 is a bulkier missile and relies on semi-active radar guidance, that is, it is guided from the launching ship up to point of impacting the target. The semi-active radar guidance makes the missile more vulnerable to jamming of radars as a result of electronic warfare (EW) by an enemy.

The Albatros NG, on the other hand, has an 'active' radar seeker, which means it has an onboard radar that negates need to rely on ship-borne guidance after being fired.

"Thanks to the fire-and-forget CAMM-ER/Albatros NG NBAD System, PN MİLGEM Corvettes will be able to engage more air targets at the same time compared to the semi-active radar-guided HHQ-16 Medium-Range Air Defense Missile System and perform missions with higher performance in the EW threat environment," *Defence Turkey* reported.

The Albatros NG also has smaller dimensions, meaning a new vertical launch system could carry more weapons.

In 2019, when Italy restored funding for developing an ER version of the CAMM, reports had said Pakistan was a prospective customer.

<https://www.theweek.in/news/world/2021/06/14/pakistan-dumps-chinese-missile-for-new-warships-chooses-european-weapon.html>

Science & Technology News



Tue, 15 June 2021

Researchers create switchable mirrors from liquid metal

Researchers have developed a way to dynamically switch the surface of liquid metal between reflective and scattering states. This technology could one day be used to create electrically controllable mirrors or illumination devices.

Liquid metals combine the electrical, thermal and optical properties of metals with the fluidity of a liquid. The new approach uses an electrically driven chemical reaction to create switchable reflective surfaces on a liquid metal. No optical coatings nor polishing steps, which are typically required to make reflective optical components, are necessary to make the liquid metal highly reflective.

In the Optical Society (OSA) journal *Optical Materials Express*, researchers led by Yuji Oki of Kyushu University in Japan show that switching between reflective and scattering states can be achieved with just 1.4 V, about the same voltage used to light a typical LED. The researchers collaborated with Michael D. Dickey's research team at North Carolina State University to develop the new method, which can be implemented at ambient temperature and pressures.

"In the immediate future this technology could be used to create tools for entertainment and artistic expression that have never been available before," said Oki. "With more development, it might be possible to expand this technology into something that works much like 3-D printing for producing electronically controlled optics made of liquid metals. This could allow the optics used

in light-based health testing devices to be easily and inexpensively fabricated in areas of the world that lack medical laboratory facilities."

Creating an optical surface

In the new work, the researchers created a reservoir using an embedded flow-channel. They then used a "push-pull method" to form optical surfaces by either pumping gallium-based liquid metal into or sucking it out of the reservoir. This process formed convex, flat, or concave surfaces; each with different optical properties.

Then, by applying electricity, the researchers initiated a chemical reaction that reversibly oxidizes the liquid metal. The oxidation changes the liquid's volume in a way that

creates many small scratches on the surface that cause light to scatter. When electricity is applied in the opposite direction, the liquid metal returns to its original state. The liquid metal's surface tension causes the scratches to disappear, restoring the surface to a clean reflective mirror state.

The researchers discovered the new technique serendipitously while experimenting with a liquid metal to see if it could be used to make molds to use with a silicone elastomer. "Our intention was to use oxidation to change the surface tension and reinforce the surface of the liquid metal," said Oki. "However, we found that, under certain conditions, the surface would spontaneously change into a scattering surface. Instead of considering this a failure, we optimized the conditions and verified the phenomenon."

Characterizing the phenomenon

The researchers electrochemically and optically characterized the different surfaces that were created by applying electricity. They found that changing the voltage on the surface from -800 mV to +800 mV would decrease the light intensity as the surface changed from reflective to scattering. The electrochemical measurements revealed that a voltage change of 1.4 V was sufficient to create redox reactions with good reproducibility.

"We also found that under certain conditions the surface can be slightly oxidized and still maintain a smooth reflective surface," said Oki. "By controlling this, it might be possible to create even more diverse optical surfaces using this approach that could lead to applications in advanced devices such as biochemical chips or be used to make 3-D printed optical elements."

More information: Keisuke Nakakubo et al, Dynamic control of reflective/diffusive optical surfaces on EGaIn liquid metal, *Optical Materials Express* (2021). DOI: [10.1364/OME.425432](https://doi.org/10.1364/OME.425432)

Journal information: [Optical Materials Express](https://phys.org/news/2021-06-switchable-mirrors-liquid-metal.html)

<https://phys.org/news/2021-06-switchable-mirrors-liquid-metal.html>



Researchers have developed a way to dynamically switch the surface of liquid metal between reflective (top left and bottom right) and scattering states (top right and bottom left). When electricity is applied, a reversible chemical reaction oxidizes the liquid metal, creating scratches that make the metal scattering. Credit: Keisuke Nakakubo, Kyushu University

Near-field routing of hyperbolic metamaterials

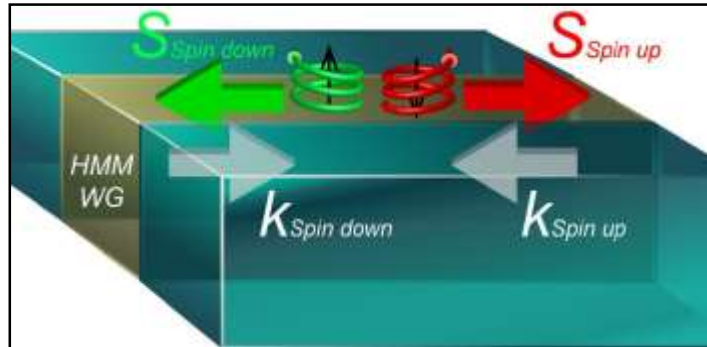
Near-field light is invisible light at the subwavelength scale. Harnessed for a variety of practical applications, such as wireless power transfer, near-field light has an increasingly significant role in the development of miniature on-chip photonic devices. Controlling the direction of near-field light propagation has been an ongoing challenge that is of fundamental interest in photonics physics and can significantly advance a variety of applications.

So far, propagation of near-field light in a single direction is achieved by specific interactions between the electric dipole and the magnetic dipole in a system, which has led to inevitable complexities in device design. Hyperbolic metamaterials (HMMs), an important class of artificial anisotropic material with hyperbolic isofrequency contours, have attracted

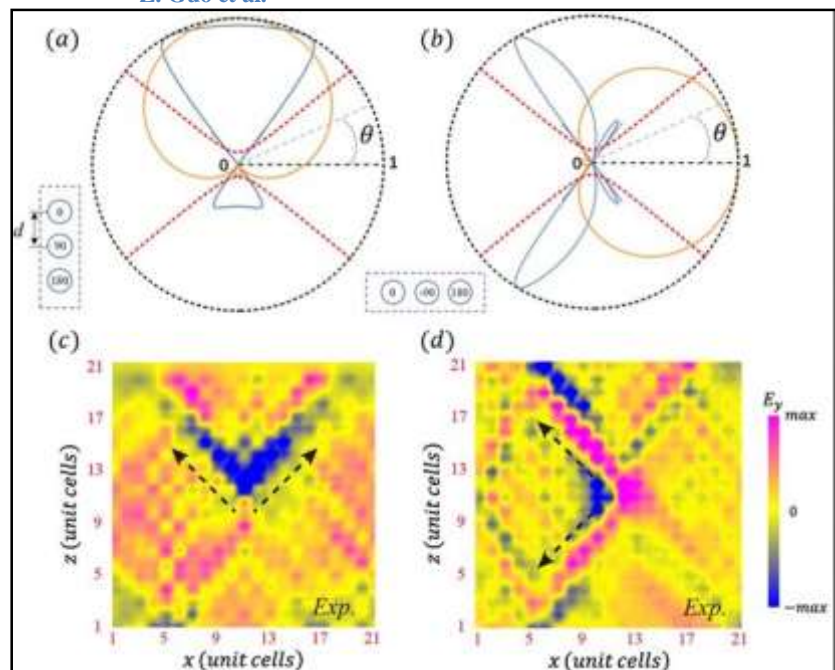
attention due to their unique ability to control near-field light by enabling subwavelength confinement of electromagnetic waves. Large wave-vector modes in HMMs are of particular interest because those modes are easier to integrate and have a smaller loss of energy at transfer.

As reported in *Advanced Photonics*, researchers from Tongji University in China recently demonstrated an all-electric scheme able to flexibly control the propagation direction of near-field light. They reported anomalous unidirectional excitation of hyperbolic modes with large wave-vector at subwavelength scales. According to their research, selective near-field coupling in HMMs is enabled by discrete electric dipoles with different phases, which serve as a metasource composed of all-electric components and with a symmetry-associated inner freedom.

Their research not only addresses the need for an all-electric experimental design scheme for near-field photonics, but also contributes fundamentally valuable symmetry-based excitation principles. Using a Huygens metasource, the researchers were able to observe the unidirectional excitation of hyperbolic bulk modes in a planar HMM. They found that unidirectional excitation in



Reversible unidirectional propagation of hyperbolic modes. Credit: Z. Guo et al.



Unidirectional excitation of hyperbolic bulk modes using an all-electric Huygens metasource: (a) (b) Calculated excitation factor of $|Fk|$ the all-electric Huygens metasource as a function of the propagation direction θ in different settings. The $|Fk|$ functions in the HMM and air are denoted by blue and orange lines, respectively. The dashed red and black lines indicate the HMM dispersion $\omega(k_x, k_z)$ and the maximum value of $|Fk|$. (c), (d) Measured unidirectional propagation of the all-electric Huygens metasource in a circuit-based HMM for (a) and (b), respectively. Image credit: Z. Guo et al

free space is the same as in the vertical direction, but opposite to that in the horizontal direction. These different propagation characteristics in horizontal and vertical directions are unique to the hyperbolic modes. In addition, the researchers used spin metasources to study the directional propagation of light in a planar hyperbolic waveguide. They found that, for the clockwise-rotating spin metasource, only the guided mode propagating from right to left is excited. And for the counterclockwise-rotating source, only the guided mode propagating from left to right is excited.

Overall, the research advances the fields of optical science and information communication, as the results provide the necessary conditions for highly efficient and experimentally verified photonics routing. For emerging applications in integrated optical devices, as well as wireless power transfer, switching, and filtering, this work promises unprecedented flexible control of near-field light.

More information: Zhiwei Guo et al, Anomalous unidirectional excitation of high-k hyperbolic modes using all-electric metasources, *Advanced Photonics* (2021). [DOI: 10.1117/1.AP.3.3.036001](https://doi.org/10.1117/1.AP.3.3.036001)
<https://phys.org/news/2021-06-near-field-routing-hyperbolic-metamaterials.html>



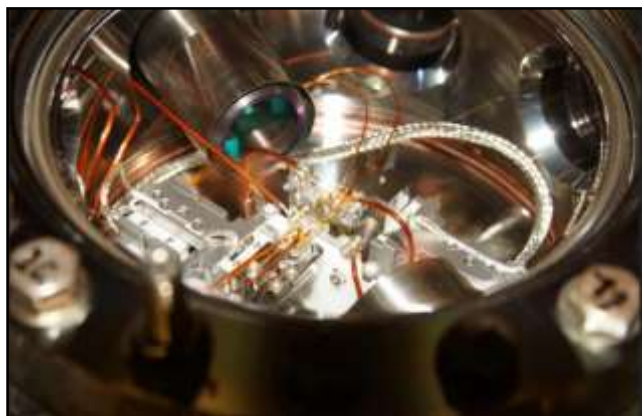
Tue, 15 June 2021

Insulators turn up the heat on quantum bits

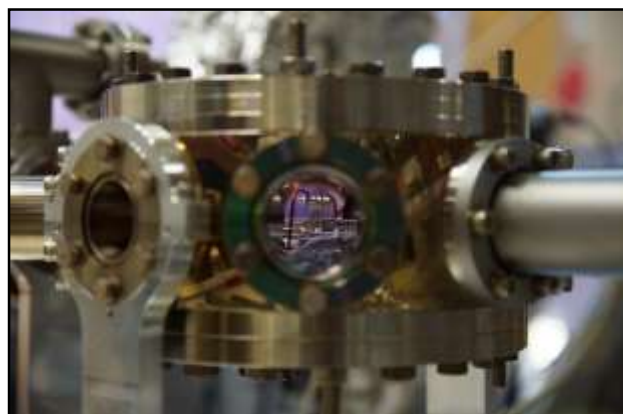
Physicists have long suspected that dielectric materials may significantly disrupt ion-trap quantum computers. Now, researchers led by Tracy Northup have developed a new method to quantify this source of error for the first time. For the future operation of quantum computers with very many quantum bits, such noise sources need to be eliminated already during the design process if possible.

Quantum technologies are based on quantum properties of light, electrons, and atoms. In recent decades, scientists have learned to master these phenomena and exploit them in applications. Thus, the construction of a quantum computer for commercial applications is also coming within reach. One of the emerging technologies that is currently being advanced very successfully is ion trap quantum computers. Here, charged particles are trapped with electromagnetic fields in a vacuum chamber and prepared in such a way that they can serve as carriers for information and be used for computing, which includes cooling them to the lowest temperatures permitted by quantum mechanics.

However, the quantum mechanical properties exploited in this process are highly error-prone. Even the smallest deficiencies can heat up the strongly cooled particles and thereby lead to errors in the processing of quantum information. Possible sources of such faults are weakly conducting or non-conducting materials, which are used, for example, as insulators in a metallic ion trap, or optics, which are necessary for coupling ions with laser light.



In the ion trap, the distance between the ions and optics can be precisely adjusted. Credit: University of Innsbruck



View into the vacuum chamber where the ion trap is isolated from external noise. Credit: University of Innsbruck

"Even for ion traps made exclusively of metal, oxide layers on the metals would cause such failures," explains Tracy Northup at the Department of Experimental Physics of the University of Innsbruck in Austria. Northup's team, together with collaborators in Innsbruck and in the U.S., have found a way to determine the influence of dielectric materials on the charged particles in ion traps.

Experimentally confirmed

This was achieved because the Innsbruck quantum physicists have an ion trap in which they can precisely set the distance between the ions and dielectric optics. Based on an earlier proposal by Rainer Blatt's group, the physicists computed the amount of noise caused by the dielectric material for this ion trap and compared it with data from experiment. "Theory and experiment agree very well, confirming that this method is well suited for determining the influence of dielectric materials on the ions," explains Markus Teller from the Innsbruck team. To calculate the noise, the so-called fluctuation-dissipation theorem from statistical physics was used, which mathematically describes the response of a system in thermal equilibrium to a small external perturbation.

"In quantum computers, there are many possible sources of noise, and it is very difficult to sort out the exact sources," says Tracy Northup. "Our method is the first to quantify the influence of dielectric materials in a given ion trap on the charged particles. In the future, designers of ion trap quantum computers will be able to assess this effect much more accurately and design their devices to minimize these perturbations."

After having successfully demonstrated the method on their own ion trap, the Innsbruck physicists now want to apply it to the ion traps of collaborators in the U.S. and Switzerland.

More information: Markus Teller et al, Heating of a Trapped Ion Induced by Dielectric Materials, *Physical Review Letters* (2021). DOI: [10.1103/PhysRevLett.126.230505](https://doi.org/10.1103/PhysRevLett.126.230505)

Journal information: [Physical Review Letters](https://phys.org/news/2021-06-insulators-quantum-bits.html)
<https://phys.org/news/2021-06-insulators-quantum-bits.html>

New research finds compound that blocks Covid-19 virus and protects lung cells

The research team tested Elovonoids (ELVs) on infected lung tissue from a 78-year-old man in petri dish cultures. They found that ELVs reduced the ability of the SARS-CoV-2 spike protein to bind to receptors and enter cells

Washington: Research conducted at Louisiana State University Health New Orleans Neuroscience Center of Excellence reports that 'Elovonoids', bioactive chemical messengers made from omega-3 very-long-chain polyunsaturated fatty acids, may block the virus that causes Covid-19 from entering cells and protect the air cells (alveoli) of the lung.

The findings of the research are published in the journal Scientific Reports.

"Because the compounds are protective against damage in the brain and retina of the eye and the Covid-19 virus clearly damages the lung, the experiment tested if the compounds would also protect the lung," noted Nicolas Bazan, MD, PhD, Director of the LSU Health New Orleans Neuroscience Center and senior author of the paper.

The research team tested Elovonoids (ELVs) on infected lung tissue from a 78-year-old man in petri dish cultures. They found that ELVs not only reduced the ability of the SARS-CoV-2 spike protein to bind to receptors and enter cells, but they also triggered the production of protective, anti-inflammatory proteins that counteract lung damage.

The scientists report that ELVs decreased the production of ACE2. ACE2 is a protein on the surface of many cell types. ACE2 receptors act like locks on cells, and the SARS-CoV-2 spike proteins act like keys that open the locks letting the virus enter cells to multiply rapidly. They also demonstrated for the first time that alveolar cells are endowed with pathways for the biosynthesis of ELVs.

"Since SARS-CoV-2 affects nasal mucosa, the GI tract, the eye, and the nervous system, uncovering the protective potential of ELVs expands the scope of our observations beyond the lung. Our results provide a foundation for interventions to modify disease risk, progression, and protection of the lung from Covid-19 or other pathologies (including some types of pneumonia)," added Dr Bazan.

<https://www.hindustantimes.com/lifestyle/health/new-research-finds-compound-that-blocks-covid-19-virus-and-protects-lung-cells-101623722313324.html>



New research finds compound that blocks Covid-19 virus and protects lung cells (Shutterstock)

