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# 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

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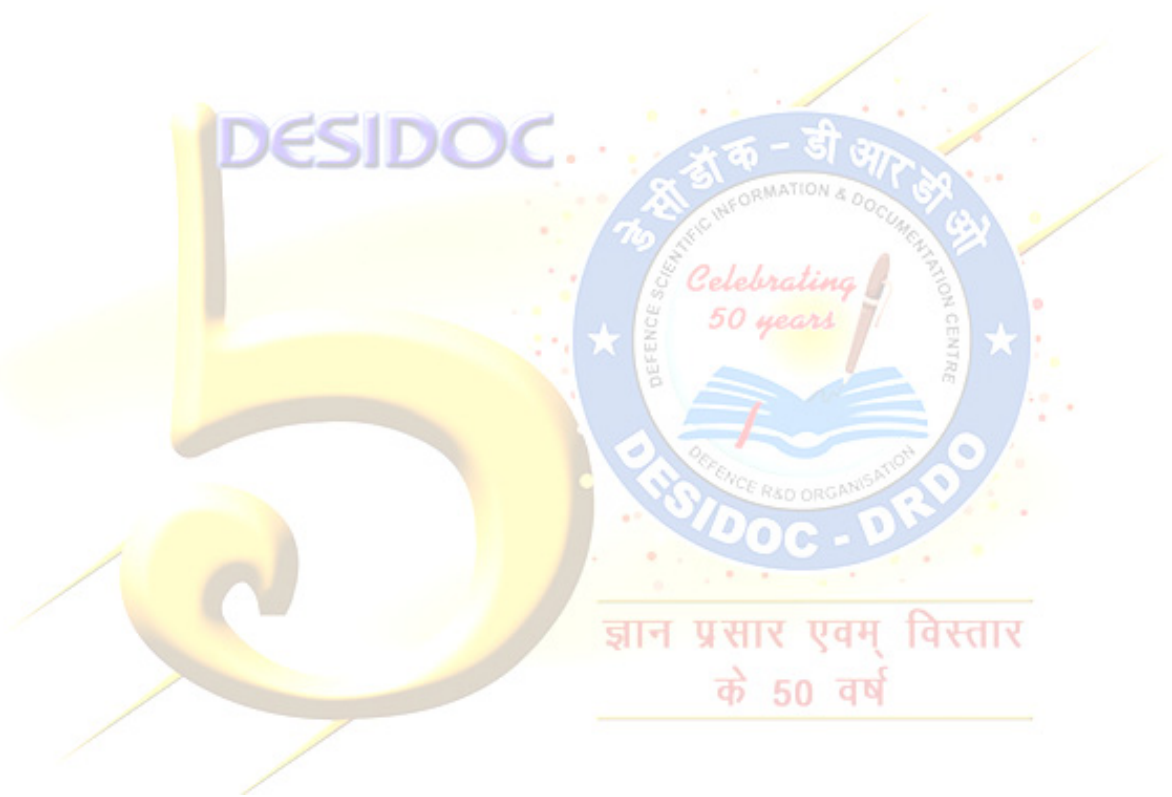
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**National Technology Day**

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## **Raksha Mantri Shri Rajnath Singh calls for India to become a net exporter of technology as DRDO celebrates National Technology Day**

Raksha Mantri Shri Rajnath Singh stressed the need for India to become self-reliant and “net exporter of technology”. He addressed the scientists of Defence Research and Development Organisation (DRDO) on the occasion of National Technology Day (NTD) in here today through video conference.

Shri Rajnath Singh said, “In the last five years, we have set new targets, and worked hard to formulate the right policy framework to achieve them. I am sure that you can see this change in every field of defence research, development and manufacture.” He added, “We always have to keep in mind that there is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology.”

While calling upon the country’s pool of experts to contribute to make India a technological powerhouse, Shri Rajnath Singh said the Government and people fully support their future endeavours in this direction.

Shri Rajnath Singh said defence organisations are tackling the challenges posed by COVID-19 using state-of-the-art technology. India’s defence forces and Research & Development efforts have contributed significantly in finding solutions to the challenges posed by this invisible enemy. He added, “DRDO has developed more than 50 products in the last 3-4 months, like bio suit, sanitiser dispenser, PPE kits, etc through its continuous efforts to contribute to the fight against COVID-19. The indomitable spirit of our defence industry has increased the opportunity for mass production of these high quality products in record time.”

The NTD is observed on 11 May commemorating the nuclear tests conducted at Pokhran in 1998 that symbolised successful achievements of home grown technologies and stressed the need for self-reliance in critical areas.

Speaking on significance of the occasion, Raksha Mantri said, “This day is dedicated to the knowledge, talent and perseverance of our Indian scientists, especially those who have made their valuable contribution in finding solutions to the complex national security challenges of the country”. He further said, “National Technology Day is an opportunity to take stock of our technological advancements and if we are to emerge as a technological force then we should know what to do. Such introspection is necessary because science and technology have become the most important drivers of a nation’s economy.” The day reminds us of the continuous effort to achieve self-reliance in important technologies, encourage innovations and maintain technology flow for product realisation, he added.

National Technology Day 2020 was celebrated at DRDO to commemorate and pay tribute to the dedication, determination, and sacrifice of scientists and engineers, who have worked for achieving a national technological identity with the success of Shakti-Pokhran 2. On this occasion, a webinar was held and a Presentation on DRDO technologies to fight against COVID-19 was given.

Member NitiAayog Dr VK Saraswatin his address congratulated DRDO for outstanding work done during the first 45 days in fight against COVID-19. He stated that the country has energised S&T infrastructure in this fight. He further advised DRDO to provide more focus on life sciences laboratories and must revive work on bio-defence programme. He emphasised the need for the development of more robotic devices where DRDO has strong base.

Principal Scientific Advisor (PSA) to the Government of India Prof K VijayRaghavan in his speech appreciated DRDO and said that it is extraordinary for it to rise to the occasion in the fight against COVID-19. He said that we should develop indigenous capability in all technology areas. He also emphasised the need of developing IT enabled technologies and applications.

Secretary DDR&D & Chairman DRDO Dr G Satheesh Reddy congratulated all the teams for their innovative efforts in supporting the fellow citizens, Armed Forces and Corona Warriors in combating COVID-19. He appealed to all to rededicate themselves to the service of the nation by providing cutting edge technologies for making the country strong and self-reliant.

Dr Reddy said that during lockdown, products should be supplied all over the world. Delayed delivery is no delivery. The DRDO has developed 53 products to fight COVID-19. He added that some of the systems were inducted in record time.

Senior officials of MoD and DRDO were also present on the occasion.

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रक्षा मंत्रालय

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## रक्षा मंत्री श्री राजनाथ सिंह ने डीआरडीओ के राष्ट्रीय प्रौद्योगिकी दिवस के अवसर पर भारत को प्रौद्योगिकी का निर्यातक बनाने का आह्वान किया

रक्षा मंत्री श्री राजनाथ सिंह ने भारत को आत्मनिर्भर और “प्रौद्योगिकी का निर्यातक” बनाने की आवश्यकता पर बल दिया। उन्होंने आज वीडियो कॉन्फ्रेंस के माध्यम से राष्ट्रीय प्रौद्योगिकी दिवस (एनटीडी) के अवसर पर रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) के वैज्ञानिकों को संबोधित किया।

श्री राजनाथ सिंह ने कहा, “पिछले पांच वर्षों में, हमने नए लक्ष्य निर्धारित किए हैं, और उन्हें प्राप्त करने के लिए सही नीतिगत रूपरेखा तैयार करने में कड़ी मेहनत की है। मुझे विश्वास है कि आप रक्षा अनुसंधान, विकास और निर्माण के हर क्षेत्र में इस बदलाव को देख सकते हैं।” उन्होंने कहा, “हमें हमेशा ध्यान में रखना है स्वदेशी प्रौद्योगिकी और स्वदेशी निर्माण का कोई विकल्प नहीं है। हम वास्तव में तभी आत्मनिर्भर होंगे, जब भारत प्रौद्योगिकी के शुद्ध आयातक के बजाय शुद्ध निर्यातक बनने में सफल होगा।”

श्री राजनाथ सिंह ने भारत को एक तकनीकी रूप से शक्तिशाली देश बनाने में योगदान देने के लिए विशेषज्ञों का आह्वान करते हुए कहा कि सरकार और देशवासी इस दिशा में आपके भविष्य के प्रयासों को पूरा समर्थन देंगे।

श्री राजनाथ सिंह ने कहा कि रक्षा संगठन अत्याधुनिक प्रौद्योगिकी का उपयोग करते हुए कोविड-19 की चुनौतियों का सामना कर रहे हैं। भारत के रक्षा बलों और अनुसंधान और विकास के प्रयासों ने इस अदृश्य दुश्मन द्वारा पैदा की गयी चुनौतियों का समाधान खोजने में महत्वपूर्ण योगदान दिया है। उन्होंने कहा, “डीआरडीओ ने कोविड -19 के खिलाफ लड़ाई में योगदान देने के अपने निरंतर प्रयासों के माध्यम से पिछले 3-4 महीनों के दौरान 50 से अधिक उत्पाद विकसित किए हैं। इनमें बायो सूट, सैनिटाइजर डिस्पेंसर, पीपीई किट आदि शामिल हैं। हमारे रक्षा उद्योग की अदम्य भावना ने रिकॉर्ड समय में बड़े पैमाने पर उच्च गुणवत्ता वाले उत्पादों के निर्माण का अवसर प्रदान किया है।”

पोखरण में 1998 में किए गए परमाणु परीक्षणों की याद में 11 मई को एनटीडी मनाया जाता है। यह देश में विकसित प्रौद्योगिकी की सफल उपलब्धि का प्रतीक है। उन्होंने महत्वपूर्ण क्षेत्रों में आत्मनिर्भरता की आवश्यकता पर बल दिया।

इस अवसर के महत्व के बारे में रक्षा मंत्री ने कहा, "यह दिन हमारे भारतीय वैज्ञानिकों के ज्ञान, प्रतिभा और दृढ़ता के लिए समर्पित है, विशेष रूप से उनके लिए जिन्होंने देश की जटिल राष्ट्रीय सुरक्षा चुनौतियों का समाधान खोजने में अपना बहुमूल्य योगदान दिया है"। उन्होंने आगे कहा, “राष्ट्रीय प्रौद्योगिकी दिवस हमारी तकनीकी प्रगति का जायजा लेने का एक अवसर है और यदि हमें एक तकनीकी शक्ति के रूप में उभरना है तो हमें पता होना चाहिए कि हमें क्या करना है। इस तरह का आत्मनिरीक्षण आवश्यक है क्योंकि विज्ञान और प्रौद्योगिकी देश की अर्थव्यवस्था के सबसे महत्वपूर्ण कारक बन गए हैं।” उन्होंने कहा कि यह दिन हमें महत्वपूर्ण प्रौद्योगिकियों में आत्मनिर्भरता हासिल करने, नवाचारों को प्रोत्साहित करने और उत्पाद की प्राप्ति के लिए प्रौद्योगिकी प्रवाह को बनाए रखने के लिए निरंतर प्रयास करने की याद दिलाता है।

वैज्ञानिकों तथा इंजीनियरों के समर्पण, दृढ़ संकल्प और बलिदान को श्रद्धांजलि देने के लिए डीआरडीओ में राष्ट्रीय प्रौद्योगिकी दिवस 2020 मनाया गया। विशेष रूप से उन वैज्ञानिकों तथा इंजीनियरों को याद किया गया, जिन्होंने शक्ति-पोखरण 2 की सफलता के साथ राष्ट्रीय तकनीकी पहचान हासिल करने के लिए काम किया। इस अवसर पर, एक वेबिनार आयोजित किया गया और कोविड-19 के खिलाफ लड़ने के लिए डीआरडीओ प्रौद्योगिकी पर एक प्रस्तुति दी गई।

नीति आयोग के सदस्य डॉ वी के सारस्वत ने अपने संबोधन में कोविड-19 के खिलाफ लड़ाई में पहले 45 दिनों के दौरान उत्कृष्ट कार्य के लिए डीआरडीओ को बधाई दी। उन्होंने कहा कि इस लड़ाई में देश ने विज्ञान एवं प्रौद्योगिकी के बुनियादी ढांचे को मजबूत किया है। उन्होंने डीआरडीओ को जीवन विज्ञान प्रयोगशालाओं पर अधिक ध्यान देने की सलाह दी। उन्होंने कहा कि जैव रक्षा कार्यक्रम को पुनर्जीवित किया जाना चाहिए। उन्होंने अधिक रोबोट उपकरणों के विकास की आवश्यकता पर जोर दिया, जिसमें डीआरडीओ का आधार मजबूत है।

भारत सरकार के प्रधान वैज्ञानिक सलाहकार (पीएसए) प्रोफेसर के विजयराघवन ने अपने संबोधन में डीआरडीओ की सराहना की और कहा कि कोविड-19 के खिलाफ लड़ाई में अवसर के अनुकूल कार्य करना असाधारण है। उन्होंने कहा कि हमें सभी प्रौद्योगिकी क्षेत्रों में स्वदेशी क्षमता विकसित करनी चाहिए। उन्होंने आईटी सक्षम तकनीकों और अनुप्रयोगों के विकास की आवश्यकता पर भी जोर दिया।

डीडीआर एंड डी के सचिव तथा डीआरडीओ के चेयरमैन डॉ जी सतीश रेड्डी ने कोविड-19 का मुकाबला करने में साथी नागरिकों, सशस्त्र बलों और कोरोना वारियर्स को समर्थन देने के लिए सभी टीमों को बधाई दी। उन्होंने सभी से अपील की कि वे देश को मजबूत और आत्मनिर्भर बनाने के लिए अत्याधुनिक तकनीकों को प्रदान करने के लिए काम करें और इसके लिए खुद को राष्ट्र की सेवा में समर्पित करें।

डॉ रेड्डी ने कहा कि लॉकडाउन के दौरान, उत्पादों की दुनिया भर में आपूर्ति की जानी चाहिए। विलंबित आपूर्ति कोई आपूर्ति नहीं है। डीआरडीओ ने कोविड -19 से लड़ने के लिए 53 उत्पाद विकसित किए हैं। उन्होंने कहा कि कुछ प्रणालियों को रिकॉर्ड समय में शामिल किया गया था।

इस अवसर पर रक्षा मंत्रालय और डीआरडीओ के वरिष्ठ अधिकारी भी उपस्थित थे।

एएम / जेके/ डीसी

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రక్షణ మంత్రిత్వ శాఖ

Mon, 11 May 2020 4:22 PM

## డిఆర్డిఓ జాతీయ టెక్నాలజీ దినోత్సవాన్ని జరుపుకుంటున్న నేపథ్యంలో భారత్ సాంకేతిక రంగంలో నికరమైన ఎగుమతిదారు

### కావాలని ఆకాంక్షించిన రక్షణ మంత్రి శ్రీ రాజనాథ్ సింగ్

భారతదేశం స్వావలంబన, "టెక్నాలజీ ఎగుమతిదారు" గా మారవలసిన అవసరాన్ని రక్షణ మంత్రి శ్రీ రాజనాథ్ సింగ్ నొక్కి చెప్పారు. ఈ రోజు ఇక్కడ జాతీయ సాంకేతిక దినోత్సవం (ఎస్ టి డి) సందర్భంగా డిఫెన్స్ రీసెర్చ్ అండ్ డెవలప్ మెంట్ ఆర్గనైజేషన్ (డిఆర్ డిఓ) శాస్త్రవేత్తలనుద్దేశించి వీడియో కాన్ఫరెన్స్ ద్వారా ఆయన ప్రసంగించారు.

“గత ఐదేళ్లలో, మనం కొత్త లక్ష్యాలను నిర్దేశించాము, వాటిని సాధించడానికి సరైన విధాన చట్టాన్ని రూపొందించడానికి కృషి చేశాము. రక్షణ పరిశోధన, అభివృద్ధి, తయారీ రంగాలలో ఈ మార్పును మీరు చూడగలరని నేను ఖచ్చితంగా అనుకుంటున్నాను” అని శ్రీ రాజనాథ్ సింగ్ అన్నారు. “దేశీయ సాంకేతిక పరిజ్ఞానం, స్వదేశీ తయారీకి ప్రత్యామ్నాయం లేదని మనం ఎల్లప్పుడూ గుర్తుంచుకోవాలి. సాంకేతిక పరిజ్ఞానం యొక్క నికర దిగుమతిదారుకు బదులుగా నికర ఎగుమతిదారుగా అవతరించడంలో భారతదేశం విజయవంతం అయినప్పుడే మనం నిజంగా స్వావలంబన పొందుతాము” అని రక్షణ మంత్రి స్పష్టం చేశారు. భారతదేశాన్ని సాంకేతిక శక్తి కేంద్రంగా మార్చడానికి దేశ నిపుణుల బృందానికి పిలుపునిస్తూ, ప్రభుత్వం, ప్రజలు ఈ దిశగా వారి భవిష్యత్ ప్రయత్నాలకు పూర్తిగా మద్దతు ఇస్తున్నారు” అని ఆయన తెలిపారు.

అత్యాధునిక సాంకేతిక పరిజ్ఞానాన్ని ఉపయోగించి, కోవిడ్ -19 ఎదుర్కొంటున్న సవాళ్లను రక్షణ సంస్థలు ఎదుర్కొంటున్నాయని శ్రీ రాజనాథ్ సింగ్ అన్నారు. ఈ అదృశ్య శత్రువు ఎదుర్కొంటున్న సవాళ్లకు పరిష్కారాలను కనుగొనడంలో భారతదేశ రక్షణ దళాలు, పరిశోధన, అభివృద్ధి ప్రయత్నాలు గణనీయంగా దోహదపడ్డాయి. కోవిడ్-19 కు వ్యతిరేకంగా పోరాటానికి దోహదం చేయడానికి నిరంతర ప్రయత్నాల ద్వారా డిఆర్ డిఓ గత 3-4 నెలల్లో బయో సూట్, శానిటైజర్ డిస్పెన్సర్, పిపిఇ కిట్లు మొదలైన 50 కి పైగా ఉత్పత్తులను అభివృద్ధి చేసింది. రక్షణ పరిశ్రమ దృఢ స్ఫూర్తి, రికార్డు సమయంలో ఈ అధిక నాణ్యత గల ఉత్పత్తులను భారీగా ఉత్పత్తి చేసే అవకాశాన్ని పెంచింది” అని రక్షణ మంత్రి

తెలిపారు 1998లో పోక్రాన్ లో విజయవంతంగా నిర్వహించిన అణు పరీక్ష జరిగిన ఈ రోజును ఎన్ఫిడి దినోత్సవంగా జరుపుకుంటున్నాము.

ఈ రోజు మన భారతీయ శాస్త్రవేత్తల జ్ఞానం, ప్రతిభ, పట్టుదలకు అంకితం చేయబడింది, ముఖ్యంగా దేశంలోని సంక్లిష్టమైన జాతీయ భద్రతా సవాళ్లకు పరిష్కారాలను కనుగొనడంలో విలువైన కృషి చేసిన వారికి... " అని శ్రీ రాజనాథ్ సింగ్ తెలిపారు. "జాతీయ సాంకేతిక దినోత్సవం మన సాంకేతిక పురోగతిని తెలుసుకోవడానికి ఒక అవకాశం, మనం సాంకేతిక శక్తిగా ఎదగాలంటే ఏమి చేయాలో తెలుసుకోవాలి. ఇటువంటి ఆత్మపరిశీలన అవసరం ఎందుకంటే సైన్స్, టెక్నాలజీ దేశ ఆర్థిక వ్యవస్థకు అతి ముఖ్యమైన చోదక శక్తులుగా మారాయి. ముఖ్యమైన సాంకేతిక పరిజ్ఞానాలలో స్వావలంబన సాధించడానికి, ఆవిష్కరణలను ప్రోత్సహించడానికి, నిరంతర కృషిని ఈ రోజు గుర్తు చేస్తుంది" అని శ్రీ రాజనాథ్ సింగ్ స్పష్టం చేశారు.

శక్తి-పోక్రాన్-2 విజయంతో జాతీయ సాంకేతిక గుర్తింపును సాధించడానికి కృషి చేసిన శాస్త్రవేత్తలు, ఇంజనీర్ల అంకితభావం, సంకల్పం త్యాగం జ్ఞాపకార్థం, జాతీయ సాంకేతిక దినోత్సవం 2020 ను డిఆర్డీఓ లో జరుపుకుంటారు. ఈ సందర్భంగా, ఒక వెబ్నార్ జరిగింది. దీనిలో కోవిడ్-19 కు చేస్తున్న పోరాడటానికి డిఆర్డీఓ టెక్నాలజీలపై ప్రదర్శన ఇచ్చింది. కోవిడ్-19 కి వ్యతిరేకంగా పోరాటంలో మొదటి 45 రోజులలో చేసిన కృషికి నీతి ఆయోగ్ సభ్యుడు డాక్టర్ వి.కె. సారస్వత్ అభినందించారు. ఈ పోరాటంలో దేశం ఎస్ & టీ మౌలిక సదుపాయాలను పటిష్టం చేసిందని ఆయన పేర్కొన్నారు. లైఫ్ సైన్సెస్ ప్రయోగశాలలపై మరింత దృష్టి పెట్టాలని ఆయన సూచించారు. బయో డిఫెన్స్ ప్రోగ్రామ్లో పనిని పునరుద్ధరించాలి. డిఆర్డీఓ బలమైన స్థావరం ఉన్న మరిన్ని రోబోటిక్ పరికరాల అభివృద్ధి అవసరాన్ని ఆయన నొక్కి చెప్పారు.

కేంద్ర ప్రభుత్వ ప్రిన్సిపల్ సైంటిఫిక్ అడ్వైజర్ (పిఎస్ఎ) ప్రొఫెసర్ కె.విజయ రాఘవన్ తన ప్రసంగంలో డిఆర్డీఓను ప్రశంసించారు. కోవిడ్ -19 కి వ్యతిరేకంగా పోరాటంలో డిఆర్డీఓ అసాధారణమైన ఎదుగుదల సాధించిందని అన్నారు. అన్ని సాంకేతిక రంగాలలో స్వదేశీ సామర్థ్యాన్ని పెంపొందించుకోవాలని ఆయన అన్నారు. ఐటి ఆధారిత టెక్నాలజీలు, అప్లికేషన్లను అభివృద్ధి చేయవలసిన అవసరాన్ని ఆయన నొక్కి చెప్పారు. కోవిడ్-19 ను ఎదుర్కోవడంలో తోటి పౌరులు, సాయుధ దళాలు కరోనా యోధులకు మద్దతు ఇవ్వడంలో అన్ని బృందాలు చేసిన వినూత్న కృషికి డిడిఆర్ & డి కార్యదర్శి, చైర్మన్ డాక్టర్ జి సతీష్ రెడ్డి అభినందించారు. దేశాన్ని బలంగా, స్వావలంబనగా మార్చడానికి అత్యాధునిక సాంకేతిక పరిజ్ఞానాలను అందించడం ద్వారా తమను తాము దేశ సేవకు అంకితం చేయాలని ఆయన అందరికీ విజ్ఞప్తి చేశారు.

లాక్ డౌన్ సమయంలో, ప్రపంచవ్యాప్తంగా ఉత్పత్తులను సరఫరా చేయాలని డాక్టర్ రెడ్డి అన్నారు. కోవిడ్-19 తో పోరాడటానికి డిఆర్డీఓ 53 ఉత్పత్తులను అభివృద్ధి చేసింది. ఈ కార్యక్రమంలో ఎంఓడి, డిఆర్డీఓ సీనియర్ అధికారులు పాల్గొన్నారు.

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# Tribute to Scientists and Covid Warriors

*By Dr Sudershan Kumar*

It was on May 11, India added a feather to its crown when successfully fired the Operation Shakti nuclear missile in Pokhran Test Range. It was the second test conducted by India; the initial test code- 'Smiling Buddha' was carried out at the same site on May 18, 1974.

Every year since 1998, the 11th of May is celebrated as the National technology day. On the dates of 11th and 13th May back in 1998, India had showcased its growing military might to the entire world by conducting the five nuclear tests under the assigned code name "Operation Shakti". The "Operation Shakti" was the culmination of the tireless efforts of the Indian scientists and encompassed one fusion bomb and the rest four fission bombs. These are till date remembered as Pokhran-II successful explosions. Meanwhile, way back in 1974, on 18th May, India had conducted its first nuclear test at Pokhran test range, which was based on the principle of nuclear fission (commonly known as Pokhran-I) under the code name "Smiling Buddha. Both these tests reciprocated the diligence and capabilities of our scientists. Furthermore, the impressive, extraordinary feat performed by Indian Scientists on 11th and 13th May 1998 not only baffled the whole world but also changed the dynamics of south Asia. But at the same time this also sent out a clear message to the world that India cannot be cowed down by any power and neither can it be subjugated. The fact that Indian scientist have the "Capacity, Capability, Competence, Commitment and Brilliance" to develop any technology was endorsed by these tests and any such technology which matters for the security and over all development of the country will be available for it. Consequent upon conducting these five tests, the then Prime Minister Atal Bihari Vajpayee had proudly declared that India had become the 6th country in the world to join nuclear club.

These tests redefined India's global position in terms of its self reliance in nuclear technology and also its impeccable non proliferation record. India emerged as the first country as simultaneously being not a part of Non proliferation treaty (NPT) but also being able to develop equally complex nuclear technology at its own. Technology basically refers to methods, systems, devices which emerge from the basic scientific knowledge used for various practical purposes. There fore "technological superiority is very much a critical component for nation 's security. In peace it acts as a deterrence, in crisis as an option and in war it provides clear edge over the adversary".

## **Today is Technology day**

There fore it seems and acknowledged fact that no foreign power will part with its latest and critical technology. Even if some business minded countries are willing to do it then is surely to be acquired at a very high cost. Of course all copy rights will be retained by the host country. In order to obtain superiority over each other, nations around the globe are striving hard to develop either their own technologies or to acquire these by using all means. Thus India is also not lagging behind in this race of development of indigenous technologies. Indian scientists, technologists and engineers are leaving no stone unturned to achieve this mission of development of most advanced and critical technologies specially against the backdrop of the emerging new dimensions and changing paradigms of the security threats and also for the over all development of the country. Some of the major milestones achieved previously in the field of aeronautic and missile technology by India need to be reemphasized here. First, indigenously developed twin seater light Air craft Hansa -3 had a first maiden flight from city of Bangalore on 11th May in 1998. This light general purpose aviation air craft had utility in training pilots, aerial photography, surveillance etc. Also during the same time period DRDO had a successful trial of quick reaction surface to air missile Trishul. This missile was one of the unit of India's Integrated guided missile program. These successes in May 1998 acted as the catalyst and inspired further advancements in the field of technology in all spheres. Hence the then Government at the Centre had declared 11th May as a national technology day. Furthermore to instill confidence and encouragement among the scientists, the technology development board (TDB) on the technology day (11 May) recognizes the contribution of scientists by felicitating them.

TDB also selects different themes every year to commemorate the occasion with lectures and exhibitions being organised across the country. In the year 2019 the national theme was “science and technology for sustainable future”. Similarly for the year 2020 the national theme for technology day is “women in science”. Besides, on this day, our scientists, engineers and technologists are also reminded of the need to introspect, to reach new heights. They need to brainstorm on various aspects like- What they have achieved ? What the nation expects from them? Evolving ways and means to full fill them. Even though numerous technologies have so far been developed by our country ‘s primer establishments in various fields of science but few especially in the areas of space and defence have been highlighted and many need to be mentioned. India’ s premier institute, Indian Space Research Organisation (ISRO) successfully accomplished 13 missions including six launch vehicles and seven satellite missions in the year 2019 itself. Notable among them were the RISAT-2B a radar imaging reconnaissance satellite, mission Chandrayaan -2. This Chandrayaan 2 consisted of the lunar orbiter and also included the Vikram lander and the Pragyan lunar rover. Even though the final landing of Vikram was not as desired but still the instruments of space crafts are fully functional and they are providing data regularly. More over Vikram was also located in an unbroken condition on the surface of moon. Besides, Cartosat-3 the third generation advanced satellite launched through (Polar Satellite Launch Vehicle) PSLV-C 47 has added another feather in ISRO’s cap. In addition ISRO established new gallery along with rocket space garden at Sri Hari Kota station.

This enabled nearly 5000 people to watch their space missions live. This certainly led to instilling and nurturing innovative ideas and interest among youth and the inquisitive brains of our country. Similarly in equipping armed forces with the latest critical technologies/systems, scientists working in 54 DRDO laboratories are leaving no stone unturned to carry out research and development in innovative and cutting edge technologies in various clusters of science.

Notable among them are successful trials of all weather subsonic cruise missile Nirbhay, submarine launched K-4 missile, Multi Barrel Rocket Launcher Pinaka with capacity to fire 74 rockets in 44sec and many others. It is worthy to mention here that last year on March 27th India demonstrated its might by successfully testing Anti satellite weapon under the operation code named Mission Shakti. Last but not the least, it would not be out of context to mention here that since December 2019, the entire world is passing through an unprecedented catastrophe cause by covid-19 pandemic. This covid-19 pandemic so far has affected nearly 3.5 million people around the globe resulting in nearly 2.5 lakh deaths but around eleven lakh people have also been recovered. But these numbers are changing rapidly. Moreover it has caused severe blow to world economy. India has also not been left untouched from this Covid-19 pandemic. But timely and proactive multi prong approach adopted under the dynamic and visionary leadership of Prime Minister Shri Narendra Modi, the Central Government with active support of state and central agencies and with full cooperation of 1.34 billion people of India has so far been able to curtail this pandemic to a large extent. These measures include isolation ,social distancing , sanitizing, use of masks lock down and many others including recognizing the services of front line Covid-19 warriors. Parallely all out efforts were made by DRDO and other premier agencies to develop innovative devices for front line warriors who are fighting Covid-19 war.

These include varieties of sanitizers, masks including N-95 and N-99, bio suits thermal imagers, ventilators Mobile Covid-19 testing labs ,multipurpose drones, special type of mobile App for tracking Covid-19 people and fast testing kits, individual protecting equipment and many others. Parellely all out efforts have been made to up grade the required infrastructure including establishment of additional quarantine centre and authorization of private labs for rapid testing etc. Looking in to present scenario in the country and efforts made by front line corona warriors which include doctors, paramedical staff, policemen for maintaining lock down, agencies involved in providing essential service and many others involved in distribution of food and ration to the needy also deserve special tribute on this day along with scientists and engineers of the country.

*(The author is former Director General and Special Secretary DRDO, MoD GoI)*

[feedbackexcelsior@gmail.com](mailto:feedbackexcelsior@gmail.com)

<https://www.dailyexcelsior.com/tribute-to-scientists-and-covid-warriors/>

## Why May 11 be celebrated as National Technology Day? Things you should know

It was on May 11, India added a feather to its crown when successfully fired the Operation Shakti nuclear missile in Pokhran Test Range. It was the second test conducted by India; the initial test code-'Smiling Buddha' was carried out at the same site on May 18, 1974.

On May 11 and 13, 1998 India set off five nuclear devices at a test site in Pokhran in Rajasthan. It was the first such test in 24 years.

Many names were given to these tests, originally these were called Operation Shakti-98, and the five nuclear bombs were designated Shakti-I to V. Later, the operation came to be known as Pokhran II, and the 1974 explosion as Pokhran-I.

### National Technology Day

The Indian government declared 11 May as National Technology Day to commemorate the Pokhran nuclear tests that were carried out on 11 May 1998. It was officially signed by then Prime Minister Atal Bihari Vajpayee.

### Pokhran II: Objectives

India had three objectives to achieve by Pokhran II. According to Rakesh Sood, former diplomat and someone who was involved in the post-nuclear tests diplomacy, said we had three objectives, "First was to validate new designs to ensure the credibility of the nuclear deterrent as the data set from the 1974 test was limited. Second was to declare that India was now a nuclear weapon state and modify the terms of our engagement with other states accordingly. Third was to generate an acceptance of India as a responsible state with an impeccable non-proliferation record."

### Development and test teams

The following were the main technical personnel involved in the operation of Pokhran II

### Project Chief Coordinators

- Dr. A.P.J. Abdul Kalam (later, President of India), Scientific Adviser to the prime minister and Head of the DRDO.
- Dr. R. Chidambaram, Chairman of the Atomic Energy Commission and the Department of Atomic energy.

### Defence Research & Development Organization (DRDO):

- Dr. K. Santhanam; Director, Test Site Preparations.

### Atomic Minerals Directorate for Exploration and Research:

- Dr. G. R. Dikshitulu; Senior Research Scientist B.S.O.I Group, Nuclear Materials Acquisition.

### Bhabha Atomic Research Centre (BARC):

- Dr. Anil Kakodkar, Director of BARC.
- Dr. Satinder Kumar Sikka, Director; Thermonuclear Weapon Development.
- Dr. M. S. Ramakumar, Director of Nuclear Fuel and Automation Manufacturing Group; Director, Nuclear Component Manufacture.
- Dr. D.D. Sood, Director of Radiochemistry and Isotope Group; Director, Nuclear Materials Acquisition.
- Dr. S.K. Gupta, Solid State Physics and Spectroscopy Group; Director, Device Design & Assessment.
- Dr. G. Govindraj, Associate Director of Electronic and Instrumentation Group; Director, Field Instrumentation

<https://timesofindia.indiatimes.com/home/education/current-affairs/why-may-11-be-celebrated-as-national-technology-day-things-you-should-know/articleshow/75669853.cms>

## **Defence Minister Rajnath Singh calls for India to become a net exporter of technology as DRDO celebrates national technology day**

New Delhi: Raksha Mantri Shri Rajnath Singh stressed the need for India to become self-reliant and “net exporter of technology”. He addressed the scientists of Defence Research and Development Organisation (DRDO) on the occasion of National Technology Day (NTD) in here today through video conference.

Shri Rajnath Singh said, “In the last five years, we have set new targets, and worked hard to formulate the right policy framework to achieve them. I am sure that you can see this change in every field of defence research, development and manufacture.” He added, “We always have to keep in mind that there is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology.”

While calling upon the country’s pool of experts to contribute to make India a technological powerhouse, Shri Rajnath Singh said the Government and people fully support their future endeavours in this direction.

Shri Rajnath Singh said defence organisations are tackling the challenges posed by COVID-19 using state-of-the-art technology. India’s defence forces and Research & Development efforts have contributed significantly in finding solutions to the challenges posed by this invisible enemy. He added, “DRDO has developed more than 50 products in the last 3-4 months, like bio suit, sanitiser dispenser, PPE kits, etc through its continuous efforts to contribute to the fight against COVID-19. The indomitable spirit of our defence industry has increased the opportunity for mass production of these high quality products in record time.”

The NTD is observed on 11 May commemorating the nuclear tests conducted at Pokhran in 1998 that symbolised successful achievements of home grown technologies and stressed the need for self-reliance in critical areas.

Speaking on significance of the occasion, Raksha Mantri said, “This day is dedicated to the knowledge, talent and perseverance of our Indian scientists, especially those who have made their valuable contribution in finding solutions to the complex national security challenges of the country”. He further said, “National Technology Day is an opportunity to take stock of our technological advancements and if we are to emerge as a technological force then we should know what to do. Such introspection is necessary because science and technology have become the most important drivers of a nation’s economy.” The day reminds us of the continuous effort to achieve self-reliance in important technologies, encourage innovations and maintain technology flow for product realisation, he added.

National Technology Day 2020 was celebrated at DRDO to commemorate and pay tribute to the dedication, determination, and sacrifice of scientists and engineers, who have worked for achieving a national technological identity with the success of Shakti-Pokhran 2. On this occasion, a webinar was held and a Presentation on DRDO technologies to fight against COVID-19 was given.

Member NitiAayog Dr VK Saraswatin his address congratulated DRDO for outstanding work done during the first 45 days in fight against COVID-19. He stated that the country has energised S&T infrastructure in this fight. He further advised DRDO to provide more focus on life sciences laboratories and must revive work on bio-defence programme. He emphasised the need for the development of more robotic devices where DRDO has strong base.

Principal Scientific Advisor (PSA) to the Government of India Prof K VijayRaghavan in his speech appreciated DRDO and said that it is extraordinary for it to rise to the occasion in the fight against COVID-19. He said that we should develop indigenous capability in all technology areas. He also emphasised the need of developing IT enabled technologies and applications.

Secretary DDR&D & Chairman DRDO Dr G Satheesh Reddy congratulated all the teams for their innovative efforts in supporting the fellow citizens, Armed Forces and Corona Warriors in combating COVID-19. He appealed to all to rededicate themselves to the service of the nation by providing cutting edge technologies for making the country strong and self-reliant.

Dr Reddy said that during lockdown, products should be supplied all over the world. Delayed delivery is no delivery. The DRDO has developed 53 products to fight COVID-19. He added that some of the systems were inducted in record time.

Senior officials of MoD and DRDO were also present on the occasion.

<https://indiaeducationdiary.in/defence-minister-rajnath-singh-calls-for-india-to-become-a-net-exporter-of-technology-as-drdo-celebrates-national-technology-day/>

**THEWEEK**

Tue, 12 May 2020

## **Rajnath calls for India to be ‘net exporter of technology’ on Pokhran test anniversary**

*The defence minister stressed the need for India to become self-reliant*

*By Pradip R Sagar*

When Prime Minister Narendra Modi, on Monday on account of National Technology Day, hailed all those at the forefront of research and innovation to defeat COVID-19 and remembered the “exceptional achievement” of the country’s scientists in carrying out the 1998 Pokhran nuclear tests, his cabinet colleague and Defence Minister Rajnath Singh stressed the need for India to become self-reliant and a “net exporter of technology”.

National Technology Day is observed on May 11 on the anniversary of the 1998 underground nuclear tests that India conducted in the deserts of Pokhran, Rajasthan.

Speaking to scientists of the Defence Research and Development Organisation (DRDO) via video conference, Rajnath said, “There is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology.”

Acknowledging the contribution of defence organisations in tackling the challenges posed by COVID-19 using state-of-the-art technology, the defence minister said, “DRDO has developed more than 50 products in the last 3-4 months, like bio-suit, sanitiser dispenser, PPE kits etc through its continuous efforts to contribute to the fight against COVID-19. The indomitable spirit of our defence industry has increased the opportunity for mass production of these high quality products in record time.”

On the occasion, Dr V.K. Saraswat, Niti Aayog member and former chairman DRDO, stressed that defence scientists must provide more focus on life sciences laboratories and must “revive work on bio-defence programme”.

He also emphasised on the need for the development of more “robotic devices” where DRDO has strong base.

Head of DRDO and Scientific Adviser to the defence minister Dr G. Satheesh Reddy said that during lockdown, products should be supplied all over the world. While adding that “delayed delivery is no delivery”, Reddy said that the DRDO has developed 53 products to fight COVID-19 and some of the systems were inducted in record time.

Principal Scientific Advisor (PSA) to the Government of India Prof K. Vijay Raghavan said emphasised the need of developing IT enabled technologies and applications.

<https://www.theweek.in/news/india/2020/05/11/rajnath-calls-for-india-to-be-net-exporter-of-technology-on-pokhran-test-anniversary.html>

# The Statesman

Tue, 12 May 2020

## India needs to become ‘self-reliant’, ‘net exporter of technology’: Rajnath Singh on National Technology Day

*Minister said defence organisations are tackling the challenges posed by COVID-19 using state-of-the-art technology*

New Delhi: Defence Minister Rajnath Singh on the occasion of National Technology Day stressed the need for India to become self-reliant and ‘net exporter of technology’.

He addressed the scientists of Defence Research and Development Organisation (DRDO) on the occasion of National Technology Day (NTD) in here today through video conference.

“In the last five years, we have set new targets and worked hard to formulate the right policy framework to achieve them. I am sure that you can see this change in every field of defence research, development and manufacture.” He added, “We always have to keep in mind that there is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology,” Rajnath Singh said.



Defence Minister Rajnath Singh. (Photo: IANS/PIB)

While calling upon the country’s pool of experts to contribute to make India a technological powerhouse, Rajnath Singh said the Government and people fully support their future endeavours in this direction.

Minister said defence organisations are tackling the challenges posed by COVID-19 using state-of-the-art technology. India’s defence forces and Research & Development efforts have contributed significantly in finding solutions to the challenges posed by this invisible enemy.

He added, “DRDO has developed more than 50 products in the last 3-4 months, like bio-suit, sanitiser dispenser, PPE kits, etc through its continuous efforts to contribute to the fight against COVID-19. The indomitable spirit of our defence industry has increased the opportunity for mass production of these high-quality products in record time.”

National Technology Day is celebrated on this day as on the same day in 1998, India successfully conducted nuclear tests at Pokhran. Adding the significance to the day, DRDO has launched surface-to-air Trishul missile.

India’s first indigenous aircraft ‘Hansa-3 was also launched on the same day.

<https://www.thestatesman.com/india/india-needs-to-become-self-reliant-net-exporter-of-technology-rajnath-singh-on-national-technology-day-1502887149.html>

## Govt exhorts DRDO to revive work on biological defence initiative

*Biological Warfare Convention prohibits offensive bioweapons, but allows antidote development*

*By Ajai Shukla*

New Delhi: NITI Aayog member and former Defence Research & Development Organisation (DRDO) Chief V K Saraswat said on Monday that the DRDO must “revive work on a bio (logical)-defence programme”.

Speaking at a videoconference on National Technology Day, Saraswat called on the DRDO to provide “more focus” on its six laboratories that work on life sciences.

While Saraswat did not directly suggest that the Covid-19 pandemic was related to biological warfare, it is significant that the government is exhorting military laboratories to work concertedly on biological defence.

India is one of the 183 signatories to the Biological Weapons Convention of 1975 (BWC), which bans the possession of “biological agents and toxins” except for “prophylactic, protective or other peaceful purposes”. While banning the development or possession of offensive biological weapons, the BWC permits member countries to develop defensive biological means.

The DRDO operates six laboratories under its “life sciences cluster”. These include Defence Bioengineering and Electromedical Laboratory (DEBEL), Bengaluru; Defence Institute of Bio-Energy Research (DIBER), Haldwani; Defence Food Research Laboratory (DFRL), Mysore; Defence Institute of Physiology and Allied Sciences (DIPAS), Delhi; Defence Institute of High Altitude Research (DIHAR); and Defence Institute of Psychological Research (DIPR), Delhi.

Speaking on the occasion, Defence Minister Rajnath Singh congratulated the DRDO for “tackling the challenges posed by Covid-19 using state-of-the-art technology”.

“The DRDO has developed more than 50 products in the last three-four months, like bio suit, sanitizer-dispenser, PPE (personal protection equipment) kits,” he said.

On Sunday, the DRDO announced the development of an “automated contactless UVC sanitisation cabinet, called the Defence Research Ultraviolet Sanitiser (DRUVS)”, which sanitizes mobile phones, iPads, laptops, currency notes, cheque leaves, challans, passbooks and papers without physical contact.

On May 4, the DRDO unveiled an “Ultra Violet (UV) Disinfection Tower” for chemical-free disinfection of infection-prone surfaces in laboratories and offices, such as computers, printers and scanners. Using UV waves, the tower disinfects a small room in 10 minutes and a large room in 30 minutes.

On April 14, the DRDO unveiled a Covid-19 Sample Collection Kiosk (COVSACK), which allows health workers to collect samples from patients without wearing PPE kits, since the kiosk’s shielding screen protects the medical worker from the aerosols of the patient while taking the sample.

National Technology Day is observed on May 11 every year to commemorate the 1998 nuclear tests at Pokhran and to underline the need for self-reliance in critical areas.

[https://www.business-standard.com/article/defence/govt-exhorts-drdo-to-revive-work-on-biological-defence-initiative-120051101502\\_1.html](https://www.business-standard.com/article/defence/govt-exhorts-drdo-to-revive-work-on-biological-defence-initiative-120051101502_1.html)

## DRDO must revive work on bio-defence programme, says VK Saraswat

*We have developed 53 products to fight COVID-19 and some systems were inducted in record time, says Satheesh Reddy*

New Delhi: The Defence Research and Development Organisation (DRDO) must provide more focus on life sciences laboratories and “must revive work on bio-defence programme,” advised Dr. V. K. Saraswat, Member NITI Aayog and former Chairman DRDO, in an address to scientists on the occasion of National Technology Day, Defence Ministry said on Monday.

Dr. Saraswat also emphasised on the development of more robotic devices where the DRDO has strong base, the Ministry said in a statement. The National Technology Day is observed on May 11 to commemorate the nuclear tests conducted at Pokhran in 1998.

Addressing the scientists through video conference, Defence Minister Rajnath Singh stressed on self-reliance and India becoming a “net exporter of technology”. “The DRDO has developed more than 50 products in the last 3-4 months, like bio suit, sanitiser dispenser, Personal Protection Equipment (PPE) kits and so on through its continuous efforts to contribute to the fight against COVID-19,” the Defence Ministry quoted Mr. Singh as having said.



NITI Aayog member V. K. Saraswat/  
File | Photo Credit: G.K. Ramakrishna

Dr. G. Satheesh Reddy, Chairman, DRDO, said during the lockdown, the DRDO has developed 53 products to fight the coronavirus (COVID-19) and some of the systems were inducted in record time. He said “delayed delivery is no delivery”.

<https://www.thehindu.com/news/national/drdo-must-revive-work-on-bio-defence-programme-says-vk-saraswat/article31558273.ece>

ज्ञान प्रसार एवम् विस्तार  
के 50 वर्ष



## The Tribune

Tue, 12 May 2020

### Fight against COVID: TBRL develops contactless sanitizer dispenser

*The machine can be used in hospitals, public areas*

Chandigarh: An automatic high pressure mist-based contactless hand sanitizer dispenser developed by the Defence Research and Development Organisation (DRDO) has now been optimised to meet requirement of the medical fraternity as well as the general public at offices, factories, colleges, public places and homes.

The optimisation has been undertaken by the Chandigarh-based Terminal Ballistics Research Laboratory (TBRL) in collaboration with the local industry keeping in mind large requirement of the equipment and ease of operation.

The TBRL is engaged in the development, production and characterisation of different high explosive compositions and evaluation of warheads bombs, missiles, airborne systems and protective systems.

The machine designed and developed by the TBRL dispenses high pressure mist to meet the requirement of "donning and doffing areas" in hospitals treating COVID-19 patients and quarantine places.

The sanitizer is sprayed as long as users keep their hand below the delivery nozzle. This is unlike other devices which are timer based and dispense a fixed quantity of sanitizer.

The machine was demonstrated by the TBRL on Monday before two senior doctors at the PGIMER here who are handling COVID-19 patients.

According to one of the doctors, the machine generates high pressure droplets that are able to enter the skin pores and penetrate under the nail tips.

The pressurised mist is able to cleanse even minute areas. The quick response of the sensor not only ensures timely delivery of sanitizing mist but also reduces any wastage, the doctor added.

Two models with a capacity of two litres and five litres have been designed, which are expected to cost Rs 5,000 to Rs 6,000 per unit and commercial production is expected to commence soon.

<https://www.tribuneindia.com/news/nation/fight-against-covid-tbri-develops-contactless-sanitizer-dispenser-83455>



Hand sanitiser dispenser developed by the TBRL. Tribune Photo

## DRDO का 'सेनिटाइजर डिस्पेंसर', बिना छूए हाथ होंगे साफ

By Mohit



चंडीगढ़: रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की चंडीगढ़ स्थित एक प्रयोगशाला ने एक ऐसा 'सेनिटाइजर डिस्पेंसर' विकसित किया है जो स्वचालित होगा और इसे छूने की जरूरत नहीं पड़ेगी। यह हाइ प्रेशर वाला और नमी आधारित होगा। अधिकारियों ने सोमवार को यह जानकारी दी। उन्होंने बताया कि इस सेनिटाइजर डिस्पेंसर का उद्देश्य लोगों को बिना इसे छूए हाथ को साफ किये जाने की सुविधा उपलब्ध कराना है। अधिकारियों ने बताया कि चंडीगढ़ में 'टर्मिनल द बैलिस्टिक्स रिसर्च लेबोरेटरी' (टीबीआरएल) ने कोरोना वायरस से मुकाबला कर रहे चिकित्सकों और घरों, कार्यालयों, कॉलेजों और सार्वजनिक स्थानों पर आम जनता की आवश्यकताओं को पूरा करने के लिए बिना छूने वाला सेनिटाइजर डिस्पेंसर विकसित किया है। रक्षा मंत्रालय की एक विज्ञप्ति के अनुसार जांच के दौरान चंडीगढ़ के पीजीआईएमईआर के चिकित्सक डा.आर आर गुरु ने कहा कि टीबीआरएल ने बिना छूने वाला सेनिटाइजर डिस्पेंसर विकसित किया है जो उच्च दबाव की बूंदें उत्पन्न करता है और रोम छिद्रों तथा नाखूनों की दरारों में जाकर अच्छी प्रकार से सफाई करता है और इससे सेनिटाइजर की बर्बादी भी नहीं होती है।

<https://www.punjabkesari.in/national/news/drdo-lab-develops-high-pressure-mist-based-contactless-sanitizer-dispenser-1164969>

**Outlook**  
THE FULLY LOADED MAGAZINE

Tue, 12 May 2020

## DRDO lab develops high-pressure, mist-based contactless sanitizer dispenser

Chandigarh: A Chandigarh-based laboratory of Defence Research and Development Organisation has developed an automatic, high-pressure- mist-based, contact-less sanitizer dispenser, said officials on Monday.

The aim of this sanitizer dispenser is to make people avail hand sanitization facility without touching it, they said. The Terminal Ballistics Research Laboratory, an important DRDO facility in Chandigarh, has developed the touch-free sanitizer dispenser to meet requirements of both the COVID-fighting doctors and general public at offices, factories, colleges and public places including homes, they said.

Against many other traditional devices, the TBRL's dispenser is designed to deliver the sanitizer to the user's palm on extending it below its nozzle, explained an official while demonstrating the working of the novel device before Chandigarh's PGIMER doctors Pranay Gupta and R R Guru.

A Defence Ministry release said during the operation and testing, Dr Guru said the TBRL-developed touch-free dispenser generates high pressure droplets, which are able to enter skin pores and nails tips while ensuring no wastage of the sanitizer.

Because of the pressurized mist, they were even able to clean the finest areas such as nail openings, that too with volume as small as one or two ml.

Two models of dispenser with two and five litre capacities have been designed and they can be placed at various places, including offices, hospitals and even outside home, as per the requirement.

The quick response of the sensor not only ensures timely delivery of the sanitizer mist but also reduces its wastage to literally zero.

A private company will soon start manufacturing them to meet the growing requirements.

*(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/drdo-lab-develops-highpressure-mistbased-contactless-sanitizer-dispenser/1831227>

**NEWS.RU #ОставайтесьДома**

Mon, 11 May 2020

## Indian engineers released contactless sanitizer for smartphones and money

### Инженеры из Индии выпустили бесконтактный санитайзер для смартфонов и денег

*The Defense Research and Development Organization (DRDO) of India has assembled a universal non-contact sanitizer.*

*Специалисты Организации оборонных исследований и разработок (DRDO) Индии собрали универсальное бесконтактное устройство-санитайзер.*

Об этом в Twitter сообщило агентство Asian News International. Новинку разработали в лаборатории DRDO в Хайдарабаде. Как уточняется в сообщении, с помощью устройства можно обеззараживать ультрафиолетом смартфоны, планшеты, ноутбуки, денежные купюры, документы и многое другое.



Судя по представленным фото, санитайзер достаточно компактен и размерами не превышает средний принтер.

The Defense Research and Development Organization (DRDO) of India has assembled a universal non-contact sanitizer.

This was reported on Twitter by Asian News International. The novelty was developed in the DRDO laboratory in Hyderabad. As clarified in the message, using the device you can disinfect smartphones, tablets, laptops, banknotes, documents, and much more with ultraviolet light.

Judging by the photos presented, the sanitizer is quite compact and does not exceed the size of an average printer.

<https://news.ru/gadgets/indijskie-inzhenery-sdelali-beskontaktnyj-sanitajzer-dlya-smartfonov-i-deneg/>

## **DRDO lab develops ‘sanitisation cabinet’ for gadgets, papers, currency notes**

*By Hemani Sheth*

Mumbai: The Defence Research and Development Organisation (DRDO) on Sunday announced that it had built a solution to sanitize currency notes, electronic gadgets, and papers in an automated, contactless way in light of the Covid-19 pandemic.

The DRDO’s Hyderabad based lab, Research Centre Imarat (RCI), has developed an automated contactless UVC sanitisation cabinet, called Defence Research Ultraviolet Sanitiser (DRUVS). The cabinet has been “designed to sanitise mobile phones, iPads, laptops, currency notes, cheque leafs, challans, passbooks, paper, envelopes, etc.” the DRDO said in a statement.



DRDO’s tech for the ‘anti-Covid’ products is an offshoot of that developed for defence

“The DRUVS cabinet is having a contactless operation which is very important to contain the spread of the virus,” it further said.

The cabinet sanitizes objects placed in it with the help of UVC.

The cabinet is equipped with proximity sensor switches that are clubbed with drawer opening and closing mechanism. The opening and closing mechanism can be controlled with the sensor switches without actually touching the cabinet making its operation automatic and contactless.

The DRUVS cabinet provides a 360-degree exposure of UVC to the objects that are placed inside the cabinet for sanitisation. Once the sanitisation is complete, the system goes in sleep mode. The operator thus does not need to supervise the machine to switch it off and need not wait or stand near the device.

Apart from this, the RCI lab has also developed an automated UVC sanitising device specifically for currency notes called NOTESCLEAN.

“Bundles of currency notes can be sanitised using DRUVS, however, disinfection of each currency notes using it will be a time-consuming process,” the DRDO said.

The lab has developed this particular sanitising technique to speed up the sanitisation of currency notes. The operator has to simply place the loose currency notes at the input slot of the device. The device then picks up each note one by one and passes it through a series of UVC lamps for complete disinfection.

<https://www.thehindubusinessline.com/news/science/drdo-lab-develops-sanitisation-cabinet-for-gadgets-papers-currency-notes/article31555785.ece#>

## DRDO lab mobilises task force to sanitise internal areas in Tezpur

Guwahati: The Defence Research Laboratory (DRL), Tezpur - the only Defence Research Development Organisation (DRDO) laboratory in the northeast - has started work to disinfect internal areas in its fight against Covid-19.

State health minister Himanta Biswa Sarma had recently expressed concerns over lack of pragmatic steps for total annihilation of the virus, which he said may survive inside household items and utensils, even as outer sanitisation is on almost everywhere.

The DRL-Covid team, led by microbiologist Ashok Naglot has focused on disinfecting places such as entry gates and channels, locks, working tables of employees, cash and cheque withdrawal and deposit counters, enquiry counters, ATM entry gates, ATM keypads, lockers for keeping files and other places, which usually don't come under the sanitisation drives.

DRL (DRDO), Tezpur, started the drive in Sonitpur district. "Desktop computer keypads, chairs, railings of stairs, doors knobs, slabs and racks for keeping files, in-house canteen and dining facilities, guard rooms, main shutter gates of respective offices and departments in Tezpur were our thrust areas. The objective of the drive is to minimise chances of Covid-19 spread within offices where public footfall is high even during the lockdown," said Naglot.

He added, "The whole internal sanitisation activity carried out by the DRL team was quite important as district administration was focusing only on sanitisation of roads, outer portion of buildings and complexes. The team started this type of sanitisation activity after the WHO recommended disinfectant chemical on March 27 after various civil and military establishments approached us for it."

The DRL team comprising Naglot, Vijay Pal, senior technical assistant and Nipu Jyoti Kalita, technician (photographer) has carried out the drive in Tezpur.

Naglot said 28 ATMs in and around Tezpur, where general public footfalls were high even during the lockdown were brought under the internal sanitization drive, which has covered important offices belonging to the state and central governments, including military establishments located in and around Tezpur.

Soon after the announcement of country-wide lockdown in March, the director of DRL, Tezpur, Sanjai K Dwivedi constituted the Covid-19 task force.

The team also sanitised Army establishments and units governed under the umbrella of HQ 4 Corps, Tezpur, covering important entry points, offices, messes, jawan lines, isolation and quarantine rooms and centres of respective units.

<https://timesofindia.indiatimes.com/city/guwahati/drdo-lab-mobilises-task-force-to-sanitise-internal-areas-in-tezpur/articleshow/75672597.cms>

## DFRL hands over mobile BSL-3 containment laboratory 'Parakh' to MMC&RI

*Mobile Lab equipped to test clinical samples for coronavirus cases in Mysuru district*

Mysuru: The Defence Food Research Laboratory, defence laboratory of the Defence Research and Development Organisation (DRDO), Siddharthanagar, Mysuru, on Monday handed over the sophisticated mobile Biosafety level-3 (BSL3) containment laboratory to test clinical samples for Covid19 to Mysore Medical College and Research Institute (MMC&RI).

This lab has been developed by DRDO. DRDO, Ministry of Defence, in collaboration with ESIC Medical College & Hospital, Sanathnagar (Hyderabad) with due permission of the Indian Council of Medical Research (ICMR) and Government of Telangana. The lab has been developed within a record time of 2 weeks, whereas it would normally take about 6 months.

The BSL3 facility is accessible to the research community working on highly pathogenic and infectious diseases such as tuberculosis (TB), HIV, Japanese encephalitis virus (JEV) and other BSL-3 class pathogens and to experimentally infect animal models via aerosol route for the development of novel diagnostics, drugs, and vaccines against TB. This lab has special safety and engineering features for maintaining requisite negative pressure environment to ensure unidirectional airflow, and for ensuring safety of lab personal.

Defence Minister Rajnath Singh had on April 23 dedicated the first COVID-19 sample collection mobile Lab of the country to the nation through video conference from New Delhi.

Rajnath Singh had appreciated the efforts of DRDO and ESIC in setting up of this Bio-Safety Level 2 and Level 3 lab in a record time of 15 days which usually takes about six months time.

The mobile lab is used exclusively for testing Covid-19 samples and on returnable basis.

Dr CP Nanjaraj, Director of MMCRI; Dr Anil Dutt Semwal, Director of DFRL; Dr BL Nanjundaswamy, Superintendent, KR Hospital; Dr Anuradha, Dr Amrutha, Dr B Shashidar, Dr HN Dinesh, Dr Joseph, Dr Paridha and Dr Jayaprakash were present on the occasion. (NAV, HN)

<https://citytoday.news/dfri-handover-mobile-bsl-3-containment-laboratory-parakh-to-mmcri/>



## DFRL's mobile lab helps Mysuru boost its COVID-19 testing capacity

*Mysuru has its lone testing lab Virus Research and Diagnostic Laboratory (VRDL) at the city's KR Hospital.*

Mysuru: To battle COVID-19, Mysuru is increasing its testing capacity by over 30 per cent, with its newest addition of a mobile testing lab, built by the city's own DRDO Defence Food Research Lab (DFRL).

According to authorities, with the mobile laboratory, the district will be able to test over 30 per cent more samples a day and it can reduce its dependence on NIMHANS in Bengaluru.

Mysuru has its lone testing lab Virus Research and Diagnostic Laboratory (VRDL) at the city's KR Hospital. Earlier, the lab was given a much-needed capacity addition from CSIR Central Food Research Laboratory, which gave two PCR machines to the lab.



With the latest addition from DFRL, the lab has become a classic example of what can be achieved when premier institutes join hands with the district machinery.

The mobile lab, christened as PARAKH — A Mobile Microbial Containment Lab — was designed during situations like bio warfare, but with the ongoing situation, it was handed over to the district. It has BSL level-three certification for containment, thereby enabling it to test COVID-19 and other similar heavily communicable infections.

It has a RT-PCR machine as well as facilities for storage of biomedical waste. It can even be deployed in a site of emergency since it can operate on battery power.

The lab was handed over by Dr Anil Dutt Semwal, director of DFRL to KR hospital at a formal event on Monday. According to MMCRI dean Nanjaraj CP, an extra 200-300 samples can be tested in addition to the 400-450 samples being tested at VRDL a day.

<https://www.newindianexpress.com/states/karnataka/2020/may/12/dfrls-mobile-lab-helps-mysuru-boost-its-covid-19-testing-capacity-2142139.html>



## Parakh: DRDO-DFRL's mobile microbial containment lab handed over to MMCRI

Mysuru: On May 11, 2020, Defence Food Research Laboratory (DFRL), an Indian defence laboratory of the Defence Research and Development Organisation (DRDO), has handed over an innovative, state of the art Mobile Microbial Containment (BSL-3) Laboratory 'PARAKH' to the Mysuru Medical College and Research Institute (MMCRI) to test samples of coronavirus (Covid-19) at its hi-tech Viral Research and Diagnostic Laboratory (VRDL).

- It is to be noted that Defence minister Rajnath Singh on April 23, 2020, had dedicated the 1<sup>st</sup> corona sample collection mobile lab “Mobile BSL-3 VRDL Lab” to the nation through video conference in New Delhi.

**Key Points:**

**1. About Parakh:**

- It is a fully autonomous containment lab, developed within record time of 2 weeks by ministry of Defence in collaboration with ESIC (Employees’ State Insurance Corporation) Medical College & Hospital, Sanathnagar, Hyderabad with the permission from Indian Council of Medical Research (ICMR).
  - It is designed on ISO (International Organization for Standardization) 20 feet container and installed on Ashok Leyland 1618-2C-4700 wb cabin Chassis.
  - In order to handle clinical, food and environmental samples during biological emergency without any risk to personal and environment, it works on the line of Class ISO 7 and functions with negative pressure.
2. The mobile lab equipped with dynamic pass box for transferring the samples directly Class-III Biosafety cabinet for safe handling, PCR (Polymerase chain reaction) workstation, real-time PCR machine, incubator, deep freezer and refrigerator for testing samples and storing solutions for treatment of liquid effluents, safe storage of solid bio-hazard wastes and decontamination by autoclaving and Heating Ventilation Air Condition (HVAC) for maintenance of unidirectional airflow.
  3. The facility also has provision of captive and raw power supply, fuel & one can easily transported water by road and deployed at the site of emergency as per the requirement.
  4. Anuradha, Head, Microbiology, MMCRI; Amrutha, Officer In-charge, Viral Research and Diagnostic Laboratory (VRDL) and other officials from DFRL were also present during the occasion.

<https://affairscloud.com/parakh-drdo-dfrls-mobile-microbial-containment-lab-handed-over-to-mmcri/>



Tue, 12 May 2020

## Telangana governor appreciates facilities provided by DRDO to ESIC hospital, Hyderabad

*Telangana Governor Tamilisai Soundararajan on Monday appreciates facilities provided by Defence Research and Development Organisation (DRDO) to Employees State Insurance Corporation (ESIC) Hospital at Hyderabad during COVID-19 pandemic*

Hyderabad: Telangana Governor Tamilisai Soundararajan on Monday appreciates facilities provided by Defence Research and Development Organisation (DRDO) to Employees State Insurance Corporation (ESIC) Hospital at Hyderabad during COVID-19 pandemic. Speaking during her visit to Hospital, Soundararajan said: "I congratulate all the medical professionals, paramedical professionals, staff for their exemplary work in this critical situation. I also appreciate DRDO for providing assistance to this hospital. DRDO has created facilities in a very short period of time. This medical college at an initial stage was in Coma, but the Director has revived it, so if the medical college itself can be revived then whatever may be the critical patients can be revived successfully."



Telangana Governor Tamilisai Soundararajan speaking at ESIC hospital in Hyderabad on Monday. (Photo/ANI). Image Credit: ANI



"We all are in a critical situation due to COVID-19, but this type of preparation by the authorities encourage patients to face any situation. When the patients know that facilities are in place, then they will become confident," she added. ESIC particularly is serving 80 Lakh employees. It is treating COVID-19 as well as non COVID-19 patients, particularly cancer patients and dialysis patients. It also has a mobile virology lab. (ANI)

<https://www.devdiscourse.com/article/health/1045578-telangana-governor-appreciates-facilities-provided-by-drdo-to-esic-hospital-hyderabad>

## DRDO Technology



**DEFENCE AVIATION POST**

Your Connect To The World Of Defence And Aviation

Tue, 12 May 2020

# Can the Prospina ATGM rival the Israeli Spike & the US Javelin?

The NAG missile (Cobra), also called "PROSPINA" for the land-attack version, is an Indian third-generation, all-weather, fire-and-forget, lock-on after launch, anti-tank guided missile (ATGM) with an operational range of 500 m to 20 km. Developed by the Defence Research and Development Organisation (DRDO), the PROSPINA (formerly named as the NAG) missile is claimed to be far superior to the Javelin of the US and the Israeli Spike missiles.

PROSPINA, which has 'fire & forget' and 'top attack' capabilities, will be highly supportive to the mechanised infantry and airborne forces of Indian Army.

The Fire and Forget 3rd generation ATGM NAG is incorporated with many advanced technologies including the imaging infrared radar (IIR) seeker with integrated avionics, a capability which is possessed by few nations in the world. The capabilities of the top attack ATGM NAG is unique in nature and in the latest mission it successfully destroyed the target. Talking of the lethality, PROSPINA carrying an 8 kg HEAT (High Explosive Anti Tank) warhead is capable of beating even the thickest of modern armours.



DRDO officials revealed that highly sensitive detectors have now been placed on the missile tip for sensing heat or infra-red signals in three different thermal scenarios including that of a thermal differential within the target, between the target and the background and surrounding temperature variations.

### Testing

On 7 July 2019, the DRDO carried out three successful trials of the NAG missile in the Pokhran firing range. The missiles were tested during both day and night. The missile was reportedly in the final stages of being inducted.

<https://www.defenceaviationpost.com/2020/05/can-the-prospina-atgm-rival-the-israeli-spike-the-us-javelin/>

## ThePrint

Tue, 12 May 2020

### Tough to 'weaponise' coronavirus, but can't rule out attacks: Armed Forces Medical Chief

*Lt Gen. Anup Banerji says until a vaccine or treatment for coronavirus is found, the armed forces will stay vigilant*

*By Amrita Nayak Dutta*

New Delhi: The possibility of adversaries weaponising or using the coronavirus against the Indian armed forces is remote, but they remain susceptible to such attacks until a vaccine or preventative medical therapy is found, Lt Gen. Anup Banerji, Director General of the Armed Forces Medical Services (AFMS) told ThePrint.

The DG is the head of the AFMS and is responsible for the overall medical policy of the armed forces.

The senior military officer further said that the virus is not a "lucrative" biological agent, and although highly contagious, has "very low mortality" in the young and those with no comorbidities.

"In fact, most of those infected remain asymptomatic," he said.

"However, in the absence of an effective vaccine or a proven chemoprophylaxis, we will remain susceptible to such attacks," the officer added.

Chemoprophylaxis refers to the use of medicine to treat diseases.

Lt Gen. Banerji's comments come days after the Army's 15th Corps Commander, Lt Gen. B.S. Raju, had told the BBC that the Army has received intelligence inputs that Pakistan is pushing a lot of coronavirus cases into Pakistan-occupied Jammu and Kashmir.

Lt Gen. Raju had said that India is "conscious that Pakistan is taking risk of putting gullible people training as terrorists into small, enclosed spaces in their launch pads", and these people coming from across the Line of Control could be carriers of the virus.

#### **Preparing for Bio-threats not a new Plan**

On India's current policies to prevent such threats, senior Army officers explained that while the pandemic has brought the aspect of such bio-threats into prominence lately, the Army has always considered chemical, biological, radiological and nuclear (CBRN) warfare as a critical part of its operational planning.

"Accordingly, a comprehensive policy is in place for defence against CBRN attacks, from which is derived our CBRN equipment policy," a senior officer, who has specifically dealt with the subject, told ThePrint.

The Army has in place the Faculty of CBRN Protection (FCBRNP), nodal training institute that deals with defensive CBRN warfare, and is responsible for inculcating basic and advanced training.

On the status of availability of adequate protective gear on the ground to deal with such attacks, the officer said the Army is adequately prepared to ensure "both individual and collective protection for its troops during a bio-threat in operations or a bio-emergency at home in peace".

“Exhaustive protocols are in place to ensure adequate protection for troops in sync with the guidelines being issued by the Government of India, without adversely affecting our security apparatus,” the officer added, and said that events which require mass movement of personnel such as training courses, exercises, conferences, postings, move of units etc., have been suspended to conform to the lockdown.

### **Policy in Place and Debate for Change**

Given the speculation of how Covid-19 could be used as a bio-weapon since it is highly virulent, a second senior Army officer said that a doctrinal change is needed under which population protection and survivability of soldiers needs to be incorporated.

“It needs to be implemented to ensure that the necessary equipment is available to frontline troops,” the second officer said.

However, the first officer quoted said the detailed curriculum available focuses on all aspects of CBRN warfare and exposes combatants to the nuances of ‘On Job Training’ on the equipment held in the inventory.

“Experience from the ongoing Covid-19 pandemic is being suitably factored into the training philosophy. Since a virulent pathogen does not differentiate between a civilian or military personnel, no major doctrinal change as such is warranted,” the officer said.

The Navy has the Nuclear Biological Chemical Damage control (NBCD) school where all personnel compulsorily undergo basic, refresher and specialised training from *ab initio*, i.e., from entry to senior levels.

Naval sources said every operational unit is trained and equipped to meet contingencies of nuclear radiation, chemical attack and biological attack in addition to fighting fires and flooding on ships, and personnel are sensitised to these various forms of warfare and counteracting the same.

“Modern ships are designed to pass through contaminated areas that are mainly radioactive but could also include airborne attacks with chemical or biological weapons,” said a senior Naval officer said.

“The entire ship is closed down to an external environment and made airtight. The ventilation and filtration systems are recycled internally for habitation and continuation of operations,” the officer added.

“Personnel are cleansed through cleansing stations before entering the citadel spaces. A citadel is a group of interconnected compartments which are maintained sterile from the environment for personnel to operate from. There are other systems too that endeavour to protect an entire ship passing through contamination zones,” the officer said.

Apart from the Navy and Army, the Indian Air Force also has a dedicated institute on nuclear, biological, chemical protection, and has placed quick response teams with manpower trained for CBRN across the IAF bases in the country.

<https://theprint.in/defence/tough-to-weaponise-coronavirus-but-cant-rule-out-attacks-armed-forces-medical-chief/418865/>



Tue, 12 May 2020

## Defence Ministry ready to deal with visible, invisible enemies of India: Rajnath

New Delhi: Defence Minister Rajnath Singh on Monday said his ministry is committed to destroying all the enemies of the nation including those visible on the borders or invisible ones like the coronavirus.

Speaking at an online conference organised to mark National Technology Day, Singh also said India must become self-reliant in military manufacturing and that the government was supporting the domestic defence industry by coming out with a policy framework.

"I want to assure my countrymen that the Ministry of Defence is committed to destroying all the enemies of the nation -- whether they are visible enemies on the borders or invisible enemies like the coronavirus," he said.

The National Technology Day is observed on May 11 to commemorate the nuclear tests India conducted in Pokhran on this day in 1998 that symbolised achievement of home-grown technologies in critical areas.

"The Defence Research and Development Organisation has developed more than 50 products in the last three-four months like bio-suit, sanitiser dispenser, PPE kits, etc through its continuous efforts to contribute to the fight against COVID-19," he said. "The indomitable spirit of our defence industry has increased the opportunity for mass production of these high-quality products in record time," Singh added. The defence minister said the government has set new targets and formulated the "right" policy framework to achieve indigenisation in defence production. "We always have to keep in mind that there is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology," he said.

At present, India is one of the top importers of military hardware globally. According to a latest report by Stockholm International Peace Research Institute (SIPRI), a leading think-tank on military spending, India's defence expenditure stood at USD 71.1 billion in 2019, which is third highest after the US and China.

In 2017, the government came up with an ambitious policy under which select private firms were to be roped in to build key military platforms like submarines and fighter jets in India in partnership with global defence majors.

"Our journey is long, but the important thing is that we have worked on it. We will work continuously to establish India as a defence manufacturing nation," Singh said.

<https://www.deccanherald.com/national/defence-ministry-ready-to-deal-with-visible-invisible-enemies-of-india-rajnath-836370.html>



At present, India is one of the top importers of military hardware globally. (Credit: PTI Photo)

## India, Japan postpone fighter jet exercise despite rising activities of China in Indo-Pacific

Despite pandemic, China has been carrying out several maritime activities in South China Sea and Indian Ocean in past few weeks. Besides, China and India also engaged in massive border clashes across the Line of Actual Control for past two weeks.

Japan's defence ministry on Monday announced that it was postponing a Japan-India joint fighter aircraft exercise, which was scheduled to take place in Japan. It was concurred to precede with coordination in the last 2+2 Foreign and Defence Ministerial Meeting in November 2019.



The joint fighter exercise with India will be the fourth such endeavour for Japan, following similar undertakings involving the US, UK and Australia.

Nevertheless, the two countries vowed to maintain a seamless defence posture and continue strengthening bilateral defence cooperation to uphold and reinforce a Free and Open Indo-Pacific.

Last week, Japanese Defence Minister Taro Kono talked to his Indian counterpart Rajnath Singh over the phone.

The two countries have been expanding their defence co-operation, including joint drills, for the past two years against the backdrop of the increasing presence of China in the Indian Ocean, which is considered India's geopolitical sphere of influence. The two sides were also involved in advanced level talk on an acquisition and cross-servicing agreement, a logistic sharing pact that allows for the sharing of food, fuel, transportation, ammunition and equipment.

Japan has been increasing security cooperation with India as a counter measure to China's maritime expansion in the Indo-Pacific region.

Recently, China's defence ministry announced the deployment of the Task Force of the People's Liberation Army Navy (PLAN) in order to carry out anti-piracy patrols in the Indian Ocean Region.

On the other hand, China has intensified its military activities in the South China Sea despite the ongoing pandemic. China claims ownership over significant patches of the South China Sea, while the US (India's major defence partner) countered the claim, saying it prohibits freedom of navigation in the area. The US Navy deployed the USS Montgomery (LCS-8) and the replenishment ship USNS Cesar Chavez (T-AKE-14) in the South China Sea last week. China has also increased military activities across the Line of Actual Control since 25 April and on Sunday, Indian defence ministry confirmed that troops of the two countries involved in physical clashes in Sikkim and Ladakh sector in which several injuries were reported.

<https://www.defencenews.in/article/India,-Japan-Postpone-Fighter-Jet-Exercise-Despite-Rising-Activities-of-China-in-Indo-Pacific-830558>



*Tue, 12 May 2020*

## **P75I: Its time that India look local for Submarine production**

*By Mahesh Shetty*

India's Project-75(I) most important and strategically significant Naval programs being undertaken by the Ministry of Defence (MoD) for construction of six conventional submarines for the Indian Navy for Rs 45,000 crore is likely to face further delays as tight defense budget and Chinese virus pandemic situation in the country and halted economic activity leaves little room for India to carry out major defense acquisition programs.

Project-75(I) was supposed to be the last time India built-in India, next-generation conventional submarines through technology transfer from foreign partners before India moves to local design and production of next-generation 12 submarines in near future. The current situation does provide the Indian Navy and Private sector shipyards and defense firms an opportunity to fast track what was initially planned in the development of local submarine technology.

India can use the current Scorpene submarine as a base to develop a locally enhanced submarine design for Project-75(I). India and France share a good and deep military relationship and India can use this leverage to either buy intellectual property rights of the submarine design or pay them some royalties so that the next generation of submarines under Project-75(I) can be developed with higher local content to built local manpower talent both in Public and Private sector space and the technologies required.

The second option for the Indian Navy under Project-75(I) could be to convert existing Nuclear Attack Submarine design into a Conventional design and use technology received under TOT for the Scorpene submarine program to develop a Hybrid Indian-French conventional submarine.

The third option could be to procure design for the Upgraded Kilo Submarine from Russia and use that as a base to develop a new submarine with Indian technologies which already has been developed for India's nuclear submarines.

The Last option which is not going to be easy and will be the most time consuming one, which will be to go for a clean-sheet design of the new submarine which can gradually be improved over the years for every generation.

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<https://idrw.org/p75i-its-time-that-india-needs-looks-local-for-submarine-production/#more-227205>



## Tata firm inks Rs.1,200-cr. defence contract

*Firm to modernise 37 airfields of Air Force, Navy, Coast Guard*

Mumbai: Tata Power Strategic Engineering Division (Tata Power SED) has signed a Rs.1,200-crore contract with the Ministry of Defence for modernising infrastructure of 37 airfields of Indian Air Force, Indian Navy and Indian Coast Guard. Tata Power SED is a division of Tata Power.

“The Rs.1,200-crore contract involves supply, installation and commissioning of modern airfield equipment like Cat II Instrument Landing System and Cat II Airfield Lightning System along with other navigational aids and air traffic management systems besides creating the required civil and electrical infrastructure,” said Tata Power in a statement.

In March 2011, Tata Power SED had obtained from Ministry of Defence a contract for about Rs.1,220 crore for modernisation of 30 airfields and successfully executed the same.

“The above contract is continuation of the previous order with additional 37 airfields undergoing modernisation which would provide excellent control of airfield systems to air traffic controllers, enhancing aerospace safety and operational capability by facilitating operations in poor visibility and adverse weather conditions,” said the statement.

Tata Power is in the process of selling its defence business (Tata Power SED) to Tata Advanced Systems Limited (TASL) through a scheme of arrangement.

The transfer of the business to TASL has already been approved by the NCLT and the process is expected to be completed once regulatory and other routine approvals are received.

<https://www.thehindu.com/business/tata-firm-inks-1200-cr-defence-contract/article31560572.ece>

hindustantimes

Tue, 12 May 2020

## Western Army Chief visits Indo-Pak border, reviews operational preparedness

*Pakistan had reportedly increased its flying operations within its territory, as it fears retaliation from India after the recent attacks*

*By Ravi Krishan Khajuria*

Jammu: Western Army Commander, Lieutenant General RP Singh, visited forward areas of the Rising Star Corps in Kathua and Samba districts of Jammu & Kashmir (J&K) on Monday to review the current security situation and operational readiness of the troops amid a recent spike in ceasefire violations along the 744-km-long Line of Control (LoC) and 198- km-long Indo-Pak international border (IB).

“The Army Commander was accompanied by Lt Gen Upendra Dwivedi, GOC (General Commanding Officer), Rising Star Corps. The Army commander interacted with the commanders of the field formations and was briefed about the operational and logistics preparedness and plans to upgrade the security infrastructure,” said Jammu-based defence spokesperson Lt Col Devender Anand.

He also interacted with troops and lauded them for their high morale and motivation.

“He appreciated the high state of preparedness of the Rising Star Corps to thwart any threat manifested by inimical and anti-national elements. He also commended the efforts of the formations in the fight against the coronavirus disease (Covid-19) pandemic,” Col Anand added.

Lt Gen Singh's visit to the strategic western border comes close on the heels of two back-to-back terror attacks in north Kashmir's Kupwara district, where eight security personnel, including Col Ashutosh Sharma, Major Anuj Sood, a J&K Police sub-inspector, two soldiers and three Central Reserve Police Force (CRPF) personnel, were killed.

Pakistan had reportedly increased its flying operations within its territory, as it fears retaliation from India after the recent attacks.

Pakistani Prime Minister Imran Khan had also tweeted about a possible false flag operation by India after New Delhi stated that Islamabad was the brain behind a spurt in violence in Kashmir.

"I have been warning the world about India's continuing efforts to find a pretext for a false flag operation targeting Pakistan. The latest baseless allegations by India of 'infiltration' across LoC are a continuation of this dangerous agenda," Khan had tweeted.

<https://www.hindustantimes.com/india-news/western-army-chief-visits-indo-pak-border-reviews-operational-preparedness/story-WNV014wy0aWvuFkG1HeQM.html>

**modern**diplomacy

*Tue, 12 May 2020*

## **India's increasing military expenditure: Implications for the South Asian security**

*By Irfan Mahar*

India is one of the top nations which has been increasing its military expenditure, weapons import from multiple countries and private firms, and defence budget. Over the last three decades, India has been experiencing momentous variations in its military-strategic thinking resultantly this brings the significant changes in its defence policies as well. In this regard, India has been trying to revolutionize its military capacity via importing sophisticated conventional arms. Recently, a report published by Stockholm International Peace Research Institute (SIPRI) on 27th of April 2020, shows that "global military expenditure sees a largest annual increase in a decade reaching \$1917 billion in 2019". SIPRI's database entertains that the total global military expenditure represents an increase of 3.6 per cent as compared to the previous year 2018. Moreover, the five largest spenders in 2019 according to statistics computed by SIPRI were the U.S., China, India, Russia, and Saudi Arabia, respectively. SIPRI statistics also show that two Asian states, namely China and India, have featured among the top three military spenders for the first time.

As far as India is concerned, it has increased its military expenditure by 6.8 per cent as compared to 2018 reaching \$71.1 billion. According to Siemon T. Wezeman (the Senior Researcher at SIPRI) "India's tensions and rivalry with both Pakistan and China are among the major drivers for its increased military spending". This massive increase in the Indian military expenditure makes it the world's second-largest arms importer after Saudi Arabia. Delhi has involved in various deals and agreement with the world's top nations for the import of military technology. Recently, Prime Minister Narendra Modi signed \$3 billion in defence deal with President Trump during his visit to India in February 2020. According to this deal, the U.S. would provide helicopters and other equipment to India's military. Moreover, the U.S. is fully assisting India in its desire to acquire global power status through military means. Pentagon in October 2019 stated that "the bilateral defence trade between Washington and Delhi expected to reach \$18 billion by the year-end". In addition to this, the U.S. State Department in 2019 said that it is going to sell India "MH-60R Seahawk helicopters (\$2.6 billion), Apache helicopters (\$2.3 billion), P-8I maritime patrol aircraft (\$3 billion), and M777 howitzers (\$737 million)".

This growing Indo-US nexus in defence has continued since long such as both the nations concluded a significant communication agreement in September 2018 named Communication Compatibility and Security Agreement (COMCASA) to facilitate closer defence cooperation. In



August 2016, India also signed a military logistic agreement with the U.S designated the Logistic Exchange Memorandum of Agreement (LEMOA) to counter the growing maritime influence of China. This agreement allows both the nations to govern the use of each other's land, air and naval bases for repair and resupply. Ash Carter the then U.S. Defence Secretary and Manohar Parrikor (Indian Defence Minister) said that "signing of the agreement would make the logistics of joint operations so much easier and so much more efficient". Another agreement named General Security and of Military Information Agreement (GSOMIA) signed between Delhi and Washington in 2002. it paves the way for greater technological cooperation in the military sector. Similarly, GSOMIA also "allows the sharing of classified information from the U.S. government and American companies with the Government of India and Defense Public Sector Undertakings (DPSU).

There can be various reasons behind India's military modernization; however, its military buildup raises severe questions for creating instability and posing security threats to the regional states, particularly Pakistan. Pakistan and India are considered the arch-rivals in nuclear South Asia since conventional violence between them could quickly turn into a nuclear war. As far as the deterioration of the security situation of South Asia is concerned, Delhi played an essential role in worsening the security and generating threats for the stability of the region. South Asia region has already been considered the most sensitive part of the world because of a massive increase in traditional and non-traditional security threats, particularly after the incident of 9/11. In this regard, a report published by SOS Children's Villages Canada about the poverty in India states that "two-thirds of people in India live in poverty: 68.8% of the Indian population lives on less than \$2 a day. Over 30% even have less than \$1.25 per day available – they are considered extremely poor. It makes India one of the poorest countries in the world; women and children, the weakest members of Indian society, suffer most".

It is the situation of poverty in India where people are dying because of poverty, hunger, and strife. In contrast, its rulers are spending a tremendous amount of money on military expenditures as well as their lavish lives."

Instead of focusing on multiple problems such as poverty, corruption, instability, inequality and violation of minority rights, barbarism over Muslims etc. India is bent upon increasing its defence budget. It exposes Indian hegemonic designs for the South Asian region. It is ultimately becoming the primary reason for instability and insecurity not only for Pakistan but also for other regional states. Furthermore, both India and Pakistan are considered arch-rivals in the South Asia region. Multiple unresolved problems cause their power asymmetry to prevail such as Kashmir, constant warmongering by the political leadership as well as Indian military, Indian involvement in Balochistan, and Indian massive military modernization etc. Besides, after the establishment of BJP government India aspires to be the world power such as PM Modi after taking office in May 2014, said to his diplomats that "to help India position itself in a leading role, rather than [as] just a balancing force, globally". Likewise, Subrahmanyam Jaishankar, the then foreign secretary of India, also entertained that "country now aspires to be a leading power, rather than just a balancing power". These all force postures and recent military developments by Indian government pose some severe implications and dangers for regional peace and stability.

<https://moderndiplomacy.eu/2020/05/12/indias-increasing-military-expenditure-implications-for-the-south-asian-security/>

# Most advanced fighter jets in the world: US made F-22, China made Chengdu J20 and more

*We have compiled a list of the most advanced fighter jets in the world, which by default, are all fifth-gen fighter jets*

*By Arjit Garg*

In the modern day warfare, the country with the most advanced weaponry holds an upper edge. While there are many destructive weapons that can be used to annihilate enemies like the nuclear submarines to modern-day naval aircraft carriers, none could match the sheer speed of a fighter jet.

A fighter aircraft or a fighter jet, as it is often referred as, is a fixed-wing aircraft designed for air-to-air combat and is one of the most widely used form of firepower used by any country. A fighter jet is used to dominate the battlefield and can change the course of a fight.

While a lot depends on the skill of the pilot, the machine plays the most crucial role. A fighter jet can act as a bomber, interceptor, heavy fighter, and night fighter. The modern day 21st century fighter jets are called the fifth-gen jets and are far superior than any other generation of fighter jets.

While there's no fixed definition of a fifth-generation jet fighter, Giovanni de Briganti has mentioned the defining elements of a fifth-generation fighter to be:

Stealth

High maneuverability

Advanced avionics

Networked data fusion from sensors and avionics

Multirole capabilities

There are only a handful of fifth gen fighter jets in service as of 2020. We have compiled a list of the most advanced fighter jets in the world, which by default, are all fifth gen fighter jets. Here's the list:

## **Lockheed Martin F-22 Raptor: Country of Origin - USA**

The F-22 Raptor is the oldest and most advanced fighter jets in the world. Developed by Lockheed Martin and Boeing for the USAF, the fighter jet is not for sale to other countries and was inducted by the US Air Force in 2005. The F-22 Raptor is a single-seat, twin-engine fifth-generation extremely advanced tactical fighter known for its stealth, integrated avionics, superior performance and super-maneuvrability. The Raptor made its first flight in September 1997 and can be used in a wide array of missions, including surveillance, reconnaissance, attack, electronic warfare and signals intelligence.

## **Lockheed Martin F-35 Lightning II: Country of Origin - USA**

Yet another Lockheed Martin's creation, the F-35 Lightning II is widely regarded as the one of the most sophisticated fighter jets in the world. It is also the only international fifth-generation multirole fighter plane in the world, which means unlike F-22 Raptor that can't be exported, the F-35 Lightning II can be used by Air Force of other countries like Turkey and Japan are current buyers of this fighter jet that can do vertical take-off and landing, much like helicopters. The single-seat fighter is armed with a range of weapon systems such as Sidewinder and Storm Shadow, as well as Joint Direct Attack Munitions (JDAMs). The F-35 comes in three variants - the conventional take-off and landing (CTOL), short take-off / vertical landing (STOVL) and carrier variant (CV).

## **Sukhoi Su-57: Country of Origin - Russia**

Competing against the duo of US made fifth gen fighter jets is the Russia made Sukhoi Su-5, which is the countries first fifth-generation fighter jet. The Su-57 is a single-seat, twin-engine,

multi-role fighter aircraft manufactured by Sukhoi, the same company that makes Su-30 MKI for India. Formerly called PAK FA and T-50, the Su-57 is still to be inducted in the Russian Air Force due to some delays. However, the jet is fully ready and will replace the existing fleet of Su-27 fourth-generation fighter. The aircraft can defend all types of ground, air and surface targets of the enemy and can carry short-range air-to-air missiles, air-to-surface missiles, short and medium-range guided and unguided weapons, and aerial bombs in 250kg, 500kg, and 1,500kg classes.

### **Chengdu J-20: Country of Origin - China**

Last on our list is the China made Chengdu J-20, which is a fifth-generation, single-seat, twin-engine stealth fighter jet manufactured by Chengdu Aircraft Industry Group (CAIG). The jet is made for the People's Liberation Army Air Force (PLAAF) and has been on the active duty since 2017. The aircraft can hold a mix of beyond-visual-range air-to-air and short-range missiles, air-to-surface missiles, laser-guided bombs and anti-radiation missiles.

Apart from these fifth gen fighter jets, the current-gen fighter jets used by most of the countries across the globe are called the fourth gen fighter jets and some of them after inducing advanced updates are also called 4.5 gen fighter jet or 4++ fighter jet. Dassault Rafale is one such fighter jet which will soon be inducted in the Indian Air Force. Eurofighter Typhoon and Sukhoi Su-35 among others are few other popular names. However, these jets are not as advanced as the fifth-gen fighter jets and hence, were not included in the list.

<https://www.news18.com/news/auto/most-advanced-fighter-jets-in-the-world-us-made-f-22-china-made-chengdu-j20-and-more-2597171.html>

## **Science & technology**

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*Tue, 12 May 2020*

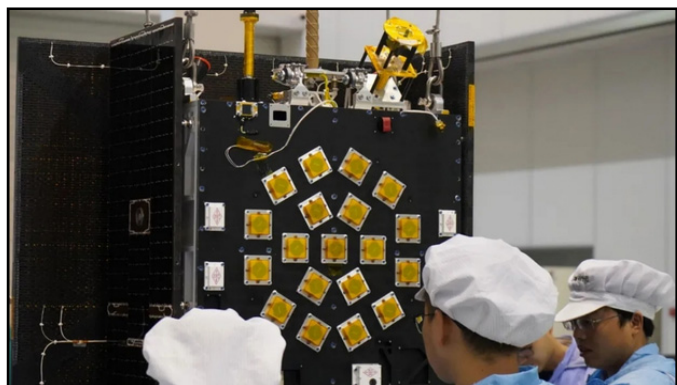
# **Kuhaizhou-1A launches two satellites, one named in tribute to Wuhan**

*By Rui C. Barbosa*

A Chinese Kuhaizhou-1A (Y6) rocket has launched the first two operational satellites for the Xingyun narrowband constellation. The launch took place at 01:16 UTC on Tuesday from the Jiuquan Satellite Launch Center. The two satellites Xingyun-2 (01) 'Wuhan' and Xingyun-2 (02) were developed by the Xingyun Satellite Co., a subsidiary of China Aerospace Science and Industry Corporation (CASIC), Sanjiang Group, in Wuhan.

The first satellite of the Xingyun project was named "Wuhan", which was intended to "pay tribute to the heroic Wuhan city and the heroic Wuhan people", according to Chinese state media.

Each satellite has a launch mass of 93 kg and its main payload is an L-band communication system and a trans-satellite laser communication package. There are believed to be other, unspecified, hosted payloads onboard.



The narrow-band data transfer rate is 2.4 – 9.6 kbps for uplink and 2.4 kbps for downlink. The satellites will operate at a 561 km altitude SSO.

The two satellites are aimed to achieve independent innovation in technology areas such as inter-satellite laser link technology, spaceborne digital multi-beam communication payload, and air-to-ground satellite communication protocol and also in several key industries such as polar environment monitoring.

Promotional materials class satellites as “laying the foundation for the subsequent networking of space-based Internet of Things”.

Since its establishment in December 2017, Xingyun Company has been devoted to the construction of the Xingyun Project (“Sky-based Internet of Things”).

As the first space-based IoT constellation to announce independent investment and construction in China, the Xingyun Project is one of the key projects of the “Five Cloud Project”, a commercial aerospace project that China Aerospace Science and Technology has followed the development trend of the international commercial aerospace industry.

The Xingyun project is divided into three stages:  $\alpha$ ,  $\beta$ , and  $\gamma$ . The constellation consisting of 80 low-orbit communication satellites will be completed around 2023 aimed at solving the problems of communication blind spots caused by the serious lack of cellular network coverage in the development of terrestrial IoT.

Up to now, the Xingyun Company has cooperated with the Aerospace Science and Technology Rocket Technology Co., Ltd. and other units to prepare the satellites for launch.

Like previous Kuaizhou-1A launches, this mission was managed by Expace Technology Co., Ltd., a subsidiary of China Aerospace Science & Industry Corp. It is specialized in R&D, manufacturing and marketing of the Kuaizhou series launch vehicle.

The Kuaizhou-1A is promoted as “high reliability, high precision and low-cost solid launch vehicle” developed by China Aerospace Science and Technology Corporation (CASIC) and commercialized by the China Space Sanjiang Group Corporation (Expace).

The launch vehicle can send a 200kg payload into a 700km sun-synchronous orbit.

The vehicle is based on the road-mobile DF-21 missile, with the addition of two stages. There are no obvious differences between the KZ-1A (that was previously commercially available as the FT-1 Feitian-1) and the KZ-1 launch vehicle. However, with the KZ-1, the payload remains attached to the fourth liquid stage, while the KZ-1A is used for multiple payloads.

The KZ-1A solid launch vehicle adopts a mobile launch platform, integrated power supply equipment, test and launch control facilities, aiming facility and temperature control facility, to carry vehicles from the technical support center to launch site, complete temperature control of payload, vehicle test and launch.

The rocket is 20 meters long with a lift-off mass of 30 tons and is 1.4 meters in diameter. The solid propulsion system consists of three solid vehicle motors to provide power during first stage flight, second stage flight and third stage flight. All of the three solid motors use a single fixed nozzle.

The vehicle can be used with two kinds of fairings having a diameter of 1.2 and 1.4 meters according to the space demand of cargo to be orbited.

The usual launch profile involves first stage separation taking place 1 minute and 23 seconds after launch. The second stage separation takes place at 2 minutes 21 seconds after launch, and the fairing jettisoning 15 seconds after second stage separation.

Ignition of the third stage occurs at 192 seconds into the flight, ending 1 minute 32 seconds later. Three seconds after third stage separation, the fourth and final stage provides the last kick into orbit, with a burn duration of 12 minutes and 45 seconds. Spacecraft separation takes place 17 minutes and 40 seconds after launch.

The first satellite separates 25 minutes 55 seconds into the flight and the second satellite separates 2 minutes 30 seconds later.

The first launch of the Kuaizhou-1A launch vehicle orbited the Jilin Linye-1 forestry satellite and two small CubeSats-2U: the Xingyun Shiyun-1 and the Kaidun-1 'Caton-1'. The launch took place on January 9, 2017, from Jiuquan.

The Jiuquan Satellite Launch Center, in Ejin-Banner – a county in Alashan League of the Inner Mongolia Autonomous Region – was the first Chinese satellite launch center and is also known as the Shuang Cheng Tze launch center.

Jiuquan was originally used to launch scientific and recoverable satellites into medium or low earth orbits at high inclinations. It is also the place from where all the Chinese crewed missions are launched.

The site includes a Technical Centre, two Launch Complexes, Mission Command and Control Centre, Launch Control Centre, propellant fuelling systems, tracking and communication systems, gas supply systems, weather forecast systems, and logistic support systems.

The LC-43 launch complex, also known as the South Launch Site (SLS) is equipped with two launch pads: 91 and 94. Launch Pad 91 is used for the crewed program for the launch of the Long March-2F launch vehicle (Shenzhou and Tiangong). Launch Pad 94 is used for unmanned orbital launches by the Long March-2C, Long March-2D and Long March-4C launch vehicles.

Other launch zones at the launch site are used for launching the Kuaizhou, the CZ-11 Chang Zheng-11 and other solid rocket motor commercial and private launch vehicles.

The first orbital launch took place on April 24, 1970 when the CZ-1 Chang Zheng-1 rocket launched the first Chinese satellite, the Dongfanghong-1 (04382 1970-034A).

<https://www.nasaspacesflight.com/2020/05/kuhaizhou-1a-satellites-tribute-wuhan/>



Tue, 12 May 2020

## NIST Scientists create new recipe for single-atom transistors

*Linking multiple copies of these devices may lay the foundation for quantum computing*

Once unimaginable, transistors consisting only of several-atom clusters or even single atoms promise to become the building blocks of a new generation of computers with unparalleled memory and processing power. But to realize the full potential of these tiny transistors -- miniature electrical on-off switches -- researchers must find a way to make many copies of these notoriously difficult-to-fabricate components.

Now, researchers at the National Institute of Standards and Technology (NIST) and their colleagues at the University of Maryland have developed a step-by-step recipe to produce the atomic-scale devices. Using these instructions, the NIST-led team has become only the second in the world to construct a single-atom transistor and the first to fabricate a series of single electron transistors with atom-scale control over the devices' geometry.

The scientists demonstrated that they could precisely adjust the rate at which individual electrons flow through a physical gap or electrical barrier in their transistor -- even though classical physics would forbid the electrons from doing so because they lack enough energy. That strictly quantum phenomenon, known as quantum tunneling, only becomes important when gaps are extremely tiny, such as in the miniature transistors. Precise control over quantum tunneling is key because it enables the transistors to become "entangled" or interlinked in a way only possible through quantum mechanics and opens new possibilities for creating quantum bits (qubits) that could be used in quantum computing.

To fabricate single-atom and few-atom transistors, the team relied on a known technique in which a silicon chip is covered with a layer of hydrogen atoms, which readily bind to silicon. The

fine tip of a scanning tunneling microscope then removed hydrogen atoms at selected sites. The remaining hydrogen acted as a barrier so that when the team directed phosphine gas (PH<sub>3</sub>) at the silicon surface, individual PH<sub>3</sub> molecules attached only to the locations where the hydrogen had been removed (see animation). The researchers then heated the silicon surface. The heat ejected hydrogen atoms from the PH<sub>3</sub> and caused the phosphorus atom that was left behind to embed itself in the surface. With additional processing, bound phosphorous atoms created the foundation of a series of highly stable single- or few-atom devices that have the potential to serve as qubits.

Two of the steps in the method devised by the NIST teams -- sealing the phosphorus atoms with protective layers of silicon and then making electrical contact with the embedded atoms -- appear to have been essential to reliably fabricate many copies of atomically precise devices, NIST researcher Richard Silver said.

In the past, researchers have typically applied heat as all the silicon layers are grown, in order to remove defects and ensure that the silicon has the pure crystalline structure required to integrate the single-atom devices with conventional silicon-chip electrical components. But the NIST scientists found that such heating could dislodge the bound phosphorus atoms and potentially disrupt the structure of the atomic-scale devices. Instead, the team deposited the first several silicon layers at room temperature, allowing the phosphorus atoms to stay put. Only when subsequent layers were deposited did the team apply heat.

"We believe our method of applying the layers provides more stable and precise atomic-scale devices," said Silver. Having even a single atom out of place can alter the conductivity and other properties of electrical components that feature single or small clusters of atoms.

The team also developed a novel technique for the crucial step of making electrical contact with the buried atoms so that they can operate as part of a circuit. The NIST scientists gently heated a layer of palladium metal applied to specific regions on the silicon surface that resided directly above selected components of the silicon-embedded device. The heated palladium reacted with the silicon to form an electrically conducting alloy called palladium silicide, which naturally penetrated through the silicon and made contact with the phosphorus atoms.

In a recent edition of *Advanced Functional Materials*, Silver and his colleagues, who include Xiqiao Wang, Jonathan Wyrick, Michael Stewart Jr. and Curt Richter, emphasized that their contact method has a nearly 100% success rate. That's a key achievement, noted Wyrick. "You can have the best single-atom-transistor device in the world, but if you can't make contact with it, it's useless," he said.

Fabricating single-atom transistors "is a difficult and complicated process that maybe everyone has to cut their teeth on, but we've laid out the steps so that other teams don't have to proceed by trial and error," said Richter.

In related work published today in *Communications Physics*, Silver and his colleagues demonstrated that they could precisely control the rate at which individual electrons tunnel through atomically precise tunnel barriers in single-electron transistors. The NIST researchers and their colleagues fabricated a series of single-electron transistors identical in every way except for differences in the size of the tunneling gap. Measurements of current flow indicated that by increasing or decreasing the gap between transistor components by less than a nanometer (billionth of a meter), the team could precisely control the flow of a single electron through the transistor in a predictable manner.

"Because quantum tunneling is so fundamental to any quantum device, including the construction of qubits, the ability to control the flow of one electron at a time is a significant achievement," Wyrick said. In addition, as engineers pack more and more circuitry on a tiny computer chip and the gap between components continues to shrink, understanding and controlling the effects of quantum tunneling will become even more critical, Richter said.

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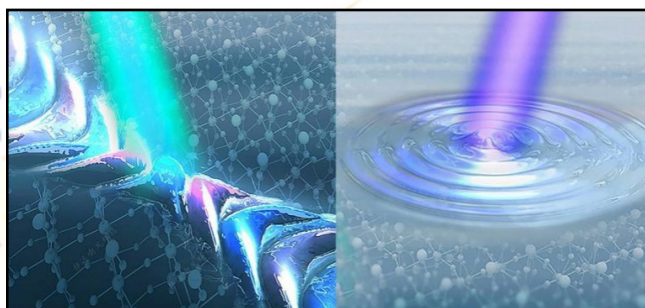
[https://eurekalert.org/pub\\_releases/2020-05/nios-nsc050720.php](https://eurekalert.org/pub_releases/2020-05/nios-nsc050720.php)

## Scientists discover how to control light on the nanoscale over wide frequency ranges

By Elhuyar Fundazioa

An international team led by researchers from the University of Oviedo and the Centre for Research in Nanomaterials and Nanotechnology (CINN-CSIC), together with scientist from the Basque research centers CIC nanoGUNE, Donostia International Physics Center (DIPC), Materials Physics Center (CSIC-UPV/EHU), and international collaborators from the Chinese Academy of Sciences, Case Western Reserve University (USA), Austrian Institute of Technology, Paris Materials Centre, and University of Tokyo has discovered an effective method for controlling the frequency of confined light at the nanoscale in the form of phonon polaritons (light coupled to vibrations in the crystal). The results have now been published in *Nature Materials*.

Research with nanolight based on phonon polaritons has developed considerably in recent years thanks to the use of sheet-structured nanomaterials such as graphene, boron nitride or molybdenum trioxide: the so-called van der Waals materials. Nanolight based on phonon polaritons is very promising because it can live longer than other forms of nanolight, but one of the main drawbacks to the technological applications of this nanolight based on phonon polaritons is the limited frequency ranges characteristic of each material, it exists only in narrow frequency region.



An international team has proposed a novel method that allows to widely extend this range of working frequencies of phonon polaritons in van der Waals materials. Credit: University of Oviedo

But now, an international team has proposed a novel method that allows to widely extend this range of working frequencies of phonon polaritons in van der Waals materials. This consists in the intercalation of alkaline and alkaline earth atoms, such as sodium, calcium or lithium, in the laminar structure of the van der Waals vanadium pentaoxide material, thus allowing to modify its atomic bonds and consequently its optical properties.

Considering that a large variety of ions and ion contents can be intercalated in layered materials, on-demand spectral response of phonon polaritons in van der Waals materials can be expected, eventually covering the whole mid-infrared range, something critical for the emerging field of phonon polariton photonics.

The finding, published in the journal *Nature Materials*, will allow progress in the development of compact photonic technologies, such as high-sensitivity biological sensors or information and communication technologies at the nanoscale.

Reference: “Broad spectral tuning of ultra-low-loss polaritons in a van der Waals crystal by intercalation” by Javier Taboada-Gutiérrez, Gonzalo Álvarez-Pérez, Jiahua Duan, Weiliang Ma, Kyle Crowley, Iván Prieto, Andrei Bylinkin, Marta Autore, Halyna Volkova, Kenta Kimura, Tsuyoshi Kimura, M.-H. Berger, Shaojuan Li, Qiaoliang Bao, Xuan P. A. Gao, Ion Errea, Alexey Y. Nikitin, Rainer Hillenbrand, Javier Martín-Sánchez and Pablo Alonso-González, 13 April 2020, *Nature Materials*. DOI: [10.1038/s41563-020-0665-0](https://doi.org/10.1038/s41563-020-0665-0)

<https://scitechdaily.com/scientists-discover-how-to-control-light-on-the-nanoscale-over-wide-frequency-ranges/>

## JNU bags project on Covid-19 research from BIRAC

*The detection of the coronavirus is being majorly done by Reverse Transcription–Polymerase Chain Reaction (RT-PCR) by using a real-time PCR machine, a very accurate lab test for detecting, tracking, and studying the coronavirus.*

New Delhi: Jawaharlal Nehru University (JNU) Vice-Chancellor M Jagadesh Kumar on Monday said the varsity has bagged a project on COVID-19 research from BIRAC, a public sector enterprise set up by the Department of Biotechnology.

The Biotechnology Industry Research Assistance Council (BIRAC) has given its nod to the JNU under diagnostics category to develop a low-cost portable microfluidics embedded on chip RT-PCR and microelectrode array coupled point-of care optoelectronic device for large-scale screening of emerging viral disease like SARS-CoV-2, the VC said. The detection of the coronavirus is being majorly done by Reverse Transcription–Polymerase Chain Reaction (RT-PCR) by using a real-time PCR machine, a very accurate lab test for detecting, tracking, and studying the coronavirus. “But this technology is expensive, requires high-end laboratory-based equipment and is time consuming. Expert personnel are also needed to operate the instrument and perform the testing in the laboratory. Thus, the capacity of sample handling per day is limited,” he said.

To overcome the cost and other disadvantages of the conventional methods, a team led by Dr Jaydeep Bhattacharya from the School of Biotechnology, JNU, has designed a chip-based low-cost portable spatial RT-PCR where the PCR has been integrated with the in-built detection system containing LED and diode detector he explained. “Moreover, this portable device can also be battery operated and therefore, enabling us to perform a point-of-care measurement. The JNU has already filed an Indian Patent application on this technology. Our technology can complete the testing in about 50 minutes as compared to 120-180 minutes required for conventional real-time PCR,” he added.

Citing the advantages of the technology developed by JNU, he said the small size of the machine, less time for testing, less cost, will make testing possible even in remote areas and simple training can be given to the personnel handling the device. “Our technology is expected to cost Rs 60,000-1 lakh as compared to 10-15 lakh required for conventional real-time PCR,” he said.

The varsity said it is targeting to demonstrate the first prototype testing device in about 4 months.

The team working on the device consists of scientists from JNU (Dr. Jaydeep Bhattacharya, Dr. Rupesh Chaturvedi and Dr. Ravi Tandon), Amity University, Gurgaon (Dr. Ranjita Ghosh Moulick), Centre for Development of Advanced Computing, Kolkata (Dr. Souvik Pal and Dr. Subrata Sarkar) and Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi (Dr. Sameer Gulati), he said. PTI SLB CK

<https://www.hindustantimes.com/education/jnu-bags-project-on-covid-19-research-from-birac/story-QvICUYvo979fpHkeRiECVJ.html>



## नई जानकारी / अमेरिकी वैज्ञानिकों का दावा: आंखों से भी शरीर में पहुंच सकता है कोरोनावायरस, आंसू से भी संक्रमण का खतरा

- कोविड-19 के 30 फीसदी मरीजों में कंजेक्टिवाइटिस के लक्षण भी पाए गए, आंखों में लालिमा और सूजन देखी गई
- अमेरिका की जॉन्स हॉपकिन्स यूनिवर्सिटी के शोधकर्ताओं ने कहा- फेफड़ों की तरह आंखों में भी एसीई-2 रिसेप्टर पैदा होता है

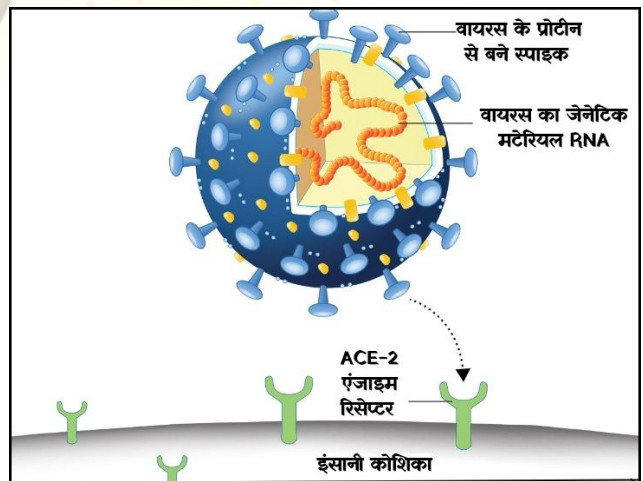
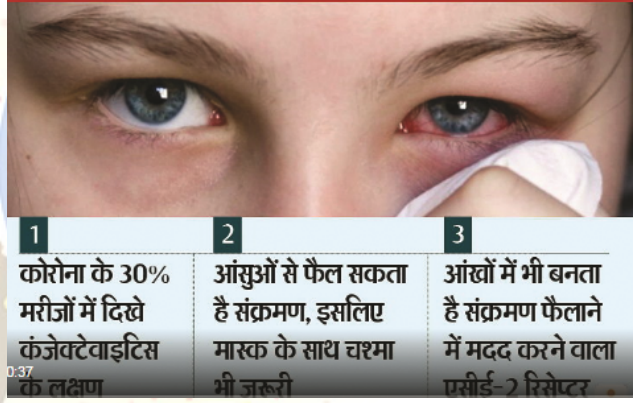
नई दिल्ली: कोरोनावायरस आंखों से भी शरीर में पहुंच सकता है और आंसुओं के जरिए भी संक्रमण फैल सकता है। यह दावा अमेरिका की प्रतिष्ठित रिसर्च यूनिवर्सिटी जॉन्स हॉपकिन्स के शोधकर्ताओं ने किया है। उनका कहना है कि एसीई-2 नाम के एंजाइम रिसेप्टर की मदद से कोरोनावायरस शरीर की कोशिकाएं को जकड़कर इंसान की आंख से भी प्रवेश कर सकता है।

नई रिसर्च के नतीजों में सामने आया है कि फेफड़ों, श्वसन मार्ग और दूसरे अंगों की तरह आंखों में भी ACE-2 रिसेप्टर का निर्माण होता है। इनकी मदद से कोरोना का Sars-CoV-2 शरीर में पहुंच सकता है। अगर संक्रमित मरीज के खांसने या थूक की ड्रॉपलेट्स आंखों तक पहुंचते हैं तो भी कोरोना संक्रमण फैलने का खतरा हो सकता है।

**कंजेक्टिवाइटिस की वजह बन सकता है कोरोना**

रिसर्च रिपोर्ट के मुताबिक, कोविड-19 आंखों की प्रचलित बीमारी कंजेक्टिवाइटिस की वजह भी सकता है। 30% मरीजों में भी ऐसे लक्षण पाए गए हैं। जब आंखों में सूजन आती है और वे लाल हो जाती हैं। कोरोनावायरस श्वसन मार्ग से भी आंखों तक पहुंच सकता है और ऐसी स्थिति बीमारी को और भी गंभीर बना देती है।

### अमेरिकी रिसर्च की 3 बड़ी बातें



एसीई-2 रिसेप्टर कोशिकाओं की सतह पर पाए जाते हैं और ब्लड प्रेशर को नियंत्रित करते हैं।

## हाईबीपी और डायबिटीज के मरीजों को खतरा अधिक

शोधकर्ताओं के मुताबिक, डायबिटीज और हाई ब्लड प्रेशर के मरीजों में एसीई-2 रिसेप्टर स्वस्थ लोगों के मुकाबले अधिक पैदा होता है, इसलिए इन्हें संक्रमण का खतरा भी ज्यादा है। रिसर्च के दौरान ऐसे प्रमाण भी मिले हैं जो बताते हैं धूम्रपान करने वालों में भी यह ज्यादा बनता है।

## जितना अधिक एसीई-2 रिसेप्टर, उतना खतरा

शोधकर्ताओं का कहना है कि कोरोना आंखों के जरिए शरीर में पहुंच सकता है इसलिए आंसुओं से संक्रमण फैल सकता है। एसीई-2 रिसेप्टर एक तरह से कोरोना का गेट-वे है जिसकी मदद से ये एंट्री करता है। एसीई-2 रिसेप्टर आंखों के कॉर्निया में पाया जाता है। रिसर्च टीम के प्रमुख शोधकर्ता लिन्गली झाउ के मुताबिक, शरीर में यह रिसेप्टर जितनी ज्यादा मात्रा में बनेगा संक्रमण का खतरा उतना ही ज्यादा होगा और वायरस आसानी से रक्त तक पहुंच जाएगा।

## ब्लड प्रेशर नियंत्रित करते हैं एसीई-2 रिसेप्टर

शोधकर्ताओं के मुताबिक, यदि शरीर की कोशिका में TMPRSS2 नाम का एंजाइम पाया है तो एसीई-2 रिसेप्टर आसानी से संक्रमण फैलाने में कोरोनावायरस की मदद करता है। कोशिका में ये दोनों ही होने पर वायरस आसानी से शरीर में अपनी संख्या को बढ़ाता है।

## मास्क-शील्ड से आंखों का बचाव भी जरूरी

शोधकर्ता डॉ. लिन्गली झाउ के मुताबिक, संक्रमित इंसान के आंसुओं में वायरस के अंश हो सकते हैं इसलिए मास्क के साथ आंखों का बचाव भी जरूरी है। बचाव के लिए चश्मे या शील्ड का इस्तेमाल किया जा सकता है।

<https://www.bhaskar.com/coronavirus/news/covid-19-may-have-originated-from-recombined-bat-pangolin-coronaviruses-127291389.html?art=next>



ज्ञान प्रसार एवम् विस्तार  
के 50 वर्ष