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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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BrahMos missiles unit to come up between Lucknow and Kanpur

By month-end, Uttar Pradesh government to hand over land to DRDO at a token amount of Re 1, says industries minister

By Haidar Naqvi

Kanpur Next-generation BrahMos missiles would be manufactured in UP's Defence Corridor at a facility between Lucknow and Kanpur. The land was nearly finalised and would be handed over to the DRDO by the end of this month, said Satish Mahana, minister for industrial development.

The Defence Research and Development Organisation (DRDO) had asked the UP government for 200 acres of land for the project and around ₹300 crore would be invested in its first phase.

"The government will not charge for the land. It will be given to the DRDO at a token amount of Re 1. In all probability, we will be giving away the land by the month-end," he added.

Mahana had met Brahmos Space Technology director general Sudhir Mishra last month and the latter had proposed a manufacturing facility for Brahmos missiles and defence systems in Uttar Pradesh.

In the first phase, 70 ancillary units would also be set up at the facility between Lucknow and Kanpur. As many as 400 more supporting units would come up by the time the Brahmos facility gets rolling.

The defence sector in Kanpur already has 300 small and big units producing defence equipment worth ₹1,500 crore every year. The Ordnance Factory is producing one of most important components for Pinaka missile systems.

The DRDO had asked for land on the Lucknow, Kanpur and Jhansi stretch of the Defence Corridor and officials saw several locations during the past two weeks. The land between Lucknow and Kanpur topped priority, said officials.

Brahmos supersonic cruise missile is considered one of the most lethal weapons, which flies at a speed of 3.5 mach (or 4,300 km per hour) having a range of 290 km. The missile was tested successfully last year in the Andaman and Nicobar Islands.

<https://www.hindustantimes.com/cities/lucknow-news/brahmos-missiles-unit-to-come-up-between-lucknow-and-kanpur-101631722980055.html>



The Defence Research and Development Organisation (DRDO) had asked the UP government for 200 acres of land for the project and around ₹300 crore would be invested in its first phase (Pic for representation)

Anantapur: DRDO to extend training to start-ups

Highlights

MP Talari Rangaiah and MLA Anantha Reddy has taken an initiative to motivate prospective entrepreneurs to set up food processing units using locally available fruit and vegetable produce.

Anantapur: MP Talari Rangaiah and MLA Anantha Reddy has taken an initiative to motivate prospective entrepreneurs to set up food processing units using locally available fruit and vegetable produce.

As part of their initiative, they roped in Defence Research Development Laboratory (DRDO) to extend needed infrastructure and training to start-up entrepreneurs.

Accordingly, they held discussions with JNTUA VC G Ranga Janardhana and zeroed in on Oil Processing Technology Research Institute (OPTRI) premises which is affiliated to JNTUA.

The MP, MLA and JNTUA VC Janardhana and Agriculture DD Swami and Horticulture DD Padmalatha along with Registrar Sasidhar and Rector Vijay Kumar visited the campus and discussed arrangements for hosting the food processing training and machinery and equipment.



MP Talari Rangaiah, MLA Anantha Reddy and JNTUA VC G Ranga Janardhana holding talks for arranging the food processing training, machinery and equipment plant on OPTRI premises in Anantapur on Wednesday

<https://www.thehansindia.com/andhra-pradesh/3-food-processing-units-to-come-up-in-anantapur-704218?infinite-scroll=1>

IEI award for DRDO Scientist

Hyderabad: Dr APJ Abdul Kalam Missile Complex, DRDO, Defence Research and Development Laboratory (DRDL) project director Jaiteerth Raghavendra Joshi has been conferred with the prestigious Institution of Engineers (India) Bharat Ratna Sir Mokshagundam Visvesvaraya Award - 2020 in recognition of his significant R&D contributions in the development of missiles and aerospace systems and technologies. The award was conferred as part of Engineers Day celebrations on Wednesday, a press release said.

He obtained B.Tech in Mechanical Engineering from Osmania University and Ph.D in Mechanical Engineering from NIT Warangal. He has made wide-ranging contributions to Prithvi, and Agni, and in his career spanning three decades, Dr Joshi has contributed immensely in the fields of missile technology.

<https://www.thehindu.com/news/national/telangana/iei-award-for-drdo-scientist/article36483811.ece>

DRDL Scientist wins Visvesvaraya Award

Hyderabad: Dr. Jaiteerth Raghavendra Joshi, Project Director at Defence Research and Development Laboratory (DRDL) Dr. APJ Abdul Kalam Missile Complex, DRDO, was awarded the prestigious Institution of Engineers (India) Bharat Ratna Sir Mokshagundam Visvesvaraya Award – 2020 on Wednesday.

As a part of Engineers Day celebrations, Dr. Joshi was conferred this award in recognition of his contributions in the development of missiles and aerospace systems. A senior defence scientist, he is renowned for his work in design and development of advanced missile systems. In this three decade career, he contributed to Prithvi and Agni missiles in addition to serving as Deputy Project Director, LRSAM.

B.Tech from Osmania University and a Ph.D from NIT Warangal, Dr.Joshi is also a Fellow of many bodies including Institution of Engineers India (FIE), Indian Institution of Production Engineers, and more.



Dr Jaiteerth Raghavendra Joshi, Project Director, DRDL, DRDO

<https://telanganatoday.com/drdl-scientist-wins-visvesvaraya-award>

ThePrint

Rolls-Royce ready to co-develop, manufacture fighter aircraft engines in India

Rolls-Royce's India and South Asia president Kishore Jayaraman says co-development is in line with 'atmanirbhar' design and manufacturing initiative

By Snehesh Alex Philip, Edited by Rachel John

New Delhi: British firm Rolls-Royce has said it is keen to work with India to co-develop and manufacture engines for the country's fifth-generation fighter aircraft programme, called AMCA (Advanced Medium Combat Aircraft).

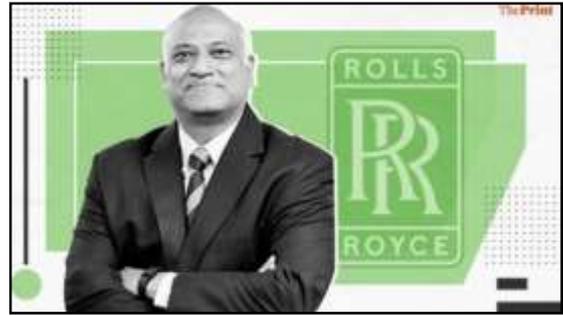
In an interview to ThePrint, Kishore Jayaraman, president of Rolls-Royce India and South Asia, also said the country will own the Intellectual Property (IP) rights for the engines if there is a partnership.

"Rolls-Royce believes we can be an able partner to build an engine in India for AMCA. That is the area of the future. To co-create, co-develop and co-manufacture. It goes in line with the

indigenous design and manufacturing initiative that India wants and the *atmanirbhar* way,” said Jayaraman.

He further noted that joint efforts to manufacture the next set of engines for India’s future aircraft will help develop an aerospace ecosystem in the country.

“(Our) keenness is on the co-creation concept. Because at the end of the day, when we co-create, we are generating IP and the IP is generated locally. When a product is designed in India, manufactured in India, you create your supply chain and you create services concept. It creates a whole new ecosystem in the Indian aerospace sector,” he said.



Rolls-Royce India and South Asia President Kishore Jayaraman | By special arrangement

Jayaraman added that Rolls-Royce believes it can create and manufacture the right engine along with the relevant agencies in India.

The company currently powers the Indian Air Force’s Jaguar deep penetration aircraft, Hawk trainers and the C-130 J Super Hercules.

Competition between Rolls-Royce and Safran

India is in talks with Rolls-Royce; French company Safran, which powers the Rafale fighter; and American firm GE, which powers the Light Combat Aircraft ‘Tejas’, for a possible collaboration to manufacture a joint fighter engine in India.

According to sources in the defence establishment, the primary competition is between Safran and Rolls-Royce. And India will look at the key area of cost along with finer details of each company’s offering in terms of transfer of technology, to make a decision.

Transfer of technology for the aircraft engine was part of the offset commitment in the Rafale contract as well. The proposal dealt with technology transfer for the development of an indigenous engine for the LCA, but it has not been fulfilled by Safran yet. The delay was slammed by the Comptroller and Auditor General (CAG) last year.

However, Jayaraman said Rolls-Royce had a “lot of talks” with the Defence Research and Development Organisation (DRDO) and other agencies, and “there have been very promising and fruitful conversations”.

‘Hybrid is the way forward’

Rolls-Royce also wants to bring in hybrid engines for marine systems to power the Navy’s next generation of vessels.

According to Jayaram, the future is hybrid. “The future is going to be all about hybrid and all-electric. And to get into that world, Rolls-Royce is also looking at hybrid propulsion for very large carriers in the naval fleet, and we can do the needful by partnering with all relevant partners and bringing it to India,” he said.

The top Rolls-Royce executive noted that it will not be all diesel or natural gas in the future, and also talked about the environmental impact of such engines.

“(The future) is going to be about hybrid, because it will yield efficiency in terms of power requirements and in terms of the environment. And Rolls-Royce is a firm believer that the environment matters. So we will bring hybrid propulsion. We are working very seriously on that,” he said.

<https://theprint.in/defence/rolls-royce-ready-to-co-develop-manufacture-fighter-aircraft-engines-in-india/734062/>

DRDO on Twitter



DRDO @DRDO_India · 19h

DRDO organised a webinar on "Quality & Reliability Trends - Defence Perspective". On the occasion Chairman DRDO launched Quality & Reliability Audit Monitoring System (QRAMS) for strengthening DRDO Q&R policy. Chairman QCI & Scientists from DRDO participated.

#AmritMahotsav



Prasar Bharati News Services पी.बी.एन.एस. @PBNS_India



Webinar on Quality & Reliability Trends - Defence Perspective was organised by DRDO.

On the occasion, Chairman DRDO launched the Quality & Reliability Audit Monitoring System (QRAMS) for strengthening DRDO Q&R policy.

@DRDO_India



1:05 PM · Sep 15, 2021





PRO, Hyderabad, Ministry of Defence @dprohyd · 11h

Dr Jaiteerth Raghavendra Joshi, Project Dir, DRDL, DRDO, Hyd has been conferred with Institution of Engineers (India) Bharat Ratna Sir Mokshagundam Visvesvaraya Award in recognition of his significant R&D contributions in development of Missiles, Aerospace Systems & Technologies.



AajTak @aajtak

सफेद दाग से निजात दिला सकती है डीआरडीओ की ल्यूकोस्किन
#DRDO #Medicine



डॉक्टरों का दावा- सफेद दाग का इलाज कर सकती है DRDO की ये दवा
सफेद दाग से बहुत से लोग परेशान होते हैं. इसकी एक शानदार दवा भारत में मौजूद है, जिसे रक्षा
अनुसंधान एवं विकास संगठन (डीआरडीओ) ने विकसित किया है. इस दवा का नाम है
aajtak.in

10:02 PM · Sep 15, 2021 · Twitter Web App

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Wed, 15 Sept 2021 6:02PM

Raksha Mantri Shri Rajnath Singh addresses 18th India-US Economic summit through video conferencing

Invites US companies to invest in India

Our aim is to 'Make in India, Make for the World': RM

Key Highlights of RM's address:

- *India is a strong & reliable investment destination*
- *US companies should focus on transfer of technology through joint ventures*
- *Research & Development with young Indian minds will create a strong defence ecosystem*
- *Government open for new ideas to create a business-friendly environment in India*

Raksha Mantri Shri Rajnath Singh has invited US companies to invest in India and contribute in realising the dream of 'Make in India, Make for the World' envisioned by Prime Minister Shri Narendra Modi. He was delivering the inaugural address at the 18th India-US Economic Summit, on the theme 'Bouncing Back – Resilient Recovery Path Post COVID-19', organised by Indo-American Chamber of Commerce through video conferencing on September 15, 2021.

Terming defence sector as an integral part of not just the security but overall growth of the country, Shri Rajnath Singh stated the initiatives taken by the Government have transformed India into a strong and reliable investment destination. He said, India is now home to stable and secure government which focuses on economic growth through series of reforms. He added that robust domestic demand and availability of talented young work force & innovation make India a major investment destination.

The Raksha Mantri called upon the industry leaders to focus on transfer of technology through joint ventures to realise the country's true potential in defence sector. The foreign OEMs can set up manufacturing facilities individually or partner with Indian companies through a JV or technology agreement to capitalise on the 'Make in India' initiative, he added. Shri Rajnath Singh exhorted them to begin the process of Research and Development with the young minds of the country which will increase the linkages among the industries and create an ecosystem through equal contribution from academia and research.

Shri Rajnath Singh emphasised that there is a lot of scope for the American and Indian defence Industries for co-production and co-development, adding that Indian industry can supply components to American Industries. Expressing confidence that American firms will find India as a major investment destination for defence manufacturing, he assured the Industry that the Government is open for new ideas to create a business-friendly environment in India and is committed to push all types of entrepreneurship and manufacturing in the defence sector.

The Raksha Mantri said the summit is taking place at a time when India is celebrating 75th year of Independence, terming it a platinum opportunity for foreign industries, especially US companies, to contribute in building 'Aatmanirbhar Bharat'. "I am sure that the economic and strategic partnership between India & US will act as a spring board and the forum will act as a bridge to achieve this," he added.

Shedding light on the growing ties between India & US, Shri Rajnath Singh said the Comprehensive Global Strategic Partnership, 2+2 Dialogue, Quad Security Dialogue and agreements like Logistics Exchange Memorandum of Agreement (LEMOA) and Communications Compatibility and Security Agreement (COMCASA) have taken the bilateral relations to greater heights. He, however, emphasised that the relations are yet to receive its full potential, saying that several progressive policies have been put in place in the last two years that have given the defence sector an unexpected growth trajectory.

The measures include setting up of Defence Industrial Corridors in Uttar Pradesh & Tamil Nadu; increasing the FDI limit to 74 per cent through automatic route and 100 per cent through Government route under certain circumstances; inclusion of 'Buy and Make' category in Defence Acquisition Procedure-2020 which provides a vendor with an economical workforce and India gets technology & trained manpower; draft Defence Production and Export Promotion Policy (DPEPP-2020) with provisions to incentivise foreign investment and notification of two positive indigenisation lists to increase business collaboration.

The Raksha Mantri highlighted that, despite the COVID-19 situation, the country's economy is back on track due to the steps taken by the Government. "India's GDP has shown a 'V' shaped growth curve in the last two years. Where the growth witnessed a contraction of 24 per cent last year, a jump of 20 per cent has been seen in the first quarter of this year. It is a reflection of the country's sound economic fundamentals," he said.

Shri Rajnath Singh further said, "We are expecting double digit growth in FY-22 despite the challenge of COVID-19. But, the challenge will be to maintain a healthy growth rate of 7-8 per cent in the years after FY-22. Under the leadership of Prime Minister Shri Narendra Modi, we are preparing for dynamic growth much beyond FY-22." He added that major structural & procedural reforms in the seven years have prepared India to take a quantum jump in terms of growth. Formulation of progressive & investor friendly tax policies, increased focus on ease of doing business, agriculture and labour reforms are some of the initiatives that have laid the foundation of a 'New India', he stated.

The Raksha Mantri also lauded the Indian industry for fulfilling the requirement of masks, PPE kits, ventilators and working with the Government to deal with the pandemic. He added that the Industry is playing a significant role in the world's largest vaccination drive being undertaken in India.

The 18th Indo-US Economic Summit has been organised keeping in view the important role India & US can play in the post-COVID-19 economic recovery. Business leaders of India & US attended the event virtually. The summit also comprises sessions on social issues like women empowerment. The IACC is the apex bilateral Chamber that aims to synergise the India-US Economic Engagement.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755155>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 15 Sept 2021 3:13PM

8th edition of Indian Army Chiefs' Conclave to commence from 16 September 2021

The 8th edition of Indian Army Chief's Conclave, a gathering of serving and former Chiefs of Army Staff of the Indian Army, will be organised at New Delhi from 16 to 18 September 2021. The highlight of the three day event will be the invite extended to former Chiefs of the Nepali Army, who were also Honorary Chiefs of the Indian Army.

The Conclave is a forum for exchange of ideas between the old guard and the current leadership of the Indian Army. It will involve discussions on the rapid transformation of the Indian Army, self-reliance through Atmanirbhar and Make in India initiatives in defence manufacturing and skilling of the Indian soldier to fight modern wars.

The former Army Chiefs will pay homage to the fallen bravehearts during a wreath-laying ceremony at the National War Memorial on 16 September 2021. An interactive session with senior officers of the Indian Army is scheduled on 17 September 2021 for exchange of ideas and views on various administrative and HR aspects of the Indian Army. The Chiefs will also interact with members of the Society of Indian Defence Manufacturers where they will be apprised of the institutional symbiosis between the Indian Army and indigenous private defence manufacturers. The Chiefs are also scheduled to meet the prodigious soldiers who earned laurels for the Nation in the recently concluded Olympic Games at Tokyo.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755050>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 15 Sept 2021 3:13PM

भारतीय सेना के प्रमुखों के सम्मेलन का 8वां संस्करण 16 सितंबर 2021 से शुरू होगा

भारतीय सेना प्रमुखों के सम्मेलन, जो भारतीय सेना के सेवारत और पूर्व थल सेना प्रमुखों की एक सभा होता है, का 8वां संस्करण दिनांक 16 से 18 सितंबर 2021 तक नई दिल्ली में आयोजित किया जाएगा। तीन दिवसीय कार्यक्रम का मुख्य आकर्षण नेपाली सेना के पूर्व प्रमुखों को दिया आमंत्रण होगा, जो भारतीय सेना के मानद प्रमुख भी रहे थे।

यह सम्मेलन पूर्व सेना प्रमुखों और भारतीय सेना के वर्तमान नेतृत्व के बीच विचारों के आदान-प्रदान का एक मंच है। इसमें भारतीय सेना के तेजी से परिवर्तन, रक्षा निर्माण के क्षेत्र में आत्मनिर्भर भारत एवं मेक इन इंडिया पहल के माध्यम से आत्मनिर्भरता की प्राप्ति और आधुनिक युद्धों से लड़ने के लिए भारतीय सैनिकों के कौशल का निखार जैसे विषयों पर चर्चा होगी।

पूर्व सेना प्रमुख दिनांक 16 सितंबर 2021 को राष्ट्रीय युद्ध स्मारक पर पुष्पांजलि समारोह के दौरान वीरगति को प्राप्त हुए सैनिकों को श्रद्धांजलि देंगे। भारतीय सेना के वरिष्ठ अधिकारियों के साथ सेना के

विभिन्न प्रशासनिक और मानव संसाधन पहलुओं पर एक संवाद सत्र दिनांक 17 सितंबर 2021 को विचारों के आदान-प्रदान के लिए निर्धारित किया गया है। सेना प्रमुख सोसाइटी ऑफ इंडियन डिफेंस मैनुफैक्चरर्स के सदस्यों के साथ भी बातचीत करेंगे जहां उन्हें भारतीय सेना और स्वदेशी निजी रक्षा निर्माताओं के बीच संस्थागत सहजीवन से अवगत कराया जाएगा। सेना प्रमुखों का टोक्यो में हाल ही में संपन्न ओलंपिक खेलों में राष्ट्र के लिए सम्मान अर्जित करने वाले विलक्षण सैनिकों से मिलने का भी कार्यक्रम है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755160>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 15 Sept 2021 9:17PM

Exercise ZAPAD-2021 culminates at Novgorod, Russia

Exercise ZAPAD-2021, a seven day long Multilateral 'Joint Strategic Exercise' which saw participation from seven countries culminated today at Mulino in the Novgorod Region of Russia.

As part of the Exercise, strategic planning, tactical actions and manoeuvres were rehearsed and executed jointly in conventional operational scenarios. The Joint Strategic Exercise included defensive & offensive manoeuvres by the Coalition Forces to restore territorial integrity under simulated combat conditions. New generation weapon systems and equipment were also demonstrated by Russian Armed Forces during the exercise.

The closing ceremony conducted on 15 September 2021 highlighted the importance of joint military training and close defence cooperation amongst the Contingents. The magnificent ceremony was presided over by Lieutenant General Yunus-Bek Evkurov, Deputy Defence Minister of the Russian Federation, who expressed his gratitude to the members of all participating contingents and observers.

Besides military training and exercise, the participating contingents showcased their skills in a number of extra-curricular & sports activities including Football, Volleyball, Kettle Bell lifting, Arm Wrestling, Tug of War and the cultural program. The exercise has promoted synergy and inter-operability amongst the Armed Forces, and will help in forging closer military ties between the nations. All contingent commanders expressed immense satisfaction in the conduct of the joint exercise in terms of standards achieved and lessons learnt.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1755263>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 15 Sept 2021 2:01PM

Indian Military contingent participates in the 6th edition of exercise SCO peaceful mission 2021 at Orenburg, Russia

Joint Counter Terrorism Exercise PEACEFUL MISSION is a Multilateral Exercise, which is conducted biennially as part of military diplomacy between Shanghai Cooperation Organisation (SCO) member states. The 6th edition of Exercise PEACEFUL MISSION is being hosted by Russia in the Orenburg Region of South West Russia from 13 to 25 September 2021. The aim of the exercise is to foster close relations between SCO member states and to enhance abilities of the military leaders to command multi-national military contingents.

The Indian military contingent comprising of an all arms combined force of 200 personnel to include 38 personnel from the Indian Air Force is participating in the Exercise PEACEFUL MISSION -2021. The Indian contingent was inducted to the exercise area by two IL-76 aircrafts. Prior to their departure, the contingent underwent training and preparation under the aegis of South Western Command.

The exercise will enable sharing of best practices between the Armed Forces of SCO nations. The exercise will also provide an opportunity to the Armed Forces of SCO Nations to train in Counter-Terrorism Operations in an urban scenario in a multinational and joint environment. The scope of the exercise includes professional interaction, mutual understanding of drills & procedures, establishment of joint command & control structures and elimination of terrorist threats.

Exercise PEACEFUL MISSION 2021 is a landmark event in military interactions and global cooperation to counter-terrorism.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755021>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 15 Sept 2021 2:01PM

भारतीय सैन्य दल ने रूस के ऑरेनबर्ग में शंघाई सहयोग संगठन (एससीओ) शांतिपूर्ण मिशन अभ्यास 2021 के छठे संस्करण में भाग लिया

संयुक्त आतंकवाद विरोधी अभ्यास शांतिपूर्ण मिशन एक बहुपक्षीय अभ्यास है जिसे शंघाई सहयोग संगठन (एससीओ) के सदस्य देशों के बीच सैन्य कूटनीति के एक भाग के रूप में द्विवार्षिक रूप से आयोजित किया जाता है। इस अभ्यास, शांतिपूर्ण मिशन, के छठे संस्करण की रूस द्वारा दक्षिण पश्चिम रूस के ऑरेनबर्ग क्षेत्र में 13 से 25 सितंबर 2021 तक मेजबानी की जा रही है। इस अभ्यास का उद्देश्य एससीओ सदस्य देशों के बीच घनिष्ठ संबंधों को बढ़ावा देना और बहुराष्ट्रीय सैन्य टुकड़ियों का नेतृत्व करने की सैन्य अधिकारियों की क्षमताओं में वृद्धि करना है।

200 सैन्य कर्मियों के साथ सभी हथियारों की संयुक्त क्षमता में भारतीय वायु सेना के 38 कर्मियों को भी शामिल करने के बाद संयुक्त भारतीय सैन्य दल इस मिशन-2021 अभ्यास में भाग ले रहा है। भारतीय दल को दो आईएल-76 विमानों द्वारा अभ्यास क्षेत्र में भेजा गया था। इस अभ्यास में शामिल होने के लिए जाने से पहले सैन्य दस्ते ने दक्षिण पश्चिमी कमान के तत्वावधान में प्रशिक्षण और तैयारी की थी।

यह अभ्यास शंघाई सहयोग संगठन (एससीओ) देशों के सशस्त्र बलों के बीच सर्वोत्तम प्रथाओं को परस्पर साझा करने में सक्षम होगा। यह अभ्यास एससीओ राष्ट्रों के सशस्त्र बलों को बहुराष्ट्रीय और संयुक्त वातावरण के शहरी परिदृश्य में आतंकवाद-रोधी अभियानों में प्रशिक्षित करने का अवसर भी प्रदान करेगा। इस अभ्यास के दायरे में पेशेवर आपसी सम्पर्क, अभ्यास और प्रक्रियाओं की आपसी समझ, संयुक्त कमान और नियंत्रण संरचनाओं की स्थापना और आतंकवादी खतरों का उन्मूलन करना शामिल है।

शांतिपूर्ण मिशन 2021 का अभ्यास आतंकवाद का मुकाबला करने के लिए परस्पर सैन्य संपर्कों और वैश्विक सहयोग में एक ऐतिहासिक घटना है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755076>

India is looking to raise new 'rocket force' for missiles, says Gen Bipin Rawat

By Rajat Pandit

New Delhi: Warning that China is becoming very aggressive, and would soon step into Afghanistan after friendly overtures to Iran and Turkey, General Bipin Rawat on Wednesday said India needs an integrated national security architecture to deal with two hostile neighbours, non-contact technological warfare and internal security challenges.

Taking recourse to Samuel Huntington's seminal thesis 'Clash of Civilizations' during a talk at the India International Centre, the chief of defence staff said it mentions that the Confucian or 'Sinic' civilization would actually join hands with the Islamic civilization to counter the western one.



Chief of Defence Staff General Bipin Rawat (File photo)

"Whether that is going to happen or not, only time will tell. But we are seeing some kind of 'jointmanship' between the Sinic and Islamic civilizations. You can see China is now making friends with Iran, moving towards Turkey and stepping into Afghanistan. They (China) will step into Afghanistan in the time to come very shortly," Gen Rawat said.

Noting that the rise of China had happened faster than what the world has envisaged, India will have to wait-and-watch how events unfold in the Taliban-controlled Afghanistan. "We don't know what is in the future. There can be more turmoil in Afghanistan and changes that can't be anticipated as of now," he added.

Turning to Pakistan, the CDS said the western adversary will continue to fuel and expand its proxy war against India. "Today, we find it happening in J&K. They (Pakistan) are attempting it in Punjab once again, and are also trying to spread their wings in other parts of the country," he said.

"A weaker adversary like Pakistan will always keep us engaged through a proxy war. They are, in fact, a proxy of our northern adversary (China). China has shown aggression in the South China Sea with the nations in that area. Whether it happens in the form of direct aggression or use of technology along our land borders, we have to be prepared," he added.

India is adopting "a whole of government approach" to deal with all security issues. The country is looking to raise a new 'rocket force' for different kinds of missiles, ensure more 'jointness' between the armed forces and the central armed police forces, and create dual-use infrastructure and logistics through civil-military fusion, he said.

Efforts are already underway to build an integrated war-fighting machinery through the creation of unified theatre commands, strengthening capabilities in the domains of space, cyberspace and special operations.

With China becoming "more and more aggressive", India also has to consider technology as a very important facet of war-fighting because an adversary will try to disrupt our strategic networks as well as energy, banking, transport and communication grids. "Future wars may not necessarily be fought like past wars, which were battles of attrition," said Gen Rawat.

Overall, India needs to start looking at "transforming" the national security architecture, which will require some kind of integration and jointness among all security forces as well as civilian organizations, he added.

<https://timesofindia.indiatimes.com/india/india-is-looking-to-raise-new-rocket-force-for-missiles-says-gen-bipin-rawat/articleshow/86247245.cms>

CDS General Bipin Rawat reveals shape of India's 'joint theatre commands'

The CDS said the military was also looking at creating a single theatre command for managing the threat from China

By Ajai Shukla

New Delhi: For the first time, Chief of Defence Staff General Bipin Rawat publicly described the Indian military's deliberations on reorganising itself into "integrated theatre commands". These are warfighting entities, containing army, navy and air force components, that would fight jointly to focus and synergise the combat power of all three services.

In what would be the boldest move since Independence, Rawat said the 17 single-service commands that currently exist would be combined into just four geographical commands, each with elements from all three services.

The first joint theatre command would be responsible for the border against Pakistan in what the military refers to as the "western theatre"; while a second command — the northern theatre command — would be responsible for the border with China. A third, navy-heavy theatre, called the "maritime command" will be responsible for the security of the Indian Ocean Region (IOR); and an island command, already functional and called the Andaman & Nicobar Command (ANC), would project power into the eastern Indian Ocean.

Rawat was speaking in New Delhi to an audience of writers and intellectuals at the India International Centre on Wednesday.

"Today, we have four different army commands looking after Pakistan: Northern, Western, South-Western and Southern commands. From the air force, we have three commands looking after that frontier: Western Air Command, South-Western Air Command and Southern Air Command. From the navy, we have a Western Naval Command and a Southern Naval Command," counted Rawat.

The frontier with China is managed by a similar multiplicity of commands. The Central Air Command, located in Allahabad, has a role in managing both the western and northern theatres, while the Eastern Air Command at Shillong is responsible for the northern theatre. "The army's Central and Eastern Commands look after the northern border while the army's Northern Command is split between the western border and the northern border. If you count, there are 17 commands that are responsible for guarding against both our adversaries," said Rawat.

Describing these joint theatre commands, Rawat said the one looking after Pakistan would have a commander, whether from the army, navy or air force — who is best suited for the job. He would have subordinate commanders from the other two services, who could offer him advice specific to their respective services.

"There is also a thought process about co-opting the central armed police forces (CAPFs) for tasks with the army. The CAPFs train with us and have weapons systems that are as good as what the army has. So they can take on some defensive tasks and, thereby, relieve the army for carrying out offensive tasks."

The CDS said the military was also looking at creating a single theatre command for managing the threat from China. This theatre commander would also have under him elements from the Eastern Naval Command and IAF components.



Chief of Defence Staff General Bipin Rawat.
Photo: PTI

Rawat said the navy's two combat commands — the western and the eastern naval commands — would be integrated into a single headquarters. Called the National Maritime Command, it would be responsible for the security of the Arabian Sea, Bay of Bengal and the northern Indian Ocean.

The fourth joint theatre command would be responsible to defend India's island territories, which Rawat called "islands of resistance".

The military has already created a joint theatre command in the Andaman and Nicobar Islands, headed by a CINCAN (Commander-in-chief Andaman and Nicobar), who has been India's only integrated commander-in-chief. The CINCAN does not report to the navy, but to the Integrated Defence Staff.

The fifth theatre, said Rawat, comprises India's air space, which is increasingly contested by manned and unmanned aircraft, missiles, rockets and artillery shells, which go as high as 15 km when they are fired. "With the air chief engaged in multiple other tasks, the solution being considered is to have a dedicated air force commander-in-chief, responsible for the air space above us," said Rawat.

The sixth joint commander would be in charge of cyber war. "Frontal attacks with tanks and infantry may not be the way the next war is fought. Instead, the troops in the rear may become the first to come under attack – a cyberattack launched by the enemy," said Rawat. "The adversary may force you to join battle in the manner that suits him. So we need a space agency."

https://www.business-standard.com/article/current-affairs/cds-general-bipin-rawat-reveals-shape-of-india-s-joint-theatre-commands-121091501662_1.html

Exclusive | Common training, joint drills among proposals for better synergy in armed forces

An expert group's study to enhance jointness in the training of the three services was commissioned last October

By Amrita Nayak Dutta

A study by a committee of defence experts has recommended a common doctrine for training the armed forces and joint drills involving Junior Commissioned Officers (JCO) and others in the triservices, officials have told News18.com, a move aimed at achieving better integration in training of the army, navy and the Indian Air Force (IAF) personnel.

The development comes in the backdrop of authorities setting in motion India's ambitious theatreisation plan for critical operational synergy among the three services. But there are indications that it will take at least three years to put the system in place, with four commanders-in-chief working on the structures.



Joint training is believed to be critical for the achievement of a common military objective. (Image: News18)

Meanwhile, the focus of the defence establishment remains on enhancing synergy among the three forces at least in the areas of training and logistics, which are considered relatively low-hanging fruits.

Why the move is important

While the three services have specific roles, joint training is believed to be critical for the achievement of a common military objective.

At present, cadets of the three services undergo basic military training at the National Defence Academy (NDA), before getting into service-specific specialisation in the last two of the total six semesters there.

After getting commissioned as officers, the next time they train together is at the Defence Services Staff College when they are promoted to Major/Lieutenant Colonel and equivalent levels. This could be 10-12 years, or even more, after they are commissioned. Other senior-level courses for joint training of officers follow with their empanelment to higher ranks.

"...the higher command course or the staff college courses are conceptual courses. There is a lack of training at the troop-level," a senior services officer said.

"An enhanced joint training is essential for better coordination and cooperation among the rank and file of the three defence services," the officer said.

The proposal for joint training of JCO and other ranks in the army with their equivalents in other services will help fill this void, he said. A joint training doctrine is essential, the officer added, as it will formulate a common policy and lay down concepts and training methodologies of how troops of the three services can function in various operations.

A second defence officer told News18.com that it is imperative that jointness in training is achieved not just at training institutes but also on the field. "This is important so that the tactics formulated in these institutions could be tested and validated for the effectiveness."

How the study was carried out

The study to enhance jointness in the training of the three services was commissioned in October last year, 35 years since another study was conducted on this topic in 1986, News18.com has learnt.

The Committee of Experts (CoE) that conducted the recent study comprised top officers from the Army's Training Command (ARTRAC) in Shimla, the IAF training command in Bengaluru and the Kochi-based Southern Naval Command of the navy.

This CoE examined and reviewed the functioning of triservices training institutes such as the National Defence College (NDC), Armed Forces Training Institutions (AFTIs), and war colleges at Mhow, Goa and Secunderabad.

CoE members visited all joint training establishments and deliberated with stakeholders before presenting the key aspects of the study to the Chiefs of Staff Committee (COSC) in February this year. It recommended changes in framework, processes and curriculum with an eye on enhancing jointness through training.

According to defence sources, CoE members looked into the professional military education training (PMET) curriculum taught to cadets at NDA as well at higher levels, such as at the Defence Services Staff College, College of Defence Management and NDC. A comparison was also drawn between the Indian PMET and those of the United States and China, before arriving at the recommendations.

Other recommendations

According to sources, a recommendation by the committee was to ensure a proper balance between theory and on-field training at defence institutes, and assessment of officers and cadets on specific learning outcomes.

The committee suggested that a vision and guidance for a joint PMET should be given by the Chief of Defence Staff and COSC, and that the training should focus on strengthening critical thinking capabilities of officers of the armed forces.

The study also recommended that there should be separate schools for "joint operations and war fighting", and a department of leadership and behavioural studies under the existing military training institutes and also those planned – such as the Indian Defence University in Gurugram that is yet to open since its foundation stone-laying ceremony in 2013.

The CoE report recommended setting up new joint training services institutions (JSTIs) to enhance integration among the services.

The Integrated Defence Staff headquarters, the sources said, had already established several JSTIs – including on military law, intelligence, nuclear biological chemical warfare (CBRN), and music and catering – for jointly training officers in these spheres.

A separate PMET for officers not empanelled for the next rank, centres of excellence in various training establishments, and aligning military education with the National Education Policy (NEP) are among the recommendations.

"Faculty development and international training of officers and leveraging potential of the alumni who've had such training in the past, adequate forward area and international study tours are the other recommendations," a third source told News18.com.

<https://www.news18.com/news/india/exclusive-common-training-joint-jco-level-drills-among-proposals-for-better-synergy-in-armed-forces-4206677.html>



Press Information Bureau
Government of India

Ministry of Science & Technology

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High-quality transparent ceramics developed for the first time in India can be used in thermal imaging and personal protection equipments

Indian researchers have developed transparent ceramics, reaching theoretical transparency through a technique called colloidal processing followed by simultaneous application of temperature and pressure, for the first time in India. The material can be used for thermal imaging applications, especially in harsh service conditions and personal protection systems such as, helmets, face shields, and goggles.

Transparent ceramics is a new class of advanced materials with unique transparency and excellent mechanical properties. These materials can be designed not only for transparent to visible light but also for ultraviolet (UV), Infrared (IR), and Radiofrequency (RF), giving opportunity for diverse applications. Though produced by different countries globally, transparent ceramics are restricted in supply as they can be used for strategic applications. Though several attempts were made in the country, the transparent ceramics produced were either on a laboratory scale or low transparency. Currently developed process is able to produce the sizes usable for several applications and on a pilot scale.

Generally, prepared from the high purity powders through a line of critically engineered processing steps, transparent ceramics needs preparation processes that will help achieve theoretical transparency by eliminating defects. Chemical Vapour Deposition (CVD) involving reactions of the precursors in the vapor phase at elevated temperatures and Hot Isostatic Pressing (HIP) involving simultaneous application of temperature and pressure are a few advanced processing techniques generally practiced to address the above challenges. An enhanced diffusion process at high temperature under pressure is suggested as the possible mechanism to eliminate the defects.

Researchers at the ARCI have produced magnesium aluminate spinel ceramics with colloidal processing followed by HIP technique which involves the simultaneous application of temperature and pressure. Spinel is currently emerging as a transparent ceramic based on the outstanding optical properties of transmission – more than 75 % in the visible and more than 80% in the infrared range. It also has higher strength of 200 megapascal and hardness of more than 13 Gigapascal. This research has been published in the journal '*Materials Chemistry and Physics*' recently.

With potential applications in infantry personal protection systems involving thermal imaging such as helmets, face shields, and goggles, these transparent ceramics developed in India is a step towards Atmanirbhar Bharat.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1755181>

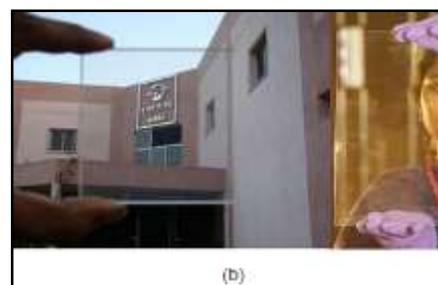


Fig.1. Transparent ceramic samples before (a) and after HIPing at ARCI(b)

ISRO to launch Gaganyaan mission by end of 2022 or early 2023 after covid delays, says Jitendra Singh

He said a brainstorming exercise by space scientists and government officials in 2015-16 helped them understand where space technology could be used

India's 'Gaganyaan' mission is likely to be launched by the end of 2022 or early 2023, Union minister Jitendra Singh said on Wednesday.

The mission, originally scheduled for a launch by 2022, was delayed due to coronavirus pandemic. It aims to launch a manned mission in the Lower Earth Orbit.

"We could have actually done this (launched Gaganyaan by 2022). We had planned to time it along the 75th anniversary of India's Independence, but it could not happen that way because of the inevitable delay caused due to COVID-19.

"But I am sure, maybe by the end of next year or may be (by) the beginning of 2023, we would be able to do that as well," he said.

Singh, the Minister of State in the Department of Space, was addressing a webinar on 'Future of India-Oceania Space Technology Partnerships' organised by the Federation of Indian Chambers of Commerce & Industry (FICCI) here.

He further said a brainstorming exercise by space scientists and government officials in 2015-16 helped them understand where space technology could be used.

"Space technology has a role to play, virtually, in every sector," he asserted.

Space technology has come very handy in the area of disaster management, the minister said, adding that space medicine is also deeply connected in the endeavour to send three Indians to space.

According to the government, four biological and two physical science-related microgravity experiments from academic institutions are shortlisted for the unmanned mission of the Gaganyaan Programme.

Singh also emphasised on the importance of reaching out to start-ups and industry players working in the arena of space.

Speaking on India's collaboration with oceanic countries in the area of space, he noted that India has a "comfort level" with these countries which makes it easy to collaborate with them.

"The Oceania countries such as New Zealand, Australia and the Pacific Island countries can also collaborate (with India) and work on joint space technology solutions and innovative products," the MoS added.

Earlier this week, Anthony Murfett, Deputy Head of Australia Space Agency had said Australia would be supporting India's Gaganyaan mission by tracking it through Cocos (Keeling) Islands.

'Mangalyaan', India's Mars Orbiter Mission, was tracked from Fiji.

<https://www.firstpost.com/india/isro-to-launch-gaganyaan-mission-by-end-of-2022-or-early-2023-after-covid-delays-says-jitendra-singh-9968251.html>

Triangular honeycombs: Physicists design novel quantum material

Smartphones, notebooks and other electronic devices of our everyday life strongly benefit from the ever-increasing miniaturization of semiconductor devices. This development comes however at a price: confining electrons enhances their scattering— cell phones heat up.

Topological insulators hold promises for a more efficient and sustainable technology. At odds with conventional semiconductors, the current flows on their boundaries, with scattering becoming prohibited thanks to symmetry reasons. In other words, things stay cool! In 2007 Laurens Molenkamp, physicist at the University of Würzburg and member of the Cluster of Excellence, discovered the first topological quantum material, generating a worldwide resonance in the scientific community.

Indenene—a hidden honeycomb

In the search for new topological materials, most of the theory efforts hitherto have been focusing on two-dimensional atom layers in a honeycomb arrangement. The motivation comes from graphene, the "Drosophila" of the quantum spin Hall systems, or more simply, a single layer of the famous graphite inside our old-style classical pencils. The research team in Würzburg pursued instead an alternative route: the theoretical physicists around Giorgio Sangiovanni have proposed to use a simpler triangular atomic lattice.

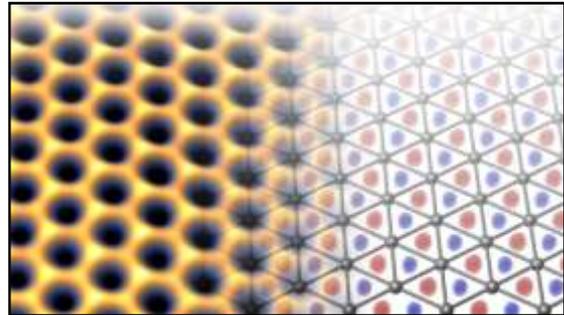
This idea has been put into practice by the experimental team of Ralph Claessen, spokesperson of ct.qmat's Würzburg branch. Using state-of-the-art molecular beam techniques, the researchers succeeded in depositing a single layer of indium atoms as triangular lattice on a silicon carbide crystal as support—resulting in indenene. Thanks to this new combinations of building blocks and chemical elements, the relevant electrons do not localize directly on the indium positions but prefer to occupy the free space in between them. From the perspective of the electrons their charge fills the "negative" of the triangular indium lattice which is actually a honeycomb lattice—hidden in the voids of the atomic structure.

Project head Giorgio Sangiovanni explains this through the quantum mechanical nature of particles: "One can describe the indium electrons as waves that pile up in the voids of the triangular lattice where at first sight you would not expect them to be. Interestingly, the resulting 'hidden' honeycomb connectivity leads to a particularly robust topological insulator, more than graphene."

Topological quantum materials with distinctive advantages

The unique materials design that has led to the synthesis of indenene can improve the current technological status in the field of topological electronics: In contrast to graphene, indenene needs not to be cooled down to ultra-low temperatures to manifest its properties as a topological insulator. This is a consequence of the particularly simple triangular lattice which allows for large structural domains, often a severe bottleneck in the synthesis of other topological materials.

"We were indeed surprised, that such a simple atomic structure can display topological properties. This is an essential asset for the successful growth of perfect indenene films that can meet the demanding standards required for device nanofabrication. Furthermore, the use of silicon



The measured electronic density (left) on the triangular indium lattice (right). The figure highlights how electrons (in yellow) do not sit on the atomic position but they rather occupy the voids in between (red and blue). As a result, an emergent honeycomb connectivity arises formally equivalent to the well-known graphene. At the same time, this "hidden" honeycomb motif equips indenene with a much larger bandgap, upgrading it to a superior quantum spin Hall system. Credit: ct.qmat

carbide as supporting substrate allows us to connect to established semiconductor technology," says Ralph Claessen, commenting the scientific result.

Outlook

The simple structure of indenene represents at the same time a challenge: as soon as the single layer of indium atoms comes in contact with air, the material loses its special properties. For this reason the researchers are currently developing an atomic capping layer that can protect indenene from unwanted contamination during its synthesis. A solution to these issues will pave the way towards a large-scale use of these topological quantum materials.

More information: Maximilian Bauernfeind et al, Design and realization of topological Dirac fermions on a triangular lattice, *Nature Communications* (2021). [DOI: 10.1038/s41467-021-25627-y](https://doi.org/10.1038/s41467-021-25627-y)

Journal information: [Nature Communications](https://www.nature.com/articles/s41467-021-25627-y)
<https://phys.org/news/2021-09-triangular-honeycombs-physicists-quantum-material.html>



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Creating cotton that is fireproof and comfortable

State-of-the-art flame retardant cotton textiles suffer from release of formaldehyde and are uncomfortable to wear. Empa scientists managed to circumvent this problem by creating a physically and chemically independent network of flame retardants inside the fibers. This approach retains the inherently positive properties of cotton fibers, which account for three-quarters of the world's demand for natural fibers in clothing and home textiles. Cotton is skin-friendly because it can absorb considerable amounts of water and maintain a favorable microclimate on the skin.



Cost effective: Sabyasachi Gaan uses steam from a commercial pressure cooker to flame retard samples of cotton fabric. Credit: Empa

For firefighters and other emergency service personnel, protective clothing provides the most important barrier. For such purposes, cotton is mainly used as an inner textile layer that needs additional properties: For example, it must be fireproof or protect against biological contaminants. Nevertheless, it should not be hydrophobic, which would create an uncomfortable microclimate. These additional properties can be built into the cotton fibers by suitable chemical modifications.

Durability vs. toxicity

"Until now, it has always taken a compromise to make cotton fireproof," says Sabyasachi Gaan, a chemist and polymer expert who works at Empa's Advanced Fibers lab. Wash-durable flame retardant cotton in industry is produced by treating the fabric with flame retardants, which chemically links to the cellulose in the cotton. Currently, the textile industry has no other choice than to utilize formaldehyde-based chemicals—and formaldehyde is classified as a carcinogen. This has been an unsolved problem for decades. While formaldehyde-based flame retardant treatments are durable, they have additional drawbacks: The -OH groups of cellulose are chemically blocked, which considerably reduces the capability of cotton to absorb water, which results in an uncomfortable textile.

Gaan knows the chemistry of cotton fibers well and has spent many years at Empa developing flame retardants based on phosphorus chemistry that are already used in many industrial applications. Now he has succeeded in finding an elegant and easy way to anchor phosphorous in form of an independent network inside the cotton.

Independent network between cotton fibers

Gaan and his colleagues Rashid Nazir, Dambarudhar Parida and Joel Borgstädt utilized a tri-functional phosphorous compound (trivinylphosphine oxide), which has the capability of reacting only with specifically added molecules (nitrogen compounds like piperazin) to form its own network inside cotton. This makes the cotton permanently fire-resistant without blocking the favorable -OH groups. In addition, the physical phosphine oxide network also likes water. This flame retardant treatment does not include carcinogenic formaldehyde, which would endanger textile workers during textile manufacturing. The phosphine oxide networks, thus formed, does not wash out: After 50 launderings, 95 percent of the flame retardant network is still present in the fabric.

To render additional protective functionalities to the flame retardant cotton developed at Empa, the researchers also incorporated in situ generated silver nanoparticles inside the fabric. This works nicely in a one-step process together with generating the phosphine oxide networks. Silver nanoparticles provide the fiber with antimicrobial properties and survive 50 laundry cycles, too.

A high-tech solution from the pressure cooker

"We have used a simple approach to fix the phosphine oxide networks inside the cellulose," Gaan says. "For our lab experiments, we first treated the cotton with an aqueous solution of phosphorus and nitrogen compounds and then steamed it in a readily available pressure cooker to facilitate the crosslinking reaction of the phosphorus and the nitrogen molecules." The application process is compatible with equipment used in the textile industry. "Steaming textiles after dyeing, printing and finishing is a normal step in textile industry. So it doesn't require an additional investment to apply our process," says the Empa chemist.

Meanwhile, this newly developed phosphorus chemistry and its application is protected by a patent application. "Two important hurdles remain," Gaan says. "For future commercialization we need to find a suitable chemical manufacturer who can produce and supply trivinylphosphine oxide. In addition, trivinylphosphine oxide has to be REACH-registered in Europe."

More information: Rashid Nazir et al, In-situ phosphine oxide physical networks: A facile strategy to achieve durable flame retardant and antimicrobial treatments of cellulose, *Chemical Engineering Journal* (2020). DOI: [10.1016/j.cej.2020.128028](https://doi.org/10.1016/j.cej.2020.128028)

<https://phys.org/news/2021-09-cotton-fireproof-comfortable.html>

Lasers light up neutron generation for radiography

Getting snapshots of systems and processes at precise time points is important to research and development in many fields, including biology, materials science, and engineering. Firing a neutron beam at a material is one way of gaining information; however, this often requires nuclear reactors and specialist facilities. Now, researchers from Osaka University have reported a laser-driven method of simultaneously generating neutrons and X-rays. Their findings are published in *Applied Physics Express*.

Looking at a system without having to destroy it is very useful when investigating structures. One way this can be done is to aim light, ionizing radiation, or particles at the material of interest and see how they interact with the target.

Neutrons—particularly low-energy ones—are excellent particles for this because they are likely to interact with different nuclei, including hydrogen. However, generating neutrons can require specialist facilities that are not easily accessible.

Recently, systems using lasers to generate neutrons have been gaining popularity because they are compact, can generate short bursts of neutrons, and can produce X-rays at the same time.

The Osaka researchers have developed a laser-driven neutron source that is small—the size of a fingertip—and can generate a lot of fast neutrons in very short bursts. The neutrons are then slowed down by a moderator to make them optimal for imaging.

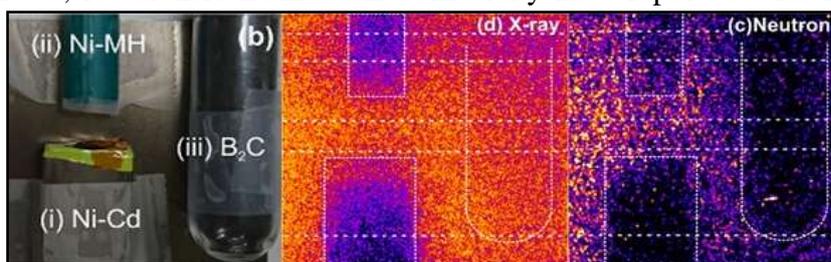
"We were able to generate a high neutron density—higher than is found in some stars—which means we could acquire the information needed very rapidly," explains study corresponding author Associate Professor Akifumi Yogo. "X-rays were also produced at the same time, so the system can offer two complimentary techniques in one."

The neutrons were generated by switching a laser on and off. This control over the neutron source makes the system safer than previous alternatives.

The researchers used their technique to show that boron carbide, which could not be imaged using X-rays, was detected using neutrons. In addition, they examined hazardous substances in a typical battery in a non-destructive way, and were able to detect the presence of cadmium using neutrons. "The rapid neutron burst we were able to achieve with our system will provide imaging information for very rapid processes," says Associate Professor Yogo. "For example, we believe events such as fuel injection in engines and bubble collapse in fast jets could be observed, which would provide valuable information for research in many industries."

The article, "Single shot radiography by a bright source of laser-driven thermal neutrons and X-rays" was published in *Applied Physics Express*.

More information: Single shot radiography by a bright source of laser-driven thermal neutrons and X-rays, *Applied Physics Express*, DOI: [10.35848/1882-0786/ac2212](https://doi.org/10.35848/1882-0786/ac2212)
<https://phys.org/news/2021-09-lasers-neutron-radiography.html>



The results of "snap shot" radiography using laser-induced neutrons and X-rays simultaneously. (Left) Photograph of the samples: Nickel metal hydride battery (Ni-MH), nickel cadmium battery (Ni-Cd), and boron carbide powder (B₂C). (Center) X-ray radiography, where B₂C is transparent to X-rays. (Right) Neutron radiography. The Ni-Cd can be distinguished from the Ni-MH based on the darkness of the shadow. In addition, low transmittance was observed for B₂C. These results highlight the advantage of neutrons, which can identify materials that are transparent to X-rays. Credit: © 2021 A. Yogo et al., *Applied Physics Express*

Older age, chronic co-morbidities associated with more severe COVID disease in children

Summary:

A recent study determined the factors associated with severe disease and poor health outcomes among children presenting to the hospital with COVID. These included older age and chronic co-morbidities such as obesity, diabetes and neurologic conditions, among others.

Over the course of the pandemic, researchers nationwide noticed differences in COVID-19 disease between children and adults.

While risk factors for hospitalization and poor outcomes are well documented in adults, less is known about the clinical factors associated with COVID disease severity in children.

In an effort to aid mitigation strategies for children who are at high risk of developing severe COVID disease, a group of physicians at Monroe Carell Jr. Children's Hospital at Vanderbilt studied data from 45 children's hospitals around the country -- 20,000 patients were included.

"This is one of the largest multicenter studies of children with COVID-19 in the United States," said James Antoon, MD, PhD, FAAP, assistant professor of Pediatrics at Children's Hospital and lead author of the study.

"And given the recent, concerning increases in COVID cases nationwide and the fact that the vast majority of children remain unvaccinated and susceptible, these findings should be taken into account when considering preventive strategies in schools and planning vaccinations when available for children less than 12 years of age," he said.

The study, "Factors Associated with COVID-19 Disease Severity in U.S. Children," published in the *Journal of Hospital Medicine*, determined the factors associated with severe disease and poor health outcomes among children presenting to the hospital with COVID. These included older age and chronic co-morbidities such as obesity, diabetes and neurologic conditions, among others.

"These factors help identify vulnerable children who are most likely to require hospitalization or develop severe COVID-19 disease," said Antoon. "Our findings also highlight children who should be prioritized for COVID-19 vaccines when approved by the FDA."

The retrospective cohort study noted that approximately 1 out of every 4 children admitted to the hospital with COVID developed severe disease and required ICU care during April and September, 2020. "Across the country there is a raging debate on how best to protect children and schools from COVID-19," said Antoon. "Some children are at increased risk for more severe disease and many of them are not yet eligible for vaccination against COVID."

"With schools opening and some already in session, these children need to be protected by vaccinating as many people as possible while also using practical strategies to limit spread, such as masking, distancing and ventilation."

Study investigators hope that the findings will buoy mitigation efforts that proved most beneficial for children and adolescents during the pandemic, including remote learning, social distancing, hand-washing and mask-wearing both for students and teachers.

Story Source:

[Materials](#) provided by [Vanderbilt University Medical Center](#). Original written by Jessica Pasley. *Note: Content may be edited for style and length.*

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