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# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO  
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# CONTENTS

S. No.	TITLE	Page No.
	<b>DRDO News</b>	<b>1-3</b>
	<b>DRDO Technology News</b>	<b>1-2</b>
1.	The Underdog Rudram Missiles: India's Mysterious Anti-Radiation Munition	<i>Financial Express</i> 1
	<b>DRDO Twitter</b>	<b>3</b>
	<b>Defence News</b>	<b>3-17</b>
	<b>Defence Strategic: National/International</b>	<b>3-17</b>
2.	Indo-Bangladesh Bilateral Exercise "Ex Sampriti-X" Concludes at Jashore, Bangladesh	<i>Press Information Bureau</i> 3
3.	Raksha Mantri reviews security situation along the border during his visit to forward areas of Jammu & Kashmir	<i>Press Information Bureau</i> 4
4.	Defense minister Rajnath Singh to pay two-day visit to Jammu and Kashmir from today	<i>Zee News</i> 5
5.	कभी नहीं देखा होगा ऐसा रोबोट- पठानकोट-पंपोर अटैक में आतंकियों को मारने में की थी सेना की मदद	<i>Aaj Tak</i> 6
6.	Government Rejects Criticism Against Agnipath Amidst Raging Protests In Several States; Issues Clarification	<i>The Economic Times</i> 8
7.	Agnipath Scheme: Jobs, Skillset, Courses for Agniveers at Entry, In-Service and Exit Levels	<i>The Economic Times</i> 10
8.	Agnipath Should Serve Our Goals in War & Peace	<i>The Tribune</i> 10
9.	India, ASEAN for Mutually-Beneficial Strategic Partnership	<i>The Pioneer</i> 12
10.	Two Years of Galwan: India-China Border Standoff is Now A Battle for Agility	<i>Indian Defence News</i> 13
11.	NATO to Boost its Forces, Equipment on Eastern Flank	<i>The Economic Times</i> 14
12.	Six NATO Countries Sign Agreement to Collaborate on Next-Gen Helo	<i>DefenseNews</i> 15
	<b>Science &amp; Technology</b>	<b>17-20</b>
13.	IISc, KIER Develop Self-Regulating Footwear to Help Diabetic Patients	<i>The Pioneer</i> 17
14.	Let Machines Do the Work: Automating Semiconductor Research With Machine Learning	<i>EurekaAlert</i> 18

*Thu, 16 Jun 2022*

## **The Underdog Rudram Missiles: India's Mysterious Anti-Radiation Munition**

*By Girish Linganna*

Media reports revealed that the tests of at least three weapons- the ASTRA-1 and ASTRA-2 beyond visual range air-to-air missiles (BVRAAMs) and the new generation anti-radiation missile (NGARM) Rudram-1- were slated to happen last month. While the first two have garnered their fair share of attention, the Rudram missile has remained elusive. Rudram (meaning “remover of sorrows”) is India’s first anti-radiation missile (ARM). It is an Air-to-Surface missile developed by the Defence Research and Development Organisation (DRDO). ARMs like Rudram are designed to detect, track and neutralise the enemy’s radio frequency sources that form a part of its defence systems. These include radar, communication assets and other radio frequency sources. These missiles depend on a navigation mechanism consisting of a satellite-based Global Positioning System (GPS) and an inertial navigation system. The latter is a computerised mechanism.

For guidance, Rudram uses a system that can detect, classify, and engage radio frequency sources over a broad band of frequencies. This system is called a “passive homing head”. Sources have revealed that once the Rudram missile locks on the target, it can strike accurately even if the radiation source switches off in between. The missile is reported to have an operational range of more than 100 km, based on the launch parameters from the fighter jet. The first rendition, the Rudram-1 missile, primarily aims at Suppression of Enemy Air Defenses (SEAD). This consists of destroying enemy communication systems, surveillance radar stations with an operational range of approximately 250 km and a maximum speed of 2 Mach- double the speed of sound. Beyond this, Rudram-2 and Rudram-3, with ranges of 350 and 550 km, respectively, are also under development.

While developed by DRDO, the indigenous weapons are jointly produced by Bharat Dynamics Limited (BDL) and Bharat Electronics Limited (BEL). Official sources revealed that DRDO began the development of ARMs of this kind around eight years ago. The projectile’s integration with fighter aircraft has been a collaborative effort of various DRDO facilities and formations of the IAF and Hindustan Aeronautics Ltd.

## **Tests and Induction**

Rudram-1 was tested in its anti-radiation mode for the first time on October 9 in 2020. It was fired from a Sukhoi-30 fighter jet against a target on Wheeler Island off the coast of Odisha. Rudram reportedly hit the radiation target “with pinpoint accuracy.” The missiles need to be carried and launched from extraordinarily complex and sensitive fighter aircraft. This resulted in the development being full of challenges, such as integrating the munition with the fighter and developing radiation seeker technologies and guidance systems. The difficulty of integrating this missile with an aircraft is further compounded by the fact that the Indian government’s plan to upgrade the Su-30 fighter fleet has taken a backseat in light of the ongoing war in Ukraine.

Officials had told the media two years ago that the plan was to carry out six or seven more tests before announcing the weapon’s readiness for induction by 2022. The induction plan is good news for the Indian Air Force (IAF). Rudram will provide air superiority tactical capability to the IAF jets. The addition of this munition is beneficial to an aircraft in a real fight. This has multiple backing reasons. One, a pilot can use the projectile in the initial part of air conflict to hit at the adversary’s air defence assets. Two, it can lead to increased survivability if used in the later parts of the fight. And most importantly, in the era of network-centric warfare, the abilities of communication, detection, and surveillance systems that the weapon system is integrated with will surely increase the power of the Indian Armed forces.

### **Advanced models coming up?**

Little is known about the features of the advanced versions of Rudram- namely, Rudram-2 and Rudram-3. It is believed that both also have INS-GPS navigation and come equipped with a passive homing head. Last month, sources told the media that trials of Rudram-2 should begin soon. Reports about Rudram-2 being an air-launched ballistic missile (ALBM) are in circulation. However, this claim has not been acknowledged by any official sources so far. An even lesser amount of information is available about Rudram-3. Unconfirmed reports suggest that this missile’s development began in 2017, and its trial will cost the government 485 crores. Only confirmation from officials of involved companies, or the government, can clear the air.

<https://www.financialexpress.com/defence/he-underdog-rudram-missiles-indias-mysterious-anti-radiation-munition/2563127/lite/>

## DRDO On Twitter



**#DRDOUpdates | #DRDO**  
Armament Research Board conducted 1 day brainstorming session at IISER, Bhopal to discuss Thrust areas, National programmes, ARMREB Vision-2047, Scholarship scheme, AI/ML & innovation through academia-industry partnerships.  
[@DefenceMinIndia](#)  
[@SpokespersonMoD](#)



3:04 PM · Jun 16, 2022 · Twitter for iPhone

## Defence News

## Defence Strategic: National/International



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Thu, 16 Jun 2022 7:21 PM*

### **Indo-Bangladesh Bilateral Exercise “Ex Sampriti-X” Concludes at Jashore, Bangladesh**

Indo-Bangladesh bilateral Joint Military Exercise “Ex SAMPRITI-X” concluded at Jashore Military Station, Bangladesh today. The Closing Ceremony of the 10th edition of “Ex Sampriti” was attended by Lieutenant General Ataul Hakim Sarwar Hasan, Chief of General Staff, Bangladesh Army along with Major General Praveen Chhabra, General Officer Commanding 20

Mountain Division of Indian Army and Major General Md Nurul Anwar, General Officer Commanding 55 Division of Bangladesh Army.

The aim of the exercise was to strengthen the military relations between the two countries. The exercise also provided an opportunity to the contingents from both the Armies to understand each other's tactical drills and operational techniques as well as to share their experience on Counter Insurgency/ Counter Terrorism, Peace Keeping and Disaster Relief Operation under the United Nations mandate. Senior officers of both the Armies conveyed their appreciation to the participating contingents for achieving the objectives of the Exercise.

Besides training, both contingents also participated in a number of activities including friendly football and cricket matches. The joint exercise, besides promoting understanding and interoperability between the two armies, further helped in strengthening ties between India and Bangladesh.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1834605>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Thu, 16 Jun 2022 4:08 PM*

## **Raksha Mantri reviews security situation along the border during his visit to forward areas of Jammu & Kashmir**

**Lauds security forces for fulfilling responsibilities efficiently in difficult situations with indomitable courage & zeal**

**India will give a befitting reply to anyone who tries to disturb its unity & integrity: Shri Rajnath Singh**

Raksha Mantri Shri Rajnath Singh visited the forward areas of Jammu & Kashmir on June 16, 2022 and took stock of the security situation along the border. Shri Rajnath Singh, who is on a two-day visit to the Union Territory, undertook a first-hand assessment of the situation in the formations looking after Line of Control (LoC) and forward areas in North Kashmir. He was accompanied by Chief of the Army Staff General Manoj Pande; General Officer Commanding-in-Chief (GoC-in-C), Northern Command Lt Gen Upendra Dwivedi; GoC, 15 Corps Lt Gen AS Aujla and GoC, 19 Infantry Division Maj Gen Ajay Chandpuria.

The Raksha Mantri was briefed on the existing ceasefire agreement on the LoC, development works on field fortifications, counter infiltration grid, operational preparedness and Army-citizen connect in border areas. Upon his arrival at 15 Corps HQs, Shri Rajnath Singh was briefed by the GOC 15 Corps on the overall security situation prevalent on Line of Control and the hinterland. He was also briefed on the measures instituted for the safety and security of Amarnath Yatra.

Shri Rajnath Singh interacted with the personnel of the Armed Forces, Border Security Force (BSF), Central Reserve Police Force (CRPF) and J&K Police. Addressing the personnel, he commended them for fulfilling their responsibilities efficiently even in challenging situations, describing their valour and zeal as remarkable. He praised the excellent synergy exhibited by all sections of civil administration, J&K Police, Central Armed Police Forces and other security agencies in projecting a 'Whole of Government' approach that has resulted in the improvement of the security situation conducive for fostering a new era of development in the UT. The Raksha Mantri lauded the security personnel for serving the country with indomitable courage & dedication and instilling the sense of national pride in the people, especially the youth.

“Our neighbour has always resorted to anti-India activities. The state also witnessed terror activities in the past. Due to the relentless efforts of the personnel of Armed Forces, BSF, CRPF & J&K Police, there has been a significant decline in the number of terror activities in the state recently. Pakistan continuously tries to disturb peace in the country through its approach of bleed India with a thousand cuts. But, our security forces are such a protective shield for this country that whoever tries to break it, bleeds himself. The Nation has immense faith in our forces who are always ready to deal with any situation,” the Raksha Mantri said.

Reiterating that India is a peace-loving country which has given the message of 'Vasudhaiva Kutumbakam' (the whole world is one family) to the world, Shri Rajnath Singh asserted that “we have never tried to hurt any country in any way, nor have we tried to capture even an inch of anyone's land. He, however, assured the Nation that if an attempt is ever made to hurt the unity and integrity of the Nation, the Armed Forces will give a befitting reply. He exuded confidence that the Armed Forces will face the future challenges with full strength and their valour & dedication will build a golden future of the country.

The Raksha Mantri highlighted that it was the dawn of a new era of development, peace and prosperity in Kashmir and applauded 15 Corps for their high level of morale and contribution to peace building in J&K.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1834534>



*Thu, 16 Jun 2022*

## **Defense minister Rajnath Singh to pay two-day visit to Jammu and Kashmir from today**

Defence Minister Rajnath Singh is arriving on Thursday on a two-day visit to Jammu and Kashmir during which he will review the overall security situation in the union territory. Official sources said that the Defence Minister will also visit various forward areas and review the preparedness of the army deployed on the country's defence. Senior commanders of the army will brief him about the overall security situation in the hinterland and the Line of Control (LoC). Following recent innocent killings by the terrorists in the Valley, security forces have intensified anti-terror operations. "The defence minister will be apprised about the situation along the LoC and the International Border (IB). He will also review the implementation of the ceasefire

agreement signed by the two armies (India and Pakistan) in 2003 and renewed at the DGMOs meeting between the two countries in February last year," sources added.

<https://zeenews.india.com/india/defense-minister-rajnath-singh-to-pay-two-day-visit-to-jammu-and-kashmir-from-today-2474363.html>



Thu, 16 Jun 2022

## कभी नहीं देखा होगा ऐसा रोबोट- पठानकोट-पंपोर अटैक में आतंकियों को मारने में की थी सेना की मदद

बम जैसे दिखने वाले रोबोट का नाम है आइरिस (Intelligent Remote Information Sensor - IRIS). लेकिन इसे बनाने वाले और इसे यूज करने वाले फौजी प्यार से इसे थ्रोबॉल रोबोट (Throwball Robot) कहते हैं. क्योंकि इसे दुश्मन की तरफ फेंक दिया जाता है. वहां जाते ही ये जासूसी, रेकी, निगरानी का काम शुरू कर देता है. ये तुरंत बता देता है कि माहौल कितना परेशान करने वाला है. उसके लिए कितनी तैयारी की जरूरत पड़ेगी !



हम इसे थ्रोबॉल रोबोट (Throwball Robot) ही कहेंगे. गुरुग्राम स्थित द हाइटेक रोबोटिक्स सिस्टम्स लिमिटेड (The Hightech Robotics Systemz Ltd.) ने इसे भारतीय रक्षा अनुसंधान एवं विकास संगठन (DRDO) के साथ मिलकर बनाया है. कंपनी में डीजीएम, बिजनेस डेवलपमेंट अपूर्व त्रिपाठी ने बताया कि असल में इस रोबोट की कहानी शुरू होती है साल 2009 में हुए 26/11 मुंबई हमले के समय. ताज होटल में भारतीय जवान जा रहे थे. लेकिन आतंकियों के गोली के शिकार बन रहे थे. पता नहीं चल रहा था कि आतंकी कहां छिपे बैठे हैं. तब इस रोबोट को बनाने का आइडिया आया.

अपूर्व त्रिपाठी ने कहा कि अगर किसी इमारत के अंदर आतंकवादी या क्रिमिनल किसी को बंधक बना लें. या खुद उसमें छिपकर बैठे हों. पुलिस, सेना या स्पेशल कमांडों फोर्स को नजदीक न जाने दें. उन्हें फायरिंग से रोके. तब यह गैटनुमा रोबोट काम आता है. इसका वजन 590 ग्राम से भी कम है. इसे आसानी से कोई भी जवान रोशनदान या खिड़की के जरिए उस कमरे में फेंक सकता है, जिसमें आतंकी या क्रिमिनल छिपे हों!



अब सवाल ये उठता है कि ये है तो गेंद की तरह. सीधा कैसे होगा. कैमरा तो किसी भी डायरेक्शन में देखने लगेगा. अपूर्व ने बताया कि थ्रोबॉल रोबोट (Throwball Robot) में ऐसा बेस बनाया गया है कि यह कितना भी उलटा-पुलटा हो जाए. यह खुद-ब-खुद अपने बेस पर खड़ा हो जाता है. अगर नहीं हो पाता है तो रिमोट से इसे सीधा कर दिया जाता है. इसमें ऑडियो और वीडियो दोनों का ऑप्शन है. ताकि आवाज स्पष्ट सुनाई दे. तस्वीर साफ दिखाई दे.

थ्रोबॉल रोबोट (Throwball Robot) में एक कैमरा सामने की तरफ और एक कैमरा ऊपर की तरफ लगा है. जिसकी वजह से यह 360 डिग्री का व्यू दिखाता है. रोबोट में इंफ्रारेड कैमरा लगा है. यानी घुप अंधेरे में भी यह स्पष्ट तस्वीर दिखाता है. यानी इसका उपयोग जंगलों में घात लगाकर हमला करने, नक्सलरोधी अभियान चलाने के लिए किया जा सकता है. अपूर्व ने बताया कि हमने इस रोबोट को सेना मुख्यालय में दिखाया. हमसे कहा गया कि इसे तत्काल उत्तरी कमांड (Northern Command) लेकर जाइए.

उत्तरी कमांड में जब थ्रोबॉल रोबोट (Throwball Robot) की ताकत और काबिलियत को दिखाया गया तो उन्होंने ऐसे 50 रोबोट्स का ऑर्डर दिया. अब ये 50 रोबोट्स राष्ट्रीय राइफल्स (RR) के पास हैं. नेशनल सिक्योरिटी गार्ड (NSG) के पास पांच रोबोट्स हैं. जम्मू-कश्मीर पुलिस ने भी 21 रोबोट्स की मांग की है. टेंडर निकाला है. जल्द ही उन्हें भी थ्रोबॉल रोबोट्स मिल जाएंगे.

अपूर्व ने बताया कि साल जनवरी 2016 में जब पठानकोट एयर फोर्स स्टेशन पर आतंकी हमला हुआ था, तब कैंटीन में कुछ आतंकी छिपे थे. उन्होंने कैंटीन को चारों तरफ बंद कर दिया था. बीच-बीच में भारतीय जवानों के ऊपर फायरिंग कर रहे थे. समझ में ये नहीं आ रहा था कि कैंटीन में कितने आतंकी हैं. तब सैन्यबलों ने कैंटीन के अंदर इस थ्रोबॉल रोबोट (Throwball Robot) को फेंका. इसने जो दिखाया वो किसी फिल्मी नजारे से कम नहीं था. आतंकियों ने सारे दरवाजों को बिस्तर, अलमारी, कुर्सी, टेबल आदि से ब्लॉक कर रखा था. अंदर दो आतंकी थे. पहले सैन्य बलों ने उन्हें खूब थकाया. इसके बाद कैंटीन को बम से उड़ा दिया.

इसी तरह अक्टूबर 2016 में जब पंपोर स्थित इंटरप्रन्योरशिप डेवलपमेंट इंस्टीट्यूट की इमारत पर आतंकियों ने हमला किया, तब भी थ्रोबॉल रोबोट (Throwball Robot) की मदद से आतंकियों की पोजिशन पता की गई थी. यह मुठभेड़ तो दो-तीन दिन तक चली थी. खैर, अब जानते हैं इस बमनुमा दिखने वाले रोबोट के फीचर्स के बारे में यह 90 मिलिमीटर व्यास का एक रग्ड रोबोटिक गोला है. जिसका वजन 590 ग्राम से कम है. यह कितनी भी गति से फेंका जाए, रुकते ही खुद को स्टेबलाइज कर लेता है. इसे एक व्यक्ति 100 मीटर दूर से रिमोटली ऑपरेट कर सकता है. माइनस 20 डिग्री सेल्सियस से लेकर 55 डिग्री सेल्सियस तक के तापमान में काम कर सकता है. इसमें दो कैमरे लगे हैं. एक सामने की तरफ और दूसरा ऊपर की तरफ. यह मिशन के दौरान दो घंटे तक काम करता रहता है

इसका उपयोग रेड, रेकी, सर्च एंड रेस्क्यू, सर्विलांस ऑपरेशन, SWAT ऑपरेशंस, दुरुह जगहों की निगरानी, रस्सी, खंभे और तार से भी तैनात किया जा सकता है. इसका ऑडियो और वीडियो फीड रिकॉर्ड हो जाता है. रिमोट वाला ही नहीं बल्कि इसके साथ लगने वाले कमांडर किट की मदद से मिशन को संचालित कर रहे कमांडर भी निगरानी कर सकते हैं. इसमें कोई ऑन-ऑफ स्विच नहीं है, जिससे इसे बंद किया जा सके. यह काम सिर्फ इसे चलाने वाला ही कर सकता है. इसके दो वर्जन हैं एक कैमरे वाला और दूसरा दो कैमरे वाला.

<https://www.aajtak.in/india/news/photo/drdo-iris-throwball-robot-intelligent-remote-information-center-know-features-specification-tstrd-1482862-2022-06-16-1>

## THE ECONOMIC TIMES

Thu, 16 Jun 2022

### **Government Rejects Criticism Against Agnipath Amidst Raging Protests In Several States; Issues Clarification**

As violent protests against the new recruitment scheme Agnipath raged across several states, the government on Thursday issued a clarification, asserting that not only the new model will bring in new capabilities to the armed forces but will also open up avenues for youth in the private sector as well as help them in becoming entrepreneurs with the aid of the financial package. Apart from issuing a 'Myth vs Facts' document to address the concerns raised on the scheme, the government's information dissemination arm issued a series of social media posts, saying in the coming years, recruitment of Agniveers will be around triple the current recruitment in armed forces and ruled out any change to the regimental system. "The scheme will bring in new dynamism to the armed forces. It will help the forces bring in new capabilities and take advantage of the technical skills and fresh thinking of the youths.

It will allow the youths to serve the nation," the Press Information Bureau said in a Facebook post. Referring to the financial package of around Rs 11.71 lakh to be given to each of the recruits at the end of the four-year tenure from the 'Seva Nidhi Package', it said it will provide financial independence to the youths and even help them to venture into entrepreneurship. The clarification came in the wake of protests in several states, including Bihar, Uttar Pradesh and Haryana. Trains were set afire, window panes of buses smashed and passersby, including a ruling BJP MLA, pelted with stones in Bihar by Army job aspirants whose protest against the Central scheme continued for the second consecutive day.

The opposition also stepped up its attack against the government with Congress leader Rahul Gandhi urging Prime Minister Narendra Modi to listen to the voice of unemployed youths and not take 'agnipareeksha (trial by fire)' of their patience by making them walk on Agnipath, Samajwadi Party president Akhilesh Yadav called the move "negligent" and potentially "fatal" for the country's future. Some military veterans have also slammed the scheme saying it will adversely impact the functioning of the armed forces. The government officials also strongly rejected criticism that 'Agniveers' could be a danger to society after their exit from the armed forces. "This is an insult to the ethos and values of the Indian armed forces. Youngsters who

have worn the uniform for four years will remain committed to the country for the rest of their lives," said an official. Even now thousands retire from armed forces with skills, but there have not been any instance of them joining anti-national forces," the officer said.

Those to be recruited under the 'Agnipath' scheme will be known as 'Agniveers'. The government on Tuesday unveiled the scheme for the recruitment of soldiers in the Army, Navy and the Air Force largely on a four-year short-term contractual basis, in a major overhaul of the decades-old selection process. Under the scheme, youths between the ages of 17 and a half and 21 years will be inducted into the three services. After completion of the four-year tenure, the scheme provides for retaining 25 per cent of the recruits for regular service. After the scheme was rolled out, the Army said it would ensure an enhanced youthful profile of the force and result in a "reduction in the average age from 32 to 26 years over a period of time. "For those wishing to be entrepreneurs -- they will get a financial package and bank loan scheme. For those wishing to study further -- they will be given a 12 class equivalent certificate and bridging course for further studies," said the official. There were apprehensions that the 'Agnipath' scheme would change the composition of several regiments that recruit youths from specific regions as well as castes such as Rajputs, Jats and Sikhs.'

No change is being done to the regimental system. In fact, it will be further accentuated because the best of 'Agniveers' will be selected, further boosting the cohesiveness of the units," said another official. On the criticism that the short-duration tenure of 'Agniveers' will harm the effectiveness of the armed forces, the officials said such a system exists in several countries, and hence, it is already tested out and considered best practice for an agile army.

The numbers of 'Agniveers' to be recruited in the first year would only make up three per cent of the armed forces, they said, adding their performance will be tested before re-induction into the army after four years. "Hence Army will get tested and tried personnel for supervisory ranks," one of the officials said. Officials said most armies across the world depend upon their youths and the new scheme will only bring about a right mix of "50 per cent of youth and 50 per cent of experience" in the long run in the supervisory ranks. They said the scheme has been launched following extensive consultations with serving armed forces officers in the last two years. The proposal has been framed by the Department of Military Officers staffed by military officers, they said. Under the scheme, the Army is likely to recruit around 40,000 soldiers, the Navy is expected to induct around 3,000 sailors and the IAF is set to recruit 3,000 airmen this year. The proposal has been framed by the Department of Military Officers staffed by military officers, they said. Under the scheme, the Army is likely to recruit around 40,000 soldiers, the Navy is expected to induct around 3,000 sailors and the IAF is set to recruit 3,000 airmen this year. Sources said the government plans to have a centralised database on the Agniveers to keep track of the skills that they would acquire during their four-year tenure.

<https://economictimes.indiatimes.com/news/defence/government-rejects-criticism-against-agnipath-amidst-raging-protests-in-several-states-issues-clarification/articleshow/92256861.cms?from=mdr>

# THE ECONOMIC TIMES

Fri, 17 Jun 2022

## **Agnipath Scheme: Jobs, Skillset, Courses for Agniveers at Entry, In-Service and Exit Levels**

Officials from the armed forces and the skill development and education ministries have begun discussions on building a framework to enhance skills acquired by Agniveers while in service and improving their career prospects. Under discussion are job roles, skillsets and certifications for Agniveers at entry, in-service and exit stages, ET gathers. In the first round of discussions, aviation, shipping and automotive-related skilling courses have been identified as key areas. It is indicated by the armed forces that a significant proportion of Agniveers will acquire technical skills in the above areas in their four years of service. Courses on drone technology and management, armoured vehicles management, submarine and shipping industry are among the first to have come up for discussions, sources said. "The idea is to open up pathways for them at various levels -- academic, self-employment and entrepreneurship. Skilling, education and training courses are being planned in discussions with the armed forces...", a senior official told ET.

It is envisaged that the skills Agniveers may have acquired in service will be given academic credits that can help acquire further national certifications that will help in landing them jobs, attuned to industry needs. The Ministry of Skill Development & Entrepreneurship (MSDE) has alerted its relevant Sector Skills Council to help develop Agniveer-specific courses which are attuned to industry. Their councils on aviation, shipping and automobiles already have representation from ex-servicemen and this is expected to help in drawing up of suitable course formats.

<https://economictimes.indiatimes.com/news/defence/agnipath-scheme-jobs-skillset-courses-for-agniveers-at-entry-in-service-and-exit-levels/articleshow/92262796.cms>

# The Tribune

Fri, 17 Jun 2022

## **Agnipath Should Serve Our Goals in War & Peace**

*By Maj Gen Ashok Kumar (RETD)*

It is a statement of fact that the 21st century will belong to Asia unless China initiates a conflict due to its expansionist agenda. Comprehensive national power will dictate India's role, more so in the emerging world order due to the Russia-Ukraine conflict. The shaping of the Indian forces will therefore play a very important role in developing national capacities. The manning, equipping, restructuring and people's support still are and will continue to play important roles in building capacities of defence forces. While attempts at doctrinal adaptation and optimisation of the fighting potential of the armed forces have commenced in the form of joint theatre commands, though delayed, substantial efforts are also being put in the 'Make in India' and

‘Aatmanirbhar Bharat’ to address the equipping issues to not only reduce the dependence on imports but also save the financial outgo. Import-based equipping results in multiple challenges including sustenance as is being faced now as our equipment to the extent of 60 per cent is of Russian origin. How we ‘man’ the equipment is also a very crucial part. The soldiers face an ongoing challenge related to handling of the modern and sophisticated equipment besides adjustment to the future war-fighting going beyond the kinetic domain and capability to handle small team operations independently. The organisation, therefore, remains officer-led in majority of the tasks both during war and peace.

The government has announced the Agnipath scheme as a new mode of recruitment. The scheme though transformative in nature is drawing criticism as only 25% of the recruited lot will be retained after a four-year tenure. Worry is being expressed about 75% being out of the job either due to not opting for being part of 25% or not being selected. Obviously, these 75% will be more capable as compared to a raw candidate competing for selection in the Central Armed Police Forces (CAPF)/state police force/other government or corporate jobs and they should succeed to get the jobs on merit. Not only this, the Home Ministry has announced to give them priority in induction into the CAPF and challenges as emerging will also be addressed. The severance package close to Rs 11 lakh (tax-free), loan facilities, educational qualifications and skill-set development will open multiple employment options.

Let us see as to what effect the Agniveers will have on the defence forces as it is the organisational aim which must be supreme. The Agnipath scheme will have the following impact: i) This category will be sourced from the All India All Class (AIAC) basis, thus reflecting the real India. The AIAC-based units post-Independence have performed exceptionally well, both during war and peace. With the AIAC, merit will be the sole criteria for selection in the forces. Close to 80% of the Army is already AIAC and with Agniveers, the entire forces will be reflective of an India purely based on merit, reaching 100% AIAC in times to come. Having based purely on merit, the defence forces will continue to remain committed for the defence of the motherland as hithertofore; ii) Since only 25% are to be re-inducted after four years, there will be a competitive environment wherein all Agniveers will try to become part of top 25% thus enhancing the qualitative profile of the unit substantially even in the duration of four years with the defence forces. The main qualitative shift will take place once those top 25% are retained. This incremental ability will be able to handle modern weapons more professionally as modern and sophisticated equipment is now not only limited to specialised units but is proliferating even to the smallest sub-units of the frontline units as well. With enhanced ability, these soldiers will be able to mould themselves better for making the defence forces ready for future wars, to be fought at multiple levels. Not only this, the Indian defence forces require junior leadership in a big way. The current method of enhancing those skills fall short of making junior leaders capable of leading small teams. The enhanced skill-set and intellect in the top 25% retained will make these personnel more trainable as and when they become NCOs.

The current average age profile of the units is in the range of 32 years. Increased age and age-related physical ability in the mountainous terrain are interlinked and it has adverse effects in certain cases. The Kargil Review Committee highlighted the need for reducing the age. However, the focus got shifted to unit commanders and the age profile of the troops remained unaddressed. The Agnipath scheme addresses this challenge efficiently. With this entry system, the average age profile of the unit will be lowered from the current 32 to 26 in the coming years. Since both of our land-based adversaries, China and Pakistan, have mountainous terrain, units

with a lower age profile will perform exceptionally well in the high altitude/other mountainous/harsh terrain and this will be touted as one of the most important battle-winning factor in the future. And the advantages continue. What is most important as to what this scheme does for the nation? Majority of our youth are currently unemployed and lack discipline, which can be seen from the large number of protests and demonstrations on various counts which don't remain peaceful and result in large-scale destruction of national assets. The 'youth bulge' of India, an asset at this juncture, can remain an asset only if the youth are skilled, employed and disciplined. Who can do it better than the armed forces? The Agnipath scheme, while being advantageous to the defence forces, also gives an excellent opportunity for nation-building. When the National Cadet Corps was raised, multiple options were discussed as to which organisation should nurture the young and energetic children and the armed forces were considered the best to do that. It is a success story for the nation that enhances the discipline and national fervour quotient in the youth joining the NCC. Nothing could be better than adopting the scheme which changes the youthful profile of the units, enhances technological threshold, enhances trainability for junior leadership and in the end, gives the desired qualitative edge across the entire spectrum to all the units of the defence forces, but in the process also transforms the nation to a different level of ability and commitment.

<https://www.tribuneindia.com/news/comment/agnipath-should-serve-our-goals-in-war-peace-404470>



*Fri, 17 Jun 2022*

## **India, ASEAN for Mutually-Beneficial Strategic Partnership**

In an effort to further strengthen ties, India and the Association of SouthEast Asian Nations(ASEAN)on Thursday agreed to work towards a comprehensive strategic partnership that is meaningful, substantive and mutually-beneficial by further enhancing their strategic ties. This was the main takeaway from the two-day meeting here of the India-ASEAN foreign ministerial conference hosted by New Delhi to mark the 30th anniversary of its relations with the 10-nation grouping. The objective to make the India-ASEAN ties substantive was stated in a statement by External Affairs Minister S Jaishankar and his Singaporean counterpart Vivian Balakrishnan at the meeting. Jaishankar and Balakrishnan are the co-chairs of the two-day meeting that began on Thursday. The meeting discussed the situation in the South China Sea, a resource-rich region that has been witnessing increasing Chinese muscle-flexing, sources said. Fall-out of the Ukraine conflict also came up for discussion, it was learnt.

India fully supports a strong, unified and prosperous ASEAN with a central role in the Indo-Pacific and both sides should identify a new set of priorities while navigating the "arduous path" arising from developments in Ukraine, Jaishankar said in his opening remarks. He talked about the "geopolitical headwinds" triggered by the Ukraine crisis and its knock-on effects on food, energy security, prices of fertilisers and commodities as well as logistics and supply chains. In his remarks, Balakrishnan slammed Russia for its invasion of Ukraine, saying such actions if unchecked can threaten the "whole system of peace and stability which we have depended on for the basis of our growth, development and prosperity over many decades".

Balakrishnan, who is the country coordinator for India in ASEAN, said Russian actions have "upended the international system of rules and norms and international law which we all depend on". In their statement, the co-chairs said the meeting reaffirmed commitment to multilateralism founded on the principles of international laws including the Charter of the United Nations, the 1982 UN Convention on the Law of the Sea (UNCLOS) and other relevant UN treaties and conventions. The foreign ministers agreed to work towards maintaining an open and inclusive regional cooperation framework, support ASEAN centrality in the evolving rules-based regional architecture and uphold multilateralism in jointly responding to regional and global challenges.

"Had a good interaction with Foreign Ministers and Representatives of @ASEAN countries as we celebrate 30 years of close India-ASEAN cooperation," Modi tweeted.

<https://www.dailypioneer.com/2022/india/india--asean-for--mutually-beneficial-strategic-partnership.html>



*Fri, 17 Jun 2022*

## **Two Years of Galwan: India-China Border Standoff is Now A Battle for Agility**

Two years ago, it was on this day that the untoward news of a brutal hand-to-hand combat between Indian and Chinese forces in the intervening night of June 15 and June 16 first broke. The sacrifice and extreme bravery shown by Colonel B Santosh Babu and his men against a numerically larger People's Liberation Army (PLA) grouping ensured that the slowly expanding Chinese incursion into eastern Ladakh was put to pause.

China did not publicly declare it had fallen until the next year. Several sacrifices from both sides and talks at military as well as diplomatic levels later, both countries are still to fully resolve the military standoff from several locations along the Line of Actual Control (LAC). However, what started as a disguised military exercise that soon turned into a bloody battle in the high mountains has now become a war between two armed forces to achieve better agility in the unforgiving environment of the Himalayas.

### **BATTLE OF THE BRIDGES**

Galwan valley—the ground zero of the unsparing clashes, was the first place where both sides agreed to disengage. India and China consented to withdraw their forces by a few kilometres from Patrol Point 14 (PP14) and created a buffer zone to avoid another violent incident. The latest satellite images of Galwan valley provided by US based space company, Planet Labs PBC shows status quo at ground zero of the clash. While both sides have maintained a no man's land around PP14, the preparation to achieve better mobility is visible on both sides. Several bridges over the water streams can be seen on the available satellite imagery.

These bridges and connecting road networks hold the key to the critical response time that a unit would require during a conflict. China has also been working on infrastructure to hold the water stream in the valley as well. The Chinese's inability to respond quickly during India's counteroffensive at Kailash range in late August of 2020 was evident. To bridge this gap, China

has been working to set up a new bridge on the western side of the Pangong Lake. Latest satellite images show two-front ongoing construction work at the bridge that has an additional platform coming up. The blacktopping at the bridge has also begun. Through this new bridge and connecting road network, PLA would be able to reduce the travel time from its permanent support positions in Rutog.

## **DEVELOPMENTS BEHIND THE LINES**

Inputs suggest that China has been recalibrating its border strategy with the help of high mobility combined armed brigades. The Chinese strategy to move from mechanised to 'informationised' warfare is evident with inputs suggesting deployment of modern assets in the theatre. The PLA has provided its combined armed brigades with CSK-series high-mobility armoured vehicles. Its tanks have been upgraded with modern fire control systems to improve combat capabilities.

China has been replacing towed howitzers with truck-mounted howitzers and deploying the PHL-03 truck-mounted multiple rocket launchers near the LAC. All these steps are intended to achieve better mobility. The extremely harsh living conditions in the region have forced the PLA leadership to rotate the deployment of its divisions. The PLA has been rotating four divisions of its Xinjiang military division on a yearly basis near eastern Ladakh. Inputs suggest that division 4 and 6, earlier deployed in the region during the start of border standoff in 2020, had been reassigned earlier this year, replacing division 8 and 11.

China has replaced older versions of the Surface to Air Missile (SAM) systems with short range HQ-17 systems, while deployment of long range SAM system HQ9 has been reported near the Chip Chap ridge and Rutog county. The biggest and obvious element of overall Chinese plan for the theatre is the ever-growing network of airbases. While China has been expanding its existing airbases, a network of new bases are also being set up.

<http://www.indiandefensenews.in/2022/06/two-years-of-galwan-india-china-border.html?m=1>

# THE ECONOMIC TIMES

*Thu, 16 Jun 2022*

## **NATO to Boost its Forces, Equipment on Eastern Flank**

NATO defence ministers on Thursday discussed ways to bolster forces and deterrence along the military alliance's eastern borders to dissuade Russia from planning further aggression in the wake of its invasion of Ukraine. The Russian invasion has led allies to rethink strategies and to agree that NATO forces should be present in greater numbers on that eastern flank. NATO says it has placed over 40,000 troops under its direct command, mainly on the eastern flank, and is looking at how it can further strengthen its presence, readiness, and capabilities.

"This will mean more NATO forward-deployed combat formations, to strengthen our battlegroups in the eastern part of the alliance, more air, sea and cyber defences, as well as pre-positioned equipment and weapons stockpiles," NATO Secretary General Jens Stoltenberg said after the meeting. The meeting of defence ministers came ahead of a June 29-30 NATO summit in Madrid that will seek to set a roadmap for the alliance in coming years. Germany has already announced its plans to strengthen its engagement in Lithuania, while France wants to increase its presence in Romania, where it plans to have deployed 1,000 troops with Leclerc tanks by the end



of the year. U.S. Defense Secretary Lloyd NSE -2.78 % Austin declined to detail any changes in America's positioning of forces across Europe but said the U.S. and its allies will take steps to rapidly deploy troops if needed. That includes positioning more equipment in the region and putting troops on higher levels of alert.

"All of our allies have learned from any shortcomings that we may have experienced in the past, and they'll build to ensure that they have the right capabilities to provide flexible and responsible and combat-credible forces when the time comes," he said. Artis Pabriks, the Latvian defence minister, said the military alliance should position larger armed forces and material in Baltic countries. "We want an improved planning. We want a headquarters structure. We want pre-positioning of different types of equipment, so if a crisis would come we should not wait," he said Stoltenberg said the question of pre-positioned equipment is a crucial one, because moving armored vehicles, supplies and ammunition takes a lot of time. "Then of course it's much easier and faster to reinforce when needed," he said. Stoltenberg said ministers made "significant progress" in their discussions on a new force model that would involve more forces at higher readiness and others assigned to the defence of specific allies. Discussions in Brussels also focused on the need for more defence spending, Stoltenberg said, with the bids from Sweden and Finland to join the alliance also on the table. Stoltenberg saluted the United States' decision to send an additional \$1 billion in military aid to Ukraine and said NATO allies are "prepared to continue to provide substantial, unprecedented support" to the country. The latest package, the U.S. said, includes anti-ship missile launchers, howitzers and more rounds for the High Mobility Artillery Rocket Systems that U.S. forces are training Ukrainian troops on. All are key weapons systems that Ukrainian leaders have urgently requested as they battle to stall Russia's march to conquer the eastern Donbas region.

Austin praised the "historic decision" by Finland and Sweden to apply for NATO membership, expressing his hopes that discussions will continue to progress favorably. Turkey, however, has voiced its opposition to the Nordic pair's NATO accession and Stoltenberg has been working hard to try to break the deadlock. Turkish President Recep Tayyip Erdogan is refusing to budge over what he says is Sweden and Finland's alleged support for Kurdish militants. "My aim is to find a solution as soon as possible," Stoltenberg said.

<https://economictimes.indiatimes.com/news/defence/nato-to-boost-its-forces-equipment-on-eastern-flank/articleshow/92259329.cms>

**DefenseNews**

*Thu, 16 Jun 2022*

## **Six NATO Countries Sign Agreement to Collaborate on Next-Gen Helo**

Six NATO countries signed a memorandum of understanding to jointly work on concepts for a next-generation helicopter on June 16 at a meeting of alliance defense ministers in Brussels. France, Germany, Greece, Italy, the Netherlands and the United Kingdom are committing €26.7 million, or roughly \$28 million, for the Next-Generation Rotorcraft Capability (NGRC) project, according to a NATO statement. Canada will likely be an observer nation. "In cooperation with

industry, the participants will start from a clean sheet to explore how to match their needs with the latest technology on the market, looking at options such as hybrid and electric propulsion, a systematic open system architecture and the delivery of radically improved flight characteristics,” the statement reads.

“Moving into the concepts phase is really going to define the requirements based against the threats that we’re going to be facing globally,” Col. Alex Willman, capability sponsor of combat aviation within the U.K.’s futures directorate, said at the Eurosatory defense trade show here, just an hour after the countries inked the deal. “What’s exciting for me is this is one of the first clean-sheet-design aircraft,” he said, adding: “NGRC to me is about transformation capability, delivering an aircraft or an airframe or a system that is an open system architecture based on digital backbones and is aimed for us as soldiers and airmen to be able to modify that aircraft to keep up with the pace of the threat.” The countries will look at range and speed improvements for a medium-lift helicopter, the ability to operate in an electronic warfare scenario and a variety of other attributes that will be refined over the next two to three years. The envisioned missions include transportation, medical evacuation, search and rescue, and assault. The Netherlands is the most recent nation to sign onto the NGRC program, as France, Germany, Greece, Italy, and the United Kingdom signed letters of intent to participate in the effort in late 2020. Many of the countries involved will see helicopters reaching the end of their expected service life, and the goal is to come up with aircraft to replace them by 2035.

The new aircraft must have an unrefueled range of more than 1,650 kilometers, with a target of eight hours endurance and a load capacity between 10,000 and 17,000 kilograms (22,000 and 37,400 pounds, respectively). The goal is also to develop a common airframe for both land, air and maritime variants, although the agency allows for the possibility of separate platforms if a common airframe proves too contentious. Working across several different nations is challenging, Cyril Heckel, NATO acquisition and development manager, said at the conference.

“You can talk about it and look at it in a theoretical abstract level, everybody gets it,” he said, but “it becomes a little bit more complicated and tricky when you’re trying to translate this theoretical appeal into actual practical action. Six sovereign nations together, they all have different ways how federal offices work, approach to the topic, different democratic biases, different funding mechanisms, different funding, different cycles, maybe also different thoughts about requirements.” But European aviation stakeholders say the time is right for helicopter programs to rise again on the continent. “We are at the start of a new era for rotary-wing or for vertical flight here in Europe,” said Roberto Garavaglia, Leonardo Helicopters senior vice president for strategy, during a June 15 panel at the Eurosatory exhibition.

Not only are helicopters proliferating in militaries around the world, but it’s the first time since the early 1980s, when the NH-90 program was established, that European nations are discussing new aircraft requirements, he noted. He acknowledged that for any future helicopter program, industry partners will have to work hard to overcome the inevitable workshare disputes that have tripped up many a joint European program in the past. “It’s easier to combine the capabilities that you can develop in Oklahoma and Michigan than those which you can develop between France and Italy, because we have hundreds of years of history, and ... we are not a federal union,” he noted.

Jerome Combe, Airbus lead for product policy and strategy, called the NGRC program an opportunity to “reset better partnerships” and develop a more “linear” way to work together

among industry partners. The NATO-led effort to field a multirole helicopter could be setting the stage for a competition between U.S.- and European-based rotorcraft industries. The U.S. Army plans to select a winner between Bell and a Sikorsky-Boeing team to build its Future Long-Range Assault Aircraft, or FLRAA, around September. The service plans to field the aircraft in 2030. At the same time, the U.S. Army is pursuing a Future Attack Reconnaissance Aircraft (FARA) with plans to fly prototypes in 2023, and the service is developing Air-Launched Effects along with a modular open systems architecture.

But the NGRC program is expected to face pressure from European industry to select local companies to design and develop the future aircraft. The U.S. and the U.K. signed a bilateral agreement earlier this year to explore the possibility of cooperation on future vertical lift (FVL) programs.

While the U.K. has signed the agreement to exchange information on FVL, it is not a commitment to buy into associated programs, Willman said. “This sits alongside the Next-Generation Rotorcraft.” Range, speed and other performance improvements are aspects of the FVL program the U.K. is interested in, he added, but “we are absolutely committed to NGRC.” The Italian military, while it does not have a similar agreement in place like the U.K. and the U.S., partnered in the U.S.-based aviation exercise Edge 2022 at Dugway Proving Ground, Utah, last month, to work on interoperability concepts for FVL. Along with Italy, the Netherlands and Germany were active participants in the exercise while Australia, Canada, France and the U.K. were observers. Italy’s participation was essential to understanding what the U.S. is doing for FVL, where timelines may match up and where there are interoperability opportunities, Col. Pier Luigi Verdecchia, of the Italian defense ministry, said.

<https://www.defensenews.com/global/2022/06/16/six-nato-countries-sign-agreement-to-collaborate-on-next-gen-helo/>

## Science & Technology News



*Fri, 17 Jun 2022*

### **IISc, KIER Develop Self-Regulating Footwear to Help Diabetic Patients**

Diabetic foot wounds heal at a slower rate than in healthy individuals, which increases the chance of infection, and may lead to complications that require amputation in extreme cases. Coming to their rescue, the Indian Institute of Science (IISc) in association with the Karnataka Institute of Endocrinology and Research (KIER), has developed a set of self-regulating footwear for diabetic. The footwear developed by the Department of Mechanical Engineering’s IISc-led team is 3D printed and can be customized to an individual’s foot dimensions and walking style.

“Unlike conventional therapeutic footwear, a snapping mechanism in these sandals keeps the feet well-balanced, enabling faster healing of the injured region and preventing injuries from arising in other areas of the feet,” said Pavan Belehalli, Head, Department of Podiatry, KIER, and one of the authors of the study published in *Wearable Technologies*. The footwear can be especially beneficial for people who have diabetic peripheral neuropathy – those who suffer from nerve damage caused by diabetes, leading to a loss of sensation in the foot. “Diabetic peripheral neuropathy is one of the long-term complications of diabetes, and its diagnosis is mostly neglected. The lack of sensation results in irregular walking patterns in persons with diabetes,”

For example, a healthy person usually places their heel first on the ground, followed by the foot and toes, and then the heel again. Such a ‘gait cycle’ distributes the pressure evenly across the foot. But due to the loss of sensation, persons with diabetes may not always follow this sequence, which means that the pressure is unevenly distributed. Regions of the foot where the pressure exerted is high are at greater risk of developing ulcers, corns, calluses and other complications, stated the researchers. There are several varieties of therapeutic footwear in the market. But the researchers observed that it is seen to be ineffective at off-loading the uneven pressure exerted by the ‘abnormal’ gait cycle of persons with diabetes. “When we remove the pressure, the arch will automatically come back to its initial position which is known as self-offloading,” explained Priyabrata Maharana, PhD student, Department of Mechanical Engineering, IISc and first author.

Now the team is collaborating with start-ups like Foot Secure and Yostra Labs to commercialise their product. This footwear can be used not only by diabetic neuropathy cases, but by others too,” said Prof Ananthasuresh.

<https://www.dailypioneer.com/2022/india/iisc--kier-develop-self-regulating-footwear-to-help-diabetic-patients.html>



*Thu, 16 Jun 2022*

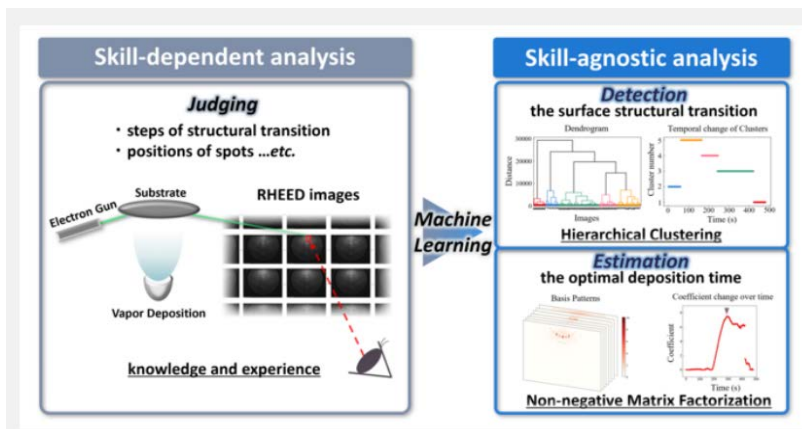
## **Let Machines Do the Work: Automating Semiconductor Research With Machine Learning**

The semiconductor industry has been growing steadily ever since its first steps in the mid-twentieth century and, thanks to the high-speed information and communication technologies it enabled, it has given way to the rapid digitalization of society. Today, in line with a tight global energy demand, there is a growing need for faster, more integrated, and more energy-efficient semiconductor devices. However, modern semiconductor processes have already reached the nanometer scale, and the design of novel high-performance materials now involves the structural analysis of semiconductor nanofilms. Reflection high-energy electron diffraction (RHEED) is a widely used analytical method for this purpose. RHEED can be used to determine the structures that form on the surface of thin films at the atomic level and can even capture structural changes in real time as the thin film is being synthesized! Unfortunately, for all its benefits, RHEED is sometimes hindered by the fact that its output patterns are complex and difficult to interpret. In virtually all cases, a highly skilled experimenter is needed to make sense of the huge amounts of data that RHEED can produce in the form of diffraction patterns. But what if we could make machine learning do most of the work when processing RHEED data?

A team of researchers led by Dr. Naoka Nagamura, a visiting associate professor at Tokyo University of Science (TUS) and a senior researcher of National Institute for Materials Science (NIMS), Japan, has been working on just that. In their latest study, published online on 09 June 2022 in the international journal *Science and Technology of Advanced Materials: Methods*, the team explored the possibility of using machine learning to automatically analyze RHEED data. This work, which was supported by JST-PRESTO and JST-CREST, was the result of joint research by TUS and NIMS, Japan. It was co-authored by Ms. Asako Yoshinari, Prof. Masato Kotsugi also from TUS, and Dr. Yuma Iwasaki from NIMS.

The researchers focused on the surface superstructures that form on the first atomic layers of clean single-crystal silicon (one of the most versatile semiconductor materials). depending on the amount of indium atoms adsorbed and slight differences in temperature. Surface superstructures are atomic arrangements unique to crystal surfaces where atoms stabilize in different periodic patterns than those inside the bulk of the crystal, depending on differences in the surrounding environment. Because they often exhibit unique physical properties, surface superstructures are the focus of much interest in materials science. First, the team used different hierarchical clustering methods, which are aimed at dividing samples into different clusters based on various measures of similarity. This approach serves to detect how many different surface superstructures are present. After trying different techniques, the researchers found that Ward's method could best track the actual phase transitions in surface superstructures.

The scientists then sought to determine the optimal process conditions for synthesizing each of the identified surface superstructures. They focused on the indium deposition time for which each superstructure was most extensively formed. Principal component analysis and other typical methods for dimensionality reduction did not perform well. Fortunately, non-negative matrix factorization, a different clustering and dimensionality reduction technique, could accurately and automatically obtain the optimal deposition times for each superstructure. Excited about these results, Dr. Nagamura remarks, "Our efforts will help automate the work that typically requires time-consuming manual analysis by specialists. We believe our study has the potential to change the way materials research is done and allow scientists to spend more time on creative pursuits."



Reflection high-energy electron diffraction (RHEED) is an imaging technique widely used to analyze the surface structures of materials grown via physical vapor deposition. However, RHEED produces huge amounts of data and is a skill-intensive tool to use

Overall, the findings reported in this study will hopefully lead to new and effective ways of using machine learning technique for materials science—a central topic in the field of materials informatics. In turn, this would have implications in our everyday lives as existing devices and technologies are upgraded with better materials. "Our approach can be used to analyze the superstructures grown not only on thin-film silicon single-crystal surfaces, but also metal crystal surfaces, sapphire, silicon carbide, gallium nitride, and various other important substrates. Thus,

we expect our work to accelerate the research and development of next-generation semiconductors and high-speed communication devices,” concludes Dr. Nagamura. We certainly hope to see more such discoveries in the future that can automate complex data analysis and ease the workload of scientists!

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