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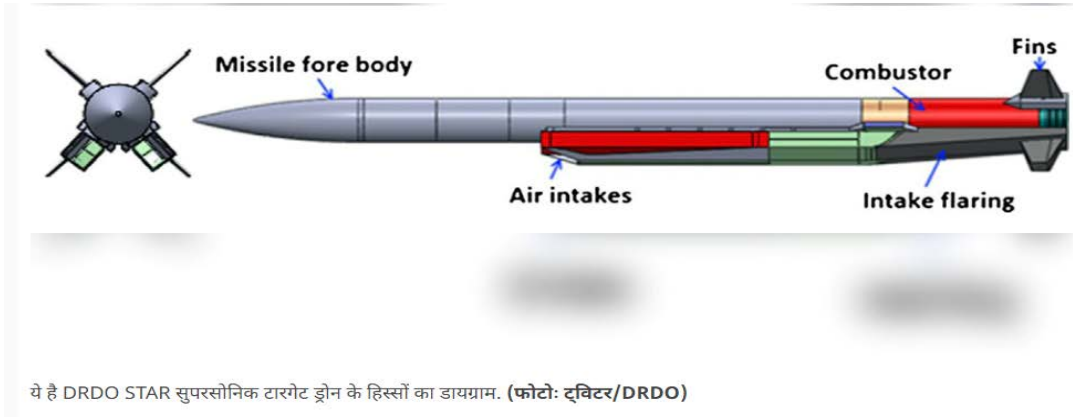
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Wed, 15 Jun 2022

### STAR Drone: भारत बना रहा है मिसाइल जैसा सुपरसोनिक ड्रोन, खासियत जान हो जाएंगे हैरान

भारतीय रक्षा अनुसंधान एवं विकास संगठन (DRDO) एकऐसा सुपरसोनिक ड्रोन बना रहा है, जो मिसाइल की तरह दिखता है. यह समुद्र से चिपक कर उड़ान भरेगा . कम ऊंचाई होने की वजह से इसे रडार में पकड़ना मुश्किल होगा . साथ ही इस पर निशाना लगाना भी मुश्किल होगा . यह 2940 किलोमीटर प्रति घंटा की रफ्तार से उड़ेगा . इसका नाम है स्टार (Supersonic TARget - STAR). इसका मकसद है भारतीय वायुसेना (Indian Air Force) और भारतीय नौसेना (Indian Navy) के फाइटर जेट्स, युद्धपोत और एयर-डिफेंस सिस्टम को टारगेट की प्रैक्टिस कराना .



स्टार (Supersonic TARget - STAR) सुपरसोनिक ड्रॉन्स के पहले स्टेज में बूस्टर है. दूसरे में लिक्विड फ्यूल रैमजेट इंजन लगा है. जिसकी वजह से समुद्र से करीब 12 फीट ऊपर आवाज की गति से दो गुनी रफ्तार में उड़ेगा . ये ड्रॉन्स अधिक ऊंचाई पर उड़ने वाले क्रूज मिसाइलों की नकल करने में माहिर होंगे. आमतौर पर ऐसे क्रूज मिसाइल 30 हजार फीट की ऊंचाई से युद्धपोत पर सीधा हमला करते हैं. उन्हें मार गिराने की प्रैक्टिस के लिए यह ड्रोन जरूरी है.

स्टार को नौसैनिक युद्धपोतों के सैनिकों को ट्रेनिंग देने के लिए बनाया जा रहा है. यह आधुनिकएंटी-शिप मिसाइलों से बचने की प्रैक्टिस में मदद करेगा . खासतौर से चीन द्वारा बनाए गए एंटीशिप मिसाइल और फ्रांसीसी एक्सोसेट मिसाइलों के हमले से.DRDO फिलहाल स्टार (Supersonic TARget - STAR) के विंड टनल टेस्टिंग में लगा है.इस टेस्टिंग के बाद इस ड्रोन की डिजाइन में जरूरी बदलाव किए जाएंगे. ऐसा माना जा रहा है कि 2023-24 में यह ड्रोन तैयार हो जाएगा . फिर इसके ट्रायल्स होंगे.

<https://www.aajtak.in/india/news/story/drdo-developing-supersonic-star-sea-skimming-target-drones-for-indian-navy-tstrd-1482134-2022-06-15>



Wed, 15 Jun 2022

## **Modeled on Russian Zircon, India Prepares to Go Hypersonic with Brahmos; Its Next-Gen (NG) Variant to be fielded by 2024**

on June 12, India began the 'silver jubilee year' celebrations to commemorate the 21 years since the launch of the Brahmos supersonic cruise missile. In the first segment of celebrations, Brahmos Aerospace made announcements that would potentially set the tone for India's missile development in the near future. Brahmos is a supersonic cruise missile developed by the Russian-Indian joint company BrahMos Aerospace. The Russian NPO Mashinostroeniya and the Indian DRDO are the collaborative producers of the weapon. The Indian Air Force, Navy, as well as Ground Forces, use the BrahMos missile.

The India-Russia defense joint venture BrahMos Aerospace announced that India would have its first hypersonic missiles in five to six years. "BrahMos Aerospace is capable of making hypersonic missiles. In five to six years, we will be able to have our first hypersonic missile by BrahMos," said Atul Rane, CEO, and MD, BrahMos Aerospace. Rane was speaking at a ceremony to kick off India's 'Silver Jubilee Year' celebrations (1998-2023) held to honor the country's most successful, cutting-edge military partnership program, the BrahMos, which is the world's greatest, fastest, and most potent contemporary precision strike weapon, Live Mint reported.

It is pertinent to mention that the Defense Research and Development Organization (DRDO) successfully tested a Hypersonic Technology Demonstrated Vehicle (HSTDV) in September 2020. India has chosen an air-breathing scramjet propulsion system, which essentially means that the vehicle requires air from the atmosphere to maintain propulsion. During the HSTDV test, the missile attained a speed of Mach 6 and traveled for just 23 seconds. However, with this indigenously manufactured technology, India joined a select group of countries, including the United States, Russia, and China, with technology capable of taking an unpredictable trajectory and eluding interceptor detection. EurAsian Times had earlier reported that this test-firing was related to making the BrahMos II hypersonic missile, modeled on Russia's Zircon hypersonic missile. Further, reports had earlier indicated India could unveil a hypersonic weapon as early as 2025, a timeline which has now been pushed going by the recent announcements of the CEO.

Currently, only Russia and China have operational hypersonic missiles in the world while the US is still in the process of developing one.

The BrahMos II is set to be twice as fast as the BrahMos cruise missile, capable of exceeding Mach 6. Even though the missile is projected to have a range of 600 kilometers, experts suggest that the BrahMos II, similar to Russia's Zircon hypersonic missile, would travel at a speed of Mach 8 and have a range of 1000 kilometers. The aspirational announcement about the hypersonic missiles comes when India is aggressively marketing its BrahMos missile to friendly countries. In a debut deal for BrahMos missiles, India secured a \$375 million contract from the Philippines to supply three BrahMos ground-based anti-ship missile systems earlier this year. Meanwhile, another cutting-edge weapon from the BrahMos kitty will debut soon. The BrahMos Joint Venture has begun work on its new, state-of-the-art BrahMos manufacturing center, which would design, develop and produce the highly advanced BrahMos Next-Generation (NG) weapon system.

### **BrahMos Next-Generation (NG) Weapon System**

The currently operational BrahMos missile has a range of up to 290 kilometers and travels at supersonic speeds throughout its flight, resulting in reduced target dispersion, faster engagement time, and non-interception by any known weapon system on the planet. It follows the 'Fire and Forget Principle,' taking various routes to reach its destination. It has massive destructive power because it has much kinetic energy when it hits a target. It has a cruise height of up to 15 kilometers and a terminal altitude of only 10 meters. A missile can carry a conventional warhead weighing 200 to 300 kg. BrahMos-NG (Next Generation) is a smaller version of the existing BrahMos. It will have the same 290 km range and Mach 3.5 speed as the existing BrahMos but will weigh around 1.5 tons, be 5 meters long, and 50 centimeters in diameter, making it 50% lighter and three meters shorter than its predecessor.

Due to BrahMos NG's reduced weight and size can be carried by a broader range of platforms, including conventional submarines and fighter planes. The missile can be used on land, in the air, on the surface, and in the water. The size of this missile enables it to be launched even from torpedo rooms of submarines. The Su-30MKI, which can currently carry only one BrahMos, will be able to take five BrahMos-NGs in the future. The missile can be installed on the MiG-29 and the indigenous LCA Tejas, said Praveen Pathak, Chief General Manager (Marketing Promotions and Export) BrahMos Aerospace International Maritime at the Defense Show (IMDS) to India Today.

According to some reports, the BrahMos-NG (Next Generation) would also be compatible with the French-made Rafale. Furthermore, the radar cross-section (RCS) of the BrahMos NG is smaller than that of the previous missile, making it stealthier and more difficult for air defense systems to find and engage the target. The features of this upcoming missile indicate that it would exponentially enhance India's combat power through its lethality, versatility, and portability. When India is faced with threats at both its borders and the threat from China only growing by the day, BrahMos NG would potentially be a force multiplier for the Indian Armed Forces.

<https://eurasianimes.com/india-prepares-to-go-hypersonic-with-brahmos-its-ng/>

## DRDO On Twitter



## Defence News

## Defence Strategic: National/International



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

**Ministry of Defence**

*Tue, 14 Jun 2022 1:12PM*

### **In a Transformative Reform, Cabinet Clears ‘AGNIPATH’ Scheme for Recruitment of Youth in the Armed Forces**

**Agniveers to be enrolled under respective Service Acts for four years  
Attractive monthly package with Risk & Hardship allowances as applicable  
in the three Services**

**One time ‘Seva Nidhi’ package to be paid to Agniveers upon completion of engagement period of four years  
46,000 Agniveers to be recruited this year  
Armed Forces to have a younger, fitter, diverse profile for facing future challenges**

The Union Cabinet today approved an attractive recruitment scheme for Indian youth to serve in the Armed Forces. The scheme is called AGNIPATH and the youth selected under this scheme will be known as Agniveers. AGNIPATH allows patriotic and motivated youth to serve in the Armed Forces for a period of four years. The AGNIPATH scheme has been designed to enable a youthful profile of the Armed Forces. It will provide an opportunity to the youth who may be keen to don the uniform by attracting young talent from the society who are more in tune with contemporary technological trends and plough back skilled, disciplined and motivated manpower into the society. As for the Armed Forces, it will enhance the youthful profile of the Armed Forces and provide a fresh lease of ‘Josh’ and ‘Jazba’ whilst at the same time bring about a transformational shift towards a more tech savvy Armed Forces – which is indeed the need of the hour. It is envisaged that average age profile of Indian Armed forces would come down by about 4-5 years by implementation of this scheme.

The nation stands to immensely benefit by infusion of highly inspired youth with deeper understanding of self-discipline, diligence and focus who would be adequately skilled and will be able to contribute in other sectors. The dividends of a short military service to the nation, society and the youth of the nation are immense. This includes inculcation of patriotism, team work, enhancement of physical fitness, ingrained loyalty for the country and availability of trained personnel to boost national security in times of external threats, internal threats and natural disasters. This is a major defence policy reform introduced by the Government to usher in a new era in the Human Resource policy of the three Services. The policy, which comes into immediate effect, will hereafter govern the enrolment for the three services.

**Benefits to the Agniveers**

Agniveers will be given an attractive customised monthly package along with Risk and Hardship allowances as applicable in the three services. On completion of the engagement period of four years, Agniveers will be paid one time ‘SevaNidhi’ package which shall comprise their contribution including accrued interest thereon and matching contribution from the Government equal to the accumulated amount of their contribution including interest as indicated below:

Year	Customised Package (Monthly)	In Hand (70%)	Contribution to Agniveer Corpus Fund (30%)	Contribution to corpus fund by GoI
All figures in Rs (Monthly Contribution)				
1 <sup>st</sup> Year	30000	21000	9000	9000
2 <sup>nd</sup> Year	33000	23100	9900	9900

3 <sup>rd</sup> Year	36500	25580	10950	10950
4 <sup>th</sup> Year	40000	28000	12000	12000
Total contribution in Agniveer Corpus Fund after four years			Rs 5.02 Lakh	Rs 5.02 Lakh
Exit After 4 Year	Rs 11.71 Lakh as SevaNidhi Package (Including, interest accumulated on the above amount as per the applicable interest rates would also be paid)			

The 'Seva Nidhi' will be exempt from Income Tax. There shall be no entitlement to gratuity and pensionary benefits. Agniveers will be provided non-contributory Life Insurance Cover of Rs 48 lakh for the duration of their engagement period in the Indian Armed Forces. During this period of service to the nation, the Agniveers will be imparted with various military skills and experience, discipline, physical fitness, leadership qualities, courage and patriotism. Post this stint of four years, the Agniveers will be infused into the civil society where they can contribute immensely towards the nation building process.

The skills gained by each Agniveer will be recognised in a certificate to form part of his unique resume. Agniveers, on completion of the four-year tenure in the prime of their youth, will be mature and self-disciplined with the realisation to become better version of himself/herself both professionally as also personally. The avenues and opportunities that will open up for their progress in the civil world after Agniveer tenure would certainly be a big plus towards nation building. Moreover, the 'Seva Nidhi' of approximately Rs 11.71 lakh would aid the Agniveer to pursue his/her future dreams without the financial pressure, which is normally the case for young people from the financially deprived strata of society.

The individuals, selected for enrolment in the Armed Forces as regular cadre, would be required to serve for a further engagement period of minimum 15 years and would be governed by the existing terms and conditions of service of Junior Commissioned Officers/Other Ranks in Indian Army and their equivalent in Indian Navy and Indian Air Force and that of Non Combatant enrolled in the Indian Air Force, as amended from time-to-time. The scheme will lead to much more youthful and technically adept war fighting force by ensuring a fine balance between youthful and experienced personnel in the Armed Forces.

#### **Advantages**

- A transformative reform of recruitment policy of the Armed Forces.
- A unique opportunity to the youth to serve the country and contribute to Nation Building.
- Armed Forces profile to be youthful and dynamic.
- Attractive financial package for the Agniveers.
- Opportunity for Agniveers to train in the best institutions and enhance their skills & qualifications.



- Availability of well-disciplined and skilled youth with military ethos in civil society.
- Adequate re-employment opportunities for those returning to society and who could emerge as role models for the youth.

### **Terms & Conditions**

Under the AGNIPATH scheme, the Agniveers will be enrolled in the Forces under respective Service Acts for a period of four years. They would form a distinct rank in the Armed Forces, different from any other existing ranks. Upon the completion of four years of service, based on organisational requirement and policies promulgated by the Armed Forces from time-to-time, Agniveers will be offered an opportunity to apply for permanent enrolment in the Armed Forces. These applications will be considered in a centralised manner based on objective criteria including performance during their four-year engagement period and up to 25% of each specific batch of Agniveers will be enrolled in regular cadre of the Armed Forces. Detailed guidelines will be issued separately. The selection will be the exclusive jurisdiction of the Armed Forces. 46,000 Agniveers will be recruited this year.

Enrolment will be undertaken through an online centralised system for all three services with specialised rallies and campus interviews from recognised technical institutes such as Industrial Training Institutes and National Skills Qualifications Framework, among others. Enrolment will be based on 'All India All Class' basis and the eligible age will be in range from 17.5 to 21 years. Agniveers will meet the medical eligibility conditions laid down for enrolment in the armed forces as applicable to respective categories/trades. The educational qualification for Agniveers will remain as in vogue for enrollment in various categories. {For example: For entry into General Duty (GD) soldier, the educational qualification is Class 10}.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1833747>



*Tue, 14 Jun 2022*

## **‘Bharat Ke Agniveer’: Centre Unveils New Defence Recruitment Model: 10 Points**

The ‘Agnipath’ recruitment model is based on all-India merit-based selection process. Those between the age of 17.5 and 21 years will serve in the armed forces for a period of four years. Union defence minister Rajnath Singh and the three service chiefs on Tuesday introduced the short-term defence recruitment policy called Agnipath at a press conference. “The Cabinet Committee on Security has taken a historic decision today to approve the transformative scheme of 'Agnipath'. Under this, Indian youth would be granted an opportunity to get inducted into the Armed services,” the defence minister said. Army chief General Manoj Pande, IAF chief Air Chief Marshal VR Chaudhari and Navy chief Admiral R. Hari Kumar were present during the announcement of the defence recruitment scheme.

“Under the 'Agnipath' scheme, efforts are to create a youthful profile of the Armed forces. It would help to train them for new technologies & also improve their health levels. This scheme

will increase employment opportunities with new skills in different sectors,” the minister added. “The recruitment model is based on all-India merit-based selection process. We are looking at the best to serve the armed forces between the ages of 17.5 to 21 years. Once selected, ‘Agniveers’ will serve for 4 years with us,” Lt Gen Anil Puri, Additional Secretary, Dept of Military Affairs, said. Some of the salient features of the ‘Agnipath’ defence recruitment scheme are as follows.

1. The recruitments under Agnipath scheme will be open to men and women progressively based on service requirements. The applicants between the age of 17 and a half and 21 years will be eligible under the scheme.
2. The medical and physical fitness requirements will be as per existing norms. Those candidates having passed their 10th and 12th examinations will be considered eligible as per armed forces.
3. As far as the compensation package is considered, the ‘Agniveers’ will be paid ₹4.76 lakhs per annum in the first year which will be hiked to Rs.6.92 lakhs in the fourth year of service.
4. The Risk, Hardship and other allowances will be applicable as per the existing norms. On completion of four years in service, a sum of Rs. 11.7 lakhs including contribution and interest.
5. The 30 per cent emoluments will be contributed by ‘Agniveers’ and equal matching amount will be contributed by the central government.
6. The Seva Nidhi Package will be exempted from income tax.
7. After completion of four years in service, the ‘Agniveers’ will get an opportunity to apply voluntarily for regular cadre. Based on merit and organisational requirement, up to 25 per cent shall be selected from that batch. A robust assessment system is being developed which will be transparent, objective, automated and centrally maintained.
8. For supreme sacrifice in the line of duty during the tenure, a non-contributory insurance cover kept for each ‘Agniveer’ worth Rs. 1 crore plus full pay for the unserved period.
9. In case an ‘Agniveer’ gets disabled during the tenure, there will be full payment for the unserved portion as well as Seva Nidhi package with full interest. Besides this, the scheme has provision for ₹44 lakh based on percentage of disability.
10. The first rally of ‘Agniveers’ will begin 90 days from today.

<https://www.hindustantimes.com/india-news/bharat-ke-agniveer-centre-unveils-agnipath-new-defence-recruitment-model-10-points-101655190223034.html>

## **Appointment of Chief of Defence Staff will be Made Soon: Rajnath Singh**

Defence minister Rajnath Singh on Tuesday announced that the appointment of Chief of Defence Staff (CDS) will be made soon. The announcement comes a few days after the guidelines for the appointment process were formally amended by the government. The new guidelines make retired officers of the rank of Lt Gen or General eligible to be appointed as the next Chief of Defence Staff (CDS). According to new gazette notifications for the three armed forces, any Lt Gen or Gen equivalent officer (retired or serving) below the age of 62 can now be appointed as the CDS, which technically makes scores of officers eligible for the top post.

As reported by ET, the government is examining records of close to 30 serving and retired officers as it moves towards appointing the next CDS, with fitness levels and medical history being a key-criteria in finalising the name. The post of CDS has been lying vacant since the untimely demise of Gen. Bipin Rawat in a helicopter crash last December. The government, earlier today, had also announced the Agnipath recruitment scheme for India's armed forces including all the three wings - Army, Air Force and Navy.

<https://economictimes.indiatimes.com/news/defence/appointment-of-chief-of-defence-staff-will-be-made-soon-rajnath-singh/articleshow/92201675.cms>



Wed, 15 Jun 2022

## **Space-Based Assets can be Applied for Military Force, Says Air Force Chief**

Air Force Air Chief Marshal VR Chaudhari said that the “increased exploitation of the space domain will lead to increased contestation” and as “reliance on space grows, space-based assets will become centres of gravity that are likely to be targeted in war and less than war situations.” Chief of Air Force Air Chief Marshal VR Chaudhari said on Tuesday said anti-satellite tests by major countries, including India, point towards the need for a comprehensive Space Situational Awareness, and “evolution of space capabilities has resulted in these assets growing well beyond mere force enhancement roles, and it is possible to use these assets to apply military force in, from and through space”.

Speaking at the 12th Annual Conference and Exhibition on Geospatial Intelligence organised by the Space Association of India, Chaudhari said that the “increased exploitation of the space domain will lead to increased contestation” and as “reliance on space grows, space-based assets will become centres of gravity that are likely to be targeted in war and less than war situations.”

“This is leading to evolution of concepts of force projection, protection and targeting in space. Anti-Satellite tests by major nations are an indication of the onset of this contestation and militarisation of outer space. While our Mission Shakti operation in 2019 highlighted our ASAT capability to deter adversaries from resorting to escalatory space conflict, it also brought to fore the need for Comprehensive Space Situational Awareness (SSA) through a robust Space Surveillance Network (SSN).”

The availability of comprehensive SSA, he said, enables a complete “defensive counter space stance” as well as usage of our ASAT capability, if and when required. “The key areas for the armed forces would be the development of Missile Defence Radars for SSA, space-based sensors and optical telescopes to track adversarial objects,” he said, adding that ISRO and DRDO’s existing capabilities would need to be “integrated into the Air Surveillance picture” of the Air Force, beyond the present 100 km altitude. “This integration would provide a gradual progression to a Space Surveillance Network. Collaboration with other countries for sharing of information would also be essential to enhance SSA,” the Air Force Chief added.

“In recent times, the increased focus on military space application has been accelerated by two key factors; firstly the increased geo-political churning which have aggravated the threat scenario in this region. Secondly, the growing realisation that the boundaries that separate civil and military space assets are getting blurred and most of the applications are dual use cases.” Advocating for a civil-military fusion in the domain, he said that while “capability enhancement in multiple domains of space application is the way forward,” this evolution “can only be fast tracked if we increase civil-military fusion”. He said that the Defence Space Agency (DSA), the lead agency for aggregating the requirements of Armed Forces “would play a key role in synergising civil-military space cooperation to achieve the desired capabilities” and it would “mandate an increased inter-play with both government and commercial space agencies.”

Space-based assets “significantly enhance the potency of air power as these assets provide increased battlefield transparency which is extremely helpful in discerning the enemy’s intentions,” Chaudhari said, adding that the Air Force’s strategy is to “fully integrate the air and space capabilities to have a common picture of the aerospace medium, reduce the sensor to shooter time and enable optimum force application.”

Space, he said, is a “natural extension of the air medium and reaffirm our need to adapt to this new environment rapidly,” and mentioned that the Air Force needs to “transcend to an air and space force in the years to come and we are working on this vision.” The doctrinal imperative to gain the higher ground for tactical advantage, in the military domain, he said, “has manifested in us seeking capabilities in air and now in space” and utilisation of “space-based assets “has revolutionised warfare by enhancing our capacities in intelligence gathering, surveillance and reconnaissance, communications, early warning, weather forecasting and navigation.”

<https://indianexpress.com/article/india/space-based-assets-can-be-applied-for-military-force-says-air-force-chief-7970102/>

*Tue, 14 Jun 2022*

## **Outcomes in Space Domain will Decide Victor in Future Conflicts: IAF Chief**

Air Chief Marshal VR Chaudhary on Tuesday said that the outcomes in the aerospace domain will probably decide the eventual victor in future conflicts. Like air power's effect on surface battles, aerospace power is fast emerging as the new paradigm which shall greatly influence all surface activities, he said. The IAF Chief was addressing the 12th Annual Conference and Exhibition on Geospatial Intelligence organised by the Space Association of India. "Notably, in our case, the Kargil war served as a trigger for having additional satellites towards force enhancement operations. However, newer technologies have made us to realign our planning for resources, strategies and ideas. In the IAF, we are using terrestrial and space enabled capabilities to ensure a high degree of network centricity," he said.

He said that as reliance on space grows, space based assets will become centres of gravity that are likely to be targeted in war and 'less than war' situations. This is leading to evolution of concepts of force projection, protection and targeting in Space, he added. The IAF Chief said that anti satellite tests by major nations are an indication of the onset of this contestation and militarisation of outer space. "In recent times, the increased focus on military Space application has been accelerated by two key factors; firstly the increased geo-political churning which have aggravated the threat scenario in this region. Secondly, the growing realisation that the boundaries that separate civil and military space assets are getting blurred and most of the applications are dual use cases," the IAF Chief said.

The evolution of Space capabilities has resulted in these assets growing well beyond mere force enhancement roles. It is now possible to use these assets to actually apply military force 'in, from and through Space', he added. He said that the key areas for the armed forces would be the development of Missile Defence Radars for Space Situational Awareness, Space Based Sensors and optical telescopes to track adversarial objects. The IAF Chief said that the existing capabilities of ISRO and DRDO would thus need to be integrated into the Air Surveillance picture of the IAF, well beyond the present 100 km altitude. This integration would provide a gradual progression to a Space Surveillance Network, he said.

<http://www.uniindia.com/outcomes-in-space-domain-will-decide-victor-in-future-conflicts-iaf-chief/india/news/2757478.html>

*Tue, 14 Jun 2022*

## **Portugal Gears Up for the Next Generation Innovation in Defence and Aerospace**

Defence innovation is taking exciting shape in the clusters of European Union and Portugal stands out in leading some of the breakthrough technologies in defense and aerospace. AED Days 2022, the main event of the Portuguese Aeronautics, Space and Defence Cluster, that gathers the national ecosystem along with the major international industry and policy players. Defence innovation is taking exciting shape in the clusters of European Union and Portugal stands out in leading some of the breakthrough technologies in defense and aerospace. AED Days 2022, the main event of the Portuguese Aeronautics, Space and Defence Cluster, that gathers the national ecosystem along with the major international industry and policy players demonstrated the advancement of such systems.

The war in Ukraine has further accelerated the pace of such effort in addressing the opportunities as well the challenges. Defence markets are expanding due to the deterioration of regional security, geopolitical reconfigurations and the need for new and advanced weapon systems. Defence expenditure has risen for the sixth consecutive year among the Members of the European Defence Agency, accounting for 198 billion euros in 2020. By 2030, Portugal will be spending over 6 billion euros in Defence; Military equipment and defence research, development & innovation investment growth is expected to triple by the end of this decade. The Military Programming Law is now under revision to provide adequate means for the Portuguese Armed Forces to perform its missions in a new and challenging international system, and to contribute to NATO and European Defence and Security efforts.

Portugal has launched the Defence4Tech Hub, and is currently developing the “SmartDefence” intelligent platform to digitise the Portuguese Defence Economy ecosystem. Portugal has recently published the National Defence Strategy for Space, and idD Portugal Defence, has established Magellan Orbital. Such effort has resulted in laying ground for innovation defence and innovation. Take a look at Portugese entity TEKEVER which has developed UAS, combining complex systems, as drones that fly 20 hours, with satellite communication, powerful sensors, a cross-platform, Ground Control Station and an AI/ML-powered data-centre. Europe’s first UAS-based maritime surveillance system. TEKEVER AR5 is the medium-altitude, medium-endurance fixed wing UAS which is chosen as Europe’s first UAS-based maritime surveillance system. The RAPSODY Project, led by TEKEVER, will test the use of unmanned aerial systems in a maritime context through real-conditions demonstration of two scenarios: search and rescue missions; and pollution and oil spill monitoring. The systems will operate over the Atlantic Ocean, the North Sea and the Mediterranean Sea. This is the first time unmanned aerial systems will be introduced into maritime surveillance missions in Europe.

How Portugal with relatively low defence budget managed to create such ecosystem? Jose Neves leads the AED Cluster Portugal which is galvanizing the industries to design and develop advance systems. He talked about nurturing such ecosystem, said: “The growing number of resources allocated towards the development of advanced military technologies will foster

defence companies and the involvement of academia and research centres.” He further added that Portugal will host an accelerator network site (Arsenal do Alfeite) and a test centre (Navy’s Operational Experimentation Centre); Digital technology is transforming our physical world, namely with the use of “digital threads” and “digital twins”, which are known to reduce costs and maximize efficiency.

Another area of innovation is mobility. Portuguese entity known as Critical Software is working on some of the most futuristic technologies, driving the next generation concept in the world of mobility. In 2018, Germany’s BMW Group and Portugal’s Critical Software formed Critical TechWorks to build software for BMW’s future vehicles. Critical TechWorks COO Jochen Kirschbaum said the company chose Portugal because, “It stands out for investment in technological education and excellent engineering schools as well as for strategic governmental investment that positions Portugal as a technological innovation center at the European level.

<https://www.financialexpress.com/defence/portugal-gears-up-for-the-next-generation-innovation-in-defence-and-aerospace/2559282/lite/>

## पंजाब केसरी

Wed, 15 Jun 2022

### उत्तर कोरिया ने नए परमाणु परीक्षण की तैयारी पूरी कर ली है : दक्षिण कोरिया

दक्षिण कोरिया के शीर्ष राजनयिक ने मंगलवार को दावा किया कि उत्तर कोरिया ने एक नए परमाणु परीक्षण की तैयारी पूरी कर ली है और देश के शीर्ष नेतृत्व द्वारा लिये गये राजनीतिक निर्णय ही इसे रोका जा सकता है। अमेरिका के विदेश मंत्री एंटोनी ब्लिंकन से यहां बातचीत के बाद दक्षिण कोरिया के विदेश मंत्री पार्क जिन ने कहा कि उत्तर कोरिया अगर इस दिशा में आगे बढ़ता है तो उसे इसकी कीमत चुकानी होगी। संदेह है कि वह आने वाले दिनों में सातवां परमाणु परीक्षण कर सकता है।

पार्क ने कहा, “ उत्तर कोरिया ने एक और परमाणु परीक्षण की तैयारी पूरी कर ली है और मुझे लगता है अब केवल एक राजनीतिक फैसला किया जाना है।” इससे पहले, अमेरिका और दक्षिण कोरिया के अधिकारियों ने कहा था कि उत्तर कोरिया परमाणु परीक्षण की तैयारी पूरी करने के करीब है। पार्क ने कहा, “ अगर उत्तर कोरिया एक और परमाणु परीक्षण करता है, तो मुझे लगता है कि इससे केवल हमारी जवाबी कार्रवाई बढ़ेगी और अंतरराष्ट्रीय प्रतिबंध भी बढ़ाए जाएंगे।”

प्रतिबंधों के अलावा पार्क ने नहीं बताया कि उत्तर कोरिया को इसकी और क्या कीमत चुकानी पड़ेगी और ना ही संबंध में कोई विस्तृत जानकारी दी कि कोई अवरोध नीति उसे कैसे रोक सकती है। हालांकि, ब्लिंकन ने कहा कि अमेरिका और उसके सहयोगी दक्षिण कोरिया तथा जापान जवाबी कार्रवाई के रूप में अपनी

सेना की तैनाती में महत्वपूर्ण फेरबदल करेंगे। उन्होंने कहा कि इसके अलावा, ‘‘दबाव बना रहेगा, यह जारी रहेगा और जैसा उचित होगा, इसे बढ़ाया जाएगा।’’ पार्क और ब्लिंकन दोनों ने जोर देकर कहा कि उत्तर कोरिया के लिए बिना किसी पूर्व शर्त के वार्ता का रास्ता खुला है।

<https://www.punjabkesari.in/international/news/pti-international-story-1618171>

## Science & Technology News



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*Tue, 14 Jun 2022 4:32 PM*

### **Novel Experimental Framework in Fluid Dynamics can Help in Earthquake Early Warnings**

Scientists have developed a novel experimental framework in fluid dynamics to describe deformation in disordered soft solids formed by mixing solid grains at significant proportions in a simple liquid which can help in developing early warning systems to minimize damage due to catastrophic events like landslides/earthquakes. Granular systems exist all around us --- in material processing industries that deal with dry grains and slurries flowing through pipelines over large distances and in catastrophic natural phenomena like earthquakes and landslides.

These systems are comprised of grains that are essentially similar to grains of rice. Rice grains can be packed better into a container by shaking the container. The forces coming from shaking make the grains gradually more compact until it reaches a critical degree of compaction. Interestingly, such critical compaction encodes the information about the interactions between the grains coming from inter-particle friction, the shape of the particles, sticky-ness, and so on. Although it is well known from previous studies that the complex flow behaviour in dense suspensions is determined by the inter-particle interactions, a quantitative correlation between the flow behaviour and the inter-particle interactions remains missing.

A group of researchers from Raman Research Institute, an autonomous institute of the Department of Science and Technology has proposed a novel experimental framework, combining the concept of fluid dynamics and how grains become gradually immobile at high enough compaction (called the jamming transition), to describe the deformation and failure in disordered soft solids formed by dispersing granular particles in simple fluids. They have established a quantitative correlation between the flow behaviour and the inter-particle interactions and validated it over a wide parameter range.

The researchers have used the concept motivated by the compaction of rice grains to understand dense suspensions and have further confirmed the idea by tuning the inter-particle interactions



using surfactants (which are essentially soap molecules). Using a combination of experimental techniques like shear-rheology which essentially measures the force-deformation response of materials, particle settling to determine the degree of compaction, and boundary imaging to observe the nature of flow in the system, they establish such a correlation in a quantitative manner in a paper recently published in the journal Communications Physics Journal of Nature publishing group.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1833834>



*Tue, 14 Jun 2022*

## **A Neuromorphic Computing Architecture that can Run Some Deep Neural Networks More Efficiently**

As artificial intelligence and deep learning techniques become increasingly advanced, engineers will need to create hardware that can run their computations both reliably and efficiently. Neuromorphic computing hardware, which is inspired by the structure and biology of the human brain, could be particularly promising for supporting the operation of sophisticated deep neural networks (DNNs). Researchers at Graz University of Technology and Intel have recently demonstrated the huge potential of neuromorphic computing hardware for running DNNs in an experimental setting. Their paper, published in Nature Machine Intelligence and funded by the Human Brain Project (HBP), shows that neuromorphic computing hardware could run large DNNs 4 to 16 times more efficiently than conventional (i.e., non-brain inspired) computing hardware.

"We have shown that a large class of DNNs, those that process temporally extended inputs such as for example sentences, can be implemented substantially more energy-efficiently if one solves the same problems on neuromorphic hardware with brain-inspired neurons and neural network architectures," Wolfgang Maass, one of the researchers who carried out the study, told TechXplore. "Furthermore, the DNNs that we considered are critical for higher level cognitive function, such as finding relations between sentences in a story and answering questions about its content." In their tests, Maass and his colleagues evaluated the energy-efficiency of a large neural network running on a neuromorphic computing chip created by Intel. This DNN was specifically designed to process large letter or digit sequences, such as sentences.

The researchers measured the energy consumption of the Intel neuromorphic chip and a standard computer chip while running this same DNN and then compared their performances. Interestingly, the researchers found that adapting the neuron models contained in computer hardware so that they resembled neurons in the brain enabled new functional properties of the DNN, improving its energy-efficiency. "Enhanced energy efficiency of neuromorphic hardware has often been conjectured, but it was hard to demonstrate for demanding AI tasks," Maass explained. "The reason is that if one replaces the artificial neuron models that are used by DNNs in AI, which are activated 10s of thousands of times and more per second, with more brain-like

'lazy' and therefore more energy-efficient spiking neurons that resemble those in the brain, one usually had to make the spiking neurons hyperactive, much more than neurons in the brain (where an average neuron emits only a few times per second a signal). These hyperactive neurons, however, consumed too much energy."

Many neurons in the brain require an extended resting period after being active for a while. Previous studies aimed at replicating biological neural dynamics in hardware often reached disappointing results due to the hyperactivity of the artificial neurons, which consumed too much energy when running particularly large and complex DNNs. In their experiments, Maass and his colleagues showed that the tendency of many biological neurons to rest after spiking could be replicated in neuromorphic hardware and used as a "computational trick" to solve time series processing tasks more efficiently. In these tasks, new information needs to be combined with information gathered in the recent past (e.g., sentences from a story that the network processed beforehand).

"We showed that the network just needs to check which neurons are currently most tired, i.e., reluctant to fire, since these are the ones that were active in the recent past," Maass said. "Using this strategy, a clever network can reconstruct based on what information was recently processed. Thus, 'laziness' can have advantages in computing." The researchers demonstrated that when running the same DNN, Intel's neuromorphic computing chip consumed 4 to 16 times less energy than a conventional chip. In addition, they outlined the possibility of leveraging the artificial neurons' lack of activity after they spike, to significantly improve the hardware's performance on time series processing tasks.

In the future, the Intel chip and the approach proposed by Maass and his colleagues could help to improve the efficiency of neuromorphic computing hardware in running large and sophisticated DNNs. In their future work, the team would also like to devise more bio-inspired strategies to enhance the performance of neuromorphic chips, as current hardware only captures a tiny fraction of the complex dynamics and functions of the human brain. "For example, human brains can learn from seeing a scene or hearing a sentence just once, whereas DNNs in AI require excessive training on zillions of examples," Maass added. "One trick that the brain uses for quick learning is to use different learning methods in different parts of the brain, whereas DNNs typically use just one. In my next studies, I would like to enable neuromorphic hardware to develop a 'personal' memory based on its past 'experiences,' just like a human would, and use this individual experience to make better decisions."

<https://techxplore.com/news/2022-06-neuromorphic-architecture-deep-neural-networks.html>

