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# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO  
Technologies, Defence Technologies, Defence Policies,  
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## DRDO News

## DRDO Technology News



Mon, 04 Apr 2022

### New director for DRDO's Defence Electronics Research Laboratory

Nuthi Srinivas Rao, an 'Outstanding Scientist', has assumed charge as the director of Defence Electronics Research Laboratory (DLRL), DRDO. He has taken over from K. Maheswara Reddy, 'distinguished scientist' who superannuated on March 31.

DLRL is a premier lab in the field of electronic warfare systems and has delivered integrated systems to the tri-services over the past six decades. Mr. Rao graduated in Electronics and Telecommunication Engineering from IETE, New Delhi, in 1986 and obtained M.Tech in digital systems and computer electronics from JNTU-Hyderabad in 2001. He joined DRDO, Pune, in October 1986 and subsequently joined DLRL in 1987. He has made significant contributions and spearheaded the design, development, productionisation and successful installation of diversified state-of-the-art electronic warfare systems onboard platforms for the Indian Navy, said a press release on Monday.

<https://www.thehindu.com/news/cities/Hyderabad/new-director-for-drdo-defence-electronics-research-laboratory/article65289707.ece>

## DRDO On Twitter



# Defence Strategic: National/International



Press Information Bureau  
Government of India

Ministry of Defence

*Tue, 05 Apr 2022 5:45 PM*

## **Two-day conference of ADGs & DDGs of NCC begins in New Delhi; Early implementation of government's plan to expand NCC on the agenda**

The two-day bi-annual conference of National Cadet Corps (NCC) commenced in New Delhi on April 05, 2022. Additional Directors General and Deputy Directors General representing all NCC Directorates across the country are attending the conference. Major topics being discussed in the conference include early implementation of the ongoing expansion plan of NCC as per Government's directives to meet the aspirations of the youth of the country.

Inaugurating the conference, DG NCC Lt Gen Gurbirpal Singh highlighted the efforts made in the last six months to improve the training, infrastructure and logistic functions of the organisation. He reiterated the commitment of NCC to motivate young Indians and transform them into responsible citizens. He stressed on the need for institutionalised training to be the main focus of all Directorates.

Lt Gen Gurbirpal Singh emphasised that resurgent India should be the prime focus of NCC and all Directorates should consciously contribute towards social awareness and community development programmes. He appreciated the contribution of all units towards 'Swachh Bharat Abhiyan' and 'Digital India'. He called for synergised efforts from all Directorates in sync with Central and State Government policies which would result in a more effective realisation of the goals set for the organisation.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1813782>



*Wed, 06 Apr 2022*

## **IAF may adopt indigenous route for 'Super Sukhoi' program to upgrade 200 Su-30MKI jets**

The IAF is considering ordering 12 new Sukhoi Su-30MKI fighters, which might be delivered in kit form. After the production line at HAL ended in 2019, almost 400 Indian businesses stopped

manufacturing about 6000 components that go into each Su-30 aircraft due to direct supplies from Russia.

Because procuring components from Russian manufacturers are less expensive due to mass production for both domestic and export markets, if the Russian supply chain does not improve in the coming months, a large portion of the Su-30MKI fleet could be grounded in the long run, according to several experts, the MoD should break away from the contract obligation and allow Indian manufacturers to begin work on some of the Russian components, which is not permitted under the contract. Officials in the Defence establishment have also encouraged the Defence Ministry to use Indian-made components for the Super Sukhoi upgrade of roughly 200 units.

Early this year, HAL offered an indigenous upgrade programme to the Indian Air Force, which they have been pursuing with their headquarters. The concept includes indigenously made avionics and radars, electronic warfare jammers, an updated cockpit layout, and indigenous armaments.

<http://www.indiandefenseneews.in/2022/04/iaf-may-adopt-indigenous-routes-for.html?m=1>

## Outlook

*Tue, 05 Apr 2022*

### **In last 8 years, Maritime sector has scaled new heights: PM Modi**

In the last eight years, India's maritime sector has scaled new heights and contributed to boosting trade and commercial activities, Prime Minister Narendra Modi said on Tuesday on the occasion of National Maritime Day. April 5 is celebrated as National Maritime Day across the country and is dedicated to the role of maritime trade in the development of the Indian economy and the role of India and its strategic location in global trade.

"Today, on National Maritime Day we recall our glorious maritime history and highlight the importance of the maritime sector towards India's economic growth," Modi said in a series of tweets. "In the last 8 years our maritime sector has scaled new heights and contributed to boosting trade and commercial activities," he said. In the last eight years, the government of India has focussed on port-led development which includes expanding port capacities and making the existing systems even more efficient, the prime minister said.

He said waterways are being harnessed to ensure Indian products get access to new markets. "While we are leveraging the maritime sector for economic progress and building an Aatmanirbhar Bharat, we are also taking adequate care to ensure the marine eco-system and diversity which India is proud of is safeguarded," Modi said.

<https://www.outlookindia.com/national/in-last-8-years-maritime-sector-has-scaled-new-heights-pm-modi-news-190080>

*Tue, 05 Apr 2022*

## **Army chief Naravane discusses Defence ties with Singapore Defence minister**

Indian Army chief General Manoj M Naravane called on Singaporean Defence Minister Dr Ng Eng Hen on Tuesday and discussed regional geopolitical developments between the two countries. The strong and long-standing bilateral defence relationship between both nations was re-affirmed during the meeting, the Indian Army said. "General MM Naravane #COAS called on Dr Ng Eng Hen, Minister for Defence, #MINDEF, #Singapore & discussed regional geopolitical developments. The strong & long-standing bilateral defence relationship between both Nations was re-affirmed," the Indian Army tweeted.

Chief of the Army Staff also called on Brigadier General David Neo, Chief of Army, Singapore Army and discussed the roadmap to further enhance defence cooperation between both countries. "General MM Naravane COAS called on Brigadier General David Neo, Chief of Army, #SingaporeArmy and discussed the roadmap to further enhance defence cooperation between both Nations," Indian Army said.

<https://www.hindustantimes.com/india-news/army-chief-naravane-discusses-defence-ties-with-singapore-defence-minister-101649153844292.html>



*Wed, 06 Apr 2022*

## **Potential for great power conflict increasing, world becoming unstable: US chief of staff**

The world is becoming more unstable and the likelihood of a significant international conflict between the great powers, including China and Russia, is increasing, Chairman of the US Joint Chiefs of Staff General Mark Milley said during congressional testimony on Tuesday.

"We are now facing two global powers, China and Russia, each with significant military capabilities, both who intend to fundamentally change rules based on the global order. We are entering a world that is becoming more unstable. The potential for significant international conflict between great powers is increasing, not decreasing," Milley told the US House Armed Services Committee. At the same time, the US military stands ready to deter and fight and win any country that seeks to attack the United States, Milley said.

The United States is witnessing the greatest threat to peace and security of Europe in the world in the past several decades and the ongoing conflict in Ukraine is threatening to undermine both European and global peace and stability, the general noted.

On February 24, Russia launched a special military operation in Ukraine after the breakaway republics of Donetsk and Luhansk requested help to defend them from attacks by Ukrainian

troops. The Russian Ministry of Defence said the operation is solely targeting Ukrainian military infrastructure and the civilian population is not in danger.

<http://www.indiandefensenews.in/2022/04/potential-for-great-power-conflict.html>



*Tue, 05 Apr 2022*

## **MoSAIC challenge in Israel to evaluate complex technology for joint combat operation of unmanned ground and air systems**

Some of the Israeli developed drones and robotic unmanned ground systems and parallel systems from the US are being tested in the evaluation, part of the MoSAIC – Mobile Standoff Autonomous Indoor Capabilities Challenge initiated by the US Department of Defence, Irregular Warfare Technical Support Directorate (IWTSD). The Directorate of Defence R&D (DDR&D) in the Israeli Ministry of Defence is organizing the Israeli competition that is testing the combined capabilities of civil drones and ground robotic systems in an urban combat scenario.

In a briefings on April 5, from the DDR&D, Col. Ryan, and the International Programs Manager at the IWTSD, Adam Tarsi said that the aim of the special technical evaluation is to select the technologies that are most suitable for indoors combat. Some of the systems developed in Israel and relevant to the competition are combat proven. Most are highly classified and will be cleared to take part in the demonstration. The leading robotics and drone companies in Israel participating in this competition as part of the technological cooperation between the Ministry of Defence and the DoD IWTSD.

The international competition is promoted by the R&D (Research and Development) Division at the DDR&D, as part of the search for state-of-the-art technologies to operate robotic and autonomous technologies within buildings that simulate a future battlefield. The competition's winners will receive funding for further product development, gain access to American and Israeli government officials, and will be accepted into the Merge Institute in California's prestigious startup program.

Twenty (20) of the most innovative startup companies in the fields of robotics and mini indoor drones are taking part in the competition. Each group's drones and robots are required to complete an obstacle course where they will face several obstacles such as doors, rubble, curtains, etc. The event is testing the abilities of companies from all over the world to complete navigation challenges, structure mapping, human and object tagging, human through-wall detection, maximizing autonomous movement in urban settings, and dealing with physical obstacles in urban areas including stair climbing and other needed capabilities.

The competition in Israel is part of the a joint effort by the US Department of Defence (DoD), Irregular Warfare Technical Support Directorate (IWTSD) and the Israel Ministry of Defence (IMOD), Directorate of Defence Research and Engineering (DDR&D) to find and validate cutting edge hardware and software solutions to address some of the challenging and longstanding technological gaps concerning remote autonomous indoor manoeuvre. According to the official website of the MoSAIC challenge, it is evident that there will be no single technological solution but rather a toolbox of scalable, layered, modular, and multi-functional capabilities to enable operators to remotely and autonomously perform the full range of indoor

missions. Accordingly, the MoSAIC Challenge will be executed as five distinct “Mini Challenges,” with each focusing on a specific enabling capability for remote autonomous indoor manoeuvre. The two officials that briefed the media said that Israel is leading in autonomous systems and the Israeli companies are proving they have some interesting technologies.

<https://raksha-anirveda.com/mosaic-challenge-in-israel-to-evaluate-complex-technology-for-joint-combat-operation-of-unmanned-ground-and-air-systems/>



*Tue, 05 Apr 2022*

## **Boeing begins CH-47F block 2 lot 1 production as US army ponders wider upgrade**

Boeing has begun upgrading the first CH-47F Chinook heavy-lift helicopter to the Block 2 standard, while the US Army continues to deliberate on implementing upgrade to the wider fleet. The manufacturer announced the milestone on 4 April, noting that the aft pylon of the first CH-47F Block 1 helicopter to go through the upgrade had been removed as the first stage in the remanufacturing process.

“Thanks to the large inventory and durability of Chinook aircraft, the [US] Army is able to start their modernisation efforts at an affordable price, without sacrificing current mission readiness,” Heather McBryan, director of Business Development for Boeing Cargo Helicopters and Future Vertical Lift (FVL) programmes, was quoted as saying.

The early induction work is being performed not far from Boeing's Chinook production facility in Philadelphia by Summit Aviation, one of more than 360 suppliers and partners that support Chinook production. “The first aircraft is now in the induction process, which on average takes 20 days. Once the tear down of the aircraft is complete, select aircraft parts will return to Boeing and Team Chinook suppliers for restoration and progress to the next stage of production,” Boeing said. The US Army contracted Boeing to launch Lot 1 of the Block 2 upgrade for the CH-47F in October 2021. This first batch of helicopters are to be delivered from early 2023.

<https://www.janes.com/defence-news/news-detail/boeing-begins-ch-47f-block-2-lot-1-production-as-us-army-ponders-wider-upgrade>





पत्र सूचना कार्यालय  
भारत सरकार

विज्ञान एवं प्रौद्योगिकी मंत्रालय

Tue, 05 Apr 2022 4:18 PM

### मिशन इनोवेशन सम्मेलन में एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंच का शुभारंभ किया गया और हाइड्रोजन वैली प्लेटफॉर्म के लिए फंडिंग के अवसर की घोषणा की गई

मिशन इनोवेशन यानी एमआई के वार्षिक सम्मेलन के दौरान 4 अप्रैल 2022 को तीन एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंचों का शुभारंभ किया गया, जहां नए ऊर्जा नवाचार सहयोग की घोषणा की गई। विज्ञान और प्रौद्योगिकी मंत्री डॉ. जितेंद्र सिंह ने स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंचों के तीन केंद्रों को प्रशस्ति पत्र प्रदान किया। विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) द्वारा स्थापित ये सामग्री गतिवर्द्धन मंच अगली पीढ़ी की कंप्यूटिंग, आर्टिफिशियल इंटेलिजेंस (एआई) और मशीन लर्निंग (एमएल) तथा रोबोटिक्स में उभरती क्षमताओं का लाभ उठाकर 10 गुनी तक तेज सामग्री की खोज की गति को बढ़ाएगा। मंच 38 से अधिक विशिष्ट संस्थानों और अगली पीढ़ी की कम लागत वाली उन्नत ऊर्जा सामग्री पर काम कर रहे 80 शोध कर्मियों के ज्ञान का नेटवर्क बनाता है।

डॉ. सिंह ने हाइड्रोजन वैली प्लेटफॉर्म की फंडिंग के अवसर की भी घोषणा की, जो ऑनसाइट उत्पादन और उपयोग द्वारा हाइड्रोजन की मांग तथा आपूर्ति को अधिकतम करने, नवीकरणीय संसाधनों का प्रभावी ढंग से उपयोग करने और भौगोलिक पहचान के साथ अत्यधिक पानी के क्षेत्रों के लिए एक वैश्विक पहल है। महत्वपूर्ण स्तर तक पहुँचने और सीखने की अवस्था के प्रभावों को अनलॉक करने के उद्देश्य से संपूर्ण हाइड्रोजन मूल्य श्रृंखला (उत्पादन, भंडारण और परिवहन) को संयोजित करने के लिए स्वच्छ हाइड्रोजन वैली के समूहों के माध्यम से एच-2 वैली के मकसद को हासिल किया जाएगा। डीएसटी ने 2030 तक भारत में तीन स्वच्छ हाइड्रोजन वैली की डिलीवरी की सुविधा के लिए प्रतिबद्धता जाहिर की है। मिशन इनोवेशन (एमआई) वार्षिक सभा, जिसने एमआई की रणनीति और कार्य योजना की समीक्षा की, चर्चा की और निर्धारित किया, ने वरिष्ठ स्वच्छ ऊर्जा नवाचार नेताओं के नेटवर्क के निर्माण के लिए राष्ट्रीय प्राथमिकताओं पर अंतर्दृष्टि साझा की।

तीन दिवसीय कार्यक्रम के दौरान, वरिष्ठ स्वच्छ ऊर्जा नवाचार नेताओं ने 2022 के लिए एमआई रणनीतिक प्राथमिकताओं को उन्नत किया। मिशन इनोवेशन हर महाद्वीप की सरकारों, अंतर्राष्ट्रीय संगठनों और निजी क्षेत्र के निवेशकों को वैश्विक निवेश तथा सहयोग का नेतृत्व करने के लिए एकजुट करता है, जो स्वच्छ ऊर्जा प्रौद्योगिकी को दुनियाभर में किफायती और सुलभ बनाने में महत्वपूर्ण बिंदुओं को प्राप्त करने के लिए आवश्यक है। यह प्रदर्शित करना कि सहयोग करने वाली सरकारें कैसे नवाचार में तेजी ला सकती हैं और 'कार्यान्वयन के वर्ष' में योगदान कर सकती हैं, एमआई एजेंडे का केंद्र है। साझेदारी और क्षमता निर्माण के माध्यम से दीर्घकालिक प्रभाव को अधिकतम करना एक अन्य एमआई प्राथमिकता है और एमआई को प्रमुख अंतर्राष्ट्रीय स्वच्छ ऊर्जा नवाचार मंच के रूप में स्थान देना जारी रखना है।

जून 2021 में एमआई पहल का एक महत्वाकांक्षी दूसरा चरण एमआई 2.0 का शुभारंभ होने के बाद इस सभा ने वैश्विक स्वच्छ ऊर्जा नवाचार के दशक में आवश्यक कार्यों पर सहमत होने के एक महत्वपूर्ण अवसर चिह्नित किया। पिछले एक साल में कुल सात मिशनों में से पांच को लांच किया गया है। बिजली प्रणालियों, हाइड्रोजन, शिपिंग, शहरी संक्रमण और कार्बन डाइऑक्साइड हटाने पर ध्यान केंद्रित करते हुए, मिशनों ने स्वच्छ ऊर्जा संक्रमण की सुविधा के लिए प्रौद्योगिकियों में तेजी लाने का संकल्प लिया। आगंतुकों के साथ मिलने पर, एमआई मिशनों में मौजूदा वैश्विक उत्सर्जन के 52 फीसदी के लिए जिम्मेदार क्षेत्रों के लिए किफायती डीकार्बोनाइजेशन का मार्ग खोलने की क्षमता है।

**डीएसटी द्वारा स्थापित तीन एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंचों में शामिल हैं:**

**भंडारण पर डीएसटी-आईआईएसईआर तिरुवनंतपुरम एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंच:** आईआईएसईआर तिरुवनंतपुरम में स्थापित 14 अनुसंधान एवं विकास संस्थानों के संघ का उद्देश्य स्वचालित प्रक्रियाओं के माध्यम से मशीन लर्निंग और आर्टिफिशियल इंटेलिजेंस का उपयोग करके सॉलिड-स्टेट बैटरी प्रौद्योगिकी के विकास में तेजी लाना है। केंद्र को सॉलिड-स्टेट बैटरी अनुसंधान की दिशा में विशेषज्ञता और ज्ञान का लाभ मिलेगा।

**डीएसटी-आईआईटी हैदराबाद बायोएनेर्जी और हाइड्रोजन पर एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंच:** आईआईटी, हैदराबाद में केंद्र का उद्देश्य नये उत्प्रेरक, नई भंडारण प्रणाली और सामग्री व अनुकूलित संयंत्र डिजाइन की खोज को तेज करने माध्यम से अधिक-सक्षम व्यावसायिक रूप से बायोमास और अपशिष्ट-जल से हाइड्रोजन रूपांतरण और भंडारण प्रणालियों के विकास में तेजी लाना है। परियोजना को 9 भागीदार संस्थानों के वैज्ञानिकों की एक टीम के बीच संयुक्त रूप से लागू किया जाएगा।

**सामग्री पर डीएसटी-आईआईटी, कानपुर एकीकृत स्वच्छ ऊर्जा सामग्री गतिवर्द्धन मंच:** इस मंच का उद्देश्य क्वांटम और क्लासिकल मेकेनिक्स सक्षम परमाणु सिमुलेशन और एआई तथा

एमएल एल्गोरिदम का उपयोग करके ऊर्जा संचयन के लिए सामग्री डिजाइन करना है। मंच से जुड़े शोधकर्ताओं के नेटवर्क में 13 विशिष्ट संस्थानों के वैज्ञानिक शामिल हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1813881>



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

**Ministry of Science & Technology**

*Tue, 05 Apr 2022 4:18 PM*

## **Integrated clean energy material acceleration platform launched & funding opportunity announced for hydrogen valley platform at MI meeting**

Three Integrated Clean Energy Material Acceleration Platforms were launched at the MI Annual Gathering session on 4<sup>th</sup> April 2022, where new Energy Innovation Collaborations were announced. Minister of Science and Technology Dr Jitendra Singh awarded the citations to the three centres leads of the Clean Energy Material Acceleration Platforms.

These Material Acceleration Platforms set up by the Department of Science and Technology (DST) would leverage emerging capabilities in next-generation computing, artificial intelligence (AI) and machine learning (ML), and robotics to accelerate the pace of materials discovery up to 10 times faster. The platforms constitute a knowledge network of more than 38 elite institutions and 80 research personnel working on next-generation low-cost advanced energy materials.

Dr Singh also announced the funding opportunity of Hydrogen Valley Platform, which is also a global initiative to optimise the hydrogen demand and supply by onsite generation and utilisation, utilise the renewable resources effectively, and water excess areas with geographical identity. The H<sub>2</sub> Valleys objectives will be achieved through cohorts of clean hydrogen valleys to combine the complete hydrogen value chain (production, storage and transportation) with the aim of reaching critical scale and unlocking learning curve effects. DST has committed to facilitate the delivery of three clean hydrogen valleys in India by 2030.

The Mission Innovation (MI) Annual Gathering, which reviewed, discussed and set MI's strategy and work plan, also shared insights on national priorities to build a network of senior clean energy innovation leaders. Over the course of the three-day programme, senior clean energy innovation leaders advanced MI strategic priorities for 2022.

Mission Innovation brings together governments from every continent, international organisations, and private sector investors to spearhead the global investment and collaboration needed to achieve tipping points in making clean energy technology affordable and accessible worldwide. Demonstrating how collaborating governments can accelerate innovation and contribute to the "Year of Implementation" is central to the MI agenda. Maximising long-term impact through partnerships and capacity building is another MI priority, as well as continuing to position MI as the key international clean energy innovation forum.

Following the launch of an ambitious second phase of the MI initiative in June 2021, MI 2.0, this gathering marked a crucial opportunity to agree on the actions needed in the decade of global clean energy innovation. Five out of a total of seven Missions have been launched over the past

year. Focusing on power systems, hydrogen, shipping, urban transitions, and carbon dioxide removal, the missions resolved to accelerate technologies to facilitate clean energy transitions. When combined with those to come, the MI Missions have the potential to unlock affordable decarbonisation pathways for sectors responsible for 52% of current global emissions.

**The three Integrated Clean Energy Material Acceleration Platforms set up by DST include:**

**DST-IISER Thiruvananthapuram Integrated Clean Energy Material Acceleration Platform on Storage:** The consortium of 14 R&D institutes set up at IISER Thiruvananthapuram aims to accelerate the development of Solid-State Battery technology using Machine learning and Artificial Intelligence through automated processes. The centre would leverage the expertise and knowledge toward solid-state battery research.

**DST-IIT Hyderabad Integrated Clean Energy Material Acceleration Platform on Bioenergy and Hydrogen:** The centre nucleated at IIT Hyderabad aims to accelerate the development of ultra-efficient commercially biomass and waste-water to hydrogen conversion and storage systems through accelerated discovery of novel catalysts, novel storage systems and materials and optimised plant condition designs. The project will be implemented jointly between a team of scientists from 09 partnering institutes.

**DST-IIT Kanpur Integrated Clean Energy Material Acceleration Platform on Materials:** The objective of this platform is to design materials for energy harvesting by employing quantum and classical mechanics enabled atomistic simulations and AI & ML algorithms. The network of researchers engaged in the platform comprises of scientists from 13 elite institutions.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1813706>

**ScienceDaily**

*Tue, 05 Apr 2022*

## **New technique offers faster security for non-volatile memory tech**

Researchers have developed a technique that leverages hardware and software to improve file system security for next-generation memory technologies called non-volatile memories (NVMs). The new encryption technique also permits faster performance than existing software security technologies.

"NVMs are an emerging technology that allows rapid access to the data, and retains data even when a system crashes or loses power," says Amro Awad, senior author of a paper on the work and an assistant professor of electrical and computer engineering at North Carolina State University. "However, the features that give NVMs these attractive characteristics also make it difficult to encrypt files on NVM devices -- which raises security concerns. We've developed a way to secure files on NVM devices without sacrificing the speed that makes NVMs attractive."

"Our technique allows for file-level encryption in fast NVM memories, while cutting the related execution time significantly," says Kazi Abu Zubair, first author of the paper and a Ph.D. student at NC State. Traditionally, computers use two types of data storage. Dynamic random access memory (DRAM) allows quick access to stored data, but will lose that data if the system crashes.

Long-term storage technologies, such as hard drives, are good at retaining data even if a system loses power -- but store the data in a way that makes it slower to access.

NVMs combine the best features of both technologies. However, securing files on NVM devices can be challenging. Existing methods for file system encryption use software, which is not particularly fast. Historically, this wasn't a problem because the technologies for accessing file data from long-term storage devices weren't particularly fast either. "But now that NVMs are allowing faster access to file data, the software approach to file encryption has become a problem, because it slows down overall operations," Abu Zubair says.

"To address this challenge, we've developed a novel architecture that incorporates some elements of the encryption and decryption process into hardware, which is faster than software. As a result, processes that allow users to store and retrieve file data securely are significantly faster."

In simulations, the researchers found that using their novel encryption architecture to secure files in NVMs slowed down operations by 3.8%, when running workloads that were representative of real-world applications. When using software approaches to provide security for the same workloads, operations slowed by about 200%.

"If this was implemented in commercial processors, it would significantly improve performance for secure file operation in large data centers and cloud systems," Abu Zubair says. "While this work addresses file encryption, we think it is important to assess other security functions -- such as auditing and run-time ransom ware detection -in the context of direct access file systems," says Awed. "And addressing those security functions using traditional software approaches can also slow system performance. We're optimistic that our hybrid hardware/software approach may be able to improve performance for those functions as well -- that's an area we're exploring."

The paper, "File system Encryption or Direct-Access for NVM Filesystems? Let's Have Both!," will be presented April 5 at the 28th IEEE International Symposium on High-Performance Computer Architecture (HPCA-22). The paper was co-authored by David Moraines of the University of Central Florida.

<https://www.sciencedaily.com/releases/2022/04/220405102846.htm>



*Tue, 05 Apr 2022*

## **ISRO Scientists to inspect objects that fell from sky in Chandrapur**

Team of ISRO scientists are visiting Chandrapur district in Maharashtra to inspect some objects, believed to be remnants of a booster rocket that streaked across the night sky over parts of central India last week. The space agency decided to depute a team of scientists for "inspection and further scientific inquiry" after the district collector of Chandrapur reached out to ISRO to examine a metal ring and a cylinder-like object that were found in an open field in Pawanpur village.

“As requested by the district administration, a team of scientists from ISRO is visiting Pawanpur for inspection and further scientific inquiry,” the space agency said in a Face book post. On April 2, several social media users posted videos and pictures of unidentified burning objects falling from the sky in north Maharashtra as well as some districts of Madhya Pradesh. Experts speculated that they could be either meteorites entering the Earth’s atmosphere or the pieces of rocket boosters which fall off after a satellite launch. A local government official in eastern Maharashtra’s Chandrapur district said an “aluminum and steel object” reportedly fell at Ladbori village in Sindewahi tehsil around 7.45 pm.

Such sightings were reported in Buldhana, Akola and Jalgaon districts of Maharashtra around 7.30 pm, and also from Barwani, Bhopal, Indore, Betul and Dhar districts of neighbouring Madhya Pradesh. Earlier, Shrinivas Aundhkar, director of the Kalam AstroSpace and Science Centre, had said that the objects could be parts of rocket boosters of the Rocket Lab Electron launcher that had put a satellite of the US-based firm BlackSky into orbit on Saturday.

<https://www.news18.com/news/india/isro-scientists-to-inspect-objects-that-fell-from-sky-in-chandrapur-4945400.html>



Tue, 05 Apr 2022

## **New search algorithm could be quantum leap in detection of gravitational waves**

A team from the University of Glasgow’s School of Physics & Astronomy has developed a quantum algorithm to drastically cut down the time it takes to match gravitational wave signals against a vast databank of templates.

This process, known as matched filtering, is part of the methodology that underpins some of the gravitational wave signal discoveries from detectors like the Laser Interferometer Gravitational Observatory (LIGO) in America and Virgo in Italy. Those detectors, the most sensitive sensors ever created, pick up the faint ripples in spacetime caused by massive astronomical events like the collision and merger of black holes. Matched filtering allows computers to pick gravitational wave signals out of the noise of the data collected by the detector. It works by sifting through the data, searching for a signal which matches one out of potentially hundreds of trillions of templates – pieces of pre-created data that are likely to correlate with a genuine gravitational wave signal.

While the process has enabled numerous gravitational wave detections since LIGO picked up its first signal in September 2015, it is time-consuming and resource-intensive. In a new paper published in the journal *Physical Review Research*, the team describe how the process could be greatly accelerated by a quantum computing technique called Grover’s algorithm. Grover’s algorithm, developed by computer scientist Lov Grover in 1996, harnesses the unusual capabilities and applications of quantum theory to make the process of searching through databases much faster.

While quantum computers capable of processing data using Grover's algorithm are still a developing technology, conventional computers are capable of modeling their behavior, allowing researchers to develop techniques that can be adopted when the technology has matured and quantum computers are readily available. The Glasgow team is the first to adapt Grover's algorithm for the purposes of gravitational wave search. In the paper, they demonstrate how they have applied it to gravitational wave searches through software they developed using the Python programming language and Qiskit, a tool for simulating quantum computing processes.

The system the team developed is capable of a speed-up in the number of operations proportional to the square-root of the number of templates. Current quantum processors are much slower at performing basic operations than classical computers, but as the technology develops, their performance is expected to improve. This reduction in the number of calculations would translate into a speed up in time. In the best case that means that, for example, if a search using classical computing would take a year, the same search could take as little as a week with their quantum algorithm. Dr. Scarlett Gao, from the University's School of Physics & Astronomy, is one of the lead authors of the paper. Dr. Gao said: "Matched filtering is a problem that Grover's algorithm seems well-placed to help solve, and we've been able to develop a system which shows that quantum computing could have valuable applications in gravitational wave astronomy.

"My co-author and I were PhD students when we began this work, and we're lucky to have had access to the support of some of the UK's leading quantum computing and gravitational wave researchers during the process of developing this software. "While we've concentrated on one type of search in this paper, it's possible that it could also be adapted for other processes which, like this one, don't require the database to be loaded into quantum random access memory." Fergus Hayes, a PhD student in the School of Physics & Astronomy, is co-lead author of the paper. He added: "Researchers here in Glasgow have been working on gravitational wave physics for more than 50 years, and work in our Institute for Gravitational Research helped to underpin the development and data analysis sides of LIGO.

"The cross-disciplinary work that Dr. Gao and I led has demonstrated the potential of quantum computing in matched filtering. As quantum computers develop in the coming years, it's possible that processes like these could be used in future gravitational wave detectors. It's an exciting prospect, and we're looking forward to developing this initial proof of concept in the future."

The paper was co-written by Dr. Sarah Croke, Dr. Christopher Messenger, and Dr. John Veitch, all from the University of Glasgow's School of Physics & Astronomy. The team's paper, titled 'A quantum algorithm for gravitational wave matched filtering', is published in *Physical Review Research*. The research was supported by funding from the Science and Technology Facilities Council (STFC) and the Leverhulme Trust.

<https://scitechdaily.com/new-search-algorithm-could-be-quantum-leap-in-detection-of-gravitational-waves/>

