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A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

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Renowned DRDO Scientist Narayana Murthy assumes interim charge of BrahMos Aerospace

DRDO scientist Dr BVHS Narayan Murthy took up the interim charge of missile manufacturing company BrahMos Aerospace Corporation on Tuesday

By Harsh Vardhan

Senior Defence Research and Development Organisation (DRDO) scientist Dr BVHS Narayana Murthy took up the interim charge of missile manufacturing company BrahMos Aerospace Corporation on Tuesday, November 30. Murthy, who is renowned for his contribution to R&D in the defence sector, is also the Director-General of Missiles and Strategic Systems (DGMSS) in DRDO. In an interview with news agency ANI, BrahMos officials said, "Distinguished Scientist Dr Narayana Murthy has been given the interim charge of the BrahMos Aerospace Corporation which manufactures the BrahMos supersonic cruise missile for the Indian Armed forces".

The officials further informed that the said appointment is an interim agreement and that the DGMSS is already in BrahMos Aerospace's Board of Directors. According to ANI, Murthy assumed charge



Image: ANI

on November 30 with Sudhir Mishra's superannuation in view as the latter completed his seven-year term on the same day. A Chief architect of advanced Onboard Computers (OBC) technologies for missile systems and other defence applications, Murthy has made transformative contributions to make India self-reliant in advanced Real-time Embedded Computers, mission computing systems and other avionics technologies.

More about Narayana Murthy

Murthy has played major roles in the development and demonstration of avionics systems that helped expand India's collection of cruise missiles. He led the design and development of advanced Avionics for "Mission Shakti," India's first Anti-Satellite Missile Test (A-SAT) and Long-Range Missile Agni 5, and also has a significant contribution to the development of the Agni series of missiles and other guided weapon systems.

A graduate in Electronics and Communication Engineering from REC, Warangal, Murthy joined DRDO in the year 1986 after completing his M.Tech from JNTU, Hyderabad and receiving a PhD in Computer Science from IIT, Hyderabad. The long list of his contributions also includes the pioneering for Long Range Smart Guided systems with precision strike capabilities as he led the conceptualization, design and development of the Smart Anti-Airfield Weapon (SAAW).

Owing to his works in over three decades, Murthy has been conferred with multiple prestigious awards. He has been conferred with Honorary Fellowship of Computer Society of India along with awards such as the Agni Award for Excellence in Self Reliance, DRDO Scientist of the Year

Award, Path Breaking Research/Outstanding Technology Development Award and DRDO Performance Excellence Award.

<https://www.republicworld.com/technology-news/science/renowned-drdo-scientist-narayana-murthy-assumes-interim-charge-of-brahmos-aerospace.html>

TIMESNOWNEWS.COM

Thu, 02 Dec 2021

Senior DRDO Scientist Narayan Murthy given additional charge of BrahMos Aerospace

Murthy led the design and development of advanced Avionics for 'Mission Shakti', India's first Anti-Satellite Missile Test (A-SAT) and Long-Range Missile Agni 5.

New Delhi: Defence Research and Development Organisation's Director-General Missiles and Strategic Systems (DGMSS) BHVS Narayan Murthy has been given the additional charge of the BrahMos Aerospace corporation.

"Distinguished scientist Mr Narayan Murthy has been given the interim charge of the BrahMos Aerospace Corporation which manufactures the BrahMos supersonic cruise missile for the Indian armed forces," BrahMos officials told ANI here.

BrahMos officials further told that it is an interim arrangement and DGMSS is already in the Board of Directors of BrahMos Aerospace Pvt Ltd.

The interim charge was given to him on Tuesday in view of the superannuation of Sudhir Mishra who completed his over the seven-year term in the office on November 30.

Murthy is the Chief Architect of advanced Onboard Computer (OBC) technologies for missile systems and other defence applications. His sustained contributions and technology leadership over the last three decades has been transformative for making India self-reliant in advanced Real-Time Embedded Computers, mission computing systems, and other avionics technologies.

He led the design and development of advanced Avionics for "Mission Shakti," India's first Anti-Satellite Missile Test (A-SAT) and Long-Range Missile Agni 5, elevating India into a league of select nations and strengthening indigenous defence capabilities.

<https://www.timesnownews.com/india/article/senior-drdo-scientist-narayan-murthy-given-additional-charge-of-brahmos-aerospace/836921>



BHVS Narayan Murthy, DRDO Director-General of Missiles and Strategic Systems.

CM inaugurates engg exhibition

Ahmedabad: Chief Minister Bhupendra Patel inaugurated a five-day exhibition, Engimach 2021, showcasing engineering, machine tools and automation products in Gandhinagar on Wednesday.

At least 500 exhibitors are taking part in the exhibition and an estimated 80,000 visitors are expected at the exhibition which will be held on the Helipad Ground till December 5. The state government has declared Engimach 2021 as a pre-Vibrant Gujarat Global Summit 2022 event.

The CM visited various stalls at the exhibition including the one set up by DRDO. He also spent time check out the electric vehicles kept on display.

“The MSME sector bore the brunt of the Covid-19 pandemic, suffering huge financial losses because of the economic downturn. The economy is on the path to recovery. Engimach 2021 is dedicated to MSMEs, and we are confident it will act as a catalyst and speed up the recovery process by helping businesses tap newer opportunities and forge tie-ups,” said Kamlesh Gohil, CMD, K&D Communication Limited. “Gujarat is the hub of MSMEs and is poised to reap maximum benefit from economic revival.”

MoS (energy) Jagdish Panchal along with Indian Institute of Foundrymen (IIF) chairman Subodh Panchal, GCCI chairman Hemant Shah, and other industry members were present at the inaugural ceremony.

<https://timesofindia.indiatimes.com/city/ahmedabad/cm-inaugurates-engg-exhibition/articleshow/88037432.cms>



Why the Indian Navy needs to invoke the spirit of Admiral Nanda

The aggressive, action-oriented navy chief transformed the navy to meet its ‘finest hour’. It needs this spirit to counter the threat from a rising PLA Navy and a resurgent Pakistan Navy

By Sandeep Unnithan

New Delhi: December 4 commemorates Navy Day, what the Indian Navy calls its finest hour—the raid on Karachi port by three missile boats. The engagement, which lasted under 30 minutes, saw the destruction of a Pakistan Navy destroyer, minesweeper and a merchant ship bringing arms and ammunition for its military. Fifty years on, the largest naval missile engagement in maritime history tells you how rare force-on-force naval combat has been since the Second World War.

It was the only war the Indian Navy participated in. It was largely because of one man—then navy chief admiral Sardarilal Matharadas Nanda. Under him the navy was bold, aggressive, took enormous risks and punched way above its weight. Remarkably, these were also the characteristics his colleagues attributed to the bull-headed navy chief.



Admiral Nanda reviewing an honour guard at INS Adyar in 1972; Image courtesy: Wikipedia

He took over when the navy was already at the margins. It had the smallest part of the defence budget and was seen as inconsequential to the outcomes of three land battles, which is where India's disputed boundaries lay. As Nanda wryly recounted in his 2004 autobiography *The Man Who Bombed Karachi*, prime minister Indira Gandhi had turned to him at the end of the meeting with the service chiefs, after looking at her watch.

The navy lost an opportunity to plunge into the 1965 war when a five-destroyer Pakistani flotilla attacked the port town of Dwarka. An Indian frigate anchored in the vicinity did not engage them because the government had kept the navy out of the war. Admiral Nanda, like so many other naval brass, was stung by the turn of events. The British-built INS Talwar was among Asia's newest gun frigates. Its radar-directed twin 'Mark 6' 4.5-inch naval cannons could belch out high explosive steel to engage the Pakistan Navy's World War 2-era destroyers from 16 km away. But those guns remained silent. Among other things, that incident would have told Nanda that the men behind the machines mattered the most. When he took over as navy chief in 1970, 'Charles Nanda', as he was nick-named, plunged headlong into preparations for war. Teaming up with his brilliant director, naval intelligence, the enigmatic captain (later vice-admiral) Mihir Kumar Roy, Nanda green-lit an ultra-secret operation to train hundreds of Mukti Bahini naval commandos. These Bengali naval commandos, trained at a secret camp on the battlefield of Plassey, went on to sink and disable over 100,000 tonnes of merchant shipping in East Pakistan in multiple covert attacks between August and November 1971. These were the largest special forces missions carried out by an Indian armed force. When war was formally declared on December 3, Nanda's missile boats rained destruction on Karachi and in the east, carrier-borne jets from the aircraft carrier INS Vikrant bombed and strafed targets in East Pakistan, cutting off the seaward retreat of the Pakistani garrison. All these operations, it needs to be emphasised, directly affected the outcome of the battle on land.

When the war began, the navy's missile boats did not have the range to strike at Karachi and return. A boiler crack prevented the navy's sole aircraft carrier the INS Vikrant prevented from steaming full speed ahead to launch aircraft. The service had no special forces units to train guerrillas. Like the stupefied captain of the Talwar in 1965, Nanda could have chosen to sit out the war. He could have cited lack of government direction or complained about inadequate force levels and, consequently, watched the service descend into further irrelevance. The Admiral of course, did none of this. He rolled up his sleeves. Under him the navy improvised and innovated. The missile boats were towed to Karachi by larger warships, the Vikrant deployed at slower speeds with a welded boiler and the navy's diving teams trained the Mukti Bahini saboteurs. How much of a one-man show this naval campaign was can be understood by looking at a 'what if?' scenario. Suppose the crisis in East Pakistan had erupted in 1973 and not in 1971 and the navy was headed by Nanda's eventual successor Admiral S.N. Kohli, how would the conflict have unfolded? The missile attacks on Karachi could have been ruled out as being too risky. The covert war plan risked being turned down for being equally tricky if not for being 'ungentlemanly warfare'. The Vikrant would have stayed in dry dock. The first scenario would almost certainly have come to pass—Kohli, then the C-in-C of the Western Naval Command had vehemently opposed the missile attack citing Karachi's shore defences.

As the Navy basks in the glory of a hard-won victory 50 years ago, it urgently needs to look eastwards at China's rising maritime power.

The new navy chief Admiral Hari Kumar, who took over on December 1, is a no-nonsense professional with a reputation of being a doer. It will be left to him and his successors to steer the navy through some of the biggest challenges in the turbulent decade ahead.

Beijing today fields the world's largest navy that is growing exponentially. China is adding warships and submarines at the rate of one Indian Navy each decade. By the end of this decade, it could possibly have enough warships for a permanently-based Indian Ocean fleet.

"The maritime rivalry between the US and China in the Indo-Pacific, the entry of the PLA Navy in strength into the waters of the Indian Ocean and the growing asymmetry between the PLA Navy and the Indian Navy, all focus on how the Indian Navy will respond to these challenges as the

primary custodian of India's maritime power," military historian Air Vice Marshal Arjun Subramaniam (retired) writes in the 2021 book 'Force in Statecraft'.

The Indian Navy's underwater arm has suffered egregious neglect. This decade, it will induct only six new conventional submarines as against a requirement of at least 12. It has failed to develop an indigenous submarine design despite buying the technology from West Germany in 1981 and France in 2005. It has been slow to realise the fearsome potential of nuclear-powered attack submarines (SSNs)—of the kind Australia is now seeking from the US and UK. The navy has preferred to lease individual SSNs from Russia, instead of building a fleet of its own. A project to build six indigenous SSNs has been stuck for over a decade and even if approved now, it will take at least 12 years for the first unit to be delivered.

Principal surface combatants, too, are being added on at a leisurely pace. It took an Indian shipyard eight years to build the INS Visakhapatnam, which entered service last month. This is double the time it takes a Chinese shipyard to build a comparable 052C class destroyer.

This is not to discount the formidable advantages the Indian navy has built up over the years. It is the pre-eminent regional naval power in the Indian Ocean with two fleets that have the ability to simultaneously project power from the western and eastern coasts. The navy was the first service to get a military communications satellite a decade ago, while the other services are still playing catch up. It has indigenously developed an impressive chain of coastal radar stations and data fusion centres tracking all shipping in the entire Indian Ocean region. The army and the air force have not been able to deploy a similar sensory perimeter capable of looking deep across India's disputed land frontiers despite having fought five border wars. The navy is slowly building up a lethal triad of anti-submarine warfare (ASW) assets—shore-based long-range P-8I aircraft, Sea Guardian HALE drones and MH-60R helicopters, all designed to operate together.

In 1971 India faced two superpowers, the US and China which backed Pakistan but only after a signed agreement assured support from the Soviet Union. The Soviet Union despatched Pacific Fleet units to tail the Seventh Fleet that entered the Bay of Bengal in 1971. It is unlikely that India could expect similar assistance from its Quadrilateral Security Dialogue or Quad partner nations, the US, Australia and Japan, in a conflict with China.

The Indian navy, it can be argued, is back where it was in 1965. If it doesn't present credible options against China in the event of a border war, it risks irrelevance. The challenges are of an order far greater because its new adversary working in concert with the old one. By the end of the decade, Pakistan will deploy eight Chinese-built conventional submarines armed with cruise missiles. These could be used to offset the overwhelming advantage it enjoys over its western adversary.

This collusive two-front threat is only one of the reasons why the navy needs to think out of the box and work in concert with the other services.

Given the economic worries, the defence budget is unlikely to increase and consequently the navy's share might not cross the usual 15 per cent of the budget. Expensive buys, like a third aircraft carrier, will find it difficult to pass the scrutiny of the Chief of Defence Staff's upcoming capability development plan that calls for rationalising big-ticket items across the services.

The National Maritime Theatre Command being set up next year will concentrate all of India's military maritime assets under a single commander. The Indian Navy-steered NMTC will need more teeth if it is to provide options against its adversaries. It needs to fine-tune the contingency plans it began working on when the Chinese threat appeared in Ladakh in May 2020.

In the interim, it needs to look at a range of force-multipliers it can rapidly deploy in the coming decade. These could include options being worked on globally, like repurposing transport aircraft and civilian airliners into long-range bombers, pioneering civil-military fusion to speed up development projects, increasing the range and lethality of existing cruise missiles and torpedoes, accelerating projects for hypersonic weapons and working with the DRDO to convert Agni ballistic missiles into long range ship-killing missiles. It needs to look at light general-purpose frigates which could be churned out rapidly by domestic shipyards. Unmanned platforms could perhaps be

what the naval missile was in 1971—massive force multipliers which gave existing platforms greater striking range. There is strangely, no Indian navy-funded swarm drone project. There are no projects either for ship or submarine launched UAVs and UCAVs or large underwater autonomous vehicles like the US Navy's Orca.

There is a need for the navy to build a network of seabed sensors for 'underwater domain awareness' to track Chinese and Pakistani submarines. This sensor chain can also be used to secure underwater bastions in the Bay of Bengal from where its ballistic missile submarines can safely launch their missiles. These technology gaps are bewildering given the presence of multiple Indian civilian scientific agencies with such capabilities. But more than anything else, the navy needs to look within and rediscover the fighting ethos displayed by its chief a half-century ago.

<https://www.indiatoday.in/india-today-insight/story/why-the-indian-navy-needs-to-invoke-the-spirit-of-admiral-nanda-1883028-2021-12-01>

COVID 19: DRDO's Contribution

RisingKashmir

Thu, 02 Dec 2021

In wake of new variant—Omicron, Sgr admin sets up 3 special quarantine centers in city for foreign guests

Every international tourist has to stay at quarantine centre for 8 hours, those positive will be shifted to DRDO hospital, say officials

Srinagar administration has set up three special quarantine centers for international guests in the wake of the outbreak of new virus variant—Omicron, officials said Wednesday.

A senior official of the district administration told news agency—Kashmir News Observer (KNO) that three special quarantine centres have been set up for the foreign guests in Srinagar district.

“Mariage hall at Sanantnagar area of city and two hotels with all facilities have been converted into quarantine centers. After undergoing Covid tests at the Srinagar international airport, international travelers will have to stay for eight-hours mandatory quarantine at these centers,” the official said.

He said in case any traveller tests positive for the Covid-19 or the new virus mutant, he/she will be shifted to DRDO Covid hospital for special treatment. The Srinagar administration has taken this step in the wake of the spread of new virus variant— mutated Omicron.

Kashmir is all set to witness international tourist arrival in the wake of onset of winter and the activities to be conducted by the tourism department including adventure tourism etc—(KNO)

<https://www.risingkashmir.com/In-wake-of-new-variant-Omicron--Sgr-admin-sets-up-3-special-quarantine-centers-in-city-for-foreign-guests--96294>

आक्सीजन जनरेशन के तीनों प्लांट तैयार, एक साथ 250 पलंग पर देंगे आक्सीजन

विधायक, कलेक्टर, एसपी की मौजूदगी में सीएमएचओ ने कराई आक्सीजन प्लांट की माक ड्रिल भिंड (नप्र)। कोरोना वायरस के आमीक्रान वैरियंट और तीसरी लहर के खतरे को भांपते हुए बुधवार को विश्व एड्स दिवस पर प्रदेशभर में आक्सीजन प्लांट की माक ड्रिल की गई। जिले में एक साथ पांच आक्सीजन जनरेशन प्लांट की माक ड्रिल की गई।

भिंड: कोरोना वायरस के आमीक्रान वैरियंट और तीसरी लहर के खतरे को भांपते हुए बुधवार को विश्व एड्स दिवस पर प्रदेशभर में आक्सीजन प्लांट की माक ड्रिल की गई। जिले में एक साथ पांच आक्सीजन जनरेशन प्लांट की माक ड्रिल की गई। जिला अस्पताल में लगे तीनों प्लांट बटन दबाते ही चालू हो गए। तीनों प्लांट से एक साथ 250 पलंग पर आक्सीजन सप्लाई दी जा सकती है। माक ड्रिल का जायजा लेने के लिए भिंड विधायक संजीव सिंह संजू, कलेक्टर सतीश कुमार एस, एसपी मनोज कुमार सिंह, सीएमएचओ डा. अजीत मिश्रा और सिविल सर्जन डा. अनिल गोयल पहुंचे। विधायक ने तीसरी लहर के खतरे को देखते हुए पूरी तैयारियां सुनिश्चित करने के लिए कहा है।



विधायक, कलेक्टर, एसपी की मौजूदगी में सीएमएचओ ने कराई आक्सीजन प्लांट की माक ड्रिल

जनरेशन प्लांट से 93 फीसद आक्सीजन:

सीएमएचओ डॉ. अजीत मिश्रा ने बताया जिला अस्पताल में तीन आक्सीजन जनरेशन प्लांट बनाए गए हैं। तीनों प्लांट वातावरण से आक्सीजन जनरेट कर मरीजों के पलंग तक पहुंचाते हैं। माक ड्रिल के दौरान देखा गया कि तीनों प्लांट से तय मानक 93 फीसद आक्सीजन मिल रही है या नहीं। सीएमएचओ का कहना है कि जिला अस्पताल में गेल इंडिया की ओर से 830 एलपीएम, डीआरडीओ का एक हजार एलपीएम, टेबा इंडिया के सीएसआर फंड से निर्मित 250 एलपीएम का आक्सीजन जनरेशन प्लांट है। इन तीनों प्लांट से प्रति मिनट 21 सौ लीटर आक्सीजन 250 पलंग पर एक साथ सप्लाई की जा सकती है। इसके अलावा गोहद में कृषि मंत्री नरेंद्र सिंह तोमर की ओर से नाफेड से 200 एलपीएम और लहार में विधायक गोविंद सिंह की निधि से 200 एलपीएम का आक्सीजन जनरेशन प्लांट चालू हो चुके हैं। इस दौरान कलेक्टर ने सीएमएचओ डा. मिश्रा और सिविल सर्जन डा. अनिल गोयल से जिला अस्पताल की तैयारियों के बारे में जानकारी मांगी।

<https://www.naidunia.com/madhya-pradesh/bhind-bhind-news-7162502>

DRDO on Twitter





DRDO @DRDO_India · 5h

DRDO signed an MoU with @iitcouncil towards mentoring of startups and MSMEs for marketing and access to non-defence customers to improve their outreach. #collaboration #AtmaNirbharBharat



DRDO @DRDO_India · 5h

Exhibiting indigenously developed missiles, radars, bridge layer tanks, ATAGS, NBC equipment and filter cartridges at EDEX-2021, Cairo, Egypt. #MakeInIndia #AtmaNirbharBharat



Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Wed, 01 Dec 2021 12:40PM

Vice Admiral Biswajit Dasgupta, AVSM, YSM, VSM takes over as the Flag Officer Commanding-In-Chief, ENC

Vice Admiral Biswajit Dasgupta, AVSM, YSM, VSM assumed charge as the Flag Officer Commanding-in-Chief (FOC-in-C), Eastern Naval Command (ENC) at an impressive Ceremonial Parade held at the Naval Base here today, 01 December 2021. Vice Adm Dasgupta inspected the Ceremonial Guard and reviewed platoons of naval personnel drawn from various ships and establishments of the ENC. The ceremony was attended by all Flag Officers and Commanding Officers of ships, submarines and establishments.



Vice Adm Biswajit Dasgupta is an alumnus of National Defence Academy. He was commissioned into the Indian Navy in 1985 and is a specialist in Navigation and Direction. He is a graduate of Defence Services Command and Staff College, Bangladesh, Army War College, Mhow and National Defence College, New Delhi.

He has commanded four frontline ships including the missile corvettes INS Nishank, INS Karmuk, stealth frigate INS Tabar and the aircraft carrier INS Viraat.

He has held other operational, training and staff appointments such as Commander Work Up at Headquarters at Indian Naval Work up Team (Kochi), Directing Staff at the Defence Services Staff College (Wellington), Officer-in-Charge of the Navy's Navigation and Direction School, Naval Assistant to the Chief of the Naval Staff and Fleet Operations Officer of the Western Fleet.

On promotion to Flag Rank, he was appointed as Chief Staff Officer (Operations) at Headquarters, Western Naval Command at Mumbai. During 2017-18, he held command of the prestigious Eastern Fleet at Visakhapatnam and was thereafter appointed as Additional Director General at NCC Headquarters, New Delhi. On promotion to the rank of Vice Admiral, he was appointed as the Controller Personnel Services at Integrated Headquarters, Ministry of Defence (Navy) at New Delhi from Jun 2019 to Jun 2020.

The Flag Officer is a recipient of the Ati Vishisht Seva Medal and Vishisht Seva Medal for distinguished service. He was also awarded the Yudh Seva Medal for coordinating evacuation operations from strife-torn Yemen in 2015 under Operation Raahat.

Vice Adm Dasgupta was the Chief of Staff, Eastern Naval Command since Jun 2020 prior to being elevated as the Commander-in-Chief.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1776739>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 01 Dec 2021 12:40PM

वाइस एडमिरल बिस्वजीत दासगुप्ता एवीएसएम, वाईएसएम, वीएसएम ने पूर्वी कमान के फ्लैग ऑफिसर कमांडिंग इन चीफ के रूप में पदभार संभाला

वाइस एडमिरल बिस्वजीत दासगुप्ता, एवीएसएम, वाईएसएम, वीएसएम ने 1 दिसंबर को नौसेना बेस में आयोजित एक शानदार समारोह में पूर्वी नौसेना के ईएनसी के फ्लैग ऑफिसर कमांडिंग इन चीफ (एफओसी इन सी) के रूप में पदभार ग्रहण किया। वाइस एडमिरल दासगुप्ता ने सेरेमोनियल गार्ड का निरीक्षण किया और ईएनसी के विभिन्न जहाजों और प्रतिष्ठानों से आए नौसेना कर्मियों की प्लाटून की समीक्षा की। इस शानदार कार्यक्रम में जहाजों, पनडुब्बियों और अन्स संस्थानों के सभी फ्लैग ऑफिसर और कमांडिंग अधिकारियों ने भाग लिया।



वाइस एडमिरल बिस्वजीत दासगुप्ता राष्ट्रीय रक्षा अकादमी के पूर्व छात्र हैं। उन्हें 1985 में भारतीय नौसेना में कमीशन प्रदान किया गया था। वे नेविगेशन और डायरेक्शन के विशेषज्ञ हैं। वह डिफेंस सर्विसेज कमांड एंड स्टाफ कॉलेज, बांग्लादेश, आर्मी वॉर कॉलेज, महू और नेशनल डिफेंस कॉलेज, नई दिल्ली से स्नातक हैं।

उन्होंने प्रक्षेपास्र वाहक आईएनएस निशंक, आईएनएस करमुक, युद्धपोत (चुपके से लड़ाई करने वाले जहाज) आईएनएस ताबर और विमानवाहक पोत आईएनएस विराट सहित चार अग्रणी जहाजों की कमान संभाली है।

उन्होंने भारतीय नौसेना वर्क अप टीम (कोच्चि) मुख्यालय में सेवा देते हुए कमांडर वर्क अप जैसे अन्य परिचालन, प्रशिक्षण और कर्मचारियों की नियुक्तियां की हैं। वे वेलिंगटन के डिफेंस सर्विसेज स्टाफ कॉलेज (रक्षा सेवा स्टाफ कॉलेज) में कर्मचारियों को निर्देशित करने के अलावा नौसेना के नेविगेशन और डायरेक्शन स्कूल में प्रभारी अधिकारी रहे हैं। वह नौसेना प्रमुख के नौसेना सहायक और पश्चिमी बेड़े के बेड़े संचालन अधिकारी भी रहे हैं।

फ्लैग रैंक में पदोन्नति पर उन्हें मुंबई में पश्चिमी नौसेना कमान मुख्यालय में बतौर मुख्य कर्मचारी अधिकारी (संचालन) के रूप में नियुक्त किया गया। 2017 से 18 के बीच उन्होंने विशाखापत्तनम में प्रतिष्ठित पूर्वी बेड़े की कमान संभाली और उसके बाद उन्हें एनसीसी मुख्यालय नई दिल्ली में अतिरिक्त महानिदेशक के रूप में नियुक्त किया गया। वाइस एडमिरल के पद पर पदोन्नति से पहले तक जून 2019 से जून 2020 तक नई दिल्ली में एकीकृत मुख्यालय, रक्षा मंत्रालय (नौसेना) में कार्मिक सेवाओं के नियंत्रक रूप में अपना योगदान दिया।

फ्लैग ऑफिसर को विशिष्ट सेवा के लिए अति विशिष्ट सेवा पदक और विशिष्ट सेवा पदक से सम्मानित किया जा चुका है। उन्हें 2015 में संघर्षग्रस्त यमन में ऑपरेशन राहत के तहत निकासी कार्यों में बेहतर समन्वय के लिए युद्ध सेवा पदक से भी सम्मानित किया गया।

वाइस एडमिरल दासगुप्ता कमांडर इन चीफ के रूप में पदोन्नत होने से पहले जून 2020 से अब तक पूर्वी नौसेना कमान के चीफ ऑफ स्टाफ थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1776830>

THE TIMES OF INDIA

Thu, 02 Dec 2021

Army to sport new, lighter combat uniform from January 15

New Delhi: The 13-lakh strong Army is going in for a change in its combat uniform by adopting a new 'digital disruptive pattern', which is 'lighter, more climate-friendly and suitable' for the terrains in which the force operates.

The new camouflage fatigues, with a mix of colours from earthen to olive, will be showcased for the first time during the Army Day Parade on January 15. "The new combat dress has been finalised after extensive deliberations, which included consultations with the National Institute of Fashion Technology (NIFT), and a study of the military uniforms of other countries," said an officer on Wednesday.

The shirt will also not be tucked into the trouser in the new combat uniform. But it is as yet unclear whether the present shiny stars, badges and accoutrements, worn by officers on shoulders and collar tabs, will be blackened for better camouflage.

"The overall aim is to have a combat dress that is more comfortable in both summers and winters, durable and provides better camouflage. A new regular uniform to replace the present one is also in the works," said another officer.

The Navy, incidentally, had introduced a digital camouflage-pattern uniform last year to replace its earlier light-blue half-sleeve shirt and navy-blue trousers. The Army, Navy and IAF have different sets of uniforms to be worn on different occasions.

While officers get Rs 20,000 as the annual "basic dress allowance", which includes shoes, the other ranks get Rs 10,000. Any special clothing for high-altitude areas like the Siachen Glacier-Saltoro Ridge region, submarines and the like is provided by the government.

The change in the Army's combat dress also comes in the backdrop of the defence ministry repeatedly asking all ministries and states to not allow their uniformed personnel to wear camouflage fatigues akin to the force. "This unnecessarily leads to false alarms that the Army has been deployed for crowd control or other law and order duties," said an officer.

<https://timesofindia.indiatimes.com/india/army-to-sport-new-lighter-combat-uniform-from-january-15/articleshow/88038949.cms>



The aim is to have a uniform that is more comfortable in both summers and winters, is durable and provides better camouflage, said an officer

India, Russia to ink AK-203 deal during Putin visit next week

- ***Russian President Vladimir Putin will pay an official visit to New Delhi on 6 December for the 21st India-Russia Annual Summit with PM Narendra Modi***

In a major boost to India and Russia military ties, the two countries are scheduled to ink the deal on supplying 7.5 lakh AK-203 assault rifles on Monday during Russian President Vladimir Putin's visit to Delhi, news agency ANI reported citing government sources.

Russian President Vladimir Putin will pay an official visit to New Delhi on 6 December for the 21st India-Russia Annual Summit with PM Narendra Modi. The leaders will exchange views on topical issues on the international agenda, including joint work within the G20, BRICS and the Shanghai Cooperation Organization.



File Photo of Russian President Vladimir Putin (Reuters)

All necessary clearances have been done including the final approval from the Cabinet Committee on Security. It is scheduled to be inked during the Russian President's visit, sources told ANI.

The meeting between Putin and Modi is also likely to see the presentation of the S-400 air defence system to India which has already started arriving in India in parts, sources said.

Work is also in progress between both sides on the Igla shoulder-fired air defence system which has been in the making for last many years now.

The Russian designed AK-203 will be made in a factory in Amethi, Uttar Pradesh.

The deal had been agreed upon between the two sides a few years ago and now the last major issue would be resolving the issues on the transfer of technology, they said.

Of the 7.5 lakh rifles to be acquired by the Indian Army, the first 70,000 will include Russian made components as the transfer of technology slowly happens.

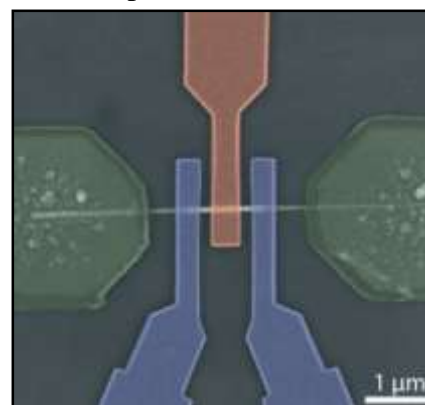
These will be delivered to the army 32 months after the production process begins.

<https://www.livemint.com/news/india/india-russia-to-ink-ak-203-deal-during-putin-visit-next-week-11638373220678.html>

Researchers develop nanometer-scale adaptive transistor

Normally, computer chips consist of electronic components that always do the same thing. In the future, however, more flexibility will be possible: New types of adaptive transistors can be switched in a flash, so that they can perform different logical tasks as needed. This fundamentally changes the possibilities of chip design and opens up completely new opportunities in the field of artificial intelligence, neural networks or even logic that works with more values than just 0 and 1.

In order to achieve this, scientists at TU Wien (Vienna) did not rely on the usual silicon technology, but on germanium. This was a success: The most flexible transistor in the world has now been produced using germanium. It has been presented in the journal *ACS Nano*. The special properties of germanium and the use of dedicated program gate electrodes made it possible to create a prototype for a new component that may usher in a new era of chip technology.



In addition to the usual control gate (red) there is also a program gate (blue). Credit: Vienna University of Technology

An additional control electrode changes everything

The transistor is the basis of every modern electronic device: it is a tiny component that either allows current to flow or blocks the flow of current—depending on whether or not an electrical voltage is applied to a control electrode. This makes it possible to build simple logic circuits but also memory storage.

How the electric charge is transported in the transistor depends on the material used: Either there are free-moving electrons that carry a negative charge, or an electron may be missing from individual atoms, so that this spot is positively charged. This is then referred to as "holes"—they can also be moved through the material.

In the novel transistor at TU Wien, both electrons and holes are manipulated simultaneously in a very special way: "We connect two electrodes with an extremely thin wire made of germanium, which is connected to metal on both sides with special, extremely clean interface. Above this germanium segment, we place a gate electrode like the ones found in conventional transistors. What is decisive is that our transistor also has another control electrode, which is placed on the interfaces between germanium and metal. It can dynamically program the function of the transistor," explains Dr. Masiar Sistani, who is a postdoctoral researcher in Prof. Walter Weber's team at the Institute for Solid State Electronics at TU Wien.

This construction makes it possible to control electrons and holes separately. "The fact that we use germanium is a decisive advantage," says Masiar Sistani. "This is because germanium has a very special electronic structure: when you apply voltage, the current flow initially increases, as you would expect. After a certain threshold, however, the current flow decreases again—this is called negative differential resistance. With the help of the control electrode, we can modulate at which voltage this threshold lies. This results in new degrees of freedom that we can use to give the transistor exactly the properties that we need at the moment."

In this way, for example, a NAND gate (a logic not-and gate) can be switched to a NOR gate (a logic neither-nor gate). "Until now, the intelligence of electronics has come simply from the interconnection of several transistors, each of which had only a fairly primitive functionality. In the future, this intelligence can be transferred to the adaptability of the new transistor itself," says Prof. Walter Weber. "Arithmetic operations, which previously required 160 transistors, are possible with 24 transistors due to this increased adaptability. In this way, the speed and energy efficiency of the circuits can also be significantly increased."

Prof. Weber's research group has only been working at TU Wien for about two years. Prof. Walter Weber has made an international name for himself with his work on novel, reconfigurable electronics. Dr. Masiar Sistani is an expert in the field of germanium electronics and has specialized in researching electronic transport phenomena. These two areas of expertise are a perfect match to make the adaptive germanium transistor possible. "Some details still need to be optimized, but with our first programmable germanium transistor we have proved that the basic idea really works. This is a decisive breakthrough for us," says Masiar Sistani.

Artificial intelligence

These new possibilities are particularly interesting for applications in the field of artificial intelligence: "Our human intelligence is based on dynamically changing circuits between nerve cells. With new adaptive transistors, it is now possible to change circuits directly on the chip in a targeted way," says Walter Weber. Multivalued logic can also be implemented in this way—i.e., circuits that work not only with 0 and 1, but with a larger number of possible states.

A rapid industrial application of this new technology is realistic: the materials used are already used in the semiconductor industry today, and no completely new manufacturing processes are necessary. In some respects, the technology would even be simpler than before: today, semiconductor materials are doped, i.e. enriched with individual foreign atoms. This is not necessary with the germanium-based transistor; pure germanium can be used.

"We don't want to completely replace the previous transistor technology with our new transistor, that would be presumptuous," says Masiar Sistani. "The new technology is more likely to be incorporated into computer chips as an add-on in the future. For certain applications, it will simply be more energy-efficient to rely on adaptive transistors."

More information: Masiar Sistani et al, Nanometer-Scale Ge-Based Adaptable Transistors Providing Programmable Negative Differential Resistance Enabling Multivalued Logic, *ACS Nano* (2021). [DOI: 10.1021/acsnano.1c06801](https://doi.org/10.1021/acsnano.1c06801)

Journal information: [ACS Nano](https://doi.org/10.1021/acsnano.1c06801)

<https://phys.org/news/2021-12-nanometer-scale-transistor.html>

Development of polyimide-mica nanocomposite film with high resistance to low-Earth-orbit environments

By Liu Jia

Polyimide (PI) composite films are widely used on the external surfaces of spacecraft to protect them from the adverse environments of low Earth orbit (LEO) due to their outstanding comprehensive performance. However, current PI composite films have inadequate mechanical properties and atomic oxygen (AO) resistance.

In a study published in *Advanced Materials*, a research team led by Prof. Yu Shuhong from University of Science and Technology of China (USTC) of the Chinese Academy of Sciences proposed a unique double-layer nacre-inspired structural design strategy, and fabricated a new PI-based nanocomposite film with greatly enhanced mechanical properties and AO resistance.

Inspired by the brick-and-mortar microstructure of natural nacre, researchers assembled mica nanosheets and PI into a double-layer nacre-inspired structure with a much higher density of mica in the top layer, which was achieved via a straightforward spray assisted assembly followed by a thermo-curing process.

By optimizing the component proportions and top layer thickness, the mechanical properties of the double-layer PI-Mica film were significantly enhanced. The tensile strength, Young's modulus, and surface hardness of the double-layer film were 45 percent, 100 percent, and 68 percent higher than those of pure PI films, respectively.

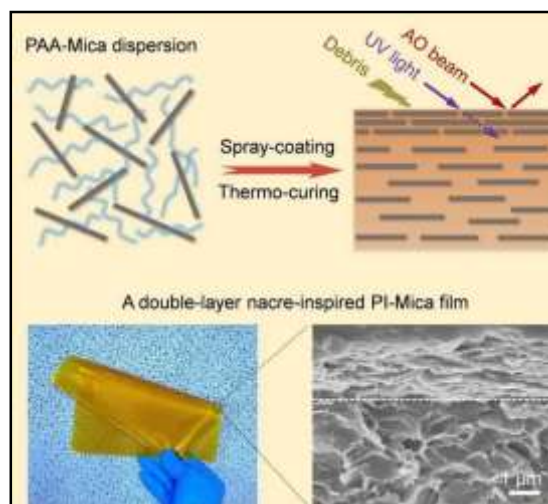
By virtue of the unique double-layer nacre-inspired structure and the intrinsic advantages of mica nanosheets, the obtained double-layer PI-Mica film achieved much better AO resistance, UV aging resistance (313 nm), and high-temperature stability (380 °C) than pure PI film. In addition, both AO fluence and erosion yield characteristics of the double-layer PI-Mica film are superior to previously reported PI-based composites. Thus, this double-layer PI-Mica film may serve as a new type of aerospace protective material, replacing existing PI-based composite films for LEO applications.

The unique double-layer nacre-inspired structural design provides a promising avenue for future design and fabrication of other high-performance bioinspired nanocomposites for diverse applications.

More information: Xiao-Feng Pan et al, Double-Layer Nacre-Inspired Polyimide-Mica Nanocomposite Films with Excellent Mechanical Stability for LEO Environmental Conditions, *Advanced Materials* (2021). DOI: [10.1002/adma.202105299](https://doi.org/10.1002/adma.202105299)

Journal information: *Advanced Materials*

<https://phys.org/news/2021-12-polyimide-mica-nanocomposite-high-resistance-low-earth-orbit.html>



Fabrication of the double-layer nacre-inspired film. Credit: Pan Xiaofeng et al.

Maths researchers hail breakthrough in applications of artificial intelligence

For the first time, computer scientists and mathematicians have used artificial intelligence to help prove or suggest new mathematical theorems in the complex fields of knot theory and representation theory.

The astonishing results have been published today in the pre-eminent scientific journal, *Nature*.

Professor Geordie Williamson is Director of the University of Sydney Mathematical Research Institute and one of the world's foremost mathematicians. As a co-author of the paper, he applied the power of Deep Mind's AI processes to explore conjectures in his field of speciality, representation theory.

His co-authors were from DeepMind—the team of computer scientists behind AlphaGo, the first computer program to successfully defeat a world champion in the game of Go in 2016.

Professor Williamson said: "Problems in mathematics are widely regarded as some of the most intellectually challenging problems out there.

"While mathematicians have used machine learning to assist in the analysis of complex data sets, this is the first time we have used computers to help us formulate conjectures or suggest possible lines of attack for unproven ideas in mathematics."

Proving mathematical conjectures

Professor Williamson is a globally recognized leader in representation theory, the branch of mathematics that explores higher dimensional space using linear algebra.

In 2018 he was elected the youngest living Fellow of the Royal Society in London, the world's oldest and arguably most prestigious scientific association.

"Working to prove or disprove longstanding conjectures in my field involves the consideration of, at times, infinite space and hugely complex sets of equations across multiple dimensions," Professor Williamson said.

While computers have long been used to generate data for experimental mathematics, the task of identifying interesting patterns has relied mainly on the intuition of the mathematicians themselves.

That has now changed.

Professor Williamson used DeepMind's AI to bring him close to proving an old conjecture about Kazhdan-Lusztig polynomials, which has been unsolved for 40 years. The conjectures concern deep symmetry in higher dimensional algebra.

Co-authors Professor Marc Lackeby and Professor András Juhász from the University of Oxford have taken the process a step further. They discovered a surprising connection between algebraic and geometric invariants of knots, establishing a completely new theorem in mathematics.

In knot theory, invariants are used to address the problem of distinguishing knots from each other. They also help mathematicians understand properties of knots and how this relates to other branches of mathematics.

While of profound interest in its own right, knot theory also has myriad applications in the physical sciences, from understanding DNA strands, fluid dynamics and the interplay of forces in the Sun's corona.



Professor Geordie Williamson FRS is a leading mathematician in the field of representation theory and Director of the University of Sydney Mathematical Research Institute. Credit: Louise Cooper/University of Sydney

Professor Juhász said: "Pure mathematicians work by formulating conjectures and proving these, resulting in theorems. But where do the conjectures come from?"

"We have demonstrated that, when guided by mathematical intuition, machine learning provides a powerful framework that can uncover interesting and provable conjectures in areas where a large amount of data is available, or where the objects are too large to study with classical methods."

Professor Lackeby said: "It has been fascinating to use machine learning to discover new and unexpected connections between different areas of mathematics. I believe that the work that we have done in Oxford and in Sydney in collaboration with DeepMind demonstrates that machine learning can be a genuinely useful tool in mathematical research."

Lead author from DeepMind, Dr. Alex Davies, said: "We think AI techniques are already sufficiently advanced to have an impact in accelerating scientific progress across many different disciplines. Pure maths is one example and we hope that this *Nature* paper can inspire other researchers to consider the potential for AI as a useful tool in the field."

Professor Williamson said: "AI is an extraordinary tool. This work is one of the first times it has demonstrated its usefulness for pure mathematicians, like me."

"Intuition can take us a long way, but AI can help us find connections the human mind might not always easily spot."

The authors hope that this work can serve as a model for deepening collaboration between fields of mathematics and artificial intelligence to achieve surprising results, leveraging the respective strengths of mathematics and machine learning.

"For me these findings remind us that intelligence is not a single variable, like an IQ number. Intelligence is best thought of as a multi-dimensional space with multiple axes: academic intelligence, emotional intelligence, social intelligence," Professor Williamson said.

"My hope is that AI can provide another axis of intelligence for us to work with, and that this new axis will deepen our understanding of the mathematical world."

More information: Alex Davies, Advancing mathematics by guiding human intuition with AI, *Nature* (2021). DOI: [10.1038/s41586-021-04086-x](https://doi.org/10.1038/s41586-021-04086-x). www.nature.com/articles/s41586-021-04086-x

Journal information: *Nature*
<https://phys.org/news/2021-12-maths-hail-breakthrough-applications-artificial.html>

Covid long-haulers may experience abnormal breathing, chronic fatigue: Study

Chronic fatigue syndrome is a medical condition that can often occur after a viral infection and cause fever, aching, and prolonged tiredness and depression

Washington: Many long-haul COVID-19 patients have chronic fatigue syndrome and other breathing issues months after their initial diagnosis, according to a study.

Chronic fatigue syndrome is a medical condition that can often occur after a viral infection and cause fever, aching, and prolonged tiredness and depression.

The study, published in the journal *JACC: Heart Failure*, is the first of its kind to identify a correlation between long-haul COVID-19 and chronic fatigue syndrome.

The researchers noted that many COVID-19 patients, some who were never hospitalised, have reported persistent symptoms after they recover from their initial COVID-19 diagnosis.

These patients have Post-Acute Sequelae of SARS-CoV-2 infection (PASC) but are more commonly referred to as “long-haulers,” the researchers said.

Severe fatigue, cognitive difficulty, unrefreshing sleep and muscle aches and pains have all been considered major symptoms for PASC patients, which is similar to what researchers saw after the 2005 SARS-CoV-1 epidemic, they said.

In that epidemic 27 per cent of patients fulfilled criteria for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) after four years.

In the latest study, researchers looked at 41 patients — 23 women and 18 men — with an age range of 23 to 69 years.

Patients were referred to the prospective study from pulmonologists or cardiologists and all had normal pulmonary function tests, chest X-rays, chest CT scans and echocardiograms.

Patients had been previously diagnosed with acute COVID-19 infection for a range of three to 15 months before undergoing the cardiopulmonary exercise test (CPET) and continued to experience unexplained shortness of breath.

“Recovery from acute COVID infection can be associated with residual organ damage,” said Donna M. Mancini, professor at the Icahn School of Medicine at Mount Sinai, US and lead author of the study.

“Many of these patients reported shortness of breath, and the cardiopulmonary exercise test is often used to determine its underlying cause,” Mancini said.

The researchers noted that CPET results demonstrate several abnormalities including reduced exercise capacity, excessive ventilatory response and abnormal breathing patterns which would impact their normal daily life activities.

Before exercising, patients underwent interviews to assess for ME/CFS.



The researchers noted that many COVID-19 patients, some who were never hospitalised, have reported persistent symptoms after they recover from their initial COVID-19 diagnosis. (Photo: Getty Images/Thinkstock)

They were asked to estimate how much in the previous six months had fatigue reduced their activity at work, in their personal life or in school.

The patients were also asked how often they had experienced sore throat, tender lymph nodes, headache, muscle aches, joint stiffness, unrefreshing sleep, difficulty concentrating or worsening of symptoms after mild exertion.

ME/CFS was considered present if at least one of the first criteria were rated as being impacted substantially and at least four symptoms in the second criteria were rated as moderate or greater. The study found that almost half (46 per cent) of patients met the criteria for ME/CFS.

Patients while connected to an electrocardiogram, pulse oximeter and blood pressure cuff, were seated on a stationary bicycle and used a disposable mouthpiece for measurement of expired gases and other ventilatory parameters.

After a brief rest period, the patients began exercises which increased in difficulty by 25 watts every three minutes. Peak oxygen consumption (VO₂), carbon dioxide (CO₂) production and ventilatory rate, and volume were measured.

Almost all the patients (88 per cent) exhibited abnormal breathing patterns referred to as dysfunctional breathing defined as rapid, shallow breathing, the researchers said.

Patients also had low CO₂ values at rest and with exercise, suggesting chronic hyperventilation, they said.

“These findings suggest that in a subgroup of long haulers, hyperventilation and/or dysfunctional breathing may underlie their symptoms. This is important as these abnormalities may be addressed with breathing exercises or ‘retraining,’” said Mancini.

The researchers acknowledged several limitations to their study. They noted that study was a small, single-centre observational research.

Also, a selection bias may have occurred as the researchers studied patients with predominantly unexplained dyspnea or shortness of breath.

<https://indianexpress.com/article/lifestyle/health/covid-long-haulers-may-experience-abnormal-breathing-chronic-fatigue-study-7649032/>

