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GEOPOLITICAL RISK ANALYSIS

Thu, 23 Sept 2021

India to test Agni-5 ICBM

By Can Eker

India will today test its nuclear-capable Agni-5 intercontinental ballistic missile.

During the test, the missile's MIRV capability—the weapon's ability to fire multiple warheads at different targets—will be evaluated.

Photo: PTI

The Agni-5 missile's 3,400 mi range of will be on full display, showcasing the Indian government's renewed emphasis on and further development in its defense industry. India's chief audience is its systemic rival and neighbor—Pakistan—with which it clashes over myriad issues.

Expect the missile launch to serve as a rallying cry for India's defense industry. Changes in India's foreign direct investment (FDI) last year are also likely to spur significant foreign investments in New Delhi's defense industry. India's wariness also stems from Pakistan's growing ties with China—which has regional strategies that vary from New Delhi's interests.

India and Pakistan's arms race will also gain momentum during the short-to medium term. In this realm, expect New Delhi to prioritize development of its K-6 submarine-launched ballistic missile which will likely be completed in the long-term. Both states will also continue conducting tests of their nuclear-capable weapons and other military equipment as a gesture of provocation. Thus, a mutual disarmament agreement is highly unlikely to occur during the long-term.

https://www.foreignbrief.com/daily-news/india-to-test-agni-5-icbm/

The EurAsian Times

Thu, 23 Sept 2021

Pakistan's Nemesis Su-30MKI Fighter Jets of Indian Air Force to hold mega drills in Kashmir

By Nitin J Ticku

The Su-30MKI is one of the most powerful fighter aircraft with the Indian Air Force. It was in October 2000, when India signed a Memorandum of Understanding (MoU) with Russia to start license production of the fighter jet at HAL's plant.

Prior to the MoU, these fighter jets were produced at Irkutsk Aircraft Production Association (now known as Irkut Corporation). The Sukhoi Su-30MKI incorporates an aerodynamic airframe made of titanium and high-intensity aluminum alloys.

An IAF Su-30MKI

The aircraft has a length of 21.9m, a wingspan of 14.7m, and a height of 6.4m. The maximum take-off weight of Su-30MKI is 38,800kg.

The Su-30MKI is now armed with the air-launched version of BrahMos supersonic cruise missile (jointly developed by India and Russia), which was successfully tested in November 2017.

The BrahMos can strike targets within a range of 290km. The IAF completed the successful integration of the cruise missile on the fighter, with the third live-firing of the missile from the aircraft held in December 2019.

India's Most Powerful Jets in Kashmir

The IAF is holding a mega airshow in the Kashmir Valley — a region Pakistan calls disputed and where both the nations have fought many wars, and skirmishes along the border are frequent.

Reports suggest that IAF is keen to motivate the youth of the tumultuous region to join the service. As part of the event, IAF's Sukhoi Su-30 MKI fighter jets among others will perform in the airshow.

The last IAF airshow in the region was held in 2008. No such event was held in the past decade due to constant turmoil in the Valley.

IAF officials have confirmed that the service is going to conduct an air show over the famous Dal Lake in Srinagar on September 26. Besides Sukhoi Su-30 MKI fighter jets, MiG-21 Bisons are going to be another major attraction at the event.

IAF's skydiving team 'Akash Ganga', Suryakiran Aerobatic and Display Team and paramotor flying will be conducting what is expected to be jaw-dropping maneuvers in the skies over Dal Lake, officials said.

The event, being jointly organized by the Air Force Station Srinagar and Jammu and Kashmir administration, is part of the ongoing celebrations, "Azadi ka Amrit Mahotsav" to commemorate the 75th anniversary of India's independence.

According to reports, the main theme of the exercise is "Give Wings to Your Dreams", aimed at motivating the youth across the valley to join the IAF as well as boosting tourism in the region.

The event will be flagged off by Jammu and Kashmir Lieutenant-Governor Manoj Sinha at the Sher-e-Kashmir International Conference Centre (SKICC) overlooking Dal Lake.

"The main aim of the airshow is to motivate the youth of the Valley to join the Indian Air Force and to promote tourism in the region", Divisional Commissioner, Kashmir, Pandurang K Pole said. The airshow will be attended by approximately 3000 school and college students

Su-30MKI Vs Pakistan Air Force

On February 26, 2019, the Pakistan Air Force (PAF) deployed around 24 fighter jets including F-16s and JF-17s, following India's airstrike on 'terror camps' in Balakot.

In response, the IAF scrambled eight fighter aircraft, including two Sukhoi-30 MKI, to intercept the Pakistani F16s, which had fired AIM-120 C5 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs).

The Su-30MKIs were the primary target for the F-16s, which were tasked to shoot down at least one Rusian-origin aircraft. Bringing down a Su-30MKI would have brought unprecedented recognition for the Pakistani pilots.

According to the veteran Air Force aviator Sameer Joshi, the PAF was of the belief that the loss of a Su-30MKI would effectually put the IAF on a backfoot and severely down the Indian morale.

Joshi said the eight F-16s were in two formations of 4 each. The north group of 4 F-16s engaged the Indian jets, which fired 3 AIM-120C AMRAAM missiles.

All the missiles missed their mark. The Sukhois pushed them back, while also picking up another group of 4 F-16s "and multiple inbound strike aircraft" from the southern formation.

This, in essence, meant that the Indian jets were massively outgunned by the PAF formation carrying more advanced BVR missiles and in sheer numbers. A fourth AMRAAM was fired by the south group.

By advanced mapping, it could be inferred that by that time the Su-30MKI jets were just 25-30 km away from the north group jets. This fourth AMRAAM was also evaded by the Sukhois.

Joshi mentions that the two Su-30MKIs, instead of retreating, counterattacked against the F-16s "ignoring the high-density BVR threat from the F-16s, in all probability breaching the AMRAAM MAR to press home the R27/77 attack 25-30 km from lead PAF jets in the North Group".

This meant that the things turned out to be the other way for the PAF, the Su-30s instead of returning dashed on to the F-16s to make them come under the R-27/77 missile range.

Interestingly, according to Joshi, the lead north group F-16 fighters, instead of attacking the incoming Sukhoi, went 'COLD' prematurely. Joshi concludes that the reason for the 10 out of 12 Pakistani bombs falling well out of the range of their intended targets was because of this unexpected counter attack by the IAF fighters.

Other aircraft were hurried to the location, including Mirage-2000 and MiG-21 Bison, which resulted in the famous F-16 and MiG-21 incident.

"The PAF jets clinically kept themselves safe from the IAF AAMs and their known engagement envelopes. The dash of the Sukhois was something, which may have taken the PAF by surprise, hence the various possibilities as enumerated above. Lessons for both sides from this BVR encounter," Joshi added.

https://eurasiantimes.com/pakistans-nemesis-su-30mki-fighter-jets-of-indian-air-force-to-hold-mega-drills-in-kashmir/

YO! VIZAG
CITY'S EXCLUSIVE MAGAZINE & PORTAL

Thu, 23 Sept 2021

Andhra University to launch solar thermal power project in the campus soon

Keeping up with the changing times, Andhra University in Vizag is all set to launch a solar thermal power project in the campus. The University's Vice-Chancellor, P.V.G.D. Prasad Reddy, was approached by a team of officers, led by New and Renewable Energy Development Corporation of Andhra Pradesh (NREDCAP) Chairman, K.K. Raju, on Tuesday to discuss the project.

Andhra University in Vizag to launch solar thermal power project in the campus soon

To make the maximum utilization of non-conventional sources of energy, it was discussed to establish a one MW solar thermal power project. This would be set up on a BOOT model, I.e., Build, Own, Operate and Transfer.

The solar thermal power project will use Australian technology. It would be set up in three areas of the varsity that would help cater to the electricity needs of the hostel messes and the auditoriums. By shifting to non-conventional energy sources, the University will be relieved of the burden of electricity bills.

The Chairman of Sunrise CSP India, Deepak Gadia, was also present at the meeting and explained the uses, and the consumption, of the solar thermal power plant. He also identified the three areas – Women Engineering College, AU Engineering College hostel complexes, and AU Convention Centre on Beach Road, for setting up and generating electricity.

It could be noted that the Defence Research and Development Organisation (DRDO), recently partnered with Andhra University to set up a Food Testing Lab (FTL), in Vizag. The Associate Director of the Mysore-based Defence Food Research Lab (DFRL), Dr R Kumar, visited the varsity and had an interaction with AU Vice-Chancellor. DFRL is an Indian defence laboratory of DRDO. They research food science and the development of convenience foods, preservation of foods, nutritional and biochemical evaluation, food safety, and food packaging.

https://www.yovizag.com/andhra-university-to-launch-solar-thermal-power-project-in-the-campus-soon/

COVID 19: DRDO's Contribution

नईदुनिया

Thu, 23 Sept 2021

आक्सीजन की कमी से किसी भी मरीज की जान नहीं जाएगी

कोरोना की तीसरी संभावित लहर सहित दूसरी बीमारियों से जूझ रहे कटघोरा के मरीजों और सड़क दुर्घटना में घायल हुए लोगों की जान बचाने के लिए राहत की बड़ी खबर आई है। कटघोरा विकासखण्ड मुख्यालय के सामुदायिक स्वास्थ्य केंद्र में अब 24 घंटे चलने वाला आक्सीजन प्लांट मरीजों के लिए चालू हो गया है।

कोरबा: कोरोना की तीसरी संभावित लहर सहित दूसरी बीमारियों से जूझ रहे कटघोरा के मरीजों और सड़क दुर्घटना में घायल हुए लोगों की जान बचाने के लिए राहत की बड़ी खबर आई है। कटघोरा विकासखण्ड मुख्यालय के सामुदायिक स्वास्थ्य केंद्र में अब 24 घंटे चलने वाला आक्सीजन प्लांट मरीजों के लिए चालू हो गया है। इस प्लांट की स्थापना सामुदायिक स्वास्थ्य केंद्र के परिसर में ही की गई है। यह यूनिट प्रेशर स्विंग एब्जारशन टेक्नोलाजी (पीएसए) पर आधारित है।

इस यूनिट में लगे उपकरण वायुमंडल की हवा को खीचंकर उसमें मौजूद आक्सीजन को कंसन्ट्रेट करते हैं। इस शुद्ध आक्सीजन को फिर पाइपलाइन के माध्यम से मरीजों तक पहुंचाया जाता है। कटघोरा के खंड चिकित्सा अधिकारी डा रूद्रपाल सिंह कंवर ने बताया कि डीआरडीओ की विकसित तकनीक पर आधारित इस आक्सीजन प्लांट की स्थापना में राष्ट्रीय राजमार्ग विकास प्राधिकरण का भी सहयोग है। इस प्लांट की क्षमता 250 लीटर प्रतिघंटा ऑक्सीजन उत्पादन की है। इसके साथ ही इस आक्सीजन को संयंत्र से जुड़े टैंक में स्टोरेज भी की जा सकता है। डा. रूद्रपाल ने बताया कि यह विकासखंड की पहली आक्सीजन यूनिट है। इसके व्यवस्थित संचालन के लिए स्थानीय मेडिकल स्टाफ को प्रशिक्षित भी किया गया है। इस प्लांट से सामुदायिक स्वास्थ्य केंद्र में अभी 20 बिस्तरों सहित प्रसव कक्ष और ऑपरेशन थियेटर में भी मरीजों की जान बचाने आक्सीजन आपूर्ति करने में सुविधा होगी। डा. कंवर ने बताया कि भविष्य में इस प्लांट से ही 30 और बिस्तरों तक आक्सीजन सप्लाई में बढ़ोत्तरी की जा सकेगी। डा. कंवर ने यह भी बताया कि अस्पताल में पहले से लगी लगभग 100 मीटर गैस पाइप लाइन के साथ लगभग 70 मीटर नई पाइप लाइन भी लगाई गई है ताकि मरीजों तक आसानी से उचित दबाव की आक्सीजन पहुंचाई जा सके। आक्सीजन प्लांट को लगातार चलाने के लिए नया डीजी सेट भी लगाया गया है।

दुर्घटना में घायल लोगों की भी बचेगी जिंदगी

कटघोरा निवासी राधिका डिक्सेना ने अस्पताल में आक्सीजन प्लांट शुरू हो जाने पर खुशी जाहिर करते हुए कहा है कि अब इस अस्पताल में आक्सीजन की कमी से किसी भी मरीज की जान नहीं जाएगी। डिलवरी के दौरान किसी भी आपात स्थिति में जच्चा-बच्चा को जरूरत पड़ने पर अब तत्काल आक्सीजन उपलब्ध हो जाएगी। राधिका ने कहा कि कटघोरा बिलासपुर-अंबिकापुर कोरबा हाइवे पर महत्वपूर्ण जगह है और इस हाइवे पर होने वाली सड़क दुर्घटनाओं के घायलों को भी सबसे पहले इसी अस्पताल में लाया जाता

है। अब आक्सीजन की सुविधा बढ़ जाने से ऐसे सड़क दुर्घटना में घायल लोगों की जिंदगी बचाने में भी इस अस्पताल का महत्व बढ़ जाएगा। अस्पताल में इलाज की सुविधाएं बढ़ने से लोगों में भी विश्वास बढ़ेगा।

बिलासपुर-रायपुर ले जाने की समस्या से भी छुटकारा

कटघोरा निवासी संतोष साहू ने कहा कि सीएचसी में प्लांट शुरू हो जाने से अब आक्सीजन की जरूरत वाले मरीजों को जिला अस्पताल या बिलासपुर-रायपुर ले जाने की समस्या से भी छुटकारा मिलेगा। ऐसे मरीजों के इलाज में आक्सीजन के कारण होने वाले खर्चे भी अब परिजनों को नहीं करने पड़ेंगे। इससे उनका समय और इलाज का अतिरिक्त खर्चा भी बचेगा। इसके साथ ही समय पर सही इलाज मिल जाने से मरीज की जान बचाना डाक्टरों के लिए भी आसान होगा।

https://www.naidunia.com/chhattisgarh/korba-devendra-7052316

अमर उजाला

Thu, 23 Sept 2021

बीएचयू अस्पताल में पीएम केयर फंड से लगेंगे दो ऑक्सीजन प्लांट

कोरोना की संभावित तीसरी लहर की आशंका को देख पीएम केयर फंड से बीएचयू अस्पताल में दो ऑक्सीजन प्लांट लगवाए जाएंगे। 1000-1000 लीटर प्रति मिनट (एलपीएम) क्षमता वाले प्लांट को लगाने और संचालन की व्यवस्था में डीआरडीओ भी सहयोग करेगा। एक एमएस ऑफिस के बगल में पहले से लगे ऑक्सीजन प्लांट वाली जगह पर लगेगा। दूसरे के लिए जगह फाइनल की जा रही है। एक प्लांट विश्वविद्यालय में आ गया है जबकि दूसरा जल्द आएगा।

बीएचयू में पीएम केयर्स फंड से दो ऑक्सीजन प्लांट तो लग चुके हैं। जल्द ही दो और लगाने का निर्णय शासन ने लिया है। सीएमओ डॉ. वीबी सिंह नोडल अधिकारी डॉ. अतुल कुमार सिंह के साथ निरीक्षण करने पहुंचे। बताया कि निरीक्षण के दौरान बीएचयू अस्पताल के प्रभारी एमएस प्रो. सौरभ सिंह भी मौजूद थे। उनसे बातचीत कर प्लांट के लिए चयनित जगह पर जल्द से जल्द काम शुरू कराने को कहा गया है। इसमें डीआरडीओ भी मदद करेगा। डीआरडीओ से पंकज त्रिपाठी ने भी प्लांट लगाने से जुड़ी जानकारी दी।

जिले को पीएम केयर्स फंड से मिल चुके हैं चार प्लांट

सीएमओ ने बताया कि बीएचयू सर सुंदर लाल अस्पताल, जिला महिला अस्पताल कबीरचौरा और बीएचयू ट्रामा सेंटर में पहले से लगाए गए हैं। इसके अलावा सर सुंदर लाल चिकित्सालय में ही पीएम केयर्स फंड से एक और प्लांट आ गया है। जल्द ही बीएचयू अस्पताल के बाल रोग विभाग के पास लगे प्लांट के साथ ही जिला महिला अस्पताल कबीरचौरा वाला प्लांट भी शुरू हो जाएगा।

https://www.amarujala.com/uttar-pradesh/varanasi/two-oxygen-plants-will-be-set-up-from-pm-care-fund-in-bhu-hospital-varanasi-news-vns613150476

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Wed, 22 Sept 2021 4:16PM

Mission deployed - INS Tabar

Towards enhancing military cooperation with friendly nations, Indian Naval Ship INS Tabar was mission-deployed in international waters for over three months from 13 June 21. During the deployment, she made 11 port calls in nine countries of Europe and Africa, traversing nearly 20,000 nautical miles. In all ports, the ship received a warm reception from local officials and was visited by several local dignitaries.

The ship's port visits saw various social and professional interactions conducted with the host countries. The ship also undertook twelve maritime partnership exercises with foreign navies at sea. These also included prominent bilateral exercises such as Exercise Konkan 21 with the Royal Navy and Exercise Indra-Navy 21 with the Russian Navy. These exercises involved wide ranging and multi-dimensional evolutions covering a diverse range of naval operations. The exercises are deemed to have enhanced interoperability among participating navies and increased the ease with which they can operate together to address shared maritime concerns and threats, if required. A few of these exercises were maiden engagements, such as that with the Royal Norwegian Navy, the Algerian Navy and the Sudanese Navy.

INS Tabar also participated in the 325th anniversary celebrations of the Russian Navy at St. Petersburg in Russia Admiral Karambir Singh, Chief of the Naval Staff, also attended the event.

Post successful completion of this Operational Deployment, the INS Tabar is now deployed for patrol in the Gulf of Aden and the Persian Gulf.

Commanded by Captain Mahesh Mangipudi, INS Tabar is a stealth frigate and has a crew of 300 personnel. Belonging to the Western Fleet, she had participated earlier in counter-piracy operations in the Gulf of Aden.

https://pib.gov.in/PressReleasePage.aspx?PRID=1756993

THE WEEK

Thu, 23 Sept 2021

Army Chief says forces ready to meet any security challenge

New Delhi: The Indian Army is continuously monitoring the situation in the country's neighbourhood and is ready to meet any security challenge that comes its way, Army Chief General M M Naravane said on Wednesday.

Addressing the AIMA National Management Convention, the Chief of Army Staff noted that the army is prepared to tackle even a dual-front war if the need arose.

He highlighted that the Indian Army was making rapid strides in changing itself from being a manpower intensive army to a technologically empowered one in order to keep an edge over opponents.

"We always continue to do a regional and environmental scan and based on that scan we do keep reviewing what threat perceptions could be. Based on those threat perceptions, we recalibrate our possible responses.

"That is always work in progress and we will always be prepared to meet whatsoever security challenges that come due to this changed situation," Gen Naravane stated.

He was responding to a query on how the Indian Army views the return of Taliban in Afghanistan and what it could mean for the country's security.

Asked about the Chinese incursions and how the Indian Army is changing its strategies and capabilities to face the situation, he noted: "As we go along, we will also be continuously monitoring the developments in various regions, whether it is land based, space based and based on these changes, we will continue to refine our operational strategies."

He pointed out that the nature of war remains constant and it is the character of war that keeps changing over a period of time.

"...the nature of war is constant, the nature of the war will always be to impose your will on the opponent...the methodology of imposing that will keep changing," Gen Naravane said.

To a query regarding the army's preparation for a multi-front war with China and Pakistan, he said: "All of us know that to our North and West we have unsettled borders and obviously with these unsettled borders, there are challenges that we face."

"But these challenges are not insurmountable and if the need arises, we will be always ready to tackle both these challenges at the same time," he said.

"Of course, there would always be a primary front and a secondary front and the focus would be on the primary front as we try to contain the secondary front. And that is the overall strategy as far as we are concerned. Act on one, contain the other, that is going to be the strategy," he said.

Gen Naravane further said with changing times, the Indian Army is also working on all aspects of future warfare.

"It has been our endeavour over the last many years to slowly and steadily change ourselves from a manpower intensive army to technologically empowered one. This change cannot happen overnight.

"This change obviously would happen when technological capacities improve, as and when sophisticated weapons keep getting inducted and once we train on them and graduate using these hi-tech weapons," he noted.

He further said: "So this is work in progress and I would like to ensure everyone that we are nowhere behind as far fighting in the newer domains of cyber, space and such aspects. We are on our way in incorporating all this big data, AI, quantum technologies. You name it and we are working on all these aspects and how to incorporate them into the characteristics of the war."

Gen Naravane also said the army has made rapid strides in honing skills in new technologies and has partnered with the industry and academia, including IITs, in this regard.

"Our officers are even attached with these institutions so that in no way should we lag behind. The industry, academia and the top notch technology institutions have (been) more than willing to come forward to meet our futuristic requirements. So we are well on the way. We are no way lagging behind," he stated.

(This story has not been edited by THE WEEK and is auto-generated from PTI)

https://www.theweek.in/wire-updates/business/2021/09/22/del72-biz-army-chief.html

INDIA TODAY

Thu, 23 Sept 2021

Covid-19 preparedness helped Indian Army tackle Chinese Army in Eastern Ladakh: Army Chief

General MM Naravane said that the Indian Army benefitted greatly during the Eastern Ladakh crisis with China due to the steps taken during the Covid-19 outbreak

By Manjeet Negi

New Delhi: Indian Army Chief General Manoj Mukund Naravane said that the Indian Army benefitted greatly during the Eastern Ladakh crisis with China due to the steps taken during the Covid-19 outbreak.

"The Indian Army was ready (due to anti-COVID measures) to meet all contingencies. As it so transpired, when the crisis developed along our borders in Eastern Ladakh, our decision for Force Preservation benefitted us, as we were in a high state of operational preparedness," Gen Naravane said while addressing a function.

He said as the situation warmed up along our Northern Borders, our jawans rose to the occasion.

"They had full faith in their leaders. They were willing to work through all the challenges and difficulties to achieve their objectives, all this within the available resources. This was possible because we had war-gamed the likely contingencies and possible options beforehand," the Army chief said.

Spontaneous actions were taken

General Naravane said force preservation does not mean that we are only taking care of ourselves. "The Indian Army prides itself as a citizens' Army, committed to the safety & security of our people. On our part, we proactively contributed to the Govt's efforts towards meeting this challenge.

"We were involved in the setting up of Quarantine Centres and Hospitals at various places across the length and breadth of the country in a record timeframe. The strengthening of medical infrastructure and oxygen supply chains was integrated into the overall national effort," he said.

Naravane said spontaneous actions were taken at all levels to meet the challenge without waiting for any formal orders. "While carrying out these tasks, our fatalities were far below the National Average. This can be attributed to the high standard of physical fitness and self-discipline, a testimony to the effectiveness of junior leadership."

The Army chief stated that even during the crisis, certain functions did not cease. "You could shut down schools and offices, factories and shopping centres, but you could not cease security. Our borders had to be protected, the soldiers had to discharge their duties."

Gen Naravane added that the Covid-19 also had "a silver lining for an Army of our size" coupled with the challenges of life and active borders. This crisis has been a defining moment.

"It forced us to introspect and improve our processes and reinvent our procedures. People on their own came to acknowledge how the power of technology can be harnessed and utilized. Old inhibitions were shed. As an organisation, it has made us more efficient," MM Naravane said.

https://www.indiatoday.in/india/story/covid-preparedness-helped-indian-army-tackle-chinese-army-1855939-2021-09-22

Hindustan Times

Thu, 23 Sept 2021

Predator drone on his mind, PM Modi to meet General Atomics CEO

Prime Minister Narendra Modi is meeting five heads of US global companies on September 23 separately with the objective of making India a key player in global supply chains and in the Indo-Pacific

By Shishir Gupta

New Delhi: In the backdrop of India acquiring 30 Predator drones from US for muscling up over the horizon military capability, Prime Minister Narendra Modi is meeting the head of armed drone manufacturer General Atomics along with four other top US company CEOs in Washington on September 23.

India plans to acquire 30 Predator drones in a proposed $3 billion deal.

According to sources based in Washington, PM Modi will be meeting all the four CEOs on one-to-one basis as each company they are heading are leaders in their respective fields. The heads of General Atomics, Qualcomm, semi-conductor major, BlackRock global investment company, First Solar, non-conventional energy leader, and Adobe, US leader in software.

It is understood that Apple CEO Tim Cook dropped out at the last moment due to health reasons as Covid numbers are climbing in the US.

It is quite evident from the line-up that PM Modi meetings with the CEOs are with the specific intention of India being a key part of global resilient chain, a military power which matches over the horizon capabilities in the Indo-Pacific and speed up non-conventional energy needs to go beyond the climate change commitments for climate justice.

While all the companies are global leaders in their own right, the meeting with General Atomics head acquires significance as Indian Navy is already operating two Predator MQ-9 unmanned aerial vehicles for building maritime domain awareness from Gulf of Aden to Lombok Straits in Indonesia.

With Indian Navy as the lead player, India has plans to acquire 30 Predator armed UAVs with each service getting 10 each for muscling its stand-off capabilities. The Predator can be armed with seven Hell-Fire air to surface missiles (ASMs) or laser guided bombs. The UAV operates at a ceiling of 50,000 feet and has an endurance of nearly 27 hours. It is a multi-mission aircraft with multi-mode radar for intelligence, surveillance, reconnaissance and targeting.

It is important for India to acquire armed drones as its own indigenous capability is limited with both Beijing and Islamabad operating Chinese made armed drones. Pakistan is also eyeing to acquire armed drones for Turkey, which now is a self-appointed leader of Sunni world and wants to bring back orthodox legacy of the bygone Ottoman Empire. The Turkish drones were used to

good effect in the Azerbaijan-Armenian conflict with Pakistani mercenaries operating against Armenia. With the Biden administration giving a green signal for India to acquire Predator drone, it is only a matter of time when the Indian Navy brings up the proposal before the Defence Acquisition Committee (DAC) for the process to take off.

https://www.hindustantimes.com/india-news/predator-drone-on-his-mind-pm-modi-to-meet-general-atomics-ceo-101632371040729.html

ThePrint

Thu, 23 Sept 2021

China's cyber warfare has grown on the back of civilian recruits

China's Ministry of State Security has established a sophisticated network of private entities that hire and train hackers to work for the Xi Jinping government

By Aadil Brar, Edited by Prashant

Cyber operations have become China's tool of choice to gain proprietary intellectual property and gather personal data worldwide.

In February 2021, malware originating from China was found in an Indian power grid. Experts have suggested the malware may have shut off the lights of Mumbai city at the height of the border stand-off in Ladakh.

The Ministry of State Security and the People's Liberation Army's (PLA) Strategic Support Force primarily handle China's cyber operations.

Representational image | Cyber crime | Pexels

The Strategic Support Force emerged from the PLA reorganisation in 2015. With the creation of this new, integrated force, China combined electronic warfare, information warfare and cyber operations. Under President Xi Jinping, though, it's the Ministry of State Security that acquired the power to wage cyber operations with the help of an army of civilian recruits.

The Ministry of State Security has in the past used open-source data hunting for zero-day exploits, which can grant access to a device from a remote location. Zero-day exploits are vulnerabilities in the software code, and exist across various electronic devices.

China's deep dive into cyber warfare

In 1999, two Chinese Air Force colonels identified the coming age of electronic warfare and cyberspace following the US' Iraq war. Qiao Liang and Wang Xiangsui's *Unrestricted Warfare* underscored the ability to wage warfare below a certain threshold of conflict. "The first rule of unrestricted warfare is that there are no rules, with nothing forbidden," said Qiao in an interview.

But since the publication of *Unrestricted Warfare*, China's military strategy has evolved. The 2015 China Military Strategy document called cyberspace "a new pillar of economic and social development and a new national security domain".

Pursuing cyber warfare isn't unique to the US or China, as all major powers have invested in offensive and defensive cyber capabilities. But China's swift improvement of capabilities has made experts across the world pay attention. The Microsoft Exchange Server hack — attributed to Chinese hackers — has revealed the capabilities that the Ministry of State Security and PLA have enhanced since the early 2000s. "China's appetite for America's private data has been one of the biggest open secrets of modern intelligence. Intelligence officials estimate that China has now stolen all the personal identifiable information of about 80% of Americans, and it has a good start

on collecting information on the remaining 20%," wrote American journalist Dina Temple-Raston following her investigation into the Microsoft hack for *National Public Radio* (NPR).

The UK, US and EU have accused the Hafnium group – with ties to the Chinese State – of hacking the Microsoft Exchange Server, which gave access to a vast trove of data.

Hacking on the back of civilian recruits

The US remains ahead of China in waging cyber operations, but China has slowly caught up with a civilian integration model. Institute of International and Strategic Studies has called China a "Tier 2" cyber power in its 2021 Cyber Capability and National Power assessment. The US remains the top cyber power.

According to reporting by *The New York Times* and other publications, China's Ministry of State Security has established a sophisticated network of private entities that hire and train hackers to work for the Xi Jinping government. The community of hackers has gathered information on US citizens from hacks such as Marriott hotel's customer database. The cyberespionage network has tried to steal Ebola vaccine data and secret technology from a self-driving car company.

The Ministry of State Security's office in Hainan set up a private entity called Hainan Xiandun Technology Development Ltd, to recruit fresh graduates of top Chinese universities with technology and linguistic skills. The US' Federal Bureau of Investigation (FBI) has indicted three officers of Hainan State Security Department in relation to Hainan Xiandun Technology Development's operations.

A 2013 recruitment advertisement by Hainan Xiandun said, "Since its establishment, the company has worked in the information security industry and has a wide customer base in the government, military, public security, telecommunications and finance". The advertisement asked for "information security technicians and interns" and suggested a salary range of 4,000 to 10,000 yuan per month ($618 to $1,546) during the probation period of three months. The recruits could get paid up to 15,000 yuan ($2,319) per month after their probation period. *The NYT* has reported salaries for certain technical roles between $1,200 to $3,000.

According to 2016 documents, Hainan Xiandun had a registered capital of 2 million RMB and the company's location was the Hainan University Library. The FBI believes that the company has since been disbanded, but continued to recruit up until 2019.

The recruits of Hainan Xiandun targeted aviation, defence, education, government, health care, biopharmaceutical and maritime companies in Austria, Cambodia, Canada, Germany, Indonesia, Malaysia, Norway, Saudi Arabia, South Africa, Switzerland, the UK, and the US.

A new protocol

China's estimated annual cost of intellectual property theft to the US economy is between $300 billion to $600 billion in the year.

Cyber threat assessment firm Recorded Future has linked the new push to cloak cyber operations behind civilian entities to China's Digital Silk Road Initiative. China wants to export its own global internet regulations by establishing the norms with the "new internet protocol" plan. For now, there are only a handful of countries, including Saudi Arabia, Iran and Russia, that have expressed interest in China's internet protocol. But China continues to push for the adoption of the new norms at various international technology forums.

Xi Jinping's recent decisions to establish regimes around personal data protection, including the regulatory actions against Didi Chuxing, are part of the strategy to reduce access by US operations to China's data.

The conflict at our physical borders has shaped 20th century geopolitics. China's advancing cyber capabilities have added another domain of conflict, which should become a part of public discourse.

(The author is a columnist and a freelance journalist. He was previously a China media journalist at the BBC World Service. He tweets @aadilbrar. Views are personal.

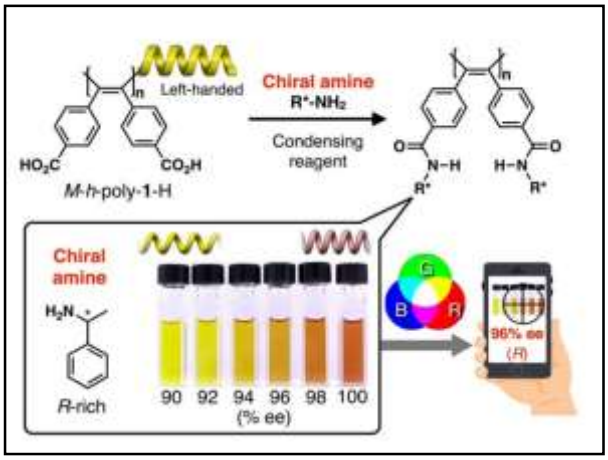
https://theprint.in/opinion/eye-on-china/chinas-cyber-warfare-has-grown-on-the-back-of-civilian-recruits/737651/

PHYS.ORG

Thu, 23 Sept 2021

Color coding molecular mirror images

Researchers at Kanazawa University report in *Science Advances* a new method for distinguishing between enantiomers, molecules that are mirror images of each other. The procedure, relevant for the pharmaceutical industry, involves the chemical reaction of target enantiomers with color indicator compounds consisting of one-handed helical polymers, leading to solutions showing different colors in specific solvents between the enantiomers.



Organic 'color indicator' compounds consisting of one-handed helical poly(diphenylacetylene)s possessing carboxy groups in the side chains (M–h-poly-1-H) for distinguishing between enantiomers of chiral amines and for determining their enantiomeric excess. Credit: Kanazawa University

Enantiomers are molecules that are each other's mirror image—like one's left and right hand. They are said to be chiral, chirality being the term for 'displaying handedness." Although a pair of enantiomers have totally the same chemical and physical properties, they often exhibit different physiological activity towards biological molecules. Being able to distinguish between enantiomers and detect chirality is important for pharmaceutical purposes—often, only one of two enantiomers acts as a drug. Now, Katsuhiro Maeda from Kanazawa University and colleagues have found a new method for determining the chirality of amines (organic molecules featuring amino groups ($-NH_2$)). The approach is based on reactions leading to solutions with different colors depending on the enantiomer present.

The method of Maeda and colleagues involves the use of special organic 'color indicator' molecules consisting of one-handed helical poly(diphenylacetylene)s possessing carboxy groups in the side chains (M–h-poly-1-H and P–h-poly-1-H), which are chiral themselves because they have so-called one-handed (right- or left-handed) helical structures (the "M' and the "P' refer to the left- and right-handed configurations, respectively). The scientists serendipitously discovered that a pair of enantiomers of particular chiral amines, when reacting with M–h-poly-1-H using a condensing reagent, displayed completely different colors in particular solvents (for example, in tetrahydrofuran-acetone, yellow and red, respectively) depending on their chirality, thereby enabling easy naked-eye differentiation between the enantiomers.

The researchers tested a whole set of other amines, as well as other nitrogen-containing organic molecules (specifically, amino alcohols and amino esters), also showing distinct colorings detectable by the naked eye. Some solutions had to be cooled down to -60 °C, however.

Computer simulations of the compounds together with various experimental analysis provided insights into the molecular mechanisms at play. They showed that for one enantiomer, intramolecular hydrogen bonding (attraction between hydrogen atoms within a molecule) does not happen, resulting in a stretched helical structure and a yellow solution, whereas it does for the other enantiomer, causing the molecular helix to contract, resulting in a red-colored solution.

The scientists used their finding to develop a procedure for obtaining the so-called enantiomeric excess (ee) of a mixture of chiral molecules, a measure of the enantiomeric 'purity': an ee of 0%

means an equal amount of left- and right-handed molecules, whereas an ee of 100% corresponds to the situation of only one type of enantiomer being present. For this, they quantified the color measurement by recording absorption spectra or by digital photography by converting to RGB (red, green, blue) values; these depend on a mixture's ee. Low-error determinations could be made that were in excellent agreement with measurements obtained by the current standard technique (called high-performance liquid chromatography).

Maeda and colleagues reckon that they can design other indicator molecules and expand the method. Quoting the researchers: "This should be applicable to the on-site, naked-eye determination of ee of various functional molecules and biologically relevant compounds."

More information: Katsuhiro Maeda et al, Helical springs as a color indicator for determining chirality and enantiomeric excess, *Science Advances* (2021). DOI: 10.1126/sciadv.abg5381

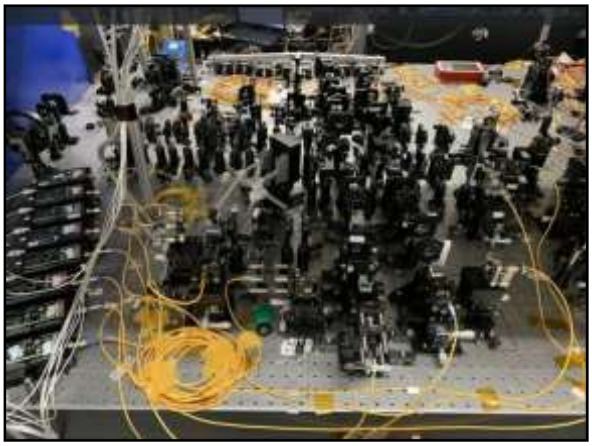
Journal information: *Science Advances*

https://phys.org/news/2021-09-coding-molecular-mirror-images.html

Thu, 23 Sept 2021

New quantum transmission protocol has higher data transmission rate, robustness against interference

Quantum cryptography is one of the most promising quantum technologies of our time: Exactly the same information is generated at two different locations, and the laws of quantum physics guarantee that no third party can intercept this information. This creates a code with which information can be perfectly encrypted.



Credit: Vienna University of Technology

The team of Prof. Marcus Huber from the Atomic Institute of TU Wien developed a new type of quantum cryptography protocol, which has now been tested in practice in cooperation with Chinese research groups: While up to now one normally used photons that can be in two different states, the situation here is more complicated: Eight different paths can be taken by each of the photons. As the team has now been able to show, this makes the generation of the quantum cryptographic key faster and also significantly more robust against interference. The results have now been published in the scientific journal *Physical Review Letters*.

Two states, two dimensions

"There are many different ways of using photons to transmit information," says Marcus Huber. "Often, experiments focus on their photons' polarization. For example, whether they oscillate horizontally or vertically—or whether they are in a quantum-mechanical superposition state in which, in a sense, they assume both states simultaneously. Similar to how you can describe a point on a two-dimensional plane with two coordinates, the state of the photon can be represented as a point in a two-dimensional space."

But a photon can also carry information independently of the direction of polarization. One can, for example, use the information about which path the photon is currently traveling on. This is exactly what has now been exploited: "A laser beam generates photon pairs in a special kind of

crystal. There are eight different points in the crystal where this can happen," explains Marcus Huber. Depending on the point at which the photon pair was created, each of the two photons can move along eight different paths—or along several paths at the same time, which is also permitted according to the laws of quantum theory.

These two photons can be directed to completely different places and analyzed there. One of the eight possibilities is measured, completely at random—but as the two photons are quantum-physically entangled, the same result is always obtained at both places. Whoever is standing at the first measuring device knows what another person is currently detecting at the second measuring device—and no one else in the universe can get hold of this information.

Eight states, eight dimensions

"The fact that we use eight possible paths here, and not two different polarization directions as it is usually the case, makes a big difference," says Marcus Huber. "The space of possible quantum states becomes much larger. The photon can no longer be described by a point in two dimensions, mathematically it now exists in eight dimensions."

This has several advantages: First, it allows more information to be generated: At 8307 bits per second and over 2.5 bits per photon pair, a new record has been set in entanglement-based quantum cryptography key generation. And secondly, it can be shown that this makes the process less susceptible to interference.

"With all quantum technologies, you have to deal with the problem of decoherence," says Marcus Huber. "No quantum system can be perfectly shielded from disturbances. But if it comes into contact with disturbances, then it can lose its quantum properties very easily: The quantum entanglements are destroyed." Higher-dimensional quantum states, however, are less likely to lose their entanglement even in the presence of disturbances.

Moreover, sophisticated quantum error-correction mechanisms can be used to compensate for the influence of external perturbations. "In the experiments, additional light was switched on in the laboratory to deliberately cause disturbances—and the protocol still worked," says Marcus Huber. "But only if we actually used eight different paths. We were able to show that with a mere two-dimensional encoding a cryptographic key can no longer be generated in this case."

In principle, it should be possible to improve the new, faster and more reliable quantum cryptography protocol further by using additional degrees of freedom or an even larger number of different paths. "However, this not only increases the space of possible states, it also becomes increasingly difficult at some point to read out the states correctly," says Marcus Huber. "We seem to have found a good compromise here, at least within the range of what is currently technically possible."

More information: Xiao-Min Hu et al, Pathways for Entanglement-Based Quantum Communication in the Face of High Noise, *Physical Review Letters* (2021). DOI: 10.1103/PhysRevLett.127.110505

Journal information: *Physical Review Letters*

https://phys.org/news/2021-09-quantum-transmission-protocol-higher-robustness.html

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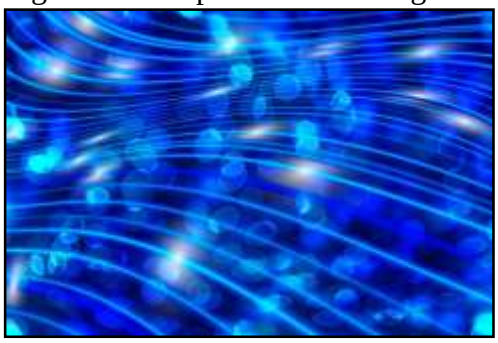
Thu, 23 Sept 2021

A new way to control qubits

By Tim Christie

A research team that includes two UO physicists have outlined new techniques for controlling the building blocks of quantum computing, a potentially significant step toward making such computers more accurate and useful.



Credit: CC0 Public Domain

Physicists David Allcock and David Wineland are founders of the new Oregon Ions Laboratory, which was recently set up in the basement of Willamette Hall. They are among 12 authors of a new paper, which is based on an experiment at the National Institute for Standards and Technology in Boulder, Colorado. Both scientists previously worked at the Colorado lab and continued to collaborate on the project after coming to the UO in 2018.

The techniques, described in the journal *Nature*, involve the use of trapped-ion quantum bits, or qubits, in quantum computing and simulations. They could lead to improvements in the operation of quantum computers, which still make too many computation errors to be effective tools, the physicists said.

The problem with quantum computers is that their logic gates—the tools used to perform basic logic functions in computing—"are really bad," Allcock said.

"They fail about 1 percent of the time," he said. "You can do about 100 (operations), then you get garbage out."

Wineland added, "The whole field is in a stage now, because of errors that exist, that we can't do lengthy calculations or simulations of practical value on our machines."

The goal is to get to 10,000 operations without error and then add layers of checks to fix the errors as they happen, he said.

"We want to get to that point," Allcock said. "Then you can use quantum computers for something useful. Right now they're just toys."

Wineland said trapped ions are like a bowl of marbles that have certain magnetic properties. Physicists can apply forces to the ions with different methods, including lasers, Allcock said. But lasers are expensive and complex machines, whereas making logic gates using magnetic forces is cheaper and more practical because they can be generated directly with integrated circuits, he said.

"What we did here is show these techniques work as well as anyone has done logic gates before," he said.

Google and IBM are among the commercial enterprises that have armies of engineers working on such problems, while academic physicists are trying to show there are better, more basic techniques for solving them.

"We've shown you can do it in a technically simpler way," he said.

If physicists and engineers can make quantum computers reliable and able to operate with large enough capacity, they could simulate other systems, Wineland said. For example, a quantum computer could simulate the action of a molecule used in drug therapy without having to synthesize it in a lab. "There are some very practical, useful outcomes," Wineland said. "We're just scratching the surface."

More information: Srinivas, R. et al. High-fidelity laser-free universal control of trapped ion qubits. *Nature* (2021). doi.org/10.1038/s41586-021-03809-4

Journal information: *Nature*

https://phys.org/news/2021-09-qubits.html

The Indian EXPRESS

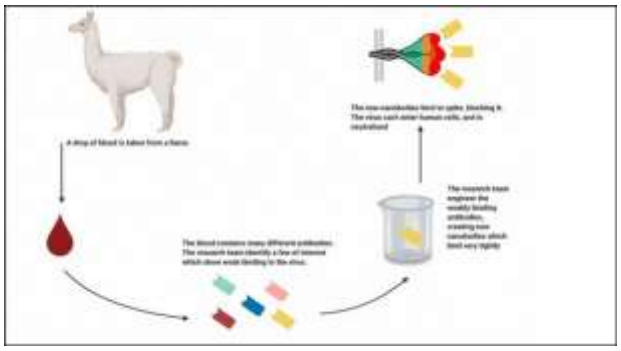
Thu, 23 Sept 2021

Nanobodies from llamas can potentially treat COVID-19: study

The team found three nanobody chains were able to neutralise both the original variants of the SARS-CoV-2 virus and the Alpha variant. A fourth nanobody chain was able to neutralise the Beta variant

London: A simple nasal spray of tiny antibodies produced by llamas could provide a new frontline treatment against the coronavirus that causes COVID-19, according to a study.

Researchers at the Rosalind Franklin Institute in the UK found that nanobodies — a smaller, simple form of antibody — can effectively target the SARS-CoV-2 virus. The study, published in the journal Nature Communications, shows that short chains of the molecules, which can be produced in large quantities in the laboratory, significantly reduced signs of the COVID-19 disease when administered to infected animal models.



The research team was able to generate the nanobodies by injecting a portion of the SARS-CoV-2 spike protein into a llama called Fifi (www.rfi.ac.uk)

The nanobodies, which bind tightly to the SARS-CoV-2 virus, neutralising it in cell culture, could provide a cheaper and easier to use alternative to human antibodies taken from patients who have recovered from COVID-19, the researchers said. Human antibodies have been a key treatment for serious COVID-19 cases during the pandemic, but typically need to be administered by infusion through a needle in the hospital, they said.

"Nanobodies have a number of advantages over human antibodies," said Professor Ray Owens, from Rosalind Franklin Institute and lead author of the research. "They are cheaper to produce and can be delivered directly to the airways through a nebuliser or nasal spray, so can be self-administered at home rather than needing an injection," Owens said.

This could have benefits in terms of ease of use by patients but it also gets the treatment directly to the site of infection in the respiratory tract.

The team was able to generate the nanobodies by injecting a portion of the SARS-CoV-2 spike protein into a llama called Fifi, who is part of the antibody production facility at the University of Reading in the UK.

The spike protein is found on the outside of the virus and is responsible for binding to human cells so it can infect them. Although the injections did not make Fifi sick, it triggered her immune system to fight off the virus protein by generating nanobodies against it.

A small blood sample was then taken from the llama and the researchers were able to purify four nanobodies capable of binding to the SARS-CoV-2 virus. The nanobodies were then combined together into chains of three to increase their ability to bind to the virus. These were then produced in cells in the laboratory.

The team, which included scientists at the University of Liverpool, University of Oxford and Public Health England, found three nanobody chains were able to neutralise both the original

variants of the SARS-CoV-2 virus and the Alpha variant that was first identified in Kent, UK. A fourth nanobody chain was able to neutralise the Beta variant first identified in South Africa.

When one of the nanobody chains were administered to hamsters infected with SARS-CoV-2, the animals showed a marked reduction in disease, losing far less weight after seven days than those who remained untreated. Hamsters that received the nanobody treatment also had a lower viral load in their lungs and airways after seven days than untreated animals, according to the researchers.

"Because we can see every atom of the nanobody bound to the spike, we understand what makes these agents so special," said Professor James Naismith, Director of the Rosalind Franklin Institute. The researchers noted that while vaccines have proven extraordinarily successful, not everyone responds to vaccination and immunity can wane in individuals at different times.

"Having medications that can treat the virus is still going to be very important, particularly as not all of the world is being vaccinated at the same speed and there remains a risk of new variants capable of bypassing vaccine immunity emerging," said Naismith. "Successful and approved, nanobodies could provide an important treatment around the world as they are easier to produce than human antibodies and don't need to be stored in cold storage facilities," he added.

https://indianexpress.com/article/technology/science/nanobodies-llamas-potentially-treat-covid-19-study-7527737/