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# समाचार पत्रों से चयित अंश
# Newspapers Clippings

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# Defence News

## Defence Strategic: National/International

Press Information Bureau
Government of India

**Ministry of Defence**

***Wed, 09 Feb 2022 8:19PM***

# Indian Army implements Radio Frequency Identification (RFID) of ammunition stock

The Indian Army commenced implementation of Radio Frequency Identification (RFID) tagging of its ammunition inventory today. The first consignment of RFID tagged ammunition, comprising three lots of 5.56mm ammunition was despatched from Ammunition Factory Khadki to Central Ammunition Depot (CAD) Pulgaon. The event was flagged off by the Director General Ordnance Services.

The RFID implementation has been steered by the Ordnance Services Directorate of the Indian Army, in conjunction with Munitions India Limited (MIL), Pune, the newly created entity formed post corporatisation of the Ordnance Factories Board (OFB).

The RFID tagging is in conformity with global standards in consultation with GS-1 India, a Global Standards organisation set up by the Ministry of Commerce and Industry. The RFID tags will be interpreted and used for assets tracking by the Enterprise Resource Application run by the Computerised Inventory Control Group (CICG) of the Ordnance Services Directorate.

The implementation of the RFID solution for ammunition asset visibility will transform management of ammunition and bring in a quantum jump in ammunition lot management and tracking capability. The endeavour will make ammunition storage and use by soldiers safer and provide enhanced satisfaction to the field Army. The implementation shall lead to increased efficiency in all technical activities carried out in Ammunition Depots and reduce inventory carrying costs.

*https://pib.gov.in/PressReleasePage.aspx?PRID=1797008*

The Indian EXPRESS

*Thu, 10 Feb 2022*

# In talks with India on two Dornier aircraft: Sri Lanka FM

***Peiris, who assumed office in August 2021, said relations between India and Sri Lanka had reached a "high point". India's concerns about China, which he said had no "rational basis", had been "consigned to the past".***

***By Nirupama Subramanian***

New Delhi: New Delhi and Colombo are discussing a proposal for the supply of two Dornier aircraft for the Sri Lankan military.

**The Dornier is a twin-engine multi-purpose aircraft, used by the Indian Navy and Coast Guard for maritime surveillance. It is also used by the Indian Air Force.**

In an interview to The Indian Express, Sri Lanka's Foreign Minister G L Peiris, who met External Affairs Minister S Jaishankar and National Security Advisor Ajit K Doval in New Delhi, said: "There is a proposal for the purchase of two Dornier aircraft. There is no finality, nothing has been agreed upon. There are proposals and counter proposals, and it is one of the matters under discussion."

He said one of the matters discussed during his visit was the upcoming UN Human Rights Council session, where Sri Lanka has been repeatedly hauled up for falling back on its 2015 commitments to address rights violations towards post-war national reconciliation.

His visit comes weeks after India provided an economic lifeline to Colombo that includes a $500-million revolving credit line from Exim Bank of India, a $1-bn credit line for food and pharmaceuticals, a deferral on the settlement of $515 million with the Asian Clearing Union, and a currency swap facility of $400 million.

There was no discussion about the implementation of the 13th Amendment in his meetings, Peiris said. Last month, Sri Lankan Tamil parliamentarians had written to Prime Minister Narendra Modi, seeking India's assistance in the implementation of this constitutional provision for devolution of powers that was included during India's 1987 intervention.

Peiris, who assumed office in August 2021, said relations between India and Sri Lanka had reached a "high point". India's concerns about China, which he said had no "rational basis", had been "consigned to the past". However, he flagged the fishermen's issue between the two countries as "the one flashpoint", requiring "urgent attention".

He said Sri Lanka and India were now seeking to "transform the character of the relationship, elevating it from a transactional level to strategic partnership". One of the main elements of this, he said, would be through "closer integration of the economy of India with that of Sri Lanka" in sectors such as ports, energy, tourism and hospitality, and pharmaceuticals.

The two sides, he said, were planning a joint working group during the visit by Jaishankar in the second half of March, that would include the two foreign ministers, the two fisheries ministers, and possibly some representation from Tamil Nadu.

Indian official sources confirmed that the two sides were in "very early" stage discussions on the supply of the two Dornier aircraft.

The Dornier is a twin-engine multi-purpose aircraft, used by the Indian Navy and Coast Guard for maritime surveillance. It is also used by the Indian Air Force. It is manufactured by Hindustan Aeronautics Ltd under licence from Swiss company RUAG, and is a showpiece of the government's "Make In India" programme.

The proposal for India to transfer a maritime surveillance aircraft to Sri Lanka has existed for four years, but with the chill in relations in the recent past, the matter was never seriously discussed.

The Dornier aircraft were among 23 from the IAF fleet that took part in a flypast and aerobatics display during the Sri Lankan Air Force's 70th anniversary in March 2021. At that time, the Indian High Commission said Sri Lanka was "Priority One" for India in the defence sphere.

Peiris said his government and New Delhi were looking to finalise more immediately a memorandum of understanding on an Indian $15-million fund for the refurbishment of Buddhist temples, and another agreement on collaboration between the Sushma Swaraj Institute of Foreign Service and the Colombo-based Bandaranaike International Diplomatic Training Institute. Another proposal under discussion is for India to supply a 4,000-metric tonne floating dock.

Sri Lanka is "hoping", Peiris said, that Prime Minister Modi will be able to attend in person the BIMSTEC summit which it is hosting this year as the chair of the grouping. The summit is to be held in the hybrid format.

"There's so much that has happened during the last few months that there could be a real substance to that visit," he said.

The decision on whether to invite the leader of the Myanmar junta that seized power in a coup last year would have to be "collegial", and Sri Lanka would consult all other members of the regional grouping including Bangladesh and Thailand.

Peiris said Sri Lanka was "in close touch" with India on the upcoming UNHRC session, at which Commissioner Michelle Bachelet is scheduled to present a second draft report on Sri Lanka. The first, presented last year, was a searing criticism of Sri Lanka's failure to address post-war issues, and the emergence of new challenges such as the marginalisation of the Muslim minority along with the Tamils.

"India is very much aware of all the progress that has been made in the recent past, particularly with regard to the work which has been done on the ground by the so called local mechanisms, such as the Office on Missing Persons, Office for Reparations, Office for National Unity and Reconciliation, the Sustainable Development Goals 16 Council and the Human Rights Commission of Sri Lanka," he said.

In November 2019, Sri Lanka withdrew from the co-sponsorship of a 2015 UNHRC resolution committing it to undertake several steps towards addressing ethnic reconciliation, including through justice for rights violations, tracing missing persons and reparations to the Tamil community.

Peiris said the resolution pitted Sri Lanka against its own armed forces, and that is why President Gotabaya Rajapaksa withdrew from its co-sponsorship. But, he said, there were steps that Sri Lanka was taking on its own, including reform of the Prevention of Terrorism Act. He described as "unfair" the criticism within Sri Lanka that the reforms were insufficient.

Earlier this month, Sri Lanka released a Muslim lawyer controversially arrested under the PTA after the 2019 Easter bombings. Peiris dismissed suggestions that these steps were being taken as Colombo was worried about punitive action by the European Union like withdrawing preferential tariffs under the Europe Generalised System of Preferences Plus scheme for Sri Lankan exports.

He said his government was confident that this would not happen, but in the "unlikely" scenario that it would be withdrawn, it would hurt the most vulnerable sections of Sri Lanka's people, including women in the garment industry and fishing communities.

"So if you take it away, it is not a punitive measure against the government, it is a punitive measure directed against the poorer sections of the Sri Lankan community, least able to bear that added burden. It simply makes no sense," he said.

*https://indianexpress.com/article/india/in-talks-with-india-two-dornier-aircraft-sri-lanka-fm-7764946/*

NEWS 18

*Thu, 10 Feb 2022*

# Defence diary: Modi Govt must use extra time to tie loose ends before appointing Gen Rawat's successor

***Many key aspects, such as defence policy, require greater clarity from the government. Additionally, roles and seniority of all secretaries in defence ministry should be defined for lesser friction in civil-military ties.***

***By Amrita Nayak Dutta***

It's exactly two months since India's first Chief of Defence Staff (CDS) General Bipin Rawat died in a tragic helicopter crash near Tamil Nadu's Coonoor, along with his wife and 12 other Armed Forces personnel.

**Chief of Defence Staff (CDS) General Bipin Rawat was killed in a helicopter crash in Tamil Nadu on December 8. (PTI File)**

Sixty days have gone by post the accident on December 8 and the government seems to be in no rush to appoint Gen Rawat's successor, even as whispers in the power corridors suggest a decision on this front by April this year.

But in the interim, even as rumour mills flow to throw new names at a clueless audience waiting to guess the next CDS, the government should first look at tying some loose ends and put out certain key aspects in black and white before taking a call on the next CDS. And doing this seems just prudent with the extra time the government is taking to decide on a final name for the post. But before getting into what exactly they are, let's quickly glance at this timeline.

**The chronology**

That India will have a CDS was announced by Prime Minister Narendra Modi from the ramparts of the Red Fort on August 15, 2019.

But what followed in the next few months was a heady mix of suspense and confusion; suspense about who would be made the first CDS of the country among the spotlighted contenders. Confusion about what exactly would be the CDS's charter and seniority in what was an established defence architecture, with defined work cut out for the three service chiefs and the union defence secretary.

There was some clarity when the government announced Gen Rawat as India's first CDS, around the time he was to retire as the Indian Army chief, after a successful tenure. But newer questions cropped up as well.

Many of them still do not have a definitive answer, irrespective of the government's amendments to the Government of India (Allocation of Business) Rules, 1961, for the defence ministry, which transferred some subjects of the defence secretary-headed Department of Defence (DoD) to the newly carved CDS-headed Affairs (DMA) but also introduced new subjects for the former.

**Change of course**

For instance, powers of revenue procurements rest with the DMA, while capital procurements and defence budget are a subject of the DoD. But in the backdrop of budgetary constraints, the CDS has to carry out inter-services prioritisation on major big-ticket capital procurements.

The government should look at strengthening the Acquisition Wing of DoD to speed up the conclusion of major contracts, and as the DMA evolves, it can be delegated more powers to modernise the Armed Forces.

Another critical area that demands clarity is defence policy — a subject formally introduced in the 2019 amended Allocation of Business Rules and put under the DoD.

Defence policy, in its current vague and undefined form, can practically govern everything — from procurement to research to the personnel matters of the Armed Forces.

For example, the updated version of the defence procurement manual — the guiding book governing all revenue procurements — had been finalised by the DMA, but is undergoing fresh rounds of vetting by the DoD since defence policy comes under it.

It is high time that instead of leaving something as vast as defence policy undefined, the government provides greater clarity to it before it appoints the next CDS.

This could entail several layers. Ideally, every department, whether it is defence research or DMA, should be solely responsible for policies on issues that are directly related to their department.

Certain policies which may have a bearing on more than one subject which are governed by more than one department in the defence ministry can be put under the DoD for a neutral and rounded view.

**Defining seniority for better civil-military relations**

The last and a critical aspect which the government must look into, before appointing the CDS, is to define in clear terms the first-among-equals among all secretaries in the defence ministry.

The government did not make the CDS a five-star rank. That would have made him senior to the cabinet secretary of India, who's the senior-most bureaucrat of the country.

However, the CDS is the chairman of the Chiefs of Staff Committee, which effectively makes him first-among-equals among the service chiefs, who are four-star military officers and senior to all secretaries heading various departments in defence ministry. But the CDS is also the secretary of DMA, which is one of the departments of the ministry.

While it is understandable that the structure of DMA will further evolve and concretise in the coming years, defining the exact seniority at this point will go quite some way in resolving any civil-military power tussle that may arise in the defence ministry.

What might be added to this is to open up senior bureaucratic positions in DMA to the civil side and those in other defence ministry departments to the military side to meet a defined ratio between the two sides.

The government had, in the past, tasked other departments in the defence ministry to handhold the DMA so that it can produce optimal results of the tasks which it has been allocated under the amended rules.

While the CDS was actively involved in establishing jointness among the Armed Forces and in paving the way for the creation of theatre commands, the DMA was vested with heavy responsibilities under the amended rules, such as the Armed Forces of the union, the Integrated Defence Headquarters of the Defence Ministry, the Territorial Army and works relating to the three services.

It's high time the government sets a defined deadline for this handholding exercise so that the DMA, under the new CDS, can achieve the maximum of the tasks allocated.

But this again rests on lesser friction in civil-military relations, which in turn rests on the government who should provide greater clarity on the roles and seniority of all positions involved.

*https://www.news18.com/news/india/defence-diary-modi-govt-must-use-extra-time-to-tie-loose-ends-before-appointing-gen-rawats-successor-4751774.html*

THE HINDU

*Thu, 10 Feb 2022*

# Jaishankar heads for Quad meet with vaccines, tech, China on agenda

***The MEA said four Foreign Ministers will "exchange views on regional strategic issues given their shared vision of a free, open and inclusive Indo-Pacific region."***

***By Ananth Krishnan***

Hong Kong: External Affairs Minister S. Jaishankar will begin a visit to Australia on Thursday and attend a meeting of the Foreign Ministers of the Quad (India, Australia, United States, Japan), which is expected to discuss cooperation on vaccines, technology and regional security issues including related to China.

**External Affairs Minister S. Jaishankar. | Photo Credit: Reuters**

The Ministry of External Affairs (MEA) said Friday's Quad meeting, during Mr. Jaishankar's first visit to Australia as EAM, will see the four ministers "exchange views on regional strategic issues given their shared vision of a free, open and inclusive Indo-Pacific region." "The Ministers will review ongoing Quad cooperation and build on the positive and constructive agenda announced by the Leaders at the two Summits in 2021, to address contemporary challenges such as the COVID pandemic, supply chains, critical technologies, climate change, infrastructure etc," the MEA said.

In Australia, Mr. Jaishankar will also hold a dialogue with his Australian counterpart Marise Payne. The visit will be followed by a trip to the Philippines on February 13. India and the Philippines last month signed a landmark $375 million deal for the supply of the BrahMos supersonic cruise missile. The MEA said the visits would "impart further momentum to bilateral relations with our key partners in the Indo-Pacific, Australia, and the Philippines, which is also a leading member of ASEAN."

While the MEA statement did not mention China, U.S. officials said ahead of the meeting that the Quad would discuss "challenges that China poses".

"The Quad is an informal grouping of likeminded democracies who share many interests, principles, and values vis-à-vis the kind of region that we want to live in – a region based on a rules-based order in which all countries big and small follow the rules, a region in which disputes are resolved peacefully, and in which countries have the freedom to make their own sovereign choices," Assistant Secretary of State for East Asian and Pacific Affairs Daniel Kritenbrink said, adding that the four Foreign Ministers "will discuss challenges to that order and to those values" and "part of that discussion will relate to the challenges that China poses to those values and to that rules-based order in a number of sectors."

China reacted sharply to that statement on Wednesday, with Foreign Ministry spokesperson Zhao Lijian saying the U.S. "despite its ruined democratic brand still forces other countries to accept its democratic standards and cobbles together cliques by drawing the ideological line." Of the Quad, he said China "hopes the U.S. and other countries concerned will grasp the trend of the times, adopt a proper mindset and discard the Cold War mentality" and "contribute more to regional peace, stability and prosperity instead of putting a strain on the relations between regional countries."

The Quad Foreign Ministers meet is expected to lay the groundwork for the second Quad leaders summit likely to take place this summer. In September last year, the four leaders, meeting in Washington for the first time, laid out an ambitious agenda for the grouping, from cooperating on vaccines to regional infrastructure and critical technologies such as 5G.

The four countries pledged to donate more than 1.2 billion COVID-19 vaccine doses globally and produce at least 1 billion doses by the end of 2022. In March last year, the four countries also set up a new critical and emerging technologies group focusing on 5G, technical standards and technology supply chains. Also in the works is a joint initiative to "identify vulnerabilities" and "bolster supply-chain security" for semiconductors.

*https://www.thehindu.com/news/national/jaishankar-to-visit-australia-philippines-from-feb-10-15-mea/article38401407.ece*

***Thu, 10 Feb 2022***

# The Quantum future of Naval Warfare

***By Lieutenant (junior grade) Lucian Rombado, U.S. Navy***

***[The United States] was ahead for so long, and in so many areas, that it hasn't really had to do much thinking about what it means to be behind.***

- ***– Physicist Mitch Ambrose, on China's quantum technology advancements***

As the tech Cold War intensifies with China and President Xi Jinping striving to establish the People's Liberation Army Navy (PLAN) as the dominant maritime power in the Indo-Pacific, the U.S. Navy faces a critical point: Achieve technological superiority for tomorrow's conflicts or surrender its competitive advantage to China. To visualize what falling behind in the race for technology entails, imagine this fictional news briefing set in the near future:

U.S. intelligence community officials reported this morning that the newly developed Chinese PLAN quantum computers have completed operational testing and have successfully demonstrated their ability to break military-grade encryption in the laboratory environment, severely degrading the confidentiality of top-secret communications across U.S. Navy platforms in the Indo-Pacific. At this afternoon's press briefing, the U.S. Secretary of Defense (SecDef) stated that the Department of Defense (DoD) is scrambling to partner with federal and civilian industry leaders to secure naval communications against these emerging quantum computing hacks. Analysts at the DoD expect China's quantum codebreaking systems to be fully deployable within three to five weeks, giving the DoD a very short window of time to devise a solution. This announcement comes just one week after the Chief of Naval Operations (CNO) issued a warning to U.S. Pacific Fleet Submarine Force leaders stating that Chinese Jin-class ballistic missile submarines have completed initial laboratory testing for quantum sensing technology, giving them unparalleled navigational accuracy without cumbersome periodic GPS calibration requirements. The U.S. Navy's Undersea Warfare Development Center is currently working with submarine force leadership to analyze the increased threat that China's new undersea quantum sensors pose to submarines operating in the Pacific. In last night's interview with the SecDef regarding the emerging Chinese quantum threat to national security, he stated, "We've been caught off guard, and it's an all-hands effort as we scramble to figure this out."

While this narrative may seem like science fiction, China's quantum computing research and development (R&D) is well underway, and the global race for quantum superiority has begun. This disruptive technology will transform military science and the way computers process data in a wartime environment. The CNO's recent 2021 Navigation Plan stresses that "we are engaged in a long-term competition [with] China . . . and we must be prepared to flawlessly execute our Navy's timeless roles of sea control and power projection. To preserve sea control and maintain a competitive edge in the Indo-Pacific amid rising Chinese aggression, the Navy must establish itself as a key player in the U.S. quantum technology community. To do so, the Navy should host operational testing on board its platforms in two critical areas: quantum cryptography and quantum sensing. The Navy's operational tests in a rugged field environment will provide valuable feedback to the engineers who design the technology. Ultimately, the Navy's role in the quantum

development cycle will accelerate the process of transferring quantum technology from the laboratory to warfighting units.

**Quantum Computing and Cryptography**

Quantum computing is part of the larger quantum technology movement, which is "an emerging field of physics and engineering [that uses] the properties of quantum effects—the interactions of molecules, atoms, and even smaller particles" to solve problems. By leveraging these quantum effects, quantum computers process information differently from classical computers. Classical computers process binary information in 1s and 0s, whereas quantum computers use "qubits." Instead of representing just 1 or 0, qubits can also exist in superposition, meaning that "they're both on and off at the same time, or somewhere on a spectrum between the two." With superposition, quantum computers can perform quick calculations by considering multiple potential outcomes instantaneously. Qubits also abide by the quantum principle of entanglement, meaning that "two members of a pair exist in a single quantum state [and] changing the state of one of the qubits will instantaneously change the state of the other one in a predictable way," thereby increasing its computational power. A quantum computer's use of qubits, and therefore the principles of superposition and entanglement, allow it to perform computations much more quickly than everyday binary computers.

By leveraging the unusual behavior of qubits to improve computing power, quantum computers pose a new threat to traditional cryptography. The modern standards of cryptography, which rely mainly on large prime number calculations to protect data, will not withstand a quantum system's computational power. According to the Brookings Institution, "the need for unbreakable encryption is staring us in the face [and] with the development of quantum computers looming on the horizon, the integrity of encrypted data is at risk now." With quantum computers, a hacker could break military-grade encryption in a matter of minutes, compromising secure communications. The best defense against malicious hackers with quantum capabilities is quantum key distribution, which the Los Alamos National Laboratory deems "the most powerful data encryption scheme ever developed [and is] by all indications, virtually unbreakable."

China has already developed the "world's first integrated quantum communication network, combining over 700 optical fibers on the ground with two ground-to-satellite links to achieve quantum key distribution over a total distance of 4,600 kilometers for users across the country." By constructing this network, China has set the pace for creating secure quantum communications that cannot be intercepted or manipulated. Further advances in Chinese quantum communication networks, especially networks designed for military use, will put the Navy at increased risk when deployed to the Indo-Pacific. If Chinese communications are virtually unbreakable and U.S. Navy communications can be exploited by Chinese quantum code-breaking technology, it will quickly lose its ability to safely operate among PLAN forces. While efforts to develop quantum key distribution are well underway with organizations such as Oak Ridge National Laboratory, it will be a long road from the design phase to battle-tested field use. However, the Navy can help speed up this process by partnering with research organizations to set up a wireless quantum key distribution network across multiple naval platforms. After the equipment is installed across these platforms, quantum technology developers could test the network at sea. Running these operational tests at sea would not only put this quantum technology through a "toughness test" in a challenging maritime environment, but it would also help developers soon tailor quantum key distribution networks for naval usage.

While quantum cryptography will be critical for secure military communications, quantum sensing will provide new capabilities for both stealthy open-ocean navigation and intelligence collection on foreign vessel locations. Quantum sensing—the use of quantum properties to measure changes in the surrounding environment—offers promising solutions to the chronic naval dilemma: dependence on GPS for navigation at sea. The Navy's current dependence on GPS leaves platforms vulnerable to GPS-jamming while at sea. If a ship's GPS downlink was jammed by a malicious Chinese signal, it would be unable to navigate safely in the open ocean. Though naval platforms

also use internal navigation systems, these lose accuracy over time and require periodic GPS downlinks to confirm the vessel's location.

Researchers at the Naval Postgraduate School are developing quantum sensing technology to "detect and track platform motion in the absence of GPS capabilities, such as underwater or in space." Quantum sensing technology on board naval platforms would provide high-quality locational data without the need for periodic GPS updates, allowing the Navy to continue stealth operations in a GPS-denied environment. Beyond the clear navigational solutions it provides, quantum sensing could also be used for intelligence, surveillance, and reconnaissance (ISR) of foreign vessels. Quantum sensors that detect changes in the physical environment could "enable militaries to detect electromagnetic emissions . . . enhancing electronic warfare capabilities and potentially assisting in locating concealed adversary forces."

Bringing quantum sensors to the fight would disrupt the traditional electronic warfare doctrine and provide increased situational awareness by revealing adversarial platform locations. Because most quantum sensing technology is tailored for national security use (unlike quantum cryptography, which offers immediate private sector benefits), the DoD must pick up the tab on this investment rather than rely on private industry to fund advancements in this technology. The Navy should take advantage of the research already completed at the Naval Postgraduate School and begin integrating this technology for operational testing at sea. To do this, the Navy should install rudimentary quantum sensors on board a submarine or surface ship and take this technology underway off the U.S. coast. Once underway, the Navy could test the sensor's navigational accuracy and ability to detect small changes in the electromagnetic environment for ISR purposes. The real-world data collected during these sea trials would provide direct feedback to engineers to improve performance at sea.

While quantum technology R&D is a challenging and expensive endeavor, the Navy must be an integral part of the national quantum technology effort. By hosting at-sea operational testing for U.S.-produced quantum technology, the Navy will stay in the loop on emerging developments and be well suited to integrate quantum technology across the fleet permanently.

Because China's quantum technology R&D is state-driven and U.S. quantum development is inherently more "disparate [and] spread across dozens of funding agencies, universities and private companies," DoD leaders must ensure the development and application of quantum technology for military use is efficient. Partnerships with quantum technology developers and operational testing on Navy platforms will be key to leveraging this technology across the DoD for years to come. A failure to keep pace with China in the race for quantum technology will leave the DoD vulnerable to a myriad of threats in the Indo-Pacific. This is a race the United States cannot lose.

*https://www.usni.org/magazines/proceedings/2022/february/quantum-future-naval-warfare*

The Tribune

***Thu, 10 Feb 2022***

# Iran unveil new missile with reported region-wide range

***State TV reported that missile has solid fuel and a range of 1,450 kilometers***

Tehran: Iran unveiled a new missile on Wednesday with a reported range that would allow it to reach both US bases in the region as well as targets inside its archfoe Israel.

State TV reported that the missile has solid fuel and a range of 1,450 kilometers, or 900 miles. It is called the Khaibar-buster, a reference to a Jewish castle overrun by Muslim warriors in the early days of Islam.

It said the missile has high accuracy, is manufactured completely domestically, and can defeat missile shield systems. The information has not been independently verified.

Israel's closest point to Iran is some 1,000 kilometers, or 620 miles, away.

The report comes as negotiations continue in Vienna to revive Tehran's tattered nuclear deal with world powers. Iran, which has long said it does not seek nuclear weapons, insists its missile program is only a deterrent.

Iran has missiles that can travel up to 2,000 kilometers, 1250 miles.

Earlier in January Iran tested an engine for a solid-fuel rocket designed to launch satellites. AP

*https://www.tribuneindia.com/news/world/iran-unveil-new-missile-with-reported-region-wide-range-368434*

# Science & Technology News

mint

***Tue, 08 Feb 2022***

## World's highest railway bridge in J&K is 35 meters taller than Eiffel Tower

***World's highest railway bridge in J&K is 35 meters taller than Eiffel Tower.***

India will soon open the world's highest railway-arch bridge over the Chenab river in Kashmir for rail traffic. Chenab Rail Bridge is an Indian railway steel and concrete arch bridge between Bakkal and Kauri in the Reasi district of Jammu and Kashmir, India.

When completed, the bridge will span the Chenab River at a height of 359 m (1,178 ft) above the river, which is 35 meters taller than Paris' Eiffel Tower.

Constructed for Rs.1,486 crore, the Chenab bridge aims to boost connectivity to the Kashmir Valley. According to the Ministry of Railways, it is said to be the biggest civil-engineering challenge faced by any railway project in India in recent history.

**Chenab Railway Bridge: Key features**

The bridge has a total length of 473.25 metres, while the length of the viaduct is 120 metres and the central embankment 94.25 metres, according to officials, adding it is supported by 96 cables.

Chenab Bridge weight: The overall weight of the arch is 10,619 MT.

Chenab Bridge designers: Viaduct & Foundations: M/s WSP (Finland); Arch: M/s Leonhart, Andra and Partners (Germany), and Foundation Protection: Indian Institute of Science Bangalore.

Construction of the bridge involved fabrication of 28,660 MT steel, 10 lakh cum Earthwork, 66,000 cum concrete, and 26 Km motorable roads.

The most sophisticated 'Tekla' software used for structural detailing.

**Constructed for Rs.1,486 crore, the Chenab bridge aims to boost connectivity to the Kashmir**

**Chenab Railway Bridge: Unique Features**

The bridge is designed to withstand high wind speed up to 266 Km/hour.

The Chenab bridge is designed for blast load in consultation with DRDO for the first time in India.

It will remain operational at a restricted speed of 30 Km/hour even after the removal of one pier/trestle.

In the first, a Phased Array Ultrasonic Testing machine was used for testing welds in an Indian Railways project.

Approx. 584Km welding was done to join the different parts of the structure, which is to the tune of the distance between Jammu Tawi to New Delhi.

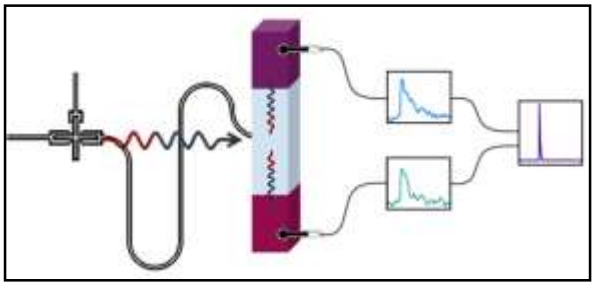
The height of the cable crane's pylon at Srinagar End is 127 metre, which is much taller than Qutub Minar of 72 metre.

*https://www.livemint.com/news/india/worlds-highest-railway-chenab-bridge-in-j-k-is-35-meters-taller-than-eiffel-tower-see-pics-11644298007039.html*

***Thu, 10 Feb 2022***

# Detecting low-energy microwave photons emitted by superconducting qubits

Professor Jukka Pekola and Doctoral Candidate Bayan Karimi from Aalto University propose a new approach to measure the energy of single microwave photons. These low energy quanta are emitted by artificial quantum systems such as superconducting qubits. Detecting them continuously has been challenging but would be useful in quantum information processing and other quantum technologies.



**A low energy photon emitted by a qubit can potentially be detected by measuring its energy with two thermometers simultaneously. The two signals are combined into a cross-correlation measurement with superior sensitivity. Credit: Bayan Karimi**

A photon is produced when a superconducting qubit transits between states, radiating energy into its environment. The researchers capture the tiny energy of this photon by transferring it into heat. The new technique relies on splitting the energy of a photon across two independent heat baths and making measurements using two uncoupled detectors at once. This would significantly enhance the signal-to-noise ratio, making it easier to detect an absorption event and its energy.

"In our proposed setup the energy of a qubit is large whereas its typical operating temperature is very low. This contrast opened an opportunity to solve the Schrödinger equation exactly for up to one million external oscillators forming the heat baths in the model describing this measurement," Pekola says.

Karimi adds that the "cross-correlation method can be used to measure extremely tiny temperature changes. It promises to detect energies several orders of magnitude smaller than in previously used methods."

The researchers explain that many fundamental questions remain open but this would be the first time the energy of a photon is split into two different thermal detectors and observed. The team in the Pico group at Aalto University is currently carrying out experiments based on this proposal. "Completing the experiment is extremely challenging, but success would be a dream come true," says Karimi.

The researchers introduced the extremely sensitive calorimeter two years ago, and Physics World listed the calorimeter as one of the quantum highlights of 2020.

**More information:** Jukka P. Pekola et al, Ultrasensitive Calorimetric Detection of Single Photons from Qubit Decay, *Physical Review X* (2022). DOI: 10.1103/PhysRevX.12.011026

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