

Oct
2021

समाचार पत्रों से चयित अंश Newspapers Clippings

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

खंड : 46 अंक : 202 12 अक्टूबर 2021

Vol.: 46 Issue : 202 12 October 2021



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalf House, Delhi - 110 054

CONTENTS

S. No.	TITLE	Page No.
	DRDO News	1-5
	DRDO Technology News	1-5
1.	वाराणसी: डीआरडीओ और बीएचयू रक्षा क्षेत्र को मजबूत करने में करेंगे काम, अटल इन्व्यूबेशन सेंटर की होगी अहम भूमिका	1
2.	मध्य प्रदेश में पहली बार जबलपुर इंजीनियरिंग कालेज में पढ़ाई जाएगी डिफेंस टेक्नोलाजी	2
3.	MNIT 15th Convocation- देश की तरक्की के लिए करें अपनी स्किल का उपयोग: प्रधान	3
4.	दीक्षांत समारोह में तीन हजार विद्यार्थियों को मिली डिग्री, खिले चेहरे	5
	Defence News	6-9
	Defence Strategic: National/International	6-9
5.	Indian industry must boost capabilities of armed forces: General Bipin Rawat	6
6.	Indian Army Chief Gen Naravane to arrive in Lanka on October 12	7
7.	Quad Navies set to kick off 2nd phase of Malabar drills	8
8.	GOCL Corporation plans direct foray into defence sector	9
	Science & Technology News	10-16
9.	OneWeb partners ISRO arm to launch satellites in India from 2022	10
10.	Quantum circuit black hole lasers to explore Hawking radiation	11
11.	New nanostructure could be the key to quantum electronics	12
12.	Particle refinement induces and increases cycle capacity of sodium/lithium-ion batteries	14
	COVID-19 Research News	15-16
13.	Alzheimer's and Covid-19 severity: A genetic link?	15

अमर उजाला

Tue, 12 Oct 2021

वाराणसी: डीआरडीओ और बीएचयू रक्षा क्षेत्र को मजबूत करने में करेंगे काम, अटल इन्क्यूबेशन सेंटर की होगी अहम भूमिका

वाराणसी: बीएचयू परिसर स्थित सेंट्रल डिस्कवरी सेंटर के पांचवें तल पर स्थापित अटल इन्क्यूबेशन सेंटर का सोमवार को डीआरडीओ, बीएसईए जोन स्टार्टअप्स के अधिकारियों ने दौरा कर यहां स्टार्ट अप, होने वाले शोध कार्यों सहित अन्य जानकारी ली। रक्षा क्षेत्र में डीआरडीओ और बीएचयू के संयुक्त प्रयास से रक्षा क्षेत्र संबंधी तकनीकी, नवाचार के क्षेत्र में आत्मनिर्भर बनाने की दिशा में भी विस्तार से चर्चा की गई।

केंद्र के निदेशक प्रो. सुजीत कुमार दुबे ने विश्वविद्यालय की शोध गतिविधियों के बारे में जानकारी दी। इस दौरान अर्जुन कुमार, निधि बंसल, प्रो. गोपाल नाथ, डॉ. एस साई कृष्णा, पीवी राजीव, मेनका तिवारी आदि मौजूद रहे।



काशी हिंदू विश्वविद्यालय।

<https://www.amarujala.com/uttar-pradesh/varanasi/drdo-and-bhu-will-work-in-strengthening-defense-sector-varanasi>

मध्य प्रदेश में पहली बार जबलपुर इंजीनियरिंग कालेज में पढ़ाई जाएगी डिफेंस टेक्नोलॉजी

सेना को युद्ध में लगने वाले असला बारूद और सुरक्षा से जुड़ी
तकनीक को लेकर जबलपुर में पाठ्यक्रम शुरू होगा।

By पंकज तिवारी

जबलपुर: सेना को युद्ध में लगने वाले असला बारूद और सुरक्षा से जुड़ी तकनीक को लेकर जबलपुर में पाठ्यक्रम शुरू होगा। शासकीय जबलपुर इंजीनियरिंग कालेज में डिफेंस टेक्नोलॉजी के स्नातकोत्तर पाठ्यक्रम पढ़ाने की तैयारी हो रही है। रक्षा मंत्रालय की सिफारिश पर अखिल भारतीय तकनीकी शिक्षा परिषद से इसके संचालक की अनुमति मांगी गई है। प्रबंधन को उम्मीद है कि अगले सत्र 2022-23 से इसमें प्रवेश प्रारंभ कर दिया जाएगा। ये पाठ्यक्रम पढ़ाने वाला जेईसी प्रदेश का पहला तकनीकी शिक्षण संस्थान होगा। यहां से पढ़ने वाले विद्यार्थी आयुध निर्माणियों को अपने हुनर को दिखाने का मौका मिलेगा।



ये है कोर्स: रक्षा विभाग के रक्षा अनुसंधान एवं विकास संस्थान(डीआरडीओ) की मदद से डिफेंस टेक्नोलॉजी की ओर से पीजी डिग्री इन एनर्जी सिस्टम और कम्युनिकेशन पाठ्यक्रम शुरू कर रहे हैं। ये इलेक्ट्रिकल और इलेक्ट्रॉनिक्स विभाग के अंतर्गत संचालित होंगे। जेईसी के प्राचार्य डा.एके शर्मा ने बताया कि प्रदेश में पहली बार ये कोर्स शुरू होने जा रहा है। पहले मौजूदा सत्र में इसे प्रारंभ करने की तैयारी थी, लेकिन अखिल भारतीय तकनीकी शिक्षा परिषद के मापदंड पूरे नहीं होने के कारण अनुमति नहीं मिल पाई है। फिलहाल संस्थान में शिक्षकों की कमी बनी हुई है। इस वजह से कई नए पाठ्यक्रम प्रारंभ नहीं हो पा रहा है। उन्होंने बताया कि उम्मीद है कि जल्द कुछ शिक्षकों की नियुक्ति होगी। पाठ्यक्रम में प्रवेश के लिए 18-18 सीट तय होगी।

डीआरडीओ से मदद: ब्रम्होस एयरोस्पेस के प्रमुख डा.सुधीर मिश्र जबलपुर इंजीनियरिंग कालेज के भूतपूर्व विद्यार्थी हैं। प्राचार्य डा.एके शर्मा ने बताया कि डा.सुधीर मिश्र के सहयोग से ये पाठ्यक्रम यहां प्रारंभ हो रहे हैं। इससे आयुध निर्माणियों के होने से यहां के विद्यार्थियों को अतिरिक्त लाभ मिलेगा।

<https://www.naidunia.com/madhya-pradesh/jabalpur-jabalpur-engineering-college-defense-technology-will-be-taught-in-jec-for-the-first-time-in-the-state-7088453>

MNIT 15th Convocation- देश की तरक्की के लिए करें अपनी स्किल का उपयोग: प्रधान

By Rakhi Hajela

एमएनआईटी ने सेलिब्रेट किया 15वां दीक्षांत समारोह

कोरोना के चलते हाईब्रिड मोड पर हुआ समारोह

2 हजार 506 स्टूडेंट्स को दी गई डिग्री

डिग्री प्राप्त करने वाली छात्राओं की संख्या इस साल 633

दीक्षांत समारोह में 75 स्टूडेंट्स को दिए गए गोल्ड मेडल, 40 छात्राएं शामिल

MNIT 15th convocation-- केंद्रीय शिक्षामंत्री धर्मेंद्र प्रधान का कहना है कि विद्यार्थियों को अपनी नॉलेज और स्किल का उपयोग देश की तरक्की के लिए करना चाहिए। सोमवार को एमएनआईटी के 15वें दीक्षांत समारोह में डिग्री और गोल्ड मेडल प्राप्त करने वाले स्टूडेंट्स को शुभकामना देते हुए उन्होंने कहा कि आज उनके जीवन का नया अध्याय शुरू हो रहा है, वह अपनी नॉलेज और स्किल का उपयोग देश की तरक्की में करें जिससे आत्मनिर्भर भारत के सपने को साकार किया जा सकता है।

गौरतलब है कि कोविड प्रोटोकॉल की पालना करते हुए सोमवार को एमएनआईटी ने अपने 15वें दीक्षांत समारोह का आयोजन हाईब्रिड मोड में किया। समारोह में 75 स्टूडेंट्स को गोल्ड मेडल और तकरीबन 2 हजार 506 स्टूडेंट्स को वचुअल रूप से डिग्री प्रदान की गई। समारोह के मुख्य अतिथि केंद्रीय शिक्षामंत्री धर्मेंद्र प्रधान और विशिष्ट अतिथि के रूप में डीआरडीओ निदेशक जी सतीश रेड्डी वचुअल रूप से शामिल हुए। जिन 75 स्टूडेंट्स को गोल्ड मेडल दिए गए उसमें 40 छात्राएं शामिल थीं।

नवाचार और उद्यमिता को बढ़ावा दे संस्थान: रेड्डी

वहीं डीआरडीओ के निदेशक जी सतीश रेड्डी ने डिग्री पाने वाले विद्यार्थियों को शुभकामना देते हुए कहा कि यह उनके जीवन एक महत्वपूर्ण अध्याय है। एमएनआईटी खुद को इस देश के प्रमुख शैक्षणिक संस्थानों में से एक रूप में प्रतिष्ठित कर रहा है। हम सभी को मिलकर शक्तिशाली भारत का निर्माण की दिशा में काम करना है। उनका कहना था कि डीआरडीओ अपने कार्यक्रमों ए डीटीडीएफ और डेयर टू ड्रीम कार्यक्रम के माध्यम से स्टार्टअप और युवा उद्यमियों को प्रोत्साहित कर रहा है और अब शैक्षणिक संस्थानों को नवाचार और उद्यमिता को बढ़ावा देने वाला केंद्र बनना चाहिए।

इससे पूर्व एमएनआईटी के निदेशक प्रो. उदयकुमार आर योरागट्टी ने संस्थान की प्रगति की रिपोर्ट प्रस्तुत की। समारोह में इंस्टीट्यूट्स के बोर्ड ऑफ गवर्नेंस, फैकल्टी मेंबर्स और स्टाफ के साथ ही एलुमिनाई भी शामिल हुए। इस दौरान बीटेक, एमटेक, एम प्लानिंग, एमबीए, एमएससी और पीएचडी के स्टूडेंट्स को डिग्री दी गई।

इन स्टूडेंट्स को दी गई डिग्री

समारोह का आयोजन कोविड प्रोटोकाल की पालना करते हुए हाईब्रिड मोड में किया गया था, ऐसे में स्टूडेंट्स अपने घरों से समारोह में ऑनलाइन शामिल हुए जबकि एमएनआईटी स्टाफ परिसर में ऑफलाइन मोड में उनसे जुड़ा। कैम्पस में एकमात्र स्टूडेंट को कन्वोकेशन ऑथ के लिए बुलाया गया था।

एकेडमिक सेशन 2019-20 के कुल 1175 स्टूडेंट्स को डिग्री प्रदान की गई। इसमें से 633 स्टूडेंट्स को बीटेक, 47 को बी आर्किटेक्चर, 292 को एमटेक और 17 को मास्टर ऑफ प्लानिंग की डिग्री दी गई। इसी तरह 67 विद्यार्थियों को फिजिक्स, कैमेट्री और मैथ्स में एमएससी की डिग्री और 43 एमबीए की डिग्री दीक्षांत समारोह में दी गई। 76 रिसर्च स्कॉलर्स को पीएचडी की डिग्री भी दी गई।

इसी तरह सत्र 2020-21 के कुल 1331 स्टूडेंट्स को दीक्षांत समारोह में डिग्री दी गई। इनमें बीटेक के 655, बी-आर्किटेक्चर के 54, एमटेक के 407, मास्टर ऑफ प्लानिंग के 18 स्टूडेंट्स के साथ ही फिजिक्स, कैमेट्री और मैथ्स में एमएससी के 87 स्टूडेंट्स शामिल थे। एमबीए के 51 स्टूडेंट्स और 59 रिसर्च स्कॉलर्स को पीएचडी की उपाधि भी दी गई। दीक्षांत समारोह में सत्र 2019-20 और 2020-21 के बीटेक, एमटेक, एमप्लानिंग, एमबीए और एमएससी कोर्सेज के टॉपर्स को गोल्ड मेडल भी दिए गए।

<https://www.patrika.com/jaipur-news/mnit-15th-convocation-central-education-minsiter-drddirector-7115950/>

दीक्षांत समारोह में तीन हजार विद्यार्थियों को मिली डिग्री, खिले चेहरे

बाराबंकी: श्री रामस्वरूप मेमोरियल विश्वविद्यालय का पहला दीक्षांत समारोह सोमवार को विश्वविद्यालय परिसर में आयोजित किया गया। सत्र 2019-20 और 2020-21 के लिए स्नातक, स्नातकोत्तर और डॉक्टरेट विद्यार्थियों को कुल 2954 डिग्री ऑनलाइन प्रदान की गईं। कोविड-19 प्रोटोकॉल के चलते यह समारोह एक प्रतीकात्मक कार्यक्रम रहा। कार्यक्रम में केवल स्वर्ण और रजत पदक विजेताओं को ही परिसर में सम्मान के लिए आमंत्रित किया गया था। 79 विद्यार्थियों को स्वर्ण पदक, 54 विद्यार्थियों को रजत पदक जबकि 68 डॉक्टरेट विद्यार्थियों को पीएचडी डिग्री से सम्मानित किया गया।

दीप प्रज्ज्वलन के साथ ही समारोह की शुरुआत प्रो. एके सिंह के स्वागत भाषण एवं विवि की वार्षिक रिपोर्ट की प्रस्तुति से हुई। प्रथम दीक्षांत समारोह में भारतीय संस्कृति की झलक दिखाई दी। मुख्य अतिथि प्रो. वीएन राजशेखरन पिल्लई ने पहले दीक्षांत समारोह पर विवि को बधाई दी। उन्होंने कहा कि शिक्षा हर पहलू में जीवन की गुणवत्ता को बढ़ाने के लिए आवश्यक है। एसआरएमयू अंतरराष्ट्रीय मानकों का ज्ञान प्रदान करते हुए उच्च शिक्षा के क्षेत्र में उत्कृष्ट प्रदर्शन कर रहा है।

समारोह की अध्यक्षता कर रहे विवि के कुलाधिपति ई. पंकज अग्रवाल ने सभी विद्यार्थियों एवं एसआरएमयू परिवार को बधाई देते हुए कहा कि प्रथम दीक्षांत समारोह विवि के लिए गौरवपूर्ण प्रयोजन है। कहा कि विवि का उद्देश्य है कि समाज को ऐसे रत्नों से नवाजें जो समाज में एक नई ऊर्जा का संचार करे एवं सकारात्मक परिवर्तन की नींव रखें। उन्होंने बताया कि उच्च शिक्षा के स्तर को बढ़ाने के लिए नई राष्ट्रीय शिक्षा नीति-2020 को शैक्षणिक सत्र 2021-22 से लागू करने का संकल्प लिया है।

डॉ. सुधीर मिश्रा, महानिदेशक (ब्रह्मोस) डीआरडीओ और सीईओ और प्रबंध निदेशक (ब्रह्मोस एयरोस्पेस) को मिसाइल प्रौद्योगिकी के क्षेत्र में उत्कृष्ट कार्यों के लिए डॉक्टरेट ऑफ साइंस की मानद उपाधि से सम्मानित किया गया। लोक कला के क्षेत्र में योगदान के लिए पद्मश्री प्रहलाद सिंह टिपानिया को डॉक्टरेट ऑफ लिटरेचर की मानद उपाधि से सम्मानित किया गया।

छह विद्यार्थियों को कुलाधिपति पदक और प्रति कुलाधिपति पदक से सम्मानित किया गया। क्रमशः सौरभ अग्रवाल, विदुषी पांडे और कृष्णम रस्तोगी को कुलाधिपति पदक मेडल से सम्मानित किया गया तथा प्रीति वलेचा, नमता वर्मा और समरीन खान को प्रति कुलाधिपति मेडल से सम्मानित किया गया।

<https://www.amarujala.com/uttar-pradesh/barabanki/dukshant-samaroh-barabanki-news-lko5996922136>



बाराबंकी। सोमवार को माती के निकट चिनहट देवा मार्ग स्थित रामस्वरूप मेमोरियल विश्वविद्यालय में आ? - फोटो : BARABANKI



Tue, 12 Oct 2021

Indian industry must boost capabilities of armed forces: General Bipin Rawat

"The armed forces look forward to Indian industry to provide cutting-edge technologies towards war winning capabilities," Chief of Defence Staff General Bipin Rawat said

New Delhi: The Indian private industry must step in to provide cutting-edge space technologies and products to boost operational capabilities of the Indian armed forces, Chief of Defence Staff General Bipin Rawat said.

"Space and cyber domains have become critical to our ability to undertake operations across the spectrum, both in peace and conflict," he said.

While the Indian Space Research Organisation (ISRO) will continue to provide leadership and guidance, the expanding needs of the nation and the armed forces require that the private industry must step in and step forward, General Rawat said.



The Chief of Defence Staff said opening space to private industry is a landmark decision. (File)

"The armed forces look forward to the Indian industry to provide products and innovations...and cutting-edge technologies towards war winning capabilities," he said.

The CDS was speaking at the launch ceremony of the Indian Space Association, a space sector industry body comprising companies such as Bharti Airtel, Larsen and Toubro, Agnikul, Dhruva Space and Kawa Space.

Opening of our space to the private industry in India is indeed a landmark and historic decision which was taken by the prime minister in June last year, he said.

The privatisation of the space industry will catapult the space industry into the future as the central driver of nation building, the CDS said.

"The concept that higher exploratory space domain, research and development activities, new technologies, human space flights, continues to be ISRO's mandate while many upstream and downstream space products as well as technological innovations be taken over by the private industry is an idea whose time has finally come," he said.

The initiative will surely help in making India a new global space hub in the years ahead, General Rawat said.

Like the armed forces the world over, the Indian armed forces are significant users of diverse space products including communication, position navigation and timing, and of course, intelligence, surveillance, and reconnaissance, he said.

"And apart from this, space situational awareness, and protection of our space-based assets have become important domains," the CDS said.

<https://www.ndtv.com/india-news/indian-pvt-industry-must-step-in-to-provide-cutting-edge-space-technologies-to-armed-forces-cds-2571265>

Indian Army Chief Gen Naravane to arrive in Lanka on October 12

Gen Naravane is expected to call on President Gotabaya Rajapaksa, who is the Commander-in-Chief of the Sri Lankan Armed Forces, and Prime Minister Mahinda Rajapaksa.

Colombo: Indian Army Chief General Manoj Mukund Naravane will arrive here on Tuesday on a five-day goodwill visit at the invitation of his Sri Lankan counterpart Gen Shavendra Silva, the Sri Lankan Army said on Monday. During his visit, Gen Naravane is expected to call on President Gotabaya Rajapaksa, who is the Commander-in-Chief of the Sri Lankan Armed Forces, and Prime Minister Mahinda Rajapaksa.

On Wednesday, Gen Naravane would be honoured at the Army Headquarters in a colourful Guard Turnout plus in an elegantly-dressed special Guard of Honour salute, the Lankan Army said. On Thursday, he will witness the final demonstration of the ongoing bilateral Exercise 'Mitra Shakti' at Maduru Oya Special Forces Training School in the east.

India and Sri Lanka last week began a 12-day mega military exercise with a focus on enhancing counter-terror cooperation at the Combat Training School in the island nation's eastern district of Ampara.

The eighth edition of the 'Mitra Shakti' exercise from October 4 to 15 got underway with the participation of an all arms contingent of 120 Indian Army personnel, headed by Colonel Prakash Kumar. The joint military exercise has been designed to enhance understanding of transnational terrorism, inter-operability skills, conduct of joint tactical operations, sharing of each other's best practices and experiences, the Sri Lanka Army said.

The annual training programme, which has largely contributed to strengthen bilateral military cooperation, understanding and bonds of neighborly relations between both services, takes place alternately either in India or Sri Lanka every year, it added.

Gen Naravane, who would be leading a five-member delegation, is expected to pay floral tributes to the Indian Peace Keeping Force (IPKF) War Heroes at the monument located here. He had served in the IPKF in Sri Lanka's north and east from 1987-1990.

Gen Naravane's visit will take place a week after Foreign Secretary Harsh Vardhan Shringla visited Sri Lanka and met the country's top leadership and underscored the importance India attaches to expeditiously taking forward mutually beneficial projects. Shringla had also thanked President Rajapaksa for his guidance and close cooperation in the defence and security sphere.

<https://www.news18.com/news/india/indian-army-chief-gen-naravane-to-arrive-in-lanka-on-october-12-4312055.html>



Indian Army chief General Manoj Mukund Naravane will arrive on Oct 12 on a five-day goodwill visit to Sri Lanka (Image: ANI/File)

Quad Navies set to kick off 2nd phase of Malabar drills

The Indian Navy will take part in the exercise's second phase with INS Ranvijay, INS Satpura, P-8I long range maritime patrol aircraft and a submarine

New Delhi: India, the United States, Japan and Australia will kick off the second phase of this year's Malabar naval drills in the Bay of Bengal on Tuesday, with the exercise seeking to build on the synergy, coordination and interoperability developed during the first phase held in August, the Indian Navy said in a statement. The second phase, to be held from October 12-15, will focus on advanced surface and anti-submarine warfare exercises, seamanship evolution and weapon firings, it said.

The navies of the Quad nations conducted the first phase of the drills near the Pacific Ocean island of Guam from August 26 to 29. It involved destroyers, frigates, corvettes, submarines, helicopters, long-range maritime patrol aircraft and elite special forces elements, including US Navy SEALs and Indian Navy's marine commandos, also known as MARCOS.

The Indian Navy will participate in the second phase with INS Ranvijay, INS Satpura, P-8I long-range maritime patrol aircraft and a submarine, the statement said. The US Navy will be represented by aircraft carrier USS Carl Vinson, and two destroyers, USS Lake Champlain and USS Stockdale. Japan will be represented by JS Kaga and JS Murasame, while the Royal Australian Navy will be represented by HMAS Ballarat and HMAS Sirius.

India is also preparing to conduct its first tri-service exercise with the United Kingdom in the Arabian Sea in October, as previously reported by Hindustan Times. The Royal Navy will send a carrier strike group, led by HMS Queen Elizabeth, for the drills that will be conducted from October 21 to 27. So far, India has conducted tri-service drills with two other countries – the US and Russia.

Earlier, the Quad navies carried out drills in November 2020 in the Arabian Sea and the Bay of Bengal.

China has been monitoring the activities of the Quad countries. Beijing has been wary of the Quadrilateral security dialogue that was revived in late 2017 by India, the US, Australia and Japan. These suspicions have increased since the four countries upgraded the forum to the ministerial level in 2019.

From carrying out naval drills with like-minded countries to reaching out to states in the Indian Ocean region, the Indian Navy is focusing on checking China's rising ambitions in the region and sending out a strong message that Beijing's power play in the South China Sea cannot be replicated in the Indian Ocean.

Last November, navy chief Admiral Karambir Singh said a "great power competition" was playing out in the Indian Ocean region, where the Indian Navy has stepped up surveillance to check China's ambitions.

<https://www.hindustantimes.com/india-news/quad-navies-set-to-kick-off-2nd-phase-of-malabar-drills-101633935786044.html>



Wary of Quad, China has been monitoring its activities ever since the Quad was revived in the late 2017 (AFP Photo/File)

GOCL Corporation plans direct foray into defence sector

The Hinduja-owned firm says one area could be electronic detonators. The company also plans to monetise assets to take on competition from smaller regional players

By KT Jagannathan

Hinduja-owned Gulf Oil Corporation (GOCL Corporation) is exploring niche segments in the commercial explosive space and plans to make a direct foray into the defence sector. One area could be electronic detonators.

Newly-appointed CEO Pankaj Kumar told *Moneycontrol* that the company would also consider monetising its land assets.

The company, which serves the mining and infrastructure sectors, already has Defence Research and Development Organisation (DRDO) and Indian Space Research Organisation (ISRO) as its clients.

Kumar said all these form part of GOCL's plan to focus on cutting costs and making the organisation competitive in the emerging environment.

A combination of factors, such as competition from smaller regional players, upfront heavy investment in research and development (R&D) and low margin from institutional businesses, have forced the company to look at costs afresh, he said.

GOCL, Kumar said, would also reduce outsourcing work and rely more on in-house talent. Simultaneously, it was also considering reconfiguring its vendor base.

Already, GOCL has a Special Products Group (SPG) to cater to the use of pyrotechnics in non-mining applications. The SPG designs and manufactures special precision products for critical applications in defence, space and other agencies.

Asset monetisation

GOCL has "a large amount" of land banks across Hyderabad, Bengaluru and Rourkela. It has 700 acres of land in Hyderabad and 1,100 acres in Rourkela. It is developing a 40-acre commercial property in Bengaluru. According to him, these land assets were acquired many years ago to serve as safety areas around its plants. With these regions undergoing a metamorphosis with the development of residential townships, he said GOCL was looking at ways and means of monetising its vast tract of land banks around these cities.

The company reported an income of nearly Rs 600 crore in FY21, with a profit of around Rs 150 crore. He said that coronavirus pandemic had impacted business, with most mining-related work coming to a virtual standstill during the past one-and-a-half year.

Kumar, who last served the trouble-hit Sterlite Copper at Thoothukudi in Tamil Nadu, has also been inducted into the board of the company as whole-time director. His appointment was recently approved by the shareholders.

Kumar replaced S Pramanik, who retired after serving and leading the company for the last 22 years. Kumar started his career in Tata Steel as a Graduate Trainee in 1990 and has since worked in senior roles at Mittal Steel, Guardian Industries, United Breweries, Adani Ports, Hindustan Zinc, Sterlite Copper, and Vedanta.

<https://www.moneycontrol.com/news/business/gocl-corporation-plans-direct-foray-into-defence-sector-7567431.html>



CEO Pankaj Kumar told *Moneycontrol* GOCL Corporation is exploring niche segments in the commercial explosive space and plans to make a direct foray into the defence sector and one area could be electronic detonators. (Representative

Tue, 12 Oct 2021

OneWeb partners ISRO arm to launch satellites in India from 2022

The non-binding letter of intent was unveiled at the launch of Indian Space Association (ISpA) in the presence of Prime Minister Narendra Modi.

Bharti-backed low earth orbit (LEO) satellite communications company OneWeb has partnered with NewSpace India (NSIL), the commercial arm of the Indian Space Research Organisation (Isro), to use Indian-built PSLV (Polar Satellite Launch Vehicle) and the heavier GSLV-MkIII (Geosynchronous Satellite Launch Vehicle) as potential platforms to launch OneWeb's satellites in India from 2022.

The non-binding letter of intent was unveiled at the launch of Indian Space Association (ISpA) in the presence of Prime Minister Narendra Modi. OneWeb is among the founding members of ISpA, which strives to be the collective voice of space and satellite companies in India and will work with stakeholders across for the development of India's space ecosystem.

OneWeb is building its initial constellation of 648 LEO satellites and has already put 322 satellites into orbit. Services will begin this year to the Arctic region including Alaska, Canada, and the UK. By late 2022, OneWeb will offer its high-speed, low latency connectivity services in India and the rest of the world.

OneWeb and NSIL will expeditiously convert the Letter of Intent into a binding agreement after obtaining all necessary approvals from their respective boards.

"ISRO has built formidable launch capabilities and India is part of the select group of countries to have history of successful launches. OneWeb will be delighted to use Isro's proven platforms to fulfil its vision of taking broadband connectivity across the earth, oceans and sky," OneWeb chairman Sunil Bharti Mittal said.

K Sivan, chairman of Isro, said, "We are delighted to have OneWeb looking into how our launch capabilities can help meet their global ambition to connect people everywhere. We are making tremendous progress and India is advancing its space capabilities and we look forward to working together."

OneWeb will undertake its 11th launch on October 14 with a further 36 satellites on board. In under a year, the company has passed the halfway stage of its first-generation constellation with 322 satellites now in space.

<https://www.financialexpress.com/industry/oneweb-partners-isro-arm-to-launch-satellites-in-india-from-2022/2348256/>



OneWeb will undertake its 11th launch on October 14 with a further 36 satellites on board.

Quantum circuit black hole lasers to explore Hawking radiation

The fundamental forces of physics govern the matter comprising the universe, yet exactly how these forces work together is still not fully understood. The existence of Hawking radiation—the particle emission from near black holes—indicates that general relativity and quantum mechanics must cooperate. But directly observing Hawking radiation from a black hole is nearly impossible due to the background noise of the universe, so how can researchers study it to better understand how the forces interact and integrate into a "Theory of Everything?"

According to Haruna Katayama, a doctoral student in Hiroshima University's Graduate School of Advanced Science and Engineering, since researchers cannot observe Hawking radiation, Hawking radiation must be brought to the researchers. She has proposed a quantum circuit that acts as a black hole laser, providing a lab-bench black hole equivalent with advantages over previously proposed versions. The proposal was published on Sept. 27 *Scientific Reports*.

"In this study, we devised a quantum-circuit laser theory using an analog black hole and a white hole as a resonator," Katayama said.

A white hole is a theoretical partner of a black hole that emits light and matter in equal opposition to light and matter a black hole consumes. In the proposed electric circuit, a metamaterial engineered to allow faster-than-light motion spans the space between horizons, near which Hawking radiation is emitted.

"The property of superluminal speed is impossible in a normal medium established in an ordinary circuit," Katayama said. "The metamaterial element makes it possible for Hawking radiation to travel back and forth between horizons, and the Josephson effect—which describes a continuous flow of current that propagates without voltage—plays an important role in amplifying the Hawking radiation through the mode conversion at the horizons, mimicking the behavior between the white and black holes."

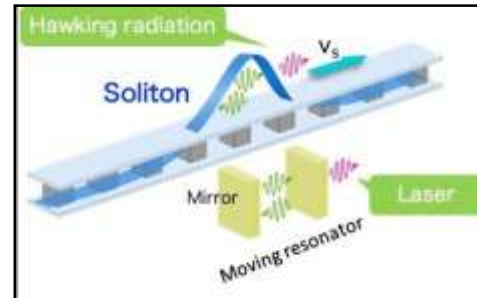
Katayama's proposal builds on previously proposed optical black hole lasers by introducing the metamaterial that allows for superluminal speed and exploiting the Josephson effect to amplify the Hawking radiation. The resulting quantum circuit induces a soliton, a localized, self-reinforcing waveform that maintains speed and shape until external factors collapse the system.

"Unlike previously proposed black hole lasers, our version has a black hole/white hole cavity formed within a single soliton, where Hawking radiation is emitted outside of the soliton so we can evaluate it," Katayama said.

Hawking radiation is produced as entangled particle pairs, with one inside and one outside the horizon. According to Katayama, the observable entangled particle bears the shadow of its partner particle. As such, the quantum correlation between the two particles can be determined mathematically without the simultaneous observation of both particles.

"The detection of this entanglement is indispensable for the confirmation of Hawking radiation," Katayama said.

However, Katayama cautioned, the lab Hawking radiation differs from true black hole Hawking radiation due to the normal dispersion of light in the proposed system. The components of light split in one direction, like in a rainbow. If the components can be controlled so that some can



Quantum-circuit black hole lasers. Scientists from Hiroshima University proposed black hole lasers using quantum Josephson metamaterial transmission lines. Solitons play the role of resonators in laser devices. Credit: Hiroshima University

reverse and bounce back, the resulting lab-made Hawking radiation would mirror the same positive frequency of true black hole Hawking radiation. She is now investigating how to integrate anomalous dispersion to achieve a more comparable result.

"In the future, we would like to develop this system for quantum communication between distinct spacetimes using Hawking radiation," Katayama said, noting the system's scalability and controllability as advantages in developing quantum technologies.

More information: Haruna Katayama, Quantum-circuit black hole lasers, *Scientific Reports* (2021). DOI: [10.1038/s41598-021-98456-0](https://doi.org/10.1038/s41598-021-98456-0)

Journal information: [Scientific Reports](https://phys.org/news/2021-10-quantum-circuit-black-hole-lasers.html)
<https://phys.org/news/2021-10-quantum-circuit-black-hole-lasers.html>

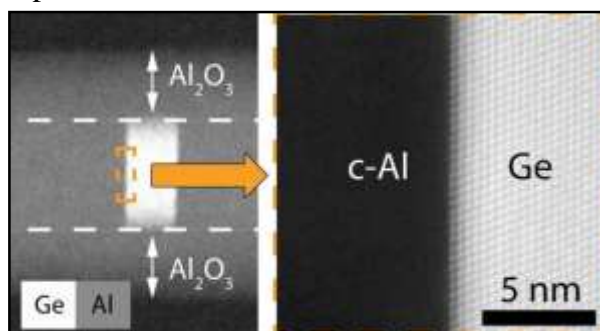


Tue, 12 Oct 2021

New nanostructure could be the key to quantum electronics

A novel electronic component from TU Wien (Vienna) could be an important key to the era of quantum information technology: Using a special manufacturing process, pure germanium is bonded with aluminum in a way that atomically sharp interfaces are created. This results in a so-called monolithic metal-semiconductor-metal heterostructure.

This structure shows unique effects that are particularly evident at low temperatures. The aluminum becomes superconducting—but not only that, this property is also transferred to the adjacent germanium semiconductor and can be specifically controlled with electric fields. This makes it excellently suited for complex applications in quantum technology, such as processing quantum bits. A particular advantage is that using this approach, it is not necessary to develop completely new technologies. Instead, mature and well established semiconductor fabrication techniques can be used to enable germanium-based quantum electronics. The results have now been published in the journal *Advanced Materials*.



Extremely precise interface between the two materials. Credit: Vienna University of Technology

Germanium: difficult to form high-quality contacts

"Germanium is a material which is acknowledged to play an important role in semiconductor technology for the development of faster and more energy-efficient components," says Dr. Masiar Sistani from the Institute for Solid State Electronics at TU Wien. "However, if one intends to use it to produce components on a nanometre scale, you run into a major problem: it is extremely difficult to produce high-quality electrical contacts, because even the smallest impurities at the contact points can have a major impact on the electrical properties. We have therefore set ourselves the task of developing a new manufacturing method that enables reliable and reproducible contact properties."

Traveling atoms

The key to this is temperature: when nanometre-structured germanium and aluminum are brought into contact and heated, the atoms of both materials begin to diffuse into the neighboring material—but to very different extents: the germanium atoms move rapidly into the aluminum, whereas aluminum hardly diffuses into the germanium at all. "Thus, if you connect two aluminum

contacts to a thin germanium nanowire and raise the temperature to 350 degrees Celsius, the germanium atoms diffuse off the edge of the nanowire. This creates empty spaces into which the aluminum can then easily penetrate," explains Masiar Sistani. "In the end, only a few nanometre area in the middle of the nanowire consists of germanium, the rest has been filled up by aluminum."

Normally, aluminum made up of tiny crystal grains, but this novel fabrication method forms a perfect single crystal in which the aluminum atoms are arranged in a uniform pattern. As can be seen under the transmission electron microscope, a perfectly clean and atomically sharp transition is formed between germanium and aluminum, with no disordered region in between. In contrast to conventional methods where electrical contacts are applied to a semiconductor, for example by evaporating a metal, no oxides can form at the boundary layer.

Feasibility check in Grenoble

In order to take a closer look at the properties of this monolithic metal-semiconductor heterostructure of germanium and aluminum, Masiar Sistani collaborated with Prof. Olivier Buisson's quantum engineering group at the University of Grenoble. It turned out that, the novel structure indeed has quite remarkable properties: "Not only were we able to demonstrate superconductivity in pure, undoped germanium for the first time, we were also able to show that this structure can be switched between quite different operating states using electric fields," reports Dr. Masiar Sistani. "Such a germanium quantum dot device can not only be superconducting but also completely insulating, or it can behave like a Josephson transistor, an important basic element of quantum electronic circuits."

This new heterostructure combines a whole range of advantages: The structure has excellent physical properties needed for quantum technologies, such as high carrier mobility and excellent manipulability with electric fields, and it has the additional advantage of fitting well with already established microelectronics technologies: Germanium is already used in current chip architectures and the temperatures required for heterostructure formation are compatible with mature semiconductor processing schemes. "We have developed a structure that not only has theoretically interesting quantum properties, but also opens up a technologically very realistic possibility of enabling further novel and energy-saving devices," says Dr. Masiar Sistani.

More information: Jovian Delaforce et al, Al–Ge–Al Nanowire Heterostructure: From Single-Hole Quantum Dot to Josephson Effect, *Advanced Materials* (2021). DOI: [10.1002/adma.202101989](https://doi.org/10.1002/adma.202101989)

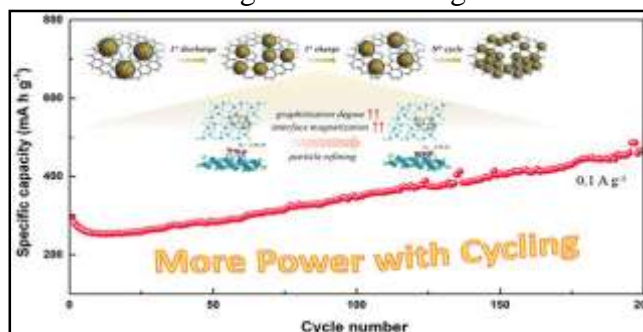
Journal information: [Advanced Materials](https://phys.org/news/2021-10-nanostructure-key-quantum-electronics.html)
<https://phys.org/news/2021-10-nanostructure-key-quantum-electronics.html>

Particle refinement induces and increases cycle capacity of sodium/lithium-ion batteries

By Li Yuan

Sodium ion batteries (SIBs) have attracted wide attention owing to the advantages of abundant sodium source and low cost. Electrodes with higher Na^+ storage capability and cycling stability are vital to improve the energy density and rate capability of SIBs.

Recently, Prof. Li Xianfeng's group and Assoc. Prof. Zheng Qiong's group from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences (CAS), in collaboration with Prof. Tang Yongfu's group from Yanshan University, proposed a new mechanism of sodium/lithium ion batteries electrode energy storage.



Schematic diagram of the mechanism of particle refinement to induce increase the cycle capacity of SIBs. Credit: WANG Canpei

This study was published in *Angewandte Chemie International Edition* on Sept. 14.

The researchers designed a coral-like FeP composite with FeP nanoparticles anchored and dispersed on a nitrogen-doped three-dimensional carbon framework (FeP@NC). The coral-like FeP@NC composite had a shorter charge transfer path and a higher conductive N-doped carbon network, which improved the charge transfer kinetics of this composite.

Due to the highly continuous N-doped carbon framework and a spring-buffering graphitized carbon layer around the FeP nanoparticle, the SIB with FeP@NC composite exhibited an ultra-stable cycling performance at 10 A g^{-1} with a capacity retention of 82.0 percent in 10,000 cycles.

More importantly, they combined electrochemical research and in-situ electron microscopy characterization to confirm a unique mechanism of particle refinement to induce increase capacity during cycling, and this capacity-enhancing effect was more pronounced under small currents.

They found that the FeP nanoparticles went through a refining-recombination process during the first cycle and presented a global refining trend after dozens of cycles. This resulted in a gradual increase in graphitization degree and interface magnetization, and further provided more extra active sites for Na^+ storage and contributed to a rising capacity with cycling. The capacity ascending phenomenon could also extend to lithium-ion batteries (LIBs). It can maintain a capacity retention of 90.3 percent for LIBs after 5,000 cycles at 10 A g^{-1} .

<https://phys.org/news/2021-10-particle-refinement-capacity-sodiumlithium-ion-batteries.html>

Alzheimer's and Covid-19 severity: A genetic link?

By Anna Guildford

- *Scientists have identified a genetic link between the development of Alzheimer's and severe COVID-19 outcomes.*
- *A new study identifies the same immune system changes in both diseases.*
- *Targeting specific "risk" genes could lead to future treatments for Alzheimer's disease and COVID-19.*

Alzheimer's disease is the most common form of dementia, a syndrome where cognitive function declines progressively over time.

According to the World Health Organization (WHO) Trusted Source, over 55 million people live with dementia worldwide, and doctors diagnose 10 million new cases each year. Around 60–70% of these are Alzheimer's cases.

Alzheimer's disease and inflammation

"While Alzheimer's is primarily characterized by a harmful buildup of amyloid protein and tangles in the brain, there is also extensive inflammation in the brain that highlights the importance of the immune system in Alzheimer's," explains Dr. Dervis Salih.

Dr. Salih is a senior research associate in neurodegenerative disease at University College London (UCL).

In previous work by UCL, genetic studies revealed that different genes can alter the risk of developing Alzheimer's disease. These "risk genes" change how [microglia](#), or immune cells of the brain, respond to amyloid protein and tangles.

Scientists have focused on a subpopulation of microglia cells known as interferon response microglia (IRM) Trusted Source, which increase with age and in response to amyloid proteins.

IRM cells respond to interferon proteins that the body releases to fight viral infections, such as SARS-CoV-2.

According to Dr. Rosa Sancho, head of research at Alzheimer's Research UK, "Fairly early in the pandemic, people with dementia emerged as a group at particular risk of severe COVID-19."

OAS1 gene and inflammation

The current findings, published in the journal *Brain*, build on previous work by Dr. Salih.

The new study, led by Naciye Magusali, a doctoral candidate at UCL, focused on the genotyping of 2,547 human DNA samples. Of these, 1,313 were from people with a diagnosis of Alzheimer's disease, and 1,234 were from controls without Alzheimer's.

The authors identified a variant of the interferon-stimulated gene oligoadenylate synthetase 1 (*OAS1*) that can increase the risk of developing Alzheimer's disease by an estimated 11–22%.

Scientists have also shown that *OAS1*, which regulates inflammatory proteins, contributes to the genetic risk Trusted Source associated with severe COVID-19 outcomes.

According to the current study, cells treated to mimic the effects of COVID-19 showed a lower expression of *OAS1*.

Dr. Salih explains: "The variant in *OAS1* associated with disease is lowering *OAS1* expression. This supports the idea that people with lower levels of *OAS1* are more likely to show a chronic cytokine response or 'cytokine storm.'"

The work shows that the body needs *OAS1* to reduce the amount of inflammation-causing proteins. According to Dr. Salih:

“We see in [...] microglial cells that *OAS1* is suppressing pro-inflammatory function of cells in response to elevated levels of interferon.”

These findings show the importance of inflammation in both the progression of Alzheimer’s disease and the severity of COVID-19.

Potential implications

Speaking about the new research, Dr. Sancho points out that “[w]e don’t know whether the effects of this risk gene could influence long-term neurological consequences of COVID-19 or whether COVID-19 [...] increases the risk of dementia later in life.”

Dr. David Strain, a senior clinical lecturer at the University of Exeter in the United Kingdom, comments: “It does add important information as to the pathogenesis of the more severe presentations of COVID-19 and will hopefully be able to shed further light on potential treatment options or even personalized preventive medicine.”

<https://www.medicalnewstoday.com/articles/alzheimers-and-covid-19-severity-a-genetic-link#OAS1-gene-and-inflammation>

