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THE NEW INDIAN EXPRESS

Mon, 04 Nov 2019

Four nuclear capable missiles lined up for test this month

India has lined up four indigenously developed nuclear capable missiles for tests this month

By Hemant Kumar Rout

Bhubaneswar: India has lined up four indigenously developed nuclear-capable missiles for tests this month. The missions assume significance as the missiles to be flight tested from different platforms are capable of reaching all major cities of Pakistan.

The weapon systems slated for tests are submarine-launched long-range ballistic missile K-4, supersonic cruise missile BrahMos, intermediate-range ballistic missile Agni-II and short range ballistic missile Prithvi.

Defence sources on Sunday told The Express that K-4 has been scheduled for November 8, followed by two versions of BrahMos - surface-to-air and air-to-air - on November 11, Agni-II on November 16 and Prithvi on November 20.

MISSILE, LAUNCH DATE	STRIKE RANGE
K4, Nov 8	3500 km
BrahMos, Nov 11	300 km
Agni-II, Nov 16	2000 km
Prithvi, Nov 20	350 km

While the Defence Research and Development Organisation (DRDO) will conduct a developmental trial of K-4 missile with advanced navigation systems from an underwater platform off Visakhapatnam coast, Strategic Forces Command (SFC) will carry out user trials of Agni-II and air-force version of Prithvi missile off Odisha coast.

BrahMos Aerospace will test fire two rounds of the cruise system to further demonstrate the weapon's ability for precision hit. With the two tests - one from land-based platform and another from fighter aircraft Sukhoi-30 MKI - BrahMos will be put on trial for the seventh time this year.

The missile, a joint venture of India and Russia, has undergone five successful tests including two each in May and October and one in September. The air-variant of the cruise weapon is expected to go into production after the test against sea-based target.

Though four nuclear-capable missiles being lined up for tests in one month amidst heightened tension along border sends a clear signal of the country's strategic preparedness, a defence official tried to cover it up stating that India sticks to its 'no first use' doctrine.

"Preparations are on in full swing for the tests. If weather permits, the missiles will be test fired as per the schedule. The focus will be on the performance of K-4 and Agni-II as both the missiles will be put to tests with new advanced systems," he said and added that the atmosphere in November allows better visibility to track the flight path.

Kept under wraps by the DRDO so far, K-4 is about 12 metre long with a diameter of 1.3 metre. Capable of three dimensional manoeuvres, it weighs around 17 tonne and is capable of delivering two tonne warhead up to a distance of over 3,500 km.

The underwater missile is considered a potential weapon for India as it can deceive enemy radars and target important installations deep in Pakistan from a standoff distance in the Bay of Bengal.

http://www.newindianexpress.com/states/odisha/2019/nov/04/four-nuclear-capable-missiles-lined-up-for-test-this-month-2056717.html

The Indian EXPRESS

Sat, 02 Nov 2019

Explained: Why are Air Independent Propulsion submarines significant for India?

The DRDO on Wednesday tested a land-based prototype of an Air Independent Propulsion (AIP) submarine

New Delhi: The DRDO on Wednesday tested a land-based prototype of an Air Independent Propulsion (AIP) submarine. The prototype operation at the Naval Materials Research Laboratory in Ambernath, Maharashtra, is considered to give a boost to the DRDO's plan to build AIP systems for Indian naval submarines. The land-based prototype was engineered to the form-and-fit of a submarine.

What is the Air Independent Propulsion (AIP) technology used in submarines?

Submarines are essentially of two types: conventional and nuclear. Conventional submarines use a diesel-electric engine, and must surface daily for oxygen for fuel combustion. If fitted with an Air Independent Propulsion (AIP) system, the sub needs to take in oxygen only once a week.

While many naval powers, including India, have acquired nuclear-powered submarines for deep-sea operations, conventional diesel-electric variants are considered useful for coastal defence. The latter are optimised for stealth, and their weapons and sensors provide for effective operations close to the shore.

Because diesel-electric submarines require to come to the surface frequently to charge their batteries, their underwater endurance time is less. 'Air-independent' propulsion technology helps to make the diesel generator less dependent on surface air.

In a fuel cell AIP, an electrolytic fuel cell releases energy by combining hydrogen and oxygen, with only water as the waste product. The cells are highly efficient, and do not have moving parts, thus ensuring that the submarine has a low acoustic signature. Older submarines can be adapted to the AIP system by retrofitting.

A fuel cell-based AIP, like the one developed by DRDO, is known to deliver better performance compared to other technologies. According to the Defence Ministry press release, the AIP system enhances the submerged endurance of diesel-electric submarines several times, thus having a multiplier effect on its lethality.

https://indianexpress.com/article/explained/explained-why-are-air-independent-propulsion-submarines-significant-for-india-6098049/

MAIL TODAY

Mon, 04 Nov 2019

A breakthrough, but miles to go

THE DRDO recently demonstrated a land-based prototype of its fuel-cell based Air Independent Propulsion (AIP) system for Indian submarines to Navy Chief Admiral Karambir Singh.

The operation of the land-based prototype, was witnessed by Admiral Singh and G Satheesh Reddy, secretary, department of defence R&D and chairman DRDO, at the Naval Materials Research Laboratory in Ambernath, Maharashtra. Conventional submarines are powered by diesel-electric propulsion. The submarine has to periodically surface for diesel recharge, a time when it is most vulnerable.

AIP significantly extends the underwater stay of conventional submarines by providing an alternate source of electric power.

The fuel-cell is one of three such currently used technologies that the DRDO has zeroed in on.

The Phosporic Acid Powered Fuel Cell in AIP is "engineered to the form-and-fit of a submarine," DRDO says. Perfecting this could make India one of a handful of countries to develop an AIP.

The Phosporic Acid Powered Fuel Cell in AIP is "engineered to the form-and-fit of a submarine," DRDO says. But Navy officials say it will take time for AIP to be ready

India cited the DRDO project as reason to reject an offer to install French-built AIP kits on the fifth and sixth Scorpene class submarines currently being built at the MDL, Mumbai. However, Navy officials say that the DRDO AIP has years to go before it is marinised and gyro-stabilised to fit inside a submarine. The DRDO has a shot at integrating the AIP into the lead boat of the INS Kalvari, when it comes in for its first long refit in 2024.

MAIL TODAY

Mon, 04 Nov 2019

K-9 Vajra makes its desert debut

THE INDIAN ARMY'S K-9 Vajra self-propelled howitzer made its fiery debut in the deserts of Rajasthan in October as part of the Bhopal-based 21 Strike Corps' ongoing war exercises 'Sindhu Sudarshan'.

Self-propelled guns — howitzers mounted on a tank chassis — allow artillery provide mobile firepower as fast-moving strike corps move into enemy territory. The Army bought 100 of the K-9 towed artillery from the consortium of L&T and South Korea's Hanwha Techwin for ₹4,500 crore in 2018, a requirement that had been 20 years in the pipeline.

NEWS18

Sat, 02 Nov 2019

DRDO to review research for defence applications at IITs and NITs

A meeting is scheduled to take place in New Delhi with the directors and officials of Ministry of Human Resource Development, will take stock of things and will plan the way ahead on research with defence applications

By Eram Agha

New Delhi: the Defence Research and Developmental Organisation will take take stock of research in select Indian Institute of Technology (IITs) and National Institute of Technology (NITs) that can have defence application on November 13.

The meeting, which is scheduled to take place in New Delhi with the directors and officials of Ministry of Human Resource Development (MHRD), will take stock of things and will plan the way ahead on research with defence applications.

“The DRDO would take stock of defense related research in IITs and NITs and also chart the future course of action in encouraging research on national security. The DRDO interest in IITs is not new there have been earlier collaborations but now it is more coordinated.” sources in MHRD said.

The letter marked to some IIT directors has asked them to present new research ideas which have defense applications. “We just know that we have to present new ideas on research that can be used in defense. I don’t see there is any problem here – We need to come together to develop defense technology that even the world becomes our audience. Our different departments have produced interesting products that have defense application, and will be reviewed in the meeting,” said one of the directors at IIT said on the condition of anonymity.

Unlike in the past, the collaboration with the DRDO, which was more on the line of blue sky projects (no real world applications), is more focused on deliverables and looking for collaboration beyond five years.

Some offerings from IITs

As reported in the past IIT Ropar has designed helmets for surgical strikes and Artificial Intelligence in Defense.

Joint Advanced Technology Centre has been set up by DRDO at IIT Delhi. News18.com has learnt that DRDO has committed Rs 300 crore for research to the institute.

The IIT Delhi website reads, “It is for making pivotal investments in breakthrough technologies for national security using capabilities of potential researchers amongst IIT Delhi academia. It will generate an innovation ecosystem that includes academia, industry and DRDO partners, with a constant focus on the Nation’s military futuristic requirements.”

The verticals in IIT Delhi are neatly marked under different categories. On the industry day IIT Delhi showcased some of the defence related research. The work in IIT Delhi is afoot in collaboration DRDO on making lighter bullet proof jackets, and boots that can absorb shock in harsh terrain.

Under the “Advanced Electromagnetic Devices and Terahertz (EMDTERA)” the research would address the needs for advanced imaging, sensing and communication technologies using THz and RF MEMS based higher bandwidth communication technologies and subsystems relevant to defence and security.

The vertical Advanced Ballistics, Special Structure and Protection Technologies’ (ABSSP), major objective is the development of lightweight body armor system for high threat level protection.

The research of Smart and Intelligent Textile (SITEX) shall mainly focus upon the creation of technologies and products for specified defence applications which are based primarily on textiles as the major component.

The remaining two verticals on Photonics and Brain Computer Interface & Brain Machine Intelligence are in the process of research articulation and approval.

In IIT Madras the researchers refused to delve in the specific projects but shred the areas in which defence related research in collaboration with DRDO is taking place – There will be Artificial Intelligence, Robotics, Augmented and Virtual Reality, Advanced and Nano-material. The IIT Madras is also working on building start-ups for defense need.

The institute will host a defense tech summit - Shaastra in 2020. The students have adopted defense as the theme for their flagship summit since the "national discourse is being dominated by Defense and Defense Technology."

The collaboration of IITs and Defence was very close to the late Minister of Defence Manohar Parriker who wanted DRDO to more closely interact with IITs especially Bombay, Madras and Jadhavpur among other.

Past and Present

Prof V Kamakoti, professor in Department of Computer Science and Engineering at IIT Madras said, “The memorandum of collaboration signed in 2001 with IIT Madras was on blue sky research. That kind of research is still on but there is lot of emphasis on clear cut deliverable, there is more work on on real world application.

“The most important thing is to have indigenous defence technology – we should know what is in the inside of the thing we have made. The confluence of academia and defence is one way of building on research for defence,” he added.

https://www.news18.com/news/india/drdo-to-review-research-for-defence-applications-at-iits-and-nits-2370829.html

DefenceNews

Mon, 04 Nov 2019

Indian Army to have first Dhanush regiment by March 2020

The Indian Army, which began inducting the indigenously upgraded Dhanush artillery guns, will have the first regiment in place by March 2020 and will get all 114 guns by 2022, Army sources said. Dhanush is the indigenously upgraded variant of the Swedish Bofors gun imported in the 1980s.

“The first regiment of 18 guns will be in place by March 2020. We will get another 36 guns by March 2021 and another 40 by March 2022. The entire order for 114 guns will be completed by 2022,” an Army source said.

In April, the Ordnance Factory Board had handed over the first batch of six Dhanush guns. The Gun Carriage Factory, Jabalpur, received the Bulk Production Clearance to manufacture 114 guns from the Army on February 18, 2019.

The Defence Ministry had stated earlier that indigenisation to the extent of about 81%, has “already been achieved” and by the end of 2019, the level of indigenisation in the manufacture of the gun “will go up to 91%.”

Options discussed

Sources said the induction process was reviewed at the recently concluded Army Commanders' Conference and "various options for the employment were discussed".

Dhanush is a 155 mm, 45-calibre towed artillery gun with a range of 36km and has demonstrated a range of 38 km with specialised ammunition. It is an upgrade of the existing 155m, 39 calibre Bofors FH 77 gun.

The Army recently procured 155mm Excalibur precision guided ammunition from the U.S. having the ability for targeted artillery strikes at extended ranges. Sources said the ammunition can be used with all 155-mm artillery guns in the inventory.

The Excalibur projectile is developed by Raytheon and BAE Systems Bofors, and according to information on Raytheon's website, it provides accurate "first-round effects" at all ranges in all weather conditions and "extends the reach of .39-calibre artillery to 40 km and .52-calibre artillery to more than 50 km".

Phased trials

The first phase of trials of Dhanush were conducted between July to September 2016 at Pokhran and Babina ranges and the second phase was conducted between October to December 2016 at Siachen base camp with three guns. The last round of user exploitation trials were completed with six guns in June last year.

The gun is fitted with an inertial navigation system having global positioning system (GPS)-based gun recording and auto-laying, an enhanced tactical computer for on-board ballistic computations, an on-board muzzle velocity recording, an automated gun sighting system equipped with camera, thermal imaging, and laser range finder.

After close to three decades, the Army inducted its first modern artillery guns system in November last year. These include M-777 Ultra Light Howitzers (ULH) from the U.S. and K9 Vajra-T self-propelled artillery guns from South Korea.

http://www.defencenews.in/article/Indian-Army-to-have-first-Dhanush-regiment-by-March-2020-757778

THE NATIONAL INTEREST

Sat, 02 Nov 2019

What if India's missile defense system caused a nuclear war with Pakistan?

The opposite of what it was meant to do

By Michael Peck

- ***Key point: If one side is immune from attack, it raises the risk of conflict because mutually-assured-destruction no longer holds***

India says it has successfully tested an interceptor capable of shooting down ballistic missiles.

But could this trigger a nuclear war with Pakistan?

On August 2, the Defense Research Development Organization (DRDO) -- India's equivalent of the Pentagon's DARPA research agency -- launched an Advanced Area Defense (AAD) missile from Abdul Kalam island off India's eastern coast.

"The endo-atmospheric missile, capable of intercepting incoming targets at an altitude of 15 to 25 kilometers [9 to 16 miles] was launched against multiple simulated targets of 1,500 kilometer [932 mile]-class ballistic missiles," according to the DRDO announcement.

"One target among simultaneously incoming multiple targets was selected on real time, the weapon system radars tracked the target and the missile locked on to it and intercepted the target with a high degree of accuracy. The complete event including the engagement and interception was tracked by a number of electro-optical tracking systems, radars and telemetry stations. All the mission objectives were successfully met."

India's missile defense program is a two-tiered system: the Prithvi missile (derived from the Prithvi tactical ballistic missile) for exo-atmospheric intercepts in outer space, before they near the target, and the Advanced Area Defense missile for endo-atmospheric intercepts within the Earth's atmosphere, in the terminal phase when the target warhead is making its final descent.

In that sense, it is similar to the 1960s U.S. Anti-Ballistic Missile System, which used Safeguard and Sprint missiles, or any integrated air defense system. A long-range interceptor to take out the incoming missile far from the target, and a short-range point defense weapon to destroy any missile that penetrates the long-range screen.

Previous tests of Indian interceptors targeted short-range Prithvi ballistic missiles on a trajectory that mimicked medium-range missiles. The Diplomat magazine suggests that the dummy target this time could have been an Agni, an intermediate-range missile capable of carrying nuclear warheads.

Indian press trumpeted that India's missile defense is a homegrown program developed by India, rather than imported from Russia and America as are so many Indian weapons such as jet fighters and tanks. That's no small point of pride for the world's second most-populous nation, once the poster child for poverty, and now the world's sixth-largest economy.

Interestingly, while India boasts of developing its own missile defense system, it is also buying Russian S-400 air defense missiles capable of intercepting missiles as well as aircraft.

"The S-400 acquisition, which has some utility for missile defense, suggests that India is interested in the capability and not merely letting DRDO have a science project," Christopher Clary, a professor of international relations at State University of New York Albany, told *The National Interest*.

But there is another danger with Indian missile defense, as history shows. When America and the Soviet Union developed anti-missile systems in the 1960s, the opposing superpower either built more missiles, or increased the number of warheads on existing missiles, to saturate enemy defenses.

So what will Pakistan do?

India and Pakistan "are already in an arms race for all intents and purposes and have been so for some time," Georgetown University professor C. Christine Fair, who has written on the Pakistani military, told *The National Interest*.

"There is, of course more nuance: Pakistan has the world's fast growing nuclear weapons program. India has chosen not to reciprocate in growing its stockpiles. Pakistan has and is trying to acquire tactical nuclear weapons while India has demurred."

"Pakistan will field more warheads on more delivery vehicles than it would in the absence of BMD [ballistic missile defense], Clary says.

"Pakistan could develop multiple warheads for its current ballistic missiles, or develop short-range tactical nuclear weapons and cruise missiles that are harder to intercept."

In turn, a Pakistani buildup might prompt an India buildup, sparking a vicious cycle reminiscent of the Cold War.

Ironically, India is notorious for developing home-grown weapons, such as aircraft and tanks, that take much longer to develop than expected, and are plagued with problems when they are fielded. But as always with nuclear weapons and missile defense, perception is everything.

"The biggest problem from India's side is that it all too frequently announced that it has a capability which mobilizes Pakistan to innovate when in fact India is a long way from achieving the stated capability but Pakistan has already developed a counter measure," Fair warns.

https://nationalinterest.org/blog/buzz/what-if-indias-missile-defense-system-caused-nuclear-war-pakistan-93021

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Sat, 02 Nov 2019

Customs, GST relief to give Rs 60,000-cr boost to defence

Around Rs 25,000 cr will be saved over the next 5 years on account of the rollback of customs duty on the import of defence equipment that is not manufactured in India while GST exemptions will augment the defence budget by Rs 35,000 cr

By Manu Pubby

New Delhi: India's defence budget will be augmented by more than Rs 60,000 crore over the next five years owing to exemptions from customs duty and goods and services tax (GST) that kicked in on October 1, said people aware of the matter.

They said estimates by the Rajnath Singh-led defence ministry show that the twin exemptions will significantly impact its budget and free up resources for modernisation and replenishment of equipment.

The defence ministry had been hit by the imposition of customs duty in 2016 on all imports of military equipment, followed by the GST the next year. Although the two levies were aimed at promoting indigenous production of defence equipment, it soon became evident that there was a lack of capability to produce certain items locally.

With the ministry forced to spend a significant chunk of its budget on imports, the twin taxes reduced the availability of modernisation budget, leading to the armed forces cutting back on plans to acquire new systems.

"A case was taken up with the finance ministry to reinstate the exemption on customs duty and exempt GST as well for imported defence items for which there is currently no domestic production capability," said one of the persons, who spoke on condition of anonymity.

A key factor in the exemption is that it has been provided for a select number of defence items and for a limited period of five years, during which it is estimated that domestic production will not be available. This would safeguard interests of the Indian industry and allow it to provide alternatives after the fiveyear window, said the person.

Officials said that around Rs 25,000 crore will be saved over the next five years on account of the rollback of customs duty on the import of defence equipment that is not manufactured in India while GST exemptions will augment the defence budget by Rs 35,000 crore.

As reported by ET, the withdrawal of customs duty on imported defence items that are not manufactured in India will improve cash flow, but the services are still short of resources to take forward their modernisation plans.

The defence allocation this year is pegged at Rs 3.18 lakh crore, with capital expenditure of Rs 1.08 lakh crore. The inadequate capital acquisition means that the three armed forces will fall short of almost Rs 18,000 crore on their committed liabilities to pay for equipment already purchased.

This gap could mean delayed payments to public sector units and a further delay in purchasing equipment.

https://economictimes.indiatimes.com/news/defence/customs-gst-relief-to-give-rs-60000-cr-boost-to-defence/articleshow/71861506.cms

DefenceNews

Sun, 03 Nov 2019

Army to help boost connectivity in border areas of Uttarakhand facing China : General Bipin Rawat

Army Chief General Bipin Rawat on Sunday said the Army and the Air Force will give all support to the Uttarakhand government in its efforts to boost connectivity, infrastructure and telecom facilities in areas close to the border with China.

Steps are underway, he said, to create advance landing facilities in high altitude areas of the state close to the border.

"We are constantly in touch with the state government and steps are underway to create advance landing facilities or airfields as proposed by the chief minister in high altitude areas of the state close to the China border," the Army Chief said.

"The Indian Army or the IAF will give all its support to the state government to boost air, rail or road connectivity in remote border areas in higher altitudes," Gen Rawat said in his address at the second edition of Raibar, a state government-sponsored programme to deliberate on measures for development of the state with focus on remote hilly areas.

Gen Rawat praised the state government for steps being taken to utilise natural resources at its disposal for the state's development.

He spoke of efforts being made by the state government to encourage walnut and pine nut farming in high altitude villages and methodical cultivation of medicinal herbs, that the Himalayan region abounds with, for their great commercial value.

"Those who live in Uttarakhand or have love for the land will agree that if there is heaven anywhere in the world it is here and here only. All we have to do is propel it on the path of progress," the Army chief, who himself hails from a village in Pauri district, said.

Noting the large representation of Uttarakhand in the armed forces, he said the state has always been sending its brave soldiers to the borders to protect the country.

"I am confident that brave sons and daughters of Uttarakhand will never hesitate in fighting the country's enemies and terrorism even if that means laying down their lives," he said.

Gen Rawat, who along with Chief Minister Trivendra Singh Rawat honoured 30 war widows and mothers of martyred soldiers from the state, said the role played by them in successive wars and counter terrorism operations in Jammu and Kashmir can never be forgotten.

http://www.defencenews.in/article/Army-to-help-boost-connectivity-in-border-areas-of-Uttarakhand-facing-China--General-Bipin-Rawat-757770

INDIA TODAY

Mon, 04 Nov 2019

India eyes United States defence tech

The Indo-US defence cooperation is hobbled by the fact that the two countries have virtually no joint development projects to develop defence hardware

By Sandeep Unnithan

New Delhi: Defence minister Rajnath Singh and Foreign minister S Jaishankar are set to leave for Washington next month for the second 'two-plus-two' dialogue with their US counterparts. On their agenda will be to speed up defence technology cooperation between India and the US.

The Indo-US defence cooperation is hobbled by the fact that the two countries have virtually no joint development projects to develop defence hardware.

The 'Defence Technology Trade Initiative' (DTTI) launched in 2015, the brainchild of then US Defence Secretary Ashton Carter, aimed to resolve this conundrum. The choice of DTTI projects - chemical and biological gear for soldiers and UAVs might seem underwhelming when you look at the big ticket items.

A Navy working group project for Electromagnetic Launch Systems for launching combat jets from aircraft carriers could be hobbled by the fact that a new Indian aircraft carrier is nowhere on the horizon.

A critical project for the co-development of a fighter jet engine was recently suspended after it fell afoul of US export controls. There are several reasons why the DTTI has remained a non-starter.

The ninth meeting of the DTTI working groups concluded in New Delhi on October 24 signed a statement of intent to strengthen dialogue and cooperation on specific DTTI projects including lightweight small arms technologies and air-launched Unmanned Aerial Systems.

The working group noted that "significant progress has been made on developing a DTTI Standard Operating Procedure (SOP) for the identification and development of cooperative projects under DTTI."

The SOP will serve as the framework for DTTI and allow both sides to reach and document a mutual understanding on how to define and achieve success. The upcoming 2+2 is the near-term opportunity to finalise the SOP. Two plus two could make 22 after all.

https://www.indiatoday.in/mail-today/story/india-eyes-united-states-defence-tech-1615417-2019-11-04

Business Standard

Mon, 04 Nov 2019

India, Uzbekistan ink pacts on cooperation in security ties

New Delhi: India and Uzbekistan have inked three pacts on cooperation in security ties after a meeting between the defence ministers of the two countries, the defence ministry said on Sunday.

Defence Minister Rajnath Singh, who is attending Council of Heads and Governments (CHGs) of the Shanghai Cooperation Organisation as the special envoy of Prime Minister Narendra Modi in

Tashkent, held talks with his Uzbek counterpart Major General Bakhodir Nizamovich Kurbanov on Saturday.

"Following the meeting, the two sides concluded a memorandum of understanding on cooperation in the field of Military Medicine between the armed forces of the two countries. In the coming days, the sides will continue discussions at the expert level to further enhance their exchanges in this sphere," a statement by the defence ministry said.

The MoU is a byproduct of interactions emanating from the MoU on Military Education signed between the two countries in October 2018, it said.

Two Institution-to-Institution MoUs on training and capacity building between institutes of higher military learning of the two countries were also signed, the statement said.

"The defence ministers agreed that the two sides would continue to work together to further raise their level of engagement in the defence sphere in keeping with strategic partnership between India and Uzbekistan," it said.

In the coming days, the statement said, the two sides will continue discussions at the expert level to further enhance their exchanges in this sphere.

The two defence ministers also witnessed the first-ever exchange over a video-link between College of Defence Management in Secunderabad, Telangana, and Armed Forces Academy of Uzbekistan in Tashkent.

This would be based on higher level of mutual trust and respect between the two countries and on their shared views and approaches on a range of regional and international issues, including promoting regional stability and security and combatting extremism and terrorism, the statement said.

During the meeting, both sides expressed satisfaction at the enhanced level of defence engagement between India and Uzbekistan.

"This enhanced level of engagement is reflected in the first ever meeting of the Joint Working Group on Defence Cooperation in February 2019, visit of Defence Secretary of India in March 2019 and the first-ever Defence-Industry Workshop organised in Tashkent in September 2019," the statement said.

India has offered a concessional line of credit of USD 40 million for procurement of goods and services by Uzbekistan from India.

The direct exchanges related to training, capacity building and education between the armed forces on both the sides has also witnessed a significant upswing.

The two defence ministers jointly presided over the curtain raiser of the first-ever India-Uzbekistan joint exercise "Dustlik 2019".

The exercise will be conducted from November 4-13, 2019, at Chirchiq Training Area near Tashkent and will be focused on counter-terrorism, an area in which the two countries share a common concern.

In the exercise, an Indian Army contingent will train along with Uzbekistan Army. The exercise will enable sharing of best practices and experiences between the armed forces of the two countries and would lead to greater operational effectiveness, the defence ministry said.

(This story has not been edited by Business Standard staff and is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/pti-stories/india-uzbekistan-ink-pacts-on-cooperation-in-security-ties-119110300311_1.html

NDTV

Mon, 04 Nov 2019

Maldives expresses gratitude to India for 1988's "Operation Cactus"

During this attempted coup, President Gayoom went into hiding and, in the early hours of November 3, sought India's help and immediate intervention

Male, Maldives: On the occasion of "Victory Day", the Foreign Minister of Maldives, Abdulla Shahid on Sunday remembered the "invaluable" military support rendered by India on this day in 1988, with "highest gratitude and deepest appreciation".

"On the 31st anniversary of Victory Day, we honour those who made the ultimate sacrifice for this nation. Today, the brave martyrs of the Maldives National Defence Force, and civilians are remembered with abundant love. We are grateful that such heroic people were amongst us. We honour all those who undertook the duties entrusted to them with unwavering dedication and dignity and fought to preserve the sovereignty of this nation," the Foreign Minister said in a statement.

"It is a day to value true friends and partnerships. The invaluable military support of the Indian Government on November 3, 1988 remains etched in our hearts. Our highest gratitude and deepest appreciation shall never diminish," he said.

On the intervening night of 2-3 November 1988, around 300 to 500 armed, Tamil / Sinhala-speaking mercenaries landed in Male harbour by boats from a mother ship and captured key locations. During this attempted coup, President Gayoom went into hiding and, in the early hours of November 3, sought India's help and immediate intervention.

Under "Operation Cactus", on the night of November 3, 1988, the Indian Air Force mounted special operations to airlift a parachute battalion group from Agra, non-stop over 2,000 km out beyond the South-Western coast of India to the remote Indian Ocean archipelago of the Maldives.

In response to that government's appeal for military help against a mercenary invasion, the IL-76s of No. 44 Squadron landed at Hulule at 0030 hours, the Indian paratroopers securing the airfield and restoring Government rule at Male within hours.

On learning that these troops were headed for Male, the mercenaries hijacked the merchant vessel "Progress Light", taking Maldivian VIP hostages with them, and set course for Sri Lanka. In Male, law and order was restored as soon as Indian troops arrived on the morning of the 4th.

INS Godavari was diverted towards Colombo to embark, by helicopter, the team of negotiators that had been flown from Male to Colombo.

Reconnaissance aircraft shadowed all moving contacts during the night of 3rd /4th. On the 6th morning, when Progress Light was 60 miles from Colombo, pressure commenced with small arms fire, followed by air-dropped depth charges ahead of the ship, followed by a gun broadside across the bows.

Naval teams boarded the ship and rescued the hostages. The mercenaries were handed over to the authorities at Male.

The Maldivian Foreign Minister said that fateful day showcased the special security threats and vulnerabilities faced by small States.

"That realisation made Maldives take up the issue at the United Nations - resulting in multiple resolutions on the security of small states and their vulnerability to external threats. The Maldives efforts in this regard, helped change the discourse on how small States are viewed and discussed in the international security debate," he said in his statement.

"To counter the emerging external threats of the twenty-first century, we have become even more aware of the need to build our national resilience, as well as invest in the ties that bind us to the larger international community. We shall, with resolute dedication, continue to work towards protecting our sovereignty and independence, through further engagement and enhanced cooperation with the our friends and partners," he added.

Former President of Maldives, Maumoon Abdul Gayoom in a tweet said, "On this auspicious Victory Day, I thank Almighty Allah and pray that He bless the souls of our martyrs and convey my greetings to the beloved people of Maldives. I also thank the Indian authorities for their prompt assistance in defeating the terrorists."

https://www.ndtv.com/india-news/maldives-expresses-gratitude-to-india-for-1988s-operation-cactus-2126717

Sun, 03 Nov 2019

Pakistan gearing up to export the JF-17 Thunder Fighter Jets to 4 Countries

Pakistan is gearing up to sell its widely acclaimed JF-17 Thunder fight aircraft to four different countries. Jointly-produced with China, JF-17 Thunder is the pride of Pakistan Air Force's arsenal, and several countries, including Malaysia, have been eyeing it.

Sources reveal that Pakistan is all set to explore the export markets in countries in Indian neighbourhood, alongside wooing several of New Delhi's traditional defence collaborations across Africa.

JF-17 Thunder Exports ::

During the Pakistan Army Chief's visit to Beijing in October, the agenda was dominated by the supplies of the Chinese fighter aircraft and other military components and hardware, which will be exported to other countries.

Sources reveal that Pakistan intends to dispatch batches of the JF-17 Thunder fighter aircrafts to India's neighbor, Myanmar, and one of New Delhi's oldest defence partners in Africa, Nigeria. Myanmar has already procured four JF-17 Thunder aircrafts with Chinese assistance, and Pakistan is now gearing up to export the Thunder jets to Malaysia and Azerbaijan.

Sources reveal that additional fighter jets will be procured by Nigeria, which has already bought three JF-17s from Pakistan. Analysts observe that the greatest selling features of JF-17s are their premium quality hardware and affordability.

Pakistan's purchase to Myanmar gained immense publicity, which encouraged the military complex to seek out other buyers for its JF-17 Thunder jets. In 2018, Pakistan had discussed the prospects of future sales of Azerbaijan and Malaysia, alongside selling additional fighter jets to Nigeria.

Pakistan's Defence Complex ::

Pakistan's collaboration with China and the assistance in terms of technology transfers has allowed the country to manufacture its own military hardware. The JF-17 Thunder is the pivot of Pakistan's defence strategy.

Sources reveal that Pakistan is increasingly venturing towards manufacturing tanks and other military equipment for its land-based forces with the assistance of technology transfers from China. Moreover, Chinese technology and hardware have also assisted Pakistan in expanding and innovating its Navy.

Senior government officials who discussed the JF-17 Thunder jet sales with the Nikkei Asian Review revealed that since 2018, Pakistan has intensified its bid to export batches of the JF-17 Thunder fighter jets.

The officials say that Pakistan is all set to manufacture the JF-17 Block III, an upgraded version of the JF-17 Thunder, which will be presented in 2020. The JF-17 Bock III will be powered with additional weaponry, new technologies and a much more advanced radar system.

The officials added that China's assistance has been instrumental in aiding Pakistan to develop a commercially viable defence industry so it can avoid investing in expensive military hardware and instead, contribute to the economy with defence sales.

http://www.defencenews.in/article/Pakistan-gearing-up-to-export-the-JF-17-Thunder-Fighter-Jets-to-4-Countries-757760

THE VERGE

Fri, 01 Nov 2019

US Interior Department is grounding its drone fleet due to risks of Chinese spying

Many of the drones are made in China or use Chinese parts

By Nick Statt

The US Interior Department, which oversees federal land and resource management, says it's grounding its entire aerial drone fleet of more than 800 UAVs out of concern for Chinese spying and drone-aided cyberattacks. The news was first reported by *The Wall Street Journal* today, and the department confirmed the grounding to *The Verge*.

Every drone in use by the Interior Department is either manufactured in China or uses some Chinese-made parts, the *WSJ* reports. Interior Secretary David Bernhardt made the order earlier today, and the drones will remain grounded until the department completes a review of the security risks they may pose.

"Secretary Bernhardt is reviewing the Department of the Interior's drone program. Until this review is completed, the Secretary has directed that drones manufactured in China or made from Chinese components be grounded unless they are currently being utilized for emergency purposes, such as fighting wildfires, search and rescue, and dealing with natural disasters that may threaten life or property," reads a statement from Department of the Interior spokesperson Melissa Brown given to *The Verge.*

Many of the drones are currently used by the department to help with combating forest fires, monitoring dams and floods, inspecting land for property and environmental damage due to erosion, and monitoring endangered species. Some of the concern is centered on whether the drones could be used to transmit data, including photography and video, of sensitive US infrastructure that may be the subject of future cyberattacks, *The Wall Street Journal* reports.

The move is the US government's latest escalation in its push to punish Chinese companies for years of alleged trade secret theft, despite the US purchasing billions of dollars in products and equipment from Chinese firms every year.

US lawmakers last month introduced a bill that would prevent federal agencies from purchasing drones from China, something that could greatly impact Chinese drone giant DJI's business. Federal agencies have warned against using DJI products in the past, but the company has never faced an

outright ban. The Department of Homeland Security also warned against using Chinese-made drones in a federal capacity earlier this year.

"We are aware the Department of Interior has decided to ground its entire drone program and are disappointed to learn of this development," a DJI spokesperson told *The Verge* in a statement. "As the leader in commercial drone technology, we have worked with the Department of Interior to create a safe and secure drone solution that meets their rigorous requirements, which was developed over the course of 15 months with DOI officials, independent cybersecurity professionals, and experts at NASA. We will continue to support the Department of Interior and provide assistance as it reviews its drone fleet so the agency can quickly resume the use of drones to help federal workers conduct vital operations."

Beyond the drone market, the Trump administration has gone to great lengths since early last year to completely cut off Chinese telecom giant Huawei from operating in the US in any capacity, out of similar national security concern. And, as a function of the ongoing US-China trade war, those steps have had a significant effect on Huawei's business and its relationship with major partners like Android steward Google, with Huawei losing its Android license and the ability to access Google Play apps.

https://www.theverge.com/2019/10/30/20940921/us-interior-department-drone-grounding-china-spying-cybersecurity-risk

the pioneer

Sat, 02 Nov 2019

NKorea conducts new test of 'super-large' rocket launcher: KCNA

Seoul: North Korea has carried out a "successful" new test of its "super-large multiple rocket launcher" system, state media said Friday -- the latest in a series of provocations by Pyongyang.

South Korea's military said Thursday that the North had launched two short-range projectiles from South Pyongan province. They each flew approximately 370 kilometres.

It was the latest in a series of launches by the North but the first since October 2, when it fired a sea-launched missile.

If confirmed, a submarine-based missile capability would change the military balance on the Korean peninsula.

Thursday's test was conducted to "verify the security of launchers' continuous fire system," the state Korean Central News Agency reported from Pyongyang.

North Korean leader Kim Jong Un, who had personally supervised previous tests of the "super-large" system, "expressed satisfaction... And sent congratulations" to the team involved, KCNA said.

Nuclear talks between Pyongyang and Washington are currently at a standstill. Pyongyang is under multiple sets of international sanctions over its nuclear weapon and ballistic missile programmes, which it says it needs to defend against a possible US invasion.

It is demanding the easing of the measures and has repeatedly urged Washington to come forward with a new offer by the end of this year.

Kim and US President Donald Trump adopted a vaguely-worded statement on the "complete denuclearisation of the Korean peninsula" at their first summit in Singapore in June last year, but little progress has since been made.

The pair met in Hanoi in February, but no deal was reached.

Trump and Kim then agreed to restart working-level talks during a brief meeting at the Demilitarised Zone dividing the peninsula in June.

The two sides met in Sweden earlier this month but Pyongyang walked away, saying it had "no desire" to negotiate unless the United States moves to end its "hostile policies."

https://www.dailypioneer.com/2019/trending-news/nkorea-conducts-new-test-of--super-large--rocket-launcher--kcna.html

NEWS18

Sun, 03 Nov 2019

कहानी का अंत नहीं है चंद्रयान-2, चांद पर सॉफ्ट लैंडिंग की कोशिश करेंगे: ISRO चीफ

इसरो (ISRO) के 50 साल पूरे होने पर दिल्ली स्थित आईआईटी में आयोजित एक कार्यक्रम में के सिवन ने ये बातें कहीं. इस साल चंद्रयान-2 अभियान (Chandrayaan 2 mission) के तहत चांद पर विक्रम लैंडर की लैंडिंग नहीं हो पाई थी.

नई दिल्ली. चांद पर मानवरहित शोध यान उतारने के भारत के महत्वाकांक्षी मिशन चंद्रयान-2 को भले ही झटका लगा हो, लेकिन भारतीय अंतरिक्ष अनुसंधान संगठन (ISRO) का हौसला बरकरार है. चांद पर चंद्रयान-2 (Chandrayaan 2) के लैंडर विक्रम (Vikram Lander) की लैंडिंग ना हो पाने पर इसरो चीफ के सिवन (K Sivan) ने कहा है कि चंद्रयान-2 मिशन कहानी का अंत नहीं है. अभियान को लेकर भविष्य में ख्याल रखा जाएगा. उन्होंने कहा कि भविष्य में चांद पर सॉफ्ट लैंडिंग कराने के पूरे प्रयास किए जाएंगे. इसरो के 50 साल पूरे होने पर दिल्ली स्थित आईआईटी में आयोजित एक कार्यक्रम में के सिवन ने ये बातें कहीं.

चांद की सतह से 300 मीटर ऊपर टूटा था संपर्क

इसरो प्रमुख के सिवन का कहना है कि आने वाले कुछ महीनों में इसरो की ओर से कई एडवांस्ड सैटेलाइट के प्रक्षेपण करने की योजना है. इस पर काम हो रहा है. उन्होंने कहा कि आप सभी चंद्रयान-2 मिशन के बारे में जानते हैं. इसके तकनीकी पक्ष की बात करें तो हम भले ही विक्रम लैंडर की चांद पर सॉफ्ट लैंडिंग नहीं करा पाए, लेकिन चंद्रयान-2 की तकनीकी प्रणाली चांद की सतह से कीब 300 मीटर ऊपर तक बेहतर काम कर रही थी.

मैं आप लोगों को भरोसा दिलाता हूं...

के सिवन ने कहा कि अभियान से जुड़े बेहद कीमती डाटा हमारे पास उपलब्ध हैं. मैं आप लोगों को भरोसा दिलाता हूं कि इसरो अपने अनुभव और तकनीकी क्षमताओं के आधार पर चांद पर शोध यान की सॉफ्ट लैंडिंग कराने का पूरा प्रयास करेगा. उन्होंने कहा कि इसरो का आदित्य L1 सोलर मिशन और मानव अंतरिक्ष उड़ान के प्रोजेक्ट पर लगातार काम हो रहा है. ये दोनों ही ट्रैक पर हैं.

इसरो प्रमुख के सिवन ने कहा कि अगले कुछ महीनों में हम कई एडवांस्ड सैटेलाइट का प्रक्षेपण करने वाले हैं. इसरो का स्मॉल सैटेलाइट लॉन्च व्हीकल (SSLV) इस साल दिसंबर या अगले साल जनवरी में उड़ान भरेगा.

भारत के NAVIC सैटेलाइट के जरिये मोबाइल पर सिग्नल भेजने की तकनीक पर भी काम हो रहा है.

7 सितंबर को विक्रम से टूटा था संपर्क

बता दें कि 7 सितंबर को 'सॉफ्ट लैंडिंग' की प्रक्रिया के दौरान अंतिम समय में लैंडर विक्रम का इसरो (ISRO) स्टेशन से संपर्क टूट गया था. यदि यह सॉफ्ट लैंडिंग करने में सफल रहता तो इसके भीतर से रोवर बाहर निकलता और चांद की सतह पर वैज्ञानिक प्रयोगों को अंजाम देता. लैंडर को चांद की सतह पर सॉफ्ट लैंडिंग के लिए डिजाइन किया गया था. हालांकि चांद की कक्षा पर मौजूद आर्बिटर बेहतर काम कर रहा है.

https://hindi.news18.com/news/nation/isro-chief-k-sivan-says-chandrayaan-2-is-not-the-end-of-story-we-will-try-soft-landing-on-moon-in-future-2570788.html

THE TIMES OF INDIA

Sun, 03 Nov 2019

ISRO Chief: Will try another moon landing in near future

New Delhi: Stating that Chandrayaan-2 mission is not the end of Indian Space Research Organisation's story, ISRO Chairman K Sivan announced that Small Satellite Launch Vehicle (SSLV) is expected to make its maiden flight around January. Sivan also said that Isro is in the process to provide Indian regional Navigation satellite system, better known as NavIC, on mobile phones. Addressing the students of Indian Institute of Technology, Delhi (IIT-D) on their 50th convocation, Sivan said, "You all have heard about Chandrayaan-2 mission. On the technology part, we could not achieve a soft landing. However, all systems functioned smoothly until 300m away from the moon's surface. ISRO will pull all its experience, knowledge and technical prowess to set things right and ensure a soft landing in near future."

Talking about future plans, Sivan said, "Our plans on Aditya L1 solar mission and human spaceflight programme are on track. A large number of advance satellite launches are planned for the coming months. SSLV will make its maiden flight sometime around January. Testing of a 200 ton semi-cryo engine is also expected to begin shortly. Work is on to provide NavIC signals on mobile phones, which will open the path to develop large number of applications for societal needs."

This year, two women students were awarded the gold medal. The President's gold medal went to Kacham Praneeth, a Btech student. The 'perfect ten' gold medals were awarded to four students.

Sivan, a graduate of IIT Bombay, advised students to make wise career choices and to choose a path that reflects ones passion and interest. "More than three decades ago, the job scenario was not as vibrant as today. Today, there are many options. There is an added volatility, uncertainty, complexity, and ambiguity about the global economy. However, you all are much smarter and aware about these scenarios than the older generations," he said.

Before the convocation address, the ISRO chief signed a memorandum of understanding with IIT-Delhi for setting up a Space Technology Cell (STC) at the institute. With this, the establishment will join the league of other premiere institutions such as IISc Bangalore, IIT Bombay, and others where the STCs have been set up to play a major role in taking up the space technology research and applications to the newer heights.

https://timesofindia.indiatimes.com/city/delhi/isro-chief-will-try-another-moon-landing-in-near-future/articleshow/71872685.cms

नवभारत टाइम्स

Sat, 02 Nov 2019

इसरो के साथ IIT खोलेगा 'स्पेस सेल'

नई दिल्ली: आईआईटी दिल्ली स्पेस टेक्नॉलजी सेल खोलने जा रही है। इंडियन स्पेस रिसर्च ऑर्गनाइजेशन (इसरो) के साथ आईआईटी यह सेल शुरू करेगा, जिसमें स्पेस टेक्नॉलजी पर रिसर्च की जाएगी। इसरो चेयरपर्सन डॉ के. सिवन और आईआईटी डायरेक्टर वी. रामगोपाल राव शनिवार को आईआईटी दिल्ली के 50वें दीक्षांत समारोह से पहले एमओयू साइन करेंगे। 2 नवंबर को आईआईटी के गोल्डन जुबली समारोह में इसरो चीफ मुख्य अतिथि होंगे। 2042 स्टूडेंटस को डिग्री मिलेगी।

स्पेस टेक्नॉलजी में रिसर्च : आईआईटी अपने कैंपस में जल्द ही 'इसरो स्पेस टेक्नॉलजी सेल' खोलेगा। आईआईटी के डायरेक्टर प्रोफेसर वी रामगोपाल राव ने बताया, इसके लिए इसरो पांच साल तक सालाना ग्रांट भी देगा। सेल में इसरो और आईआईटी की टीम साइंस और टेक्नॉलजी में रिसर्च करेगी। हमने इसरो को चार फील्ड- आर्टिफिशल इंटेलिजेंस, नैनो टेक्नॉलजी, फंक्शनल टेक्सटाइल और स्मार्ट मैन्युफैक्चरिंग में अकैडमिक पार्टनर बनने का प्रस्ताव भी दिया है। डायरेक्टर ने बताया कि इसरो के साथ आईआईटी का एक स्टार्टअप 'क्लेसेंटा' पहले से जुड़ा है, जो अंतरिक्ष यात्रियों के लिए पानी रहित साफ सफाई के प्रोडक्ट बना रहा है।

2042 स्टूडेंट्स को मिलेगी डिग्री : आईआईटी के 50वें दीक्षांत समारोह में शनिवार को 2042 स्टूडेंटस को डिग्री मिलेगी। कन्वोकेशन कमिटी के चेयरमैन शांतनु रॉय ने बताया कि 825 स्टूडेंट्स अंडरग्रैजुएट डिग्री हासिल करेंगे। इनमें से 704 बीटेक डिग्री और 102 बीटेक-एमटेक डिग्री स्टूडेंट्स हैं। 331 पीएचडी और पोस्ट ग्रैजुएट डिग्री के 1217 स्टूडेंट्स पास हो रहे हैं। आईआईटी में कुल 9650 स्टूडेंट्स हैं, जिनमें से 4126 यूजी, 2691 पीएचडी और 2833 पीएचडी स्टूडेंट्स हैं। गोल्डन जुबली के मौके पर डाक टिकट भी जारी किया जाएगा।

255 करोड़ का अल्मनाई फंड : आईआईटी डायरेक्टर ने शुक्रवार को 'बिलियन डॉलर एन्डाउमेंट ड्राइव' का ऐलान किया है, जिसके तहत इंस्टिट्यूट अपने पुराने स्टूडेंट्स से दान/चंदा लेगा। उन्होंने बताया, गुरुवार को राष्ट्रपति भवन में राष्ट्रपति ने 255 करोड़ रुपये के साथ इसका उद्घाटन किया। इस साल टारगेट एक हजार करोड़ रुपये का है और 2025 तक 7000 करोड़ तक पहुंचाने का। बोर्ड में मेंबर आईआईटी डायरेक्टर, डीन अल्मनाई अफेयर्स प्रो संजीव संघी के अलावा पांच अल्मनाई हैं। प्रो संघी ने बताया, 16 अल्मनाई ने 255 करोड़ देने की बात की है। हमारे 50 हजार अल्मनाई हैं और हम धीरे-धीरे उन तक पहुंच रहे हैं। हायर एजुकेशन फंडिंग एजेंसी (HEFA) का लोन चुकाने के लिए इस फंड के इस्तेमाल के सवाल पर डायरेक्टर ने कहा, इस बारे में सोचा नहीं गया है। हालांकि, प्रो संघी कहते हैं, अगर इस पर अल्मनाई को ऐतराज होगा तो यह नहीं किया जाएगा।

NIT स्टूडेंट्स को सीधे एंट्री : इंस्टिट्यूट अब 'प्रोफेसर ऑफ प्रैक्टिस' नियुक्त करेगा, जो कि अलग अलग इंडस्ट्री के एक्सपर्ट होंगे और स्टूडेंट्स को इंडस्ट्री की जरूरतों के हिसाब से ट्रेन करेंगे। इसके अलावा, आईआईटी में एनआईटी के यूजी स्टूडेंट्स पीएचडी प्रोग्राम में बिना किसी एंट्रेंस के पीएचडी में एडमिशन पा सकते हैं, सिर्फ इंटरव्यू होगा। इंस्टिट्यूट कुछ एनआईटी के साथ एमओयू भी साइन करेगा। साथ ही, रिसर्च सुविधाओं के लिए भी आईआईटी 250 करोड़ रुपये के फंड का इस्तेमाल करेगा।

https://navbharattimes.indiatimes.com/metro/delhi/other-news/iit-will-open-space-cell-with-isro/articleshow/71859556.cms

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Sat, 02 Nov 2019

IIT Delhi, ISRO jointly setting up space technology cell in campus

The cell will work for carrying out focused research projects in the space technology domain with specific deliverables. It is also proposed that IIT Delhi as an institute becomes academic partner of ISRO in research areas for example AI, nanotech..

By Prachi Verma

New Delhi: Indian Institute of Technology (IIT) Delhi is collaborating with Indian Space Research Organisation (ISRO) to set up a space technology cell at the campus. The cell will work for carrying out focused research projects in the space technology domain with specific deliverables. It is also proposed that IIT Delhi as an institute becomes academic partner of ISRO in research areas for example AI, nanotechnology, functional textiles, smart manufacturing or any area of joint interest, according to IIT's director V Ramgopal Rao.

The IIT is also holding its 50thConvocation on 2 November where Dr. K Sivan, Chairman, ISRO will be the chief guest.

“This is the Golden Jubilee Convocation of IIT Delhi. We are very happy to announce the Billion Dollar Endowment drive, which has an initial commitment of Rs 255 crores by our alumni. Our alumni are entirely spearheading this fund raising drive," Rao said.

In this convocation, the institute will also announce two new Masters programmes and modifications to NIT undergraduate student admission process into IIT Delhi Ph.D. programmes, Rao said.

There will be 1217 post graduate and 825 under graduate programme students who will get their degrees in the convocation.

https://economictimes.indiatimes.com/news/science/iit-delhi-isro-jointly-setting-up-space-technology-cell-in-campus/articleshow/71851722.cms

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Design for deep sea vehicle's crew module completed by space agency ISRO

A three member crew can be accommodated in the sphere, one of the key components of the manned submersible vehicle

Chennai: India's ambition to send men to the deep sea in a submersible vehicle appears to be one step closer to fruition with ISRO successfully developing a design for its crew module, a sphere shaped capsule.

"The design for the manned submersible's sphere has been successfully developed by ISRO. Now it has to be certified and then we will go ahead with the fabrication," Secretary, Ministry of Earth Sciences, Madhavan Nair Rajeevan said.

Interacting with journalists on the sidelines of the silver jubilee celebrations of the National Institute of Ocean Technology in Chennai, the top official said that designing the sphere (intended to be built using titanium) involved complex technology.

"ISRO has developed the design and it will be sent to an international agency for certification," he said, adding that the Indian space agency has taken up both designing as well as fabrication -at a later stage- of the sphere.

A three member crew can be accommodated in the sphere, one of the key components of the manned submersible vehicle.

"Work is already on for the deep ocean mission and scientific and technical work has started," he said.

An MoU has already been signed between the ISRO and NIOT on development of the module.

NIOT is tasked with aspects like electronics and navigation for the manned submersible.

Also, multiple agencies, including the Goa based National Centre for Polar and Ocean Research, Centre for Marine Living Resources and Ecology at Kochi and Indian National Centre for Ocean Information Services (Hyderabad) are involved in the initiatives.

The submersible vehicle is expected to travel to a depth of approximately 6,000 metres under the sea for various studies, whereas submarines can reach only about 200 metres.

This initiative is a part of the Deep Ocean Mission.

As part of the ambitious Rs. 10,000 crore Deep Ocean Mission, India will also study climate change in the deep oceans.

Studying climate change, marine biodiversity and survey for compounds like hydrocarbons and minerals are part of the deep ocean mission.

https://www.ndtv.com/india-news/design-for-deep-sea-submersible-vehicle-completed-by-space-agency-isro-2126708

THE HINDU

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ISRO's NavIC set to be commercialised by Antrix

The regional navigation satellite system can serve as an indigenous-GPS

MADHUMATHI D.S.
BENGALURU

The Indian Space Research Organisation (ISRO) and its older commercial arm Antrix Corporation Ltd. are poised to commercialise India's regional navigation satellite system, NavIC, with Antrix recently floating two separate tenders to identify industries that can develop dedicated NavIC-based hardware and systems.

NavIC (Navigation in Indian Constellation) is the Indian system of eight satellites that is aimed at telling business and individual users where they are, or how their products and services are moving. The indigenous positioning or location based service (LBS) works just like the established and popular U.S. Global Positioning System or GPS, but within a 1,500-km radius over the sub-continent.

Antrix's Chairman and Managing Director S. Rakesh said the company was currently identifying suitable device manufacturers on the one side and comprehensive integrators of NavIC-based systems (SIs) on the other.

Eligible manufacturers from the two sets would be empanelled so that they could bid for government projects that require monitoring of moving assets and fleet.

Early users

The early set of commercial NavIC users, he said, would be potentially be transporters of resources such as mined ore, coal and sand in various States. Several transporters currently use GPS-based systems.

Easy navigation: A boat carrying a NavIC receiver sets out to the sea for user trials at Kerala's Vizhinjam harbour. • FILE PHOTO

"Mining and transportation sectors need vehicle tracking applications that are tied to revenue sharing systems of the government," said Mr. Rakesh.

Last year, the Ministry of Road Transport and Highways mandated that all national-permit vehicles must have such tracking devices. As a pilot, many fishing boats have been fitted with these devices that have a unique texting facility.

Besides the Antrix tenders, two other recent developments have paved the way for taking NavIC closer to end users.

Positive developments

In mid-October, ISRO announced that Qualcomm Technologies Inc., a leading producer of semiconductor chips, had developed and tested NavIC-friendly chipsets across its user bases and that it would add NavIC to them.

Another important development for NavIC was the certification of the Indian system by the 3GPP (The 3rd Generation Partnership Project), a global body for coordinating mobile telephony standards.

The specifications will be available in March 2020 and the Telecommunications Standards Development Society, India has said it would adopt them as a national standard.

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VOICE OF THE PEOPLE

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Little change in gas mass of galaxies in 4 bn years: Study

By Vijay Mohan

Chandigarh: Indian scientists have achieved a rare feat of measuring the atomic hydrogen content of galaxies in the early stages of the universe, determining in the process that both star-formation efficiency of galaxies and cosmological gas mass density in galaxies appear to have not changed significantly over the past four billion years.

Using the recently upgraded Giant Metrewave Radio Telescope (GMRT) located in Pune, they determined the average atomic gas content, said to be the "fuel" for star evolution, of star-forming galaxies located four billion light years away, when the universe was about two-thirds of its current age.

The study was carried out by scientists at the Indian Institute of Science Education and Research (IISER), Mohali, and National Centre for Radio Astrophysics at Tata Institute of Fundamental Research (TIFR), Pune. Supported by the Department of Science and Technology, the study has been flagged as one of the most interesting recent results to appear in journals published by the American Astronomical Society.

Two main constituents of galaxies are gas and stars and the life cycle of a galaxy is essentially the conversion of gas to stars through gravitational collapse of gas clouds. Understanding how galaxies

form and evolve requires measurements of how both their stellar content and their gaseous content evolve with time. Over the past two decades, astronomers have accurately measured the stellar masses and star formation rates of galaxies, but little is known about the evolution of the atomic gas content of galaxies.

Apurba Bera of the TIFR, the lead author of the paper, said: "Most of the atomic gas in galaxies is in the form of hydrogen, which emits a characteristic spectral line at a particular radio wavelength. Unfortunately, this hydrogen emission is weak, and even powerful radio telescopes do not have sufficient sensitivity to detect the emission from very distant galaxies. However, the unique capabilities of the upgraded GMRT allowed us to add the hydrogen emission signals from a large number of galaxies in the field of view of the telescope, so as to measure their average gas content."

"The measurement critically requires simultaneous observations of a large number of galaxies. The large bandwidth of the GMRT and its upgrade digital systems allowed us to cover more than 400 galaxies simultaneously," Jayaram Chengalur, a professor at TIFR and a co-author of the paper, added.

https://www.tribuneindia.com/news/nation/little-change-in-gas-mass-of-galaxies-in-4-bn-years-study/855963.html

Sat, 02 Nov 2019

Prez to inaugurate science festival in Bengal

New Delhi: The 'City of Joy' Kolkata will be celebrating science festival from November 5. Around 12,000 eminent scientists, innovators and those with scientific tempers besides Government officials from the country and abroad will congregate at the four-day India International Science Fest (IISF)2019 at West Bengal's capital.

To be inaugurated by President Ram Nath Kovind, the theme for this year's fest is 'Research, Innovation, and Science Empowering the Nation (RISEN- India)' .

In a press conference here recently, Union Minister of Science and Technology and Earth Sciences, Dr Harsh Vardhan said that the 5th edition of IISF is a festival to celebrate the achievements of Indian science. "Our Government is keen that science is used to solve the various problems facing the people such as health and in this context wanted to promote scientific temper particularly among the younger generation," he had said.

The IISF will host more than 28 events, including 'Young Scientists' Conference (YSC)', Students Science Village (SSV), North-East Students Conclave, Agricultural Scientists' Meet, Assistive Technologies Conclave & Expo for Divyangjan, VIGYANIKA - International Science Literature Festival and International Science Film Festival of India (ISFFI).

Maan Bardhan Kanth from Vigyan Prasar, DST under the Ministry, said that those in search of understanding the ways to instill science spirit or develop creative and compassionate mind, there are events customized as per their interest — like YSC, SSV and Women Scientists' and Entrepreneurs' Conclave in which large number of youth will be busy in finding innovative solutions to the diverse challenges that our society faces today.

"Women Scientists' and Entrepreneurs' Conclave is a step forward to inspire young women to set their career in science or technology and promote the understanding of modern technology among common public, through exhibitions, presentations, discussions and social events," explained Kanth.

Another interesting first of its kind event will be VIGYANIKA, especially for those in love with science literature.

The major attractions of this science lit fest will be Vigyan Manthan (panel discussions), Vigyan Spandan (scientific paper presentations, science writing workshops, scientoon & debate competition, storytelling), vigyan manchan (vigyan kavi sammelan, science drama, folk art), and vigyan prakashan involving book fair, book release and meet the author activities.

The mega fest is being organised jointly by Science and Technology-related Ministries and Government Departments and Vijnana Bharati.

https://www.dailypioneer.com/2019/india/prez-to-inaugurate-science-festival-in-bengal.html