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Chinese sub lurks close to India

Ajay Banerjee

A Chinese submarine is reportedly lurking in waters around India and the security establishment has been informed about the development. The vessel is in international waters and India has conducted specific sorties over the Bay of Bengal using aircraft capable of spotting submarines lurking under the waters. The submarine accompanied by three warships was part of the anti-piracy task force on duty off the coast of Africa which is now returning to China after a four month deployment. On its return journey, the flotilla is at present docked in Colombo, Sri Lanka, from January 17 to January 21. It was in Pakistan earlier and even did a day-long drill with the Pakistan Navy frigate PNS Zulfiqar. A Chinese flotilla comprises guided-missile frigates Liuzhou and Sanya and a comprehensive supply ship, Qinghaihu. Indian authorities are tight-lipped about the nature of the submarine - nuclear powered or conventional diesel-electric. The nuclear powered one has greater endurance to remain submerged hence remain undetected. The Chinese anti-piracy escort force departed from the Gulf of Aden on January 3 on its way back to China. Colombo is its second stop which will be followed by a stop-over at Chittagong, Bangladesh. Two of these warships (not the submarine) will then arrive in India for the international fleet review on February 6-7 at Vishakapatnam on the east coast. Submarines are the favoured platforms of naval commanders when tasked to launch attacks, deter enemies or for securing the vital sea lines of communication (SLOCs) - used by merchant ships carrying goods, crude oil, equipment and produce for trillion dollar economies like China or India. Technology still does not effectively track or locate undersea vessels, more so in waters around India which have high suspended particle or salt content. A submarine is capable of "pinning down" six-seven warships of the enemy just by installing the fear of the unknown. The US has been vocal about the "lack of transparency and intent" on the part of China and the very fact that a submarine is deployed for anti-piracy operations. US Pacific Fleet Commander, Admiral Scott Swift, who was in India on January 9, had told mediapersons: "It's hard for me as a maritime commander to understand how can a submarine support anti-piracy operations." New Delhi is equally concerned. Just yesterday, Indian Navy's anti-submarine warfare capable Boeing P-8I aircraft ended a special week-long deployment to snoop around in the Bay of Bengal and be stationed at the Andaman and Nicobar Command (ANC). A report to the US Congress presented on December 21, 2015, and titled "China Naval Modernisation: Implications for US Navy" says: "As China's global footprint and international interests grow, its military modernisation programme has become progressively more focused on investments for a range of missions beyond China's periphery, including power projection, sea lane security, counter-piracy, peacekeeping, and humanitarian assistance/disaster relief (HADR)."

'US set to supply 8 F-16s to Pakistan'

The US is committed to supply eight F-16 fighter jets to Pakistan despite India's efforts to block its delivery, Pakistani defence minister Khawaja Asif said on Tuesday. "The (Barack) Obama administration is committed to supplying eight F-16 fighter jets despite efforts by India and former Pakistani ambassador to the US Husain Haqqani to block the delivery," Mr Asif said. His statement comes days after reports said that the Republican-controlled US Congress has stalled the sale of F-16 jets to Islamabad, amid growing anti-Pakistan sentiments on Capitol Hill over its reluctance in taking action against terrorist groups. Pakistani legislators in the National Assembly, during a debate, assailed the US Congress for stalling the sale of the jet, prompting the minister to intervene. Mr Asif did not clarify how India and Mr Haqqani, who was Pakistan's ambassador during the Asif Ali Zardari government, were influencing the decision of US Congress. Mr Haqqani was hated by the military and was removed after the memo-gate scandal, related to a memo he wrote to the US government against the Pakistani Army. Pakistan has sought the F-16 jets which are the backbone of its Air Force and are also being used for operations against the militants. The Obama administration in October said it is preparing to sell eight new F-16 fighter jets to Pakistan. Pakistan and the US have had a tenuous relationship but Islamabad has been successful in getting US military hardware.

The Indian Express

20 January 2016

Pakistan Test New Cruise Missile

ISLAMABAD: Pakistan today conducted a successful flight test of the indigenously developed nuclear capable cruise missile with a range of 350km which enables the country to achieve air delivered strategic standoff capability on land and at sea, the military said. The flight test of the Air Launched Cruise Missile (ALCM), Ra'ad, which is also known as Hatf VIII, was the seventh since it was first tested in 2007.

पंजाब केसरी

20 जनवरी, 2016

परमाणु समझौते पर प्रतिबद्ध ईरान

दुबई, (रायटर): ईरान के राष्ट्रपति हसन रुहानी ने कहा कि पश्चिमी देश जब तक अपनी प्रतिबद्धता पर कायम रहेंगे तब हमारे देश को तरफ से परमाणु समझौते का उल्लंघन नहीं किया जाएगा। रुहानी ने परमाणु समझौते को कूटनीति के इतिहास में अनोखा बताया तथा कहा कि ईरान परमाणु हथियारों की कमी करने की प्रतिबद्धता पर कायम रहेगा। ईरान की सरकारी समाचार एजेंसी इरना ने संयुक्त राष्ट्र परमाणु निगरानी प्रमुख यूकिया अमानो के साथ श्री रुहानी की बैठक के हवाले से कहा कि ईरान परमाणु समझौते का पालन करने के लिए प्रतिबद्ध है बशर्ते कि

दूसरा पक्ष भी इसका पालन करे। श्री अमानो ईरान के परमाणु कार्यक्रमों में कमी जांच तथा यह सुनिश्चित करने के लिए कल यहाँ पहुंचे कि यह परमाणु सामग्रियों का इस्तेमाल सिर्फ शांतिपूर्ण उद्देश्यों के लिए कर रहा है। हालांकि ईरान ने कहा कि श्री अमानो की यात्रा औपचारिक थी तथा किसी भी परमाणु स्थलों का दौरा नहीं करेंगे। गौर तलब है कि अन्तर्राष्ट्रीय परमाणु ऊर्जा एजेंसी (आईएनए) की इस घोषणा के बाद कि ईरान ने समझौते के

अनुसार अपने परमाणु कार्यक्रमों में कटौती कर ली है, उसके बाद यूरोपीय संघ और अमेरिका को और से ईरान पर आर्थिक और वित्तीय प्रतिबंधों को हटाने की प्रक्रिया शुरू हो गयी है।



Navigation satellite system's launch today

Chennai: India would go a step closer to having its own indigenous navigation satellite system, as it prepares to launch the IRNSS-1E on Wednesday from Sriharikota space port near Chennai. Indian Space Research Organisation's most trusted vehicle PSLV-C31 rocket will blast off with IRNSS-1E to space. The satellite, the fifth in the seven-constellation system, aims to provide navigation and timing services over India and its neighbourhood and ensure better accuracy to users. The applications for which IRNSS would be used includes terrestrial, aerial and marine navigation, disaster management, vehicle tracking and fleet management, mobile phone integration, mapping and geodetic data capture. IRNSS-1E, which has the lift-off mass of 1,425 kg, will be launched at 9.31 am Wednesday from the Second Launch Pad (SLP) at Satish Dhawan Space Centre (SDSC SHAR, Sriharikota). "Countdown is progressing normally. All the health parameters are also normal", a senior ISRO official told Deccan Herald Tuesday. Of the two categories of payload in IRNSS -1E, the navigation payload will transmit navigation service signals to the users, while its ranging payload consisting of a C-band transponder would determine the satellite's precise range. A highly accurate Rubidium atomic clock is also part of the satellite's navigation payload, besides which IRNSS-1E also carries Corner Cube Retro Reflectors for laser ranging. As in the previous four launches of IRNSS satellites, PSLV-C31 will use 'XL' version of PSLV.



PSLV-C31 with IRNSS-1E is all set for launch at Indian spaceport at Sriharikota

Now, wireless & dissolvable sensors to monitor brain

The implants could be used to monitor patients with brain injuries as they transmit accurate pressure and temperature readings

Scientists have developed wireless sensors that monitor pressure and temperature inside the brain and then are absorbed by the body, negating the need for surgery to remove the devices. The implants could be used to monitor patients with traumatic brain injuries. The researchers believe they can build similar absorbable sensors to monitor activity in organ systems. "The benefit of these new devices is that they dissolve over time, minimising the risk of infection, chronic inflammation and even erosion through the skin or the organ in which it's placed,"

said Rory K J Murphy, a neurosurgery resident in St Louis. About 50,000 people die of traumatic brain injury annually in the US. When patients with such injuries arrive in the hospital, doctors must be able to accurately measure intracranial pressure in the brain and inside the skull because an increase in pressure can lead to further brain injury. "The devices commonly used today are based on technology from the 1980s. They're large, unwieldy, and have wires that connect to monitors in the intensive care unit," Murphy said. The new sensors are made mainly of polylactic-co-glycolic acid (PLGA) and silicone, and they can transmit accurate pressure and temperature readings, as well as other information. "With advanced materials and designs, we demonstrated that it is possible to create electronic implants that offer high performance and clinically relevant operation in hardware that completely resorbs into the body after the relevant functions are no longer needed," said professor John A Rogers. The researchers tested the sensors in baths of saline solution that caused them to dissolve after a few days. Next, they tested the devices in rats. Now, they are planning to test it on patients.

The Hindu

20 January 2016

Amateur scientist's escape chute impresses BARC

Alappuzha (Kerala): A escape system developed by 60-year-old amateur Kerala scientist M.C.David has impressed a team of the Mumbai-headquartered Bhabha Atomic Research Centre (BARC). The innovative escape system, a simple spiral sliding chute, for high-rise buildings is all set to get its first work order from the BARC. Last week, a four-member team of officials from the research centre spent a day with David and found what he had to offer at his residence near here. Speaking to IANS, M.K. Stanly, the team leader from BARC, said they were hugely impressed by David's innovative escape chute. David claimed the sliding chute, that can be made using fire resistant fibre glass or concrete, can facilitate a quick and safe escape for people trapped in high-rise buildings. The chute can be built by the side of existing staircases of buildings, he added. In case of fire in a high-rise building, the residents just need to sit in the sliding chute to come down to the ground floor four times faster than stairs, he explained.

The Asian Age

20 January 2016

'ROBOTARIUM' TO PROVIDE REMOTE ACCESS TO ROBOTS

Washington, Jan. 19: Researchers in US are developing a new lab called 'Robotarium' that will house up to 100 ground and aerial swarm robots to allow scientists to conduct experiments remotely. University researchers, as well as middle and high school students, will schedule experiments, upload their own programming code, watch the robots in real-time via streamed video feeds and receive scientific data demonstrating the results.

The "Robotarium" being developed by Georgia Institute of Technology in US is expected to house up to 100 ground and aerial swarm robots. "Building and maintaining a

world-class, multi-robot lab is too expensive for a large number of roboticists and budding roboticists. This creates a steep barrier to entry into our field," said Magnus Egerstedt, Professor in the School of Electrical and Computer Engineering (ECE). "We need to provide more access to more people in order to continue creating robot-assisted technologies. The Robotarium will allow that," said Egerstedt. The team has already created a mini-version of the Robotarium. Researchers from the University of California, San Diego, successfully uploaded code during a recent test session. The Robotarium is expected to be

fully operational in 2017, researchers said.

"A research instrument like the Robotarium has the potential to build stronger networks of collaborative research, making the whole significantly larger than the sum of its parts," Egerstedt said. "The end result has the potential to show how remote access instruments can be structured in other areas beyond robotics," Egerstedt said. "The first thing that's going to happen when you open it to the public is someone is going to try to break it," said Aaron Ames, an associate professor in the Woodruff School of Mechanical Engineering.

— PTI

History of everything

RATHER THAN BEING FEATURELESS BLOBS IN SPACE, A NEW THEORY SUGGESTS BLACK HOLES ARE FRINGED BY 'HAIRS' THAT COULD BE A RICH SOURCE OF INFORMATION, WRITES DOUG BOLTON

A new theory on black holes developed by famed physicist Stephen Hawking could provide a method to discovering the origins of the universe. The paper theorises that black holes, once thought to be huge, featureless blobs in spacetime, could have "hairs" that contain information about the holes' pasts, potentially solving the longstanding "information problem" of the fate of matter that falls into a black hole. Black holes, as explained by Albert Einstein's theory of general relativity, are celestial bodies that are so dense that their strong gravitational pulls prevent anything, including light, from escaping them. For a long time, it was thought that black holes were essentially all identical apart from variations in their spin, angular momentum and mass. Any attempt to find out a black hole's origin would fail, since they contained no unique information. In the 1970s, Hawking developed a theory that black holes, despite their huge mass, did "leak" particles over time - a phenomenon that was named Hawking radiation. Over the course of millions of years, leaking Hawking radiation causes black holes to "evaporate", leaving a vacuum. But since the original theories on black holes stated that they were all identical, these vacuums would be, too - meaning that they would hold no information about the hole's origin. However, Hawking's new theory, developed with Cambridge University colleague Malcolm Perry and Harvard physicist Andrew Strominger, could throw that idea into doubt. By introducing a photon with no light or energy - a "soft photon" - into one of these vacuums, you change its angular momentum, the theory claims. This would mean that rather than being identical, the vacuums left by evaporated black holes are unique, with their properties depending on their origins and history. It also suggests that black holes are fringed by "hairs" - strands of energy-free particles that can carry information. As Strominger explained to Live Science, "Far from being a simple, vanilla object, it's like a large hard drive that can store essentially an infinite amount of information in the form of these zero-energy photons and gravitons." If true, this new theory means black holes could hold huge amounts of information about the universe's history. If we were somehow able to observe black holes accurately enough, we may be able to use these hairs to discover this information. This theory could be step towards discovering what happens to information that falls into a black hole. Currently, the method for decoding the information theoretically held in black holes is unknown, but as physics progresses, we might get there one day.

Belgian drone mixes plane, copter tech

"Researchers in Belgium have devised a prototype delivery drone which they say could rival the likes of Amazon Prime Air and Google's Project Wing. The University of Leuven team behind VertiKUL 2 (KUL is the acronym for Katholieke Universiteit Leuven) say the drone combines the ability of quadcopters to take-off and land vertically with both the speed of conventional aircraft and their capacity to fly long distances.

Deccan Herald

20 January 2016

First flower blooms on international space station

Washington: A bright orange zinnia has blossomed aboard the International Space Station, marking a first in space. "First flower even grown in space makes its debut," US astronaut Scott Kelly wrote on Twitter, with a photo of the flower. Zinnias grow easily on Earth and blossom in abundance in summer. But on the ISS, where they were taken to carry out experiments, they have had trouble adapting to microgravity. Several were doing poorly back in December as mold grew on some of their leaves because of high humidity, NASA said. But Kelly was seemingly able to nurture them back to health. Growing such flowers -- zinnias are edible -- is part of a long term NASA project known as Veggie. It is designed to produce food with an eye to long, manned missions to Mars. Such autonomy is key to astronauts' survival in space, NASA says. Crew on the ISS have already grown and eaten lettuce last year aboard the orbiting craft and hope to produce tomatoes by next year. Growing vegetables on the space station began in mid-2014. They are grown aeroponically -- without soil, in an air or mist environment. The system requires much less water and fertilizer, and plants grow three times faster than on Earth, NASA says. Gioia Massa, a scientist working on the Veggie project, said the plants grown so far are not perfect but have helped researchers on Earth understand better how they grow in conditions of microgravity.

Deccan Herald

20 January 2016

Dashing innovators' hopes

By Uttam Gupta

NEW INTELLECTUAL PROPERTY RIGHTS

Govt needs to shed its current intransigence. It should stop viewing patent laws from a prism that 'only MNCs benefit from these'. Interacting with America's top CEOs [including MNCs in pharmaceutical and agrochemical sectors] in September, 2015, Prime Minister Narendra Modi had assured "we are committed to protecting Intellectual Property Rights [IPRs] which is essential to fostering creativity". These MNCs spend billions of dollars on research and development to discover and develop new medicines and crop protection products and have a fundamental interest in the protection of IPRs. They had flagged Section 3[d] of Patent [Amendment] Act 2005 and provision relating to grant of compulsory licenses as major concerns. However, from the draft of new National IPR policy, it appears that the government has no intention whatsoever of diluting any of these provisions. This may even prompt US Trade Representative [USTR] to initiate "out-of-cycle review" [a euphemism for engaging with government on IPR challenges] earlier kept in abeyance in the hope that Modi will deliver. When, Section 3[d] was incorporated in amendment to Indian Patent Act in 2005, global R&D

part-2

Continue

Dashing innovators' hopes

companies had perceived this as a move to deny patents in contravention of main thrust of amended Act, that is, to provide for product patent. The USTR has been protesting against this section for over a decade and India has refused to budge. So, what is at stake and how can logjam end? The section bars grant of patents to new forms of known substances, unless the new form results in significant enhancement in efficacy over the known substance. The applicant should demonstrate that the 'new form' gives substantially higher 'efficacy' over a previously known compound. Indian law makers justified this as a carefully crafted step to rein in tendencies to seek 'frivolous' patents on some minor modifications to an existing substance, or "ever-greening" as it is understood in common parlance. The Supreme Court in the case of Glivec (2013) - cancer treatment drug for which Swiss major Novartis AG had sought a patent - not only upheld constitutional validity of Section 3[d], but also showed the way 'how to read and implement' it. So, it viewed test of efficacy to mean 'therapeutic efficacy' implying that 'pharmacological/chemical properties' only need be considered thereby virtually shutting the door to 'incremental' innovations such as 'new dosage form'; 'new delivery systems' etc. The value of such innovations to the patients in terms of quality and speed of treatment could be even more than what is offered by a better compound/new molecule [such innovations are very rare and far in between] per se. Yet, precedent set by the judgement would almost completely eliminate the possibility of applicant getting a patent on all such innovations. This is what worries global R&D companies and the USTR. A perception that this will tantamount to 'ever-greening' is a myth. Patent protection is confined only to 'new form' of 'known' substance. The latter on completion of its patent term is already available to 'generic' players for manufacture and marketing. Moreover, any company other than inventor of 'known' compound [including Indian company], can come up with a 'new form' or a 'new dosage' or 'delivery system' and take patent cover. The other major concern relates to grant of compulsory licence [CL] to generic Indian drug firms for much-in-demand new patented drug. A CL authorises the entity concerned to manufacture and market a patented product even without prior consent from innovator/holder of patent. Such flexibility allowed under TRIPs [trade related intellectual property rights] agreement of WTO was incorporated in Indian Patent Act [2005]. Under Section 84, a licence can be issued for "private commercial use" if it is found that the patent holder has not taken required steps to make patented product available in sufficient quantities or price charged is not 'affordable' to patients. Under Section 92, the patent controller can issue the licence only based on Central government notification citing circumstances of "national emergency or circumstances of extreme urgency or in case of public non-commercial use". The intent of flexibility provided under the TRIPs agreement was that government would use grant of CL sparingly; in fact, as a last resort. However, actions of the controller and Ministry of Health and Family Welfare in recent years show that this is being observed more in breach. Blockbuster drugs. In 2012, using Section 84, CL was granted to Natco Pharma to make cheaper version of Bayer's kidney and liver cancer drug sorafenib [brand name Nexavar]. This was upheld by SC in 2014. More recently, the health ministry is ever keen to grant CL for Bristol-Myers Squibb's (BMS) chronic myeloid leukaemia drug dasatinib (branded Sprycel). It is also pursuing "government route" under Section 92 to grant licence for other `blockbuster' drugs like Roche's trastuzumab (Herceptin) for treatment of breast cancer. In both areas, we see a clear attempt to throttle the rights of patent holder. Whereas, Section 3[d] read in conjunction with SC order in Glivec case puts a virtual blockade in the way of getting patent on incremental innovations, incessant attempts to grant CL is a direct infringement on patent rights. While the TRIPs agreement allows flexibilities to developing countries to help them make drugs affordable to patients, recourse to these cannot be pushed to a point of undermining the rights of innovator/patent holder. Ironically, Section 3[d] and frequent recourse to grant of CL seek to do precisely that. The government needs to shed its current intransigence. It should stop viewing patent laws from a prism that 'only MNCs benefit from these'. Instead, the guiding principle should be 'incentive for R&D and innovation' irrespective of who benefits. With this change of mindset, the government should consider making necessary amendments in patent rules. This will bring sustainable benefits to the health sector in the medium to long-term.

Answers to queries about Zika virus

By Donald G Mcneil Jr

The Centers for Disease Control and Prevention has warned pregnant women against travelling to several countries in the Caribbean and Latin America where the Zika virus is spreading. Infection with the virus appears to be linked to the development of unusually small heads and brain damage in newborns. Here are some answers and advice about the outbreak. What is the Zika virus? A tropical infection new to the Western Hemisphere. The Zika virus is a mosquito-transmitted infection related to dengue, yellow fever and West Nile virus. Although it was discovered in the Zika forest in Uganda in 1947 and is common in Africa and Asia, it did not begin spreading widely in the Western Hemisphere until last May, when an outbreak occurred in Brazil. Until now, almost no one on this side of the world had been infected. Few of us have immune defenses against the virus, so it is spreading rapidly. Millions of people in tropical regions of the Americas may have had it. How is the virus spread? One more reason to hate mosquitoes. Zika is spread by mosquitoes of the Aedes species, which can breed in a pool of water as small as a bottle cap and usually bite during the day. The aggressive yellow fever mosquito, *Aedes aegypti*, has spread most Zika cases, but that mosquito is common in the United States only in Florida, along the Gulf Coast, and in Hawaii - although it has been found as far north as Washington in hot weather. The Asian tiger mosquito, *Aedes albopictus*, is also known to transmit the virus, but it is not clear how efficiently. That mosquito ranges as far north as New York and Chicago in summer. Although the virus is normally spread by mosquitoes, there has been one report of possible spread through blood transfusion and one of possible spread through sex. How do I know if I've been infected? Is there a test? It's often a silent infection, and hard to diagnose. Until recently, Zika was not considered a major threat because its symptoms are relatively mild. Only one of five people infected with the virus develop symptoms, which can include fever, rash, joint pain and red eyes. Those infected usually do not have to be hospitalised. There is no widely available test for Zika infection. Because it is closely related to dengue and yellow fever, it may cross-react with antibody tests for those viruses. To detect Zika, a blood or tissue sample from the first week in the infection must be sent to an advanced laboratory so the virus can be detected through sophisticated molecular testing. How does Zika cause brain damage in infants? Experts are only beginning to connect the dots. Scientists do not fully understand the connection. The possibility that the Zika virus causes microcephaly - unusually small heads and damaged brains - emerged in October, when doctors in northern Brazil noticed a surge in babies with the condition. It is not known exactly how common microcephaly has become in that outbreak. About three million babies are born in Brazil each year. Normally, about 150 cases of microcephaly are reported, and Brazil says it is investigating more than 3,500 reported cases. But reporting of suspected cases commonly rises during health crises. Does it matter when in her pregnancy a woman is infected with Zika virus? Earlier seems to be worse. The most dangerous time is thought to be during the first trimester - when some women do not realise they are pregnant. Experts do not know how the virus enters the placenta and damages the growing brain of the fetus. Closely related viruses, including yellow fever, dengue and West Nile, do not normally do so. Viruses from other families, including rubella (German measles) and cytomegalovirus, sometimes do. Is there a vaccine? How should people protect themselves? Protection is a huge challenge in infested regions. There is no vaccine against the Zika virus. Efforts to make one have just begun, and creating and testing a vaccine normally takes years and costs hundreds of millions of dollars. Because it is impossible to completely prevent mosquito bites, the Centers for Disease Control and Prevention has advised pregnant women to avoid going to regions where Zika is being transmitted, and has advised women thinking of becoming pregnant to consult doctors before going. Travelers to these countries are advised to avoid or minimise mosquito bites by staying in screened or air-conditioned rooms or sleeping under mosquito nets, wearing insect repellent at all times and wearing long pants, long sleeves, shoes and hats.