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Government denies any quid pro quo deal with Italy

India on Thursday said there was no link between its bid for membership in the nuclear export control regimes, of which Italy is a member, and the marines issue, dismissing suggestion that the two countries were working on a quid pro quo deal. "It's known that marines issue is in international arbitration under the United Nations Convention on the Law of the Sea. They are two separate issues, each will be handled on its merits," the ministry of external affairs spokesperson tweeted. According to news agency reCountries rush for upper hand in Antarcticaports, the spokesperson's reaction came amid certain other reports that alleged that India was secretly negotiating a deal with Italy under which the government will not object to any Italian plea in the case of marines, who are charged with killing two Kerala fishermen and Rome will not object to India's membership of export control regimes. The two Italian marines are charged with killing two fishermen off India's coast on February 15, 2012. While Massimiliano Latorre, one of the marines, is in Italy on medical grounds since September last year, Italy is making efforts before the Supreme Court to allow Salvatore Girone, the other marine, also to return. Italy, a member of all four export control regimes that control the world's trade in nuclear supplies, including the Nuclear Suppliers Group, Missile Technology Control Regime and the Wassenaar Arrangement, had in September vetoed India's membership application to the MTCR.

Deccan Herald**1 JANUARY 2016**

Countries rush for upper hand in Antarctica

On a glacier-filled island with fjords and elephant seals, Russia has built Antarctica's first Orthodox church on a hill overlooking its research base, transporting the logs all the way from Siberia. Less than an hour away by snowmobile, Chinese laborers have updated the Great Wall Station, a linchpin in China's plan to operate five bases on Antarctica, complete with an indoor badminton court, domes to protect satellite stations and sleeping quarters for 150 people. Not to be outdone, India's futuristic new Bharathi base, built on stilts using 134 interlocking shipping containers, resembles a spaceship. Turkey and Iran have announced plans to build bases, too. More than a century has passed since explorers raced to plant their flags at the bottom of the world, and for decades to come this continent is supposed to be protected as a scientific preserve, shielded from intrusions like military activities and mining. But an array of countries are rushing to assert greater influence here, with an eye not just toward the day those protective treaties expire, but also for the strategic and commercial opportunities that exist right now. "The newer players are stepping into what they view as a treasure house of resources," said Anne-Marie Brady, a scholar at New Zealand's University of Canterbury who specializes in Antarctic politics. Some of the ventures focus on the Antarctic resources that are already up for grabs, like abundant sea life. China and South Korea, both of which operate state-of-the-art bases here, are ramping up their fishing of krill, the shrimplike crustaceans found in abundance in the Southern Ocean, while Russia recently thwarted efforts to create one of the world's largest ocean sanctuaries here. Some scientists are examining the potential for harvesting icebergs from Antarctica, which is estimated to have the biggest reserves of fresh water on the planet. Nations are also pressing ahead with space research and satellite projects to expand their global navigation abilities. Antarctica's mineral, oil and gas wealth are a longer-term prize. The treaty banning mining here, shielding coveted reserves of iron ore, coal and chromium, is expected to come up for review by 2048 and could be challenged before then. Researchers recently found kimberlite deposits hinting at the existence of diamonds. And while assessments vary widely, geologists estimate that Antarctica holds at least 36 billion barrels of oil and natural gas. Beyond the Antarctic treaties, huge obstacles persist to tapping these resources, like drifting icebergs that could imperil offshore platforms. Then there is Antarctica's remoteness, with some mineral deposits found in windswept locations on a continent that is larger than Europe and where winter temperatures hover around minus 70 Fahrenheit.

US preparing new curbs against Iran

The Obama Administration is preparing a fresh set of sanctions against individuals and companies for their alleged role in the development of Iran's ballistic missile programme, according to a media report. The expected sanctions by US treasury department against individuals and companies in Iran, Hong Kong and United Arab Emirates would be the first set of sanctions against Iran after the historic nuclear deal it reached with Tehran on the latter's nuclear weapons programme. "The planned action by the treasury department... Is directed at nearly a dozen companies and individuals in Iran, Hong Kong and the United Arab Emirates for their alleged role in developing Iran's ballistic-missile programme," the Wall Street Journal reported Wednesday. New app may help diagnose autism in childrenThe treasury department is preparing sanctions on two Iran-linked networks helping develop the missile programme. Under the planned restrictions, US or foreign nationals would be barred from doing business with the firms and people in the networks. US banks would also freeze any US-held assets, it said. The Journal quoted US officials as saying that the treasury department maintains the right to sanction Iranian entities allegedly involved in missile development, or those that support rights abuses or international terrorism. Meanwhile, Iran's Revolutionary Guards on Thursday denied that its naval forces had test-fired rockets close to a US aircraft carrier in the strategically important Strait of Hormuz. The Guards naval unit is responsible for securing Iranian interests in the Strait, a vital waterway for a large proportion of the world's oil, regularly patrolling the area and conducting exercises.

Deccan Herald

1 JANUARY 2016

New app may help diagnose autism in children

Washington: Scientists have developed a new smartphone app that may screen for symptoms of autism by reading children's facial expressions for emotional cues. "Not only could the app be used to learn more about childhood autism, it could possibly reveal signs of post-traumatic stress disorder (PTSD) and mild traumatic brain injury (TBI) in warfighters - conditions that often have subtle symptoms and are difficult to diagnose," said Predrag Neskovic, from US Office of Naval Research (ONR)'s Mathematical Data Science programme.

The app, called "Autism and Beyond," was developed by researchers and software developers at Duke University and the Duke Medical Centre in US. "Autism & Beyond" has children complete a series of questionnaires and watch short videos designed to make them smile, laugh and be surprised. Parents or caregivers use a smartphone's user-facing "selfie" camera to record children's facial movements for evaluation by doctors, researchers and software. The app's core technical component is a complex mathematical algorithm that automatically maps key landmarks on children's faces and assesses emotional responses based on movements of facial muscles.

"We analyse the video to track position and movement of the head and face, including the lips, eyes and nose - all of which indicate emotions," said Guillermo Sapiro, a professor at Duke University, who developed the algorithm. "For example, while watching stimuli like a funny video, does the child smile, look towards the caregiver or ask the caregiver to view the video as well? We study all of that. Lack of emotion and social sharing are possible characteristics of childhood autism," said Sapiro. Sapiro stresses the app is not a self-diagnosis resource, but is intended to serve as a potential screening tool for autism and other developmental challenges, and encourage users to contact a physician for specialised testing. Once the autism studies are complete, Sapiro hopes to eventually expand and tailor the app to conditions suffered.

The future of learning: Hack-a-thons and cyber learning

By ss lyengar and jerry miller

While no one can clearly define cyber learning, everyone seems to agree they are using it and point to its potential for transforming traditional modes of education to provide students a deeper, richer and more rewarding learning experience than would otherwise be possible. But what really is "cyber learning?" Is it working? And what does the future hold for this innovation? Cyber learning has been defined as, "the use of network computing and computer technology to support learning." Perhaps, it can best be defined as the use of computer technology-assisted learning systems employed in teaching and learning which provide deeper inquiry experiences, creative problem-solving activities and intensive collaboration with other students. Cyber learning allows us to explore new ways of understanding information while providing teachers with a more varied pathway to interact with and stimulate students through their combined, natural learning processes. Cyber learning has been called by many names over the past few years, depending upon the adaptation of the computer technology for the learning objectives. It is expanding at an ever increasing rate. With the growth in delivery systems and our ability to adapt these systems as novel opportunities present themselves, we now have overlapping concepts and phrases to describe cyber learning, such as distance learning, blended learning, technology-assisted learning, traditional classroom instruction (which is incorporating computer technology more and more in its delivery), hybrid learning, online learning, mobile learning or "m-learning," and electronic learning or "e-learning," in addition to cyber learning. Is cyber learning working? Before we can definitively answer this question, we must understand some of the unique challenges of cyber learning. We have already addressed one of the largest challenges, which is attempting to define cyber learning by constraining the definition to a specific delivery system. Today, we are combining many of these technology-assisted learning systems and applying them in unique ways, which make it difficult to assess the overall impact of a specific learning technology. Another challenge we face is, understanding the learning styles or methods, and the learning process. While there are three main cognitive learning styles; visual, auditory, and kinesthetic, there is a vast array of active and traditional passive learning methods for which technology has been adapted. These include teaching others as we learn ourselves, practice by doing, discussion, demonstration, audiovisual, reading and lecture. Our retention rates decrease from approximately 90 per cent retention when we teach others to less than 5 per cent if we learn by listening to lectures. While cyber learning technologies have been applied to each of these learning methods in order to increase the retention rate, it is difficult to say how effective specific cyber learning has been, since these technologies have been "blended" to improve overall retention rates. What is the future of cyber learning? Recent studies, such as those presented in The International Journal of Information and Education Technology in August 2015, indicate that cyber learning is generally, "well accepted by the students as a supplement to traditional methods of teaching." Cyber learning has made an effective contribution to the improvement of learning outcomes, and will continue to do so well into the future. In many cases, cyber learning allows participants to choose the place and time of their education, thereby enabling them to control their environments, receive the information when they are best able to learn and to ultimately, receive and retain more information at a faster rate. Students are also developing study sessions which incorporate cyber learning. Hack-a-thons Today, students worldwide are participating in "hack-a-thons." Unlike what you may think from the name, these are not events where subversive students meet to conduct cyber-attacks on government facilities, rather these events provide opportunities for large groups of people to engage in collaborative computer programming. These events can last from one day to an entire week, and provide the opportunity for computer programmers, graphic designers, interface designers, project managers and hardware development engineers to intensively collaborate on software and design projects. Hack-a-thons also provide the opportunity for those engaged in these activities to learn by doing, as well as teach others skills that they have recently acquired, all within the realm of ever-expanding technology systems. In many cases, these hack-a-thons enable participants to build applications for learning which can be incorporated into online courses, within the classroom and learning through the use of mobile phones and tablets (m-learning). Cyber learning has expanded beyond the traditional classrooms and into business and industry. One of the most successful emerging technologies is the use of virtual reality technology for training. Virtual reality allows us to develop 3-D representations of our environments, which technologists have

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The future of learning: Hack-a-thons and cyber learning

By ss Iyengar and Jerry Miller

adapted to enable learners to "see" inside engines as they are learning to make adjustments, to identify safety factors on the jobsite such as those encountered in the construction of skyscrapers, and to facilitate learning in a variety of other industries. In addition to improving employee learning, they are also reducing training and resource costs and improving safety. It's not just the young who benefit from cyber learning. One of the most interesting uses of cyber learning technologies can be found on luminosity.com, a website which provides a series of games and tools developed by a team of neuroscientists to provide personalised training targeting a wide variety of cognitive skills. Published results of the effectiveness of Luminosity's brain training have been mixed due to the complexity of variables surrounding brain science. But, 70 million users in 180 countries seem to be enjoying the technology! Yes, cyber learning is here to stay. It will continue transforming our learning systems by incorporating rapid, efficient and effective computer-based learning technologies for use by young and old, as we rush to embrace the Knowledge Age. (Iyengar is a distinguished Ryder Professor and Director, School of Computing and Information Sciences, Miami; Miller has been with US Air Force for over two decades and is Coordinator, Discovery Lab, Florida International University)

Deccan Chronicle**1 JANUARY 2016**

Reusable rockets boost space quest

Two technological feats in the last one month, one more successful than the other, may change the technology and economics of satellite launches and space programmes in the coming years. Two private space ventures in the US were able to land their rockets, which carried capsules or satellites into orbits, back into the earth. Last month, Amazon founder Jeff Bezos' company Blue Origin managed to bring back to the earth a rocket which it had launched into a low orbit. The success of space entrepreneur Elon Musk's SpaceX was more impressive. The company also brought back to the earth its rocket after launching 11 commercial satellites into space. Its rocket, Falcon 9, made a perfect soft landing on earth last week. SpaceX, which has plans for commercial space travel and colonisation of Mars, has spectacularly recovered from some recent setbacks with its successful experiment with a reusable rocket. The reusable rocket is expected to revolutionise the global space programme. Bringing a rocket back to the earth is compared to the first space mission and other landmarks in the history of space programmes. At present, rockets disintegrate after taking payloads into space and burn out on re-entry. They cost millions to build, and the inability to use them again is the major reason for the high cost of space programmes. It is said that this is like using an aircraft for a single trip from one city to another and then dumping it. Elon Musk has said that the cost of space travel can be cut by a hundred times if reusable rockets are used, because only fuel and maintenance costs will then have to be incurred. Now that the technology has been found feasible, there is hope that it can be improved upon. Falcon 9 may not be used again but improved versions may be deployed commercially from next year. Private companies are at present in the vanguard of this technology. Apart from SpaceX and Blue Origin, Richard Branson's Virgin Galactic is in the field. Government space agencies are also in the race, attracted by the prospect of much cheaper launches and space travel. They may be priced out of the market if they do not become competitive with the new technology. ISRO has also set up a division for research and development of reusable rocket technology. It will have to keep pace with the work being done in other countries. The new technology will impact all space endeavours, and is not just for facilitating fancy programmes like space tourism.

Boom in biotechnology

By Debameeta Bhattacharya

India is a major biotech player in the Asia-Pacific region next to Japan and South Korea. Bangalore in particular has evolved as a major hub in work related to stem cells. The field of regenerative medicine and stem cell research holds the potential to treat a range of serious ailments such as critical limb ischemia, diabetes mellitus and Parkinson's disease. In recent times, there has been an increasing demand for quality and trained manpower in this evolving branch of biomedicine. As a result, stem cell research is emerging as one of the latest career options. In India, several institutes are researching newer therapies based on empirical study and experiments of the effects of stem cells in different biological realms. It is not only medical professionals who can be eligible for a career in stem cell research and therapy. Vijayaraghavan, general manager, HR & Shared Services, said that there had been a drastic change in the statistics of women working today as compared to their number in the last 15 years in India. He also highlighted the evolving contribution of women scientists in the field of biotechnology in India, particularly at Stempeutics, by emphasising the work of the research and development team. Initiated in 2006, Stempeutics Research is backed by drug-maker Cipla and the Manipal Health and Medical Centre. Excerpts: What is stem cell research? This is an immature cell that has the potential to become specialised into different types throughout the body. In recent times, there has been an increasing demand for quality and trained manpower in this evolving branch of biomedicine. As a result, stem cell research is emerging as one of the latest career options. Your job description of a stem cell scientist? This research is among the most rapidly growing fields of science. In India, several institutes are researching newer therapies based on empirical study and experiments of the effects of stem cells in different biological realms. The job of a stem cell research scientist is to carry forward this study. It is not only medical professionals who can be eligible for a career in stem cell research and therapy. Students of basic biology can also find jobs in stem cell research and related fields. What are the educational requirements to become a stem cell scientist? Students need a postgraduate degree in regenerative medicine or in science and knowledge of biology. At this point, the highest scope of entry into the stem cell research industry is for students. Although a comprehensive medical academic background is not an essential requirement for entry into this field, having an understanding of the working style and concept of research is an added advantage to those who wish to contribute. Are only medical professionals eligible for a career in stem cell research and therapy? The answer is no. Students of basic biology too can find jobs in stem cell research and therapy. Stem cell research is among the most rapidly growing fields of science in India as several institutes are researching newer therapies. Even the Central government through its agencies such as the DBT, DST, and ICMR, has started investing funds to support basic and transnational research in this field of science. Could you name a few institutes where one can apply? Also, how good is the infrastructure when it comes to the career prospect? There are a few institutes like the Centre for Stem Cell Research, a unit of the Institute of Stem Cell Research and Regenerative Medicine (inStem) in Bangalore. Another one is the School of Regenerative Medicine Manipal University, which is one of the country's first stem cell training institute and was established in 2007. One can also look at the Institute for Stem Cell Biology and Regenerative Medicine, which is again in Bangalore. How prospective are career opportunities for a stem cell research scientist? The current investment in stem cell research in India is more than Rs 1,000 crore. Most of the investment in stem cell research in India is in the government sector. So there are a lot of research opportunities on a national front in this country. What is the salary that can be expected by a stem cell research scientist? This field is a lucrative one where even a middle level candidate can earn between Rs 12 to 30 lakh per annum. Building experience over the years, a middle to senior level candidate can add to this figure and finally receive anything between Rs 30 lakh-2 crore per annum. What are the stem cell research and regenerative medicine projects Stempeutics is currently working on? Stempeutics has been strongly working on some unmet medical conditions such as critical limb ischemia and osteoarthritis, for which we have developed a product, called Stempeucel, and hopes to launch in the market soon. Scientists at Stempeutics Research are also working on Stempeucare, which is a biocosmetic product, which was launched by Cipla recently. What is the future of stem cell research in India and, as of today, what are the breakthroughs that have been achieved in this field? India is a major biotech player in the Asia Pacific region, next to Japan and South Korea. Bangalore in particular has evolved as a major hub in work related to stem cells. The field of regenerative medicine and stem cell research holds the potential to treat a range of serious ailments such as type one diabetes mellitus and Parkinson's disease. In the recent times, there has been an increasing demand for quality and trained manpower in this evolving branch of biomedicine. As a result, stem cell research is emerging as one of the latest career options.

Japan team to name element 113 in Asian first

A Japanese research team has been granted the right to name new element 113, the first on the periodic table to be named by Asian scientists, the team's institute said Thursday. Japan's Riken Institute said a team led by Kosuke Morita was awarded the rights from global scientific bodies - the International Union of Pure and Applied Chemistry (IUPAC) and the International Union of Pure and Applied Physics (IUPAP) - after successfully creating the new synthetic element three times from 2004 to 2012. It is the first element on the periodic table to be discovered and named by Asian scientists, Riken said. Synthetic elements do not occur naturally on Earth and are produced artificially through experiments. "IUPAC has announced that Morita's group will be given priority for the discovery of the new element, a privilege that includes the right to propose a name for it," Riken said in a statement. Morita, a professor at Japan's Kyushu University, was informed via a letter from IUPAC on Thursday, Riken said. A release on IUPAC's website confirmed the accomplishment. "Several studies published from 2004 to 2012 have been construed as sufficient to ratify the discovery and priority," it said. The name has yet to be decided, but Riken said that Morita will propose one in 2016. "I feel grateful that the name will be included in the table for the first time after this recognition," Morita said at a press conference. The naming right topped the evening news bulletin on public broadcaster NHK television. Japan has a proud research tradition and its citizens have won about 20 Nobel prizes in science and medicine, including two in 2015. The naming right is good news for Riken, which last year was embroiled in scandal after it had to withdraw what was once billed as a scientific breakthrough in stem cell reproduction by a young researcher. IUPAC also said that Russian and US scientists working together had won the naming rights for three other elements - 115, 117 and 118.

The Tribune

1 JANUARY 2016

US plans new curbs on Iran

A truck carries a missile and a picture of Ayatollah Ali Khamenei during a parade in Iran. Reuters file The Obama Administration is preparing a fresh set of sanctions against individuals and companies for their alleged role in the development of Iran's ballistic missile programme, according to a media report. The expected sanctions by US Treasury Department against individuals and companies in Iran, Hong Kong and United Arab Emirates would be the first set of sanctions against Iran after the historic nuclear deal it reached with Tehran on the latter's nuclear weapons programme. "The planned action by the Treasury Department... is directed at nearly a dozen companies and individuals in Iran, Hong Kong and the United Arab Emirates for their alleged role in developing Iran's ballistic-missile programme," The Wall Street Journal reported yesterday. The Treasury Department is preparing sanctions on two Iran-linked networks helping develop the missile programme. Under the planned restrictions, US or foreign nationals would be barred from doing business with the firms and people in the networks. US banks would also freeze any US-held assets, it said. The Journal quoted US officials as saying that the Treasury Department maintains the right to sanction Iranian entities allegedly involved in missile development, or those that support rights abuses or international terrorism. The Iranian government did not immediately respond to a request for comment on the possible new sanctions, which are expected to be formally announced this week, according to the financial daily. It said Iranian officials had warned the White House in recent months that any such financial penalties would be viewed by Supreme Leader Ayatollah Ali Khamenei as a violation of the nuclear accord. Meanwhile, Republican Senator John McCain, Chairman of Senate Armed Services Committee, described as highly provocative the reports of Iran launching several rockets with little warning just 1,500 yards from a US aircraft carrier in the Strait of Hormuz. Paying price for missile programme First time after the historic nuclear deal, the US is preparing fresh sanctions against individuals and companies for their alleged role in the development of Iran's ballistic missile programme Under the planned restrictions, US or foreign nationals will be barred from doing business with the firms and people in the networks. US banks will also freeze any US-held assets The planned action by the Treasury Department is directed at nearly a dozen companies and individuals in Iran, Hong Kong and the UAE Iran denies rockets fired near US carrier Iran's Revolutionary Guards on Thursday denied that its naval forces had test-fired rockets close to a US aircraft carrier in the strategically important Strait of Hormuz The Guards naval unit is responsible for securing Iranian interests in the Strait, a vital waterway for a large proportion of the world's oil, regularly patrolling the area and conducting exercises. A US military official said an Iranian vessel had test-fired several rockets near three Western warships including the USS Harry S Truman aircraft carrier on December 26

A science preview of the year 2016

After a year that saw the first close-up investigation of Pluto and the unveiling of a new human species, what scientific discoveries are likely to make headlines in 2016?

Particle fever Image copyright Cern Will the Large Hadron Collider discover a new particle in 2016? Well, the world of particle physics is currently buzzing with excitement. In December, physicists gathered at Cern in Geneva to announce their first significant results since the LHC was re-started earlier in 2015. In eagerly awaited talks, team members from the two experiments that discovered the Higgs boson reported hints of a new elementary particle. The LHC smashes beams of proton particles together, allowing physicists to look for hints of exotic particles in the debris. In this case, researchers see an excess of photon pairs being produced at a mass scale that would make the potential new cosmic building block four times more massive than the heaviest known particle - the top quark. The signal is seen with a statistical significance of 3.6 sigma in the Atlas experiment and 2.6 sigma in the CMS experiment, meaning it is not definitive (at least five sigma is required to claim a discovery). Image copyright Cern Thus, physicists are urging caution, since "bumps" in the data with similar levels of significance have subsequently deflated in the past. But that hasn't stopped theorists from having a field day, flooding pre-print servers with papers speculating on the possible meaning of the result. If it isn't a mirage, the new particle might be a tantalising link to the as-yet-unconfirmed theory known as supersymmetry, in which established elementary particles are paired with so-called superpartners. This would add many more characters to the zoo of particles represented in the current framework, known as the Standard Model. Alternatively, it could be a very different animal to any that physicists have been expecting. With the LHC now operating at double the energy it did during its first run, we should find out within the year. By Jove... and Mars Nasa's flyby of Pluto was 2015's biggest event in planetary science. There's no such stand-out set-piece in this coming year's calendar, but still plenty to get excited about. On 4 July 2016, Nasa's Juno spacecraft will arrive at Jupiter, to begin the second mission in history dedicated to studying the Solar System's biggest planet (after Galileo, which lasted from 1995 until 2003). When it gets there, Juno will be travelling at the mind-bending speed of 265,000km/h (165,000mph) relative to Earth - a velocity record for a human-made object, which puts 2016's assault on the land speed title into perspective. Giant planets like Jupiter are central to the formation of planetary systems: they are born early on in the process and shape the orbits of other objects in the cosmic neighbourhood. The mission will study Jupiter's core, look for water and map its clouds. But the craft, which was launched in 2012, won't be able to shed much light on one of the jewels of the Jupiter system: its icy moon Europa. Detailed investigation of that world, which is one of the primary targets in the search for life beyond Earth, will have to wait for the launch of another US mission in the 2020s. The big European hope for next year is the first mission in its programme of Mars exploration known as Exomars. In March, an orbiter and technology demonstrator will be launched on a Russian Proton rocket from Baikonur Cosmodrome in Kazakhstan. The spacecraft arrive in Martian orbit in October. The orbiter will search for evidence of methane and other trace atmospheric gases that could be signatures of active processes on the Red Planet, while the lander - named Schiaparelli - will descend through the atmosphere and attempt to touch down successfully on the Martian surface. The lander is designed to pave the way for future landing craft, including a rover. As such, it carries only a very limited science payload - and no surface camera. Shaping the planet The Anthropocene is a term formulated in 2000 to denote the present age, where humans are dramatically altering many geologically important conditions. It might already have penetrated the surface of popular culture, but it is not an officially recognised term. As far as geologists are concerned, we are still in the Holocene, which begins around 11,700 years ago with the end of the last Ice Age. In 2016, a working group convened by Leicester University Prof Jan Zalasiewicz will put its evidence and recommendations about formalising the Anthropocene before the International Commission on Stratigraphy. This could set in motion a process that will see it officially accepted as a geological epoch - with the same hierarchical standing as the Holocene or the Pleistocene. However, defining a geological epoch is a large and complicated job, with just one of the bones of contention being when to start it from. Human impacts on natural systems are likely to be in sharp focus again next year, especially if 2016 turns out to be one of the hottest years on record. The UK Met Office says that 2016 could be at least as warm, if not warmer, than 2015. Climate change, along with the ongoing effects of the El Nino weather phenomenon, could help drive the global mean temperature beyond the high set in 2015. If the forecasts turn out to be correct, by the end of the year we may see three record or near-record years in a row for global temperatures. Loop the loop

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A science preview of the year 2016

Two big engineering projects are likely to be making headlines next year. Back in 2013, SpaceX founder Elon Musk officially unveiled the idea for a high-speed public transport system called the Hyperloop. Here's the concept: pressurised passenger capsules ride through low-pressure tubes on a cushion of air, accelerated to high speeds by a series of magnets. If it all sounds a bit "Jetsons" to you, you're not alone. But in Summer 2016, Musk is running an open competition to test out different pod designs (PDF) from independent engineers and students. The contest will take place over one weekend at a 2km-long test track near SpaceX's headquarters in Hawthorne, California. If the Hyperloop is indeed a viable idea, this might give a small glimpse of how it could work. And 2016 looks like it could be the year for Bloodhound. The 15th of October is the date that has been set. That would be exactly 19 years to the day since the current land speed record was set by Thrust SSC in the Black Rock Desert of Nevada. The new attempt by Bloodhound SSC will aim to nudge the existing mark of 763mph to over 800mph. Most of the car is built and ready to roll on its specially prepared track at Hakskeen Pan, a dried-out lake bed in Northern Cape, South Africa. The major element still outstanding is the rocket system that will be used in tandem with a Eurofighter jet engine. The rocket is coming from Norwegian experts, Nammo. Their motors are proven. What still needs work is the pump set-up that will feed the hybrid rocket with its oxidiser liquid. This is the Bloodhound team's own design and it is due to undergo final testing and qualification in the New Year. Assuming this work goes to plan, Bloodhound should be able to start low-speed trials at Hakskeen in the weeks preceding 15 October. A successful record bid would then be followed by a redesign of the back of the car and a boost in the rocket's thrust to take Bloodhound beyond 1,000mph (1,610km/h) in 2017. Catching the wave And could 2016 finally be the year that physicists detect gravitational waves? Science has been on a decades-long quest to try to sense the warping of space and time predicted by Einstein to occur whenever massive objects are accelerated. Example events would be the merger of black holes, or the end-of-life explosion of colossal stars.

The Hindu
1 JANUARY 2016

Microsoft to warn email users of suspected hacking by governments

JOSEPH MENN

A Microsoft logo is seen at a pop-up site for the new Windows 10 operating system at Roosevelt Field in Garden City, New York July 29, 2015. Microsoft Corp said on Wednesday it will begin warning users of its consumer services including Outlook.com email when the company suspects that a government has been trying to hack into their accounts. The policy change comes nine days after Reuters asked the company why it had decided not tell victims of a hacking campaign, discovered in 2011, that had targeted international leaders of China's Tibetan and Uighur minorities in particular. According to two former employees of Microsoft, the company's own experts had concluded several years ago that Chinese authorities had been behind the campaign but the company did not pass on that information to users of its Hotmail service, which is now called Outlook.com. In its statement, Microsoft said neither it nor the U.S. government could pinpoint the sources of the hacking attacks and that they didn't come from a single country. The policy shift at the world's largest software company follows similar moves since October by Internet giants Facebook Inc, Twitter Inc and most recently Yahoo Inc. Google Inc pioneered the practice in 2012 and said it now alerts tens of thousands of users every few months. For two years, Microsoft has offered alerts about potential security breaches without specifying the likely suspect. In a statement to Reuters, Microsoft said: "As the threat landscape has evolved our approach has too, and we'll now go beyond notification and guidance to specify if we reasonably believe the attacker is 'state-sponsored'." In a blog post published late Wednesday, Microsoft said: "We're taking this additional step of specifically letting you know if we have evidence that the attacker may be 'state-sponsored' because it is likely that the attack could be more sophisticated or more sustained than attacks from cybercriminals and others. (here) The Hotmail attacks targeted diplomats, media workers, human rights lawyers, and others in sensitive positions inside China, according to the former employees. Microsoft had told the targets to reset their passwords but did not tell them that they had been hacked. Five victims interviewed by Reuters said they had not taken the password reset as an indication of hacking. Online free-speech activists and security experts have long called for more direct warnings, saying that they prompt behavioral changes from email users.

Indian mobile, Pak network! Islamabad increases signal strength, NH 1 on radar

In a major security concern, Pakistan has increased its mobile tower range near the international border, keeping security agencies on their toes. The Defence Ministry remains tightlipped on the issue. Pakistan has spread its mobile tower range across the international border, touching the Jammu-Pathankot national highway in Jammu and Kashmir. Mobile phones in Kathua and Samba districts in Jammu and Kashmir are catching the service of Pakistani telecom operators, which have raised their signal strength near the international border. Pakistani telecom operators like Mobilink, Zong and PakUfone are active on National Highway 1, which connects Jammu and Kashmir with the rest of the country. It had remained among the targets of terrorists for 12 years. After crossing Lakhapur, prepaid mobile phones of networks from the rest of the country stop working and mobile phones start searching for network automatically. Some mobile networks from the other side of the border are tracked by the mobile phones, causing fear among tourists and pilgrims and raising a big question mark on security. A number of incidents involving terrorists had taken place on the highway in recent years. The strong mobile signal strength on this side of the border could help Pakistani terrorists in their operations. Despite repeated attempts, the Defence Ministry did not respond on the issue. A technical expert of a telecom operator in Jammu told The Tribune on the condition of anonymity that no one was allowed to install a tower or radiation equipment within a radius of 10 km from the border on the Indian side.

The Tribune

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Qatar halves gas price for India, waives penalty

Minister of State for Petroleum and Natural Gas Dharmendra Pradhan addresses the signing ceremony of Gas Sales and Purchase Agreements between Petronet LNG and other companies, in New Delhi on Thursday.

Qatar has agreed to lower the price of gas it sells to India on a long-term contract by about \$6 billion to reflect the slump in global energy rates and also waived the Rs 12,000-crore penalty for 'short-lifting' in 2015.

Petronet LNG Ltd (PLL), India's biggest gas importer, today signed a revised contract with RasGas of Qatar. The price as per the revised formula will come to \$6-7 per million British thermal unit as against \$12-13 per mmBtu currently, Oil Minister Dharmendra Pradhan said. Pradhan said the reworked formula will apply to 7.5 million tonne a year of LNG India buys from RasGas on a long-term contract ending in April 2028.

The revised formula will base the price on a three-month average figure of Brent crude oil, replacing a five-year average of a basket of crude imported by Japan, with a rider that PLL buys an additional 1 million tonne of LNG annually. The trailing three-month average Brent price is about \$44 a barrel while the average of Japan Crude Cocktail for the 5-year period ended September 30 was \$94. Pradhan said Qatar will also not seek Rs 12,000 crore from PLL for 'under-lifting' LNG from RasGas by 32%. The value of the under-lifted cargoes in 2015 is Rs 12,000 crore and if the change-to-price formula was implemented, it would suggest a \$2.5 billion buyer saving over three years. Revised contract The price as per the revised formula will come to \$6-7 per million British thermal unit as against \$12-13 per mmBtu currently The reworked formula will apply to 7.5 million tonne a year of LNG India buys from RasGas on a long-term contract ending in April 2028 The revised formula will base the price on a three-month average figure of Brent crude oil, replacing a five-year average of a basket of crude imported by Japan

China confirms building second aircraft carrier

China on Thursday confirmed it is building a second aircraft carrier, as neighbours worry about Beijing's new assertiveness to claims in the South China Sea. Defence Ministry spokesman Yang Yujun said the carrier had been designed in China and was being built in the port of Dalian. The construction drew on experiences from the country's first aircraft carrier, the Liaoning, bought from Ukraine in 1998 and refitted in China.

RICH N-FUEL AT TN MAFIA'S MERCY?**Kumar Chellappan |**

The Indian Rare Earths Ltd, a public sector undertaking has ordered a vigilance probe into the charge that India's rich thorium resources, a nuclear fuel crucial for the energy security of the country is being "robbed and smuggled" by a sand mafia with the active support of the company insiders. A group of engineers and technicians of IRE Ltd at Manavalakurichi in Kanyakumari district had alleged that a section of the management was hand in glove with sand mafia to rob the Thorium-rich sand from the region. Thorium is a banned item under the Atomic Energy Act of India and could be handled only by the Department of Atomic Energy. The IRE, a unit of the DAE, saw a stand off in November 2015 between the staff and management following the latter's directive to fill ilmenite in bags bearing the insignia of V V Minerals Ltd, a private sand mining company. Though the bags were withdrawn following resistance by the employees, the management issued an order directing employees not to bring mobile phones inside the company, said an employee who took the pictures of the bags and alerted union leaders. The employees allege that a section of the management is hand in glove with the sand mafia. "We are shocked by the unusual number of senior managers resigning from IRE Ltd and joining VV Minerals Ltd" S Ramachandran, vice-president, IRE Employees Union told The Pioneer. He said these engineers who had joined IRE Ltd as trainees gained experience in metallurgy and mining and shifted their loyalty to the private company which offered more salary and commission. "But what is unethical is that they provided the private company with details of the IRE's customers and markets, which are highly classified information," said a senior IRE staff. Four top executives of the IRE Ltd joined the private company which has succeeded in bagging all the previous export contracts held by the public sector. "Even some of the serving engineers and managers are working as conduits of the private company," charged Ramachandran who pointed out that the Union Government's opening up of beach sand mining to private entrepreneurs in 2008 has resulted in the present state of affairs." He also said that the manager in charge of marketing was bidding his time to switch over to the private company at the right moment. D Singh, the young chairman and managing director, IRE Ltd told The Pioneer on Thursday that a vigilance probe was on its allegations of sand smuggling and the axis between the private group and a section of IRE management. The Manavalakurichi unit, one of the four units of the IRE Ltd is tasked with the mining of ilmenite, garnet, zircon, silmenite and monazite, materials which command premium in international market. "It is the brand name IRE which made these materials the most sought after commodities in global market," one of the IRE Ltd engineers told The Pioneer. A tonne of monazite mined by IRE Ltd costs Rs five lakhs per tonne in the market. This is because of the presence of thorium, a material which could be used as fuel in nuclear power reactors. According to the International Atomic Energy Agency, 30 per cent of the global thorium reserve is concentrated in the Manavalakurichi- Chavara (Kerala) stretch. Once India's Advanced Heavy Water Reactor becomes operational, it could be powered with Thorium, making India less dependent on other countries for nuclear fuel. "IRE had licenses to mine from Midalam, a sea shore village. But the management allowed these licenses to lapse by not mining in the allocated lands. Meanwhile VV Minerals bought over all lands surrounding the IRE land. The company made access impossible for the IRE to the latter's own mining areas," said a senior IRE employee. Over the last four years, the profit made by IRE Ltd has come down, said Suresh Gopinath, a young auditor. "The company which had made a profit of Rs157 crore in 2012-2013 has to content with a mere Rs66 lakh in 2014-2015. This is a matter of concern," said Gopinath. It is strange that VV Minerals Ltd, a late entrant to the sector is bagging all the export awards for the last one decade even as the fortunes of IRE Ltd has taken a dive for the worst. The employees alleged that thorium-rich sand is illegally exported from Tamil Nadu coast to a destination in Sri Lanka from where the consignment makes its onward journey to China and Europe.

China tests rail-based missile

China on Thursday said it has conducted scientific tests of a rail car-based long-range missile capable of hitting targets across the US. "Scientific tests in the Chinese territory (have been) conducted according to the plan," defence ministry spokesperson Col. Yang Yujun told a monthly press briefing. He was responding to a question in the US media about China conducting a test of rail car-based long-range missile DF-41 capable of hitting targets throughout the US. The canister ejection test of a DF-41 missile from a rail-mobile launcher was detected on December 5 in western China, US website Free Beacon had reported. This month marks a significant milestone for Chinese strategic weapons developers and demonstrates that Beijing is moving ahead with building and deploying the DF-41 on difficult-to-locate rail cars, in addition to previously-known road-mobile launchers, the website reported quoting US officials.

INDIA, US ENTER 2016 WITH AMBITIOUS AGENDA: VERMA

After a year of intensive bilateral engagement at the highest level, US Ambassador to India Richard Verma believes that the two countries are poised to pursue an "ambitious agenda" in the New Year. "As we move into 2016, we do so with optimism and an ambitious agenda for the future," Verma noted in a stock-taking on 2015, noting: "While we are proud of our accomplishments, we know there is much more we can do together." Verma termed 2015 a "transformative year" that saw the broadening and deepening of US-India partnership with a string of firsts, beginning with President Barack Obama being the first-ever US Head of State attending India's Republic Day ceremonies as the Chief Guest. A year that marked the holding of the first composite Strategic and Commercial Dialogue, merging the two different streams, also saw the establishment of secure communication lines between the US President and the Indian PM and between their National Security Advisors "so that important, time-sensitive issues could be tackled directly by our leaders". "We exceeded all previous records in two-way trade and foreign direct investments, totaling over \$102 billion," Verma said, noting that Indian companies have invested \$11 billion in the US, while American investments in India have topped \$28 billion. Turning to Defence relations, he said India and the United States have expanded their military engagement, with the two sides training at a very high level and further integrating their understanding on how best to employ force and operate in contested environments. "We elevated our strategic partnership to "strategic plus" - signifying that we work together at a much higher level, in more places, and on more different subjects," said Verma, who also referred to the leadership role on climate change at the recent Paris conference as also cooperation in health, science, space and innovation with the launching of several new initiatives. However, for all the expanded partnership in a host of areas that Ambassador Verma enumerated, the year may have ended on a rather sour note in at least a couple of areas: the recent deportation of several Indian students and the targeting of Indian IT firms by imposing an additional \$4,000 to \$4,500 for each H-1B and L-1 visa used by them to bring skilled professionals from India for their US operations.

China building 2nd jet carrier; hints at 3rd one

The AChina on Thursday said it is building a second aircraft carrier indigenously and hinted at plans to make a third one to enhance its blue water capabilities amid mounting tensions with the US in the disputed South China Sea. China is designing and building its second aircraft carrier "completely on its own" in Dalian in north-eastern Liaoning Province, defence ministry spokesperson Colonel Yang Yujun said. This carrier, with a displacement of 50,000 tonnes, will be a base for J-15 fighters and other types of aircraft, Yang told a monthly press briefing. Blue water capabilities refer to an ability to carry out operations much farther than their territorial boundaries, across the deep oceans. Fixed-wing aircraft on the carrier will use a ski-jump to take off the carrier will have a conventional power plant, he said, indicating that it will not be a nuclear powered ship. However, he has not given a time line when the second aircraft carrier will be ready. The acknowledgement of the second aircraft carrier comes at a time when China is locked in a military tussle with the US over the South China Sea (SCS), where Washington and its allies refused to recognise China's efforts to build artificial islands with military installations. China, which claims the whole of SCS as its own, has vociferously protested US naval ship and B-52 bombers navigating through the waters and airspace of the islands. While confirming the second aircraft carrier, Yang also hinted at plans for China to build a third one. "On the progress of the second aircraft carrier, it is being designed and constructed. As for future arrangements, it depends on the progress made in the current stage. As for the long-term development of China's aircraft carriers, authorities will take into consideration various factors," Yang said, adding that China needs aircraft carriers as it has a long coastline and vast maritime areas.

चीन ने बनाई अमेरिका तक मार करने वाली मिसाइल डीएफ- 41

बीजिंग। चीन ने गुरुवार को रेल-कार आधारित लंबी दूरी की मिसाइल डीएफ- 41 का टेस्ट किया। इसकी



मारक क्षमता 7,500 मील से ज्यादा है। यानी, अमेरिका भी इसकी जद में होगा। यह मिसाइल दोहरी मार कर सकती है। रेल कार का हाई स्पीड प्लेटफॉर्म इसे बेहद खतरनाक बनाता है। दुश्मन को धोखा देने के लिए इस मिसाइल सिस्टम को पैसेंजर ट्रेन की शकल में बदला जा सकता है। लोड करने के लिए इसे सुरंग जैसी सुरक्षित जगह में ले जाया जा सकता है। चीन के रक्षा मंत्रालय के प्रवक्ता कर्नल यांग युजुन ने यह जानकारी दी। युजुन ने एक सवाल के जवाब में बताया कि चीन दक्षिण चीन सागर के विवादित हिस्से में दूसरा एयरक्राफ्ट कैरियर बना रहा है।

उनका देश तीसरा एयरक्राफ्ट कैरियर भी बना सकता है। इस विवादित हिस्से को चीन, वियतनाम, मलेशिया, फिलीपींस, ब्रुनेई और ताइवान अपना बताते रहे हैं।