

NEWS ITEM

SCIENTIFIC NEWS

PSLV-C35 Launched Eight Satellites using Single Flight: ISRO's Polar Satellite Launch Vehicle (PSLV) successfully launched the SCATSAT-1 Satellite (371 kgs) along with seven co-passenger satellites on September 26, 2016 from Satish Dhawan Space Centre SHAR, Sriharikota. This is the thirty sixth consecutively successful mission of PSLV. The total weight of all the eight satellites carried on-board PSLV-C35 was 675 kg. PSLV-C35 is the first PSLV mission to launch satellites carried onboard into two different orbits. This PSLV mission was the longest of the missions conducted till date and was completed in 2 hours 15 minutes and 33 seconds after lift-off.

Human hair served as cathodes for solar cells: Researchers at the Indian Institute of Science Education and Research (IISER) in Kolkata have used human hair to produce cost-effective, metal-free cathodes for use in solar cells. This is the first instance where a bio-waste-derived electrode has been used as cathode in a quantum dot sensitised solar cell device. While metal-free cathodes produced in the past have not performed as well as the traditional metal-based ones, the performance of graphitic porous carbon cathode was produced was at par with metal-based cathodes.

NOBEL PRIZE AWARDEES IN SCIENCE-2016

Nobel prize in Medicine: The 2016 Nobel Prize in Physiology or Medicine has been awarded to Dr. Yoshinori Ohsumi. The Nobel Committee said the Prize has been awarded to him "for his discoveries of mechanisms for Autophagy." The professor is currently at the Tokyo Institute of Technology. Announcing the prize in Stockholm, the Nobel Committee said that the cell biologist "discovered and elucidated mechanisms underlying autophagy, a fundamental process for degrading and recycling cellular components."

Nobel Prize in Chemistry: The Nobel Prize in Chemistry for 2016 has been awarded to Dr. Jean-Pierre Sauvage, Sir Dr. J. Fraser Stoddart and Bernard L. Feringa for developing molecular machines. Announcing the Prize on Wednesday in Stockholm, a statement from the Royal Swedish Academy of Sciences said, "The development of

computing demonstrates how the miniaturisation of technology can lead to a revolution. The 2016 Nobel laureates in Chemistry have miniaturised machines and taken chemistry to a new dimension". "They have developed molecules with controllable movements, which can perform a task when energy is added. Molecular machines will most likely be used in the development of things such as new materials, sensors and energy storage systems.

Noble prize in Physics: The Nobel Prize in Physics for 2016 has been awarded to Dr. David J. Thouless, and the other half to Dr. F. Duncan M. Haldane and Dr. J. Michael Kosterlitz for theoretical discoveries of topological phase transitions and topological phases of matter. Announcing the Prize in Stockholm, a statement by the Royal Swedish Academy of Sciences said that "This year's Laureates opened the door on an unknown world where matter can assume strange states. They have used advanced mathematical methods to study unusual phases, or states, of matter, such as superconductors, superfluids or thin magnetic films.

Calcium supplements may damage Heart: Taking calcium in the form of supplements may raise the risk of plaque buildup in arteries and heart damage, although a diet high in calcium-rich foods appears to be protective, scientists have stated. After analyzing 10 years of medical tests on more than 2,700 people, researchers at Johns Hopkins University School of Medicine, said the results add to growing scientific concerns about the potential harms of supplement. "Our study adds to the body of evidence that excess calcium in the form of supplements may harm the heart and vascular system," said Erin Michos, from Johns Hopkins Medicine. Previous studies have shown that "ingested calcium supplements - particularly in older people - do not make it to the skeleton or get completely excreted in the urine, so they must be accumulating in the body's soft tissues," said nutritionist John Anderson, from University of North Carolina.

Regeneration of Monkey Hearts by Lab-grown stem cells: In a step forward for organ regeneration, stem cells grown from a single monkey's skin cells revitalized the damaged hearts of five sick macaques. The experiment builds towards the goal of providing

a vast and uncontroversial source of rejuvenating cells to transplant into heart attack victims. This would obviate the need to harvest stem cells from embryos or from transplant recipients themselves. The team used so-called induced pluripotent stem cells (iPSCs).

These are created by stimulating mature, already specialized cells — such as a skin cell. Adult heart stem cells have already been experimentally used in heart attack victims. And therapy with embryonic stem cells has shown promise in treating severe heart failure. But the Japanese team said theirs was the first study to use iPSCs to fix heart damage. Human iPSCs have long been touted as a promising source of cells for heart repair. In the monkey trials, the team chose a molecule in an immune-system cell that was a match in both donor and recipients, to stop the body's defence system identifying and reacting to the "intruder" cells. "We still have some hurdles, including the risk of tumour formation, arrhythmias, cost, etc." the authors of Japan's Shinshu University stated.

Apes think far more like humans than previously believed: Kind of understanding that were thought to exist only in humans might also be shared by apes, according to the finding of new research. Research with chimpanzees, bonobos and orangutans, however, suggests that our distant relatives might be able to know the same thing. "This cognitive ability is at the heart of so many human social skills," said Christopher Krupenye of Duke. The result of the test - referred to as the "false belief test" - were similar to those found in humans that are under the age of two. The research was conducted by scientist at Duke University, Kyoto University and the Max Planck Institute for Evolutionary Anthropology.

Human life span cannot be extended any more: The peak of human life span has already been reached and instead of wasting resources trying to extend life, research should concentrate on extending health span, the duration of old age spent in good health, says a new study published in Nature. Demographers as well as biologists have contended there is no reason to think that the ongoing increase in maximum lifespan will end soon. But our data strongly suggest that it has already been attained and that this happened in the 1990s."

HIV cure is on the verge says British scientists: British scientists are on the verge of confirming a treatment for HIV, an incurable virus that leads to

deadly AIDS disease, if a new treatment trial proves successful. A British man with HIV hopes to become the first in the world to be cured of the disease by using the pioneering new therapy designed to eradicate the virus, 'The Sunday Times' reported. It is the first therapy created to track down and destroy HIV in every part of the body — including in the dormant cells that evade current treatments. If successful, it offers hope of an irreversible cure for HIV and could save millions of pounds spent on drugs. This is one of the first serious attempts at a full cure for HIV. This is a huge challenge and it's still early days but the progress has been remarkable.

CSIR developed New Herbal drug for management of Diabetes: Scientists at the Centre for Scientific and Industrial Research awarded yesterday for developing BGR-34, an Ayurvedic anti-diabetic drug, said that the drug has been found to be successful in controlling blood sugar. Developed after about four years of research at CSIR labs in Lucknow, the drug was found to reduce the HbA1c (a type of haemoglobin, its level reflects how well the body is controlling diabetes) levels from 7.8% to 7.3% in diabetic patients who were given a daily dose of BGR-34 for three months. Scientific studies have shown that complications related to diabetes can be delayed or prevented by keeping HbA1c level below 7%. Post-prandial blood sugar levels reduced from 204 to 194 mg/dl. In healthy adults it should be less than 180 mg/dl of blood. The human trial for the drug was conducted on 48 adults with diabetes.

Horses can communicate with humans: Horses can learn to communicate with humans and express their feelings and opinions, a new study has claimed. Researchers from Norwegian Veterinary Institute trained horses by offering slices of carrot as an incentive to touch a board with their muzzle to indicate if they wanted to wear a blanket. The horses' requests matched the weather, suggesting it was not a random choice.

Researchers hope that the method could be used to ask horses more questions. They believe that ordinary horse owners will be able to train their horses in this way. It was taught to tell the difference between different symbols on the board - blanket on (horizontal bar), blanket off (vertical bar) and no change (blank). Finally, the horse was taught to associate a particular action with the symbols on the board.

Chink in E.coli armour: It was stated that E. coli bacteria more susceptible to host immune

response. The researchers at IIT, Hyderabad, have found a potential way of preventing the bacterial surface-associated polysaccharide — capsular polysaccharide (CPS) — from attaching on the surface membrane and forming a protective encapsulation of the bacteria, thus making the *E. coli* vulnerable to attack by the host's immune system. The CPS is synthesised by the bacteria and exported to the surface to offer protection by evading the host immune response. Surface-association of CPS also offers impermeability to antibiotics, thus establishing infection in the host. Certain surface-associated bacterial proteins help in the attachment of CPS on the bacterial surface. The CPS is not the same in all the *E. coli* strains but varies. In all, there are 80 such capsular polysaccharides. They have modelled the 3D structures and developed an organised repository of 72 CPS varieties.

Treatment for Residual Glioma Cancer cells: Photodynamic therapy for treating residual cancer cells of a high-grade brain tumour (glioblastoma) has been reported recently. Photodynamic therapy uses a photosensitive drug that becomes active under the action of light and converts molecular oxygen into reactive oxygen species that kill cancer cells. Scientists at the Amrita Institute have turned to nanotechnology and used light in the near-infrared region to achieve better results. Light in the near-infrared region can penetrate to about 0.8 cm into body tissues. The drug encapsulated in a nanoparticle has peptides functionalised on its surface and is selectively absorbed only by cancer cells. The nanoparticles containing the drug have better ability to kill cancer cells as they absorb three times more light in the near IR region than the free drug.

Electric bandage developed by NASA for wound healing: NASA has developed a new high-tech material that uses electricity to significantly promote healing of injured wounds. In conditions of non-Earth gravity, human blood displays behaviour quite different from that on Earth. Wounds are likely to heal much more slowly and considering the survival risks and the cost of space missions, healing wounds as fast as possible is crucial.

The new material generates a small amount of electricity when interacting with another surface, including human skin. The material, called polyvinylidene fluoride (PVDF) has numerous possible applications, including wound healing. It is proven that wounds tend to heal much more quickly

if small amounts of electricity are applied to the surrounding tissue. If the PVDF fibres are aligned correctly, cells on a wound use it as a scaffold, helping the wound to heal faster.

POST DOCTORAL FELLOWSHIPS

IIT Madras Post doctoral fellowships: IIT Madras invites applications for PDFs in its different departments. The applications should be sent through email to drresearch@iitm.ac.in along with the relevant documents. For more information please visit website <https://www.iitm.ac.in/content/post-doctoral-fellowship-iit-madras>.

SERB-National Post Doctoral Fellowship (N-PDF): SERB invites applications for N-PDF. The call for applications for SERB-N PDF will be notified twice a year through the websites www.serbonline.in and www.serb.gov.in. The application form along with a research proposal highlighting the objectives of the research work to be undertaken should be submitted online through the website www.serbonline.in. The fellows will work under a mentor, and it is hoped that this training will provide them a platform to develop as an independent researcher.

Ramanujan Fellowship: The fellowship is meant for brilliant scientists and engineers from all over the world to take up scientific research positions in India, i.e. for those scientists who want to return to India from abroad. The fellowships are scientist-specific and very selective. For more information please visit website <http://www.serb.gov.in/rnf.php>

Start-Up Research Grant (Young Scientists): Start-up grant for Young Scientists is restructured **w.e.f. 1st September, 2015** into two new schemes: Early Career Research Award (ECRA) and National Post-Doctoral Fellowship (NPDF). For more information please visit website <http://www.serb.gov.in/srg.php>

SERB Overseas Postdoctoral Fellowship: SERB Overseas Postdoctoral fellowship (SERB-OPDF) aims to build national capacity in frontier areas of Science and Engineering, which are of interest to India by providing postdoctoral fellowship for a period of one year extendable to one more year subject to good performance. The Program admits candidates in identified areas and sends them to top institutions around the globe, other than USA and also to institutions where internationally acclaimed scientists are working. For more information please visit website <http://www.serb.gov.in/opf.php>

ANNOUNCEMENTS

2nd AP Science Congress: The second Andhra Pradesh Science is being organized at Vijayawada jointly by Andhra Pradesh Akademi of Sciences, Dr.NTR University of Health Sciences, Acharya Nagarjuna University and Krishna University, with a focal theme of "Science and Technology for Health" at PB Siddhartha College Auditorium on 7-9 November, 2016. It is being inaugurated by Hon'ble Chief Minister of Andhra Pradesh, Sri.N. Chandrababu Naidu and Hon'ble Union Minister for Urban Development, Housing, Poverty Alleviation, Parliamentary Affairs & Ministry of I&B, Sri.M.Venkaiah Naidu. For details of participation, contact through apsc2016vijayawada@gmail.com

104th Indian Science Congress: The pilgrimage city, Tirupati has been chosen to host the 104th Indian Science Congress meeting to be held during January 3 to 7, 2017 with a focal theme of "Science and Technology for National Development, which will be inaugurated by Prime Minister Narendra Modi on the sprawling Sri Venkateswara University campus. As many as 10,000 delegates, who are directors and

office-bearers of various science organisations, are expected to converge on the city for the mega event. Apart from the main event, there will be a women's science congress and children's science congress. For further details, one may contact through email - drsvbr.acas@gmail.com. The 104th Indian Science Congress, will witness a host of scientific luminaries from countries across the world, said Indian Science Congress Association general president Prof.D. Narayana Rao. Prof. Rao said that nine Nobel Laureates from the U.S., Japan, France, Israel and Bangladesh would be attending the event and share their experiences. In addition to this, a huge contingent of 200 scientists from foreign nations, 10,000 scientists representing various national laboratories, faculty and research scholars from Indian Universities and several others will take part in the event to exchange their views on a range of scientific issues, both on national and international level, he added. Plenary sessions are being organised in tune with the vision of Prime Minister Narendra Modi, to transform India through science and technology.

