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गंगा पुनरोत्थान के लिए बनेगा आईआईटी विशेषज्ञों का पैनल

नई दिल्ली (एसएनबी)। देश की सबसे बड़ी नदी गंगा में अविरल धारा के लिए तैयार हो रही परियोजना में आईआईटी विशेषज्ञों का भी सहयोग लिया जाएगा। इसके लिए एक और पैनल तैयार हो रहा है जिसे जल्दी ही अंतिम रूप दे दिया जाएगा। इससे पहले गंगा अभियान के लिए सरकार ने पहले एक तकनीकी सलाहकार नियुक्त किया था और उसके बाद पूर्व जल संसाधन सचिव की अध्यक्षता में एक समिति का गठन किया जाएगा।

आईआईटी के विशेषज्ञों की टीम बनाने के लिए जल संसाधन मंत्रालय में गंगा पर काम कर रही टीम की बैठक हुई जिसमें बनारस से हुबली तक गंगा नदी में जलपोत चलाने सहित कई परियोजनाओं पर विचार-विमर्श किया गया। उल्लेखनीय है कि प्रधानमंत्री नरेंद्र मोदी का सबसे महत्वपूर्ण प्रोजेक्ट होने की वजह से गंगा अभियान में कई मंत्रालय काम कर रहे हैं जिसमें जल संसाधन, नदी विकास एवं गंगा पुनरोत्थान मंत्रालय के बाद जहाजरानी मंत्रालय पर दबाव है, क्योंकि जलपोत चलाने के काम इसी मंत्रालय को करना है। पूरी परियोजना तैयार होने के बाद आगे चलकर कोई तकनीकी दिक्कत न होने पाए, इसलिए सरकार ने गंगा परियोजनाओं को तकनीकी दृष्टि से पूरी तरह अध्ययन करने के लिए आईआईटी विशेषज्ञों व अंतर्राष्ट्रीय सहयोग भी लेने का फैसला लिया है। मंत्रालय के सूत्रों से पता चला है कि अगले माह तक इस तरह के कुछ विशेषज्ञों की नियुक्ति की जाएगी। इन नियुक्तियों से पहले गंगा परियोजना को लेकर लगभग रोजाना किसी न किसी मुद्दे पर विचार-विमर्श हो रहा है।

US young scientist award for PIO boy

Washington: An Indian-American ninth grader student has won 'America's Top Young Scientist' award for his innovative design of an eco-friendly device that seeks to reduce carbon footprint while offering power for household usage. Sahil Doshi, student from Pittsburgh competed alongside nine other finalists to be declared winner of 2014 Discovery Education 3M Young Scientist Challenge. The award includes \$25,000 and a student adventure trip to a destination such as Costa Rica.

His prototype — the PoluCell — converts carbon dioxide into electricity, ingeniously helping to reduce our carbon footprint while offering power for household uses and developing nations, Discovery Education and 3M said in a statement. Inspired by the 1.2 billion people worldwide who lack access to electricity and the rising levels of toxic air pollution, Doshi was determined to create an energy storage device that could help lower harmful greenhouse gases while generating electricity for those in need, a statement said. Among others, Jai Kumar from Virginia received the third place for his innovative, window-mounted air purification system that prevents harmful pollutants from entering the home. **PTI**

Fusion energy holds key to power dream

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St. Petersburg: In this picture postcard city, nearly 700 scientists from across the world have gathered to compare notes on the most elusive of scientific dreams — fusion energy. Obscure discussions on neutron energies and plasma temperatures spill out of conference rooms to breakfast tables and smokers' groups huddling at the hotel porch, whipped by chill northern winds. Everybody knows that success is decades away, yet there is an air of repressed excitement.

The 25th Fusion Energy Conference is being attended by scientists from 43 countries including India. The Indian contingent, led by Dhiraj Bora, director of the Institute for Plasma Research, Gandhinagar, is a small one but they have for the first time, revealed India's work on superconductivity, which complements fusion research.

"Most countries are doing research which is still not in public domain. In such conferences, a measured dose of their research is reported," Bora explains.

Fusion is what makes the Sun and billions of stars like it burn. When two nuclei of atoms combine, an enormous amount of energy is released. For example, just a kilogram of the most basic fusion fuel can release enough energy to run a 1GW (one billion watts) electrical power station for a day. For comparison, look at India's power generation capacity — it is about 250 GW per year.

Just 0.6 tons of fusion fuel can produce the same amount of energy as 2 million tons of coal or 1.3 million tons of oil, or even 30 tons of uranium oxide used in current nuclear power plants. So, why is this only a dream? Because, to make atomic nuclei fuse together, incredible energy is needed. Temperatures running into millions of degrees, as in the Sun, put atoms into a state called plasma, a kind of atomic soup

with protons, neutrons and electrons floating around excitedly. This is when fusion starts. Once you put in the needed energy, you get many times more through a chain fusion reaction. To create such conditions on Earth, under tight control, is what the scientists have laboured for nearly half a century.

Since 2006, a collaborative project called ITER is building the world's first fusion reactor in the south of France. An exclusive club of the US, Russia, China, India, Japan, Korea and the European Union is doing the research and building various parts of the giant reactor. It is slated to be completed only by 2019, and actual fusion will start only by 2027. Construction costs are estimated at over \$50 billion.

Fusion energy — whenever it is achieved — will liberate humankind from both energy constraints as also global warming because it does not generate greenhouse gases. If this is the result then the dream is really worth working for.

At the conference inauguration, there is a bit of a sensation as the grand old man of Russian nuclear research Evgeny Velikhov, president of Kurchatov Institute, announces that Russia is going ahead with research on a 'hybrid reactor', that is, one that combines fission (as in nuclear bombs and nuclear power plants) with fusion. In a keynote address to the stunned gathering he details the physics of the whole concept. Russia has upped the ante in the race for achieving controlled fusion energy.

It is an exciting development and India is also thinking along these lines, says Bora, talking to TOI later. With India's vast thorium resources, we can think of integrating the thorium cycle (for fission) and our fusion research, he speculates with a twinkle in his eyes.

(Subodh Varma was at the 25th FEC at the invitation of Rosatom, the Russian Federation's department of atomic energy)

When Mars choked up Indian science

Media cheerleads the monopoly venture of the Indian Space Research Organisation, as if it was a global historical feat that put India in the league of world's scientific powers. But it shamelessly neglects many a scientific achievements that bring millions out of poverty or save lives during a terrible natural calamity

PRAFUL BIDWAI

The contrast between India's two recent science and technology (S&T) projects couldn't have been starker. One, by delivering accurate early warnings about Cyclone Hudhud, saved thousands of human lives, and prevented destruction of property on a monstrous scale. The other put India's Mars Orbiter Mission (MOM) Mangalyaan spacecraft successfully into a distant orbit around the planet—a technological achievement, but without much scientific, leave alone social, consequence.

Yet, the Indian media exulted over the second event, a monopoly venture of the Department of Space-Indian Space Research Organisation (ISRO), as if it was a world-historical feat that put India in the top league of the globe's science powers. It was like a spectacular laser show, but only visible in graphics and artists' drawings, besides pictures of a rocket blast-off from last November. The rest was left to imagination and nationalist hype.

But the media ignored the first project although it was the result of unglamorous, low-key, painstaking cooperation between different agencies including the India Meteorological Department, National Institute of Ocean Technology, National Centre for Medium-Range Weather Forecasting, Disaster Management Institute, the Indian Air Force and the Navy, and two Indian Institutes of Technology, besides the Orissa and Andhra Pradesh governments.

The effort involved creation of new infrastructure with more cyclone shelters, coastal roads, bridges and embankments, better weather observation stations including buoys, advanced computers, faster communication lines, and better preparations for rescue and relief operations. It meant raising the country's disaster preparedness budget fivefold to \$1.6 billion since 2006.

All this brought about a huge improvement in cyclone warning time. This was



NO BRIGHTER TOMORROW: India's Mars Mission was more of a media hype and less of a technological achievement

only 24 hours in 1999, when the Orissa 'super-cyclone' resulted in 3,958 deaths (officially, and 10,000 deaths by unofficial estimates).

But it improved to five days, and reduced the annual death-toll from cyclones to under 100 over the past five years. In Hudhud, it enabled the evacuation of more than 2 lakh people, stockpiling of food and other aid in shelters, and a relatively well-coordinated relief effort.

Seen in perspective, the cyclone warning-and-preparedness project is a feat of greater social relevance, as well as more innovative use of technology, than MOM, which has not had any civilian spin-offs. Of course, this is not to deny that ever since ISRO launched the indigenous satellite 'Aryabhata' in 1975, it has developed a range of technologies, including rocketry, engine design, electronic fabrication, remote tracking and control, and data processing.

One shouldn't also underrate ISRO's first-attempt success in putting MOM in a Martian orbit, built on past experience, both its own and others'. But in contrast to

these technological achievements stands MOM's very modest scientific agenda: not landing on Mars, but of observing it from a design distance of 366 km (since increased to 423 km) at the nearest point and 80,000 km from the farthest point. This cannot deliver even a fraction of the information recently generated by the US and European 'Mars Global Surveyor' and 'Mars Express' missions.

Mangalyaan weighs 1,350 kg, but only carries a small scientific payload weighing 13 kg, compared to the 'Mars Express' 116 kg. This paucity of instrumentation severely limits the extent and quality of Mangalyaan's observations. It's cannot add significantly to what's already known about Martian topography or atmosphere, including the presence of methane. The 'Global Surveyor' took over 600 million readings of surface elevations. MOM can at best take a minuscule number of readings.

According to former ISRO chairman G Madhavan Nair, a critic of the present project, MOM was originally meant to carry 12 instruments, weighing 24 kg. But

only five of these could be tested in time for the launch. The rest couldn't be carried, making the mission a 'useless, 'showpiece event'—'spending money on nothing'.

Mangalyaan's limitations basically arise from ISRO's failure to complete the development of a Geosynchronous Satellite Launch Vehicle (GSLV), which can place heavy (2,000 kg-plus) satellites into high orbit. Despite working on the GSLV for 15 years, ISRO hasn't succeeded in operationalising it. Its test-flights have repeatedly failed. The last one was aborted in August 2013.

Instead of completing the GSLV's development, ISRO hurriedly used the much less powerful Polar SLV to launch Mangalyaan. But the PSLV is only designed to put (small) satellites into a low-earth orbit. This greatly limited the speed Mangalyaan could acquire and constricted its abilities.

The MOM mission may have served as a steroid shot for ISRO. But it will do little to advance the cause of S&T in India. For decades, India was the 'Third World's unquestioned 'science superpower'. In

1980, it globally held the 8th position in the number of papers published in peer-reviewed journals, while China was a distant No 15. By 2010, China moved up to No 2, but India moved down to No 9.

India not only lags behind the developed countries in the number and quality of R&D (research and development) personnel, and in scientific output and its impact (measured in the number of citations of papers by other researchers). Other emerging economies are also catching up with India. Not just China, but even Russia and South Korea, now have more people engaged in R&D than does India. Even Brazil isn't far behind.

Although India accounts for 3.5 per cent of all scientific papers published worldwide, its share in the top one per cent of impact-making global journals is a low 0.54 per cent. As many as 52 per cent and 45 per cent of Indian publications remained uncited in 2001-2005 and 2006-2010.

Put simply, India's S&T establishment is in crisis. Its priorities are warped: two-thirds of its R&D expenditure is consumed by just three 'security'-related organisations: Department of Atomic Energy, Defence R&D Organisation (DRDO) and Department of Space, the first two of which have performed appallingly.

The rest of the S&T establishment including the four big chains of laboratories under the Councils of Agricultural Research, Scientific and Industrial Research, Medical Research, and Department of Biotechnology, have to make do with the remaining one-third share.

Their funds were cut by 25 to 30 per cent in last United Progressive Alliance budget. The Modi government has not yet restored them despite rhetoric about promoting S&T vigorously. Worse, even the allotted funds are not disbursed on time, starving projects of equipment and staff. All manner of cuts are imposed arbitrarily. Important institutions like the

Department of Science and Technology and Council of Scientific and Industrial Research remain headless, further delaying decision-making and funds allocation.

India committed a great blunder early on in severing the link between research and teaching at the undergraduate/postgraduate level which exists in the university system, and instead set up specialised laboratories with no connection with teaching or infusion of student talent. Most of these laboratories are extremely bureaucratised and run as fiefdoms, with no peer review, leave alone public accountability. Promotions to high positions are often decided on the basis of years in service, or nepotism, not on quality of work, talent or performance.

I interviewed four active researchers from disciplines like biology, theoretical physics, chemistry and astronomy, who corroborate this view. They all complain that the bureaucratisation of S&T institutions has created in them a pervasive culture of mediocrity, in which people with outstanding talent cannot function optimally. Financial instability, and irregular releases of funds, compound the problem further, demoralising good-quality researchers.

There is very little collaborative research across Indian institutions, although many scientists do joint work with foreign, especially Western, institutions. There is a proliferation of me-too projects, many of them fragmented, subcritically funded, and unproductive. The result is growing aridity, low performance and lack of enterprise. The whole experience of adventure or discovery is lost.

On a larger compass, the S&T establishment has betrayed the promise of delivering useful inventions and innovations to the people, with a few notable (partial) exceptions such as agricultural research (which soon plateaued and wasn't extended to dryland farming) and information technology. It has failed to provide reliable power and clean drinking water to the public.

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'Cosmic rays threaten manned Mars missions'

Washington: Radiation hazards in space caused by cosmic rays could threaten future deep-space astronaut missions such as those to Mars, a new study suggests.

Crewed missions to Mars remain an essential goal for Nasa, but scientists are only now beginning to understand and characterise the radiation hazards that could make such ventures risky, researchers said. Associate professor Nathan Schwadron of the University of New Hampshire Institute for the Study of Earth, Oceans, and Space and the department of physics says that due to a highly abnormal and extended lack of solar activity, the solar wind is exhibiting extremely low densities and magnetic field



RADIATION HAZARD

strengths, which causes dangerous levels of hazardous radiation to pervade the space environment.

"The behaviour of the Sun has recently changed and is now in a state not observed for almost 100

years," said Schwadron, lead author of the paper. He notes that throughout most of the space age, the Sun's activity has shown a clockwork 11-year cycle, with approximately six- to eight-year lulls in activity followed by two- to three-year periods when the Sun is more active. "However, starting in about 2006, we observed the longest solar minimum and weakest solar activity observed in the space age," said Schwadron. These conditions brought about the highest intensities of galactic cosmic rays seen since the beginning of the space age, which have created worsening radiation hazards that potentially threaten future deep-space astronaut missions. **PTI**

US probes med devices for possible cyber flaws

Hackers May Exploit Defects To Attack Patients: Experts

Boston: The US department of homeland security is investigating about two dozen cases of suspected cybersecurity flaws in medical devices and hospital equipment that officials fear could be exploited by hackers, a senior official at the agency said. The products under review by the agency's Industrial Control Systems Cyber Emergency Response Team, or ICS-CERT, include an infusion pump from Hospira Inc and implantable heart devices from Medtronic Inc and St Jude Medical Inc, according to other people familiar with the cases, who asked not to be identified because the probes are confidential.

These people said they do not know of any instances of hackers attacking patients through these devices, so the cyber threat should not be overstated. Still, the agency is concerned that malicious actors may try to gain control of the devices remotely and create problems, such as instructing an infusion pump to overdose a patient with drugs, or forcing a heart implant to deliver a deadly jolt of electricity, the sources said.

The senior DHS official said the agency is working with manufacturers to identify and repair software coding bugs and other vulnerabilities that hackers can potentially use to expose confidential data or attack hospital equipment. He declined to name the companies. "These are the things that shows like 'Homeland' are built from," said the official, referring to



Reuters

GRAVE DANGER: Researcher Haitham Al-Hassanieh holds one of the Medtronic heart defibrillators he successfully attacked, at MIT in Cambridge, Massachusetts

the US television spy drama in which the fictional vice president of the United States is killed by a cyber attack on his pacemaker.

"It isn't out of the realm of the possible to cause severe injury or death," said the official, who did not want to be identified due to the sensitive nature of his work.

Hospira, Medtronic and St Jude Medical declined to comment on the DHS investigations. All three companies said they take cybersecurity seriously and have made changes to improve product safety, but declined to give details.

ICS-CERT's mandate is to help protect critical US infrastructure from cyber threats, whether they are introduced through human er-

ror, virus infections, or through attacks by criminals or extremists.

According to the senior DHS official, the agency started examining healthcare equipment about two years ago, when cybersecurity researchers were becoming more interested in medical devices that increasingly contained computer chips, software, wireless technology and Internet connectivity, making them more susceptible to hacking. The US Food and Drug Administration, which regulates the sale of medical devices, recently released guidelines for manufacturers and healthcare providers to better secure medical devices and is holding its first public conference on the topic this week. REUTERS

Open house at IIT-Madras

<http://www.thehindubusinessline.com/industry-and-economy/education/open-house-at-iitmadrass/article6528210.ece>

Chennai, October 23:

The Department of Engineering Design, Indian Institute of Technology — Madras, will showcase its research activities in a range of areas to industry on Saturday (October 25). According to a press release from the Department, the day-long open house event will bring out its work in the areas of automotive, biomedical, robotics, design and materials. The objective is to increase interaction between IIT and industry.

TISS to spearhead MHRD's vocational training initiative

The framework for the TISS School of Vocational Education (SVE) was conceptualised in 2011, to spread skill development to every nook and corner of the country

http://www.business-standard.com/article/management/tiss-to-lead-govt-s-skill-training-initiative-114102200991_1.html

Tata Institute of Social Sciences (TISS) has opened the [School of Vocational Education](#) to spearhead the vocational training programme envisaged in the initiative proposed by the ministry of human resource development (MHRD). [TISS](#) has been selected as the nodal point to implement the initiative.

Professor Neela Dabir, deputy director, TISS, said 20 per cent of the institute's graduates from traditional education streams are employable and the rest need to acquire additional qualification to get a job.

"Therefore, there is a definite need to offer meaningful job-oriented skill/vocational training courses in a variety of fields. The fields/sectors for vocational courses should be carefully chosen; the choice of courses has to be demand driven," said Dabir.

The framework for the TISS School of Vocational Education (SVE) was conceptualised in 2011, to spread skill development to every nook and corner of the country. This entailed identifying partners, developing courses, curriculum and content, as well as the entire supporting mechanism.

Dabir said TISS SVE has been set up to create an ecosystem that would bring back dignity of labour to blue collar jobs and create a sustainable source of income. This project has been initiated under the aegis of All India Council for Technical Education (AICTE) proposed by the MHRD. The approach adopted by TISS SVE is called the Work Integrated Training Programme (WITP). The aim is to enable students to learn skills by engaging in on-the-job training, along with classroom theoretical inputs.

Through this 'earn while you learn' model, the trainee may also earn a stipend during the on-the-job course duration. The courses will be conducted pan India through Hub Partners (supporting effective delivery of classroom-based inputs) and Skill Knowledge Partners or SKPs (an industry partner that will provide on-the-job training).

Dabir said while they do not guarantee placements, it is expected that most of the students will be absorbed by SKPs after completion of their courses. But they can also apply in similar set ups. The hub partner, however, would extend placement guidance and support to the trained students.

TISS-SVE will have Bachelor of Vocational Education (BVoc) programme, where every individual level/year is a standalone certification recognised and awarded by TISS as a deemed university. These target youth who are seeking non-formal education methods to enhance their employability and earning capabilities.

The students will also have short-term skill enhancement courses, which would be less than six months duration. The objective is to upgrade the specialised skills that each sector demands to enhance earning capabilities.

Apart from the BVoc programme and short-term courses, Dabir said TISS would also offer skill enhancement courses. The focus of these programmes is to provide opportunities to people who are already part of the industry to upgrade their skills in view of career succession and to keep up with the change in technology, process, etc.

Dabir said the University Grants Commission (UGC) has also recognised the need to have a proper structure for BVoc courses, and, therefore, there is a combination of certain general education courses along with vocational theory and practical courses. All BVoc courses are designed in accordance with the UGC guidelines, and this makes it possible to consider the BVoc degree equivalent to any other bachelor's degree.

The general education courses are common to all BVoc programmes, but choice of courses can be given in the vocational component, and based on the demand of the job market different electives can be offered to students.

"We are hopeful that this approach to education will get recognition and acceptance in India in due course of time," said Dabir.

Organise events on Vallabhai Patel's birthday: UGC to varsities

http://zeenews.india.com/news/india/organise-events-on-vallabhai-patels-birthday-ugc-to-varsities_1488604.html

New Delhi: With Sardar Vallabhbhai Patel's birth anniversary on October 31 being celebrated as 'Rashtriya Ekta Diwas', UGC today asked universities to organise events and take pledge to uphold unity and security of the nation.

"We are all aware of Patel's contribution to India's unity, safety and security. As a mark of honour for his contribution, you are requested to organise events to spread the message of unity, safety and security," UGC chairman Ved Prakash said in a communication to Vice Chancellors.

The institutions have also been asked to administer the Rashtriya Ekta Diwas pledge to all the students, staff and the members of the faculty and organise a 'Run for Unity' where others can also participate.

The universities have been specifically asked to accord "top priority" to the pledge and the run.

The varsities have been asked to also organise panel discussions on the contribution of Sardar Patel, debates, publicise his works and screening of documentary films on his life.

New course for engineers in heritage conservation

The State government has decided to conduct a six-week course on conservation and restoration of monuments for the present set of engineers, who lack the requisite skills.

Need for such a course was felt as a large number of restoration and conservation projects had been undertaken by various government departments, especially the Hindu Religious and Charitable Endowments (HR&CE) department, in the last three years.

Based on the recommendations of the 13th Finance Commission, Rs. 90 crore has been set apart for the renovation of over 200 temples without tampering their heritage value.

In the last three years, 183 temples were provided with Rs. 67.50 crore as part of the Finance Commission's grant.

This year, the government has sanctioned Rs. 22.5 crore for 46 temples. Also, using the government's grant and funds, a number of temples had been covered under renovation and restoration.

In all, restoration and renovation works are over in respect of 5,400 temples so far.

A major work is on to the ramparts of the Ranganathar temple in Srirangam. The authorities have decided to take up one such work at the Arunchaleswarar temple in Tiruvannamalai.

As for secular monuments, the prominent projects relate to restoration of the Kalas Mahal in Chepauk and the National Art Gallery building in Egmore here.

To be run by the State Archaeology Department, the course, in two batches, will be compulsory to those engineers working with the HR&CE Department. Also, those who are in the Public Works and Highways Departments can participate in the course.

The syllabus for the course has been framed with the help of the HR&CE, the Archaeological Survey of India, IIT, Madras University and the State Archaeology and Museums Departments.

An official explains that the course covers all heritage monuments, both temples and secular. He adds that such a course is the first of its kind in the country.

A week ago, the government issued an order giving approval for the course.

All India Survey on Higher Education 2014-15 launched

http://zeenews.india.com/news/india/all-india-survey-on-higher-education-2014-15-launched_1488491.html

New Delhi: The Human Resource Development (HRD) ministry on Wednesday launched the All-India Survey on Higher Education (AISHE) 2014-15, an annual, web-based, pan-India exercise on the status of higher education in the country.

The annual survey collects data on several parameters, including student enrollment, examination results, education finance and infrastructure.

The data helps in making informed policy decisions and conducting research in education development.

"So far, the ministry has released the final reports of the AISHE 2011-12 and provisional reports of the AISHE 2012-13, which are in the public domain. While the survey exercise is in its fourth consecutive year now, the AISHE 2013-14, launched on June 17, 2014, is also underway," said an official statement.

"With the launch of the AISHE 2014-15 in October, the time lag in dissemination of higher education statistics has been eliminated," added the statement.