Newspaper Clips
December 18, 2014

IIT Delhi gearing up to celebrate Alumni Day 14

Wednesday, December 17, 2014
http://indiaeducationdiary.in/Shownews.asp?newsid=32372

Report by India Education bureau, New Delhi: IIT Delhi in collaboration with IIT Delhi Alumni Association is preparing for its annual Alumni Day scheduled on 28th December 2014. The iconic event shall be celebrated with the theme, 'Envision the Future Together', to strengthen the Alumni - Alma Mater bond and to explore ways to give back to the institute. Alumni Day is celebrated by all IITDAA chapters across the world on the same day in sync with the main event held at IIT Delhi.

IIT Delhi with Alumni Day poise to take a thought leadership role in contributing to the Technological and Economical development of the country and for the same alumni are encouraged to connect, collaborate, create, participate and contribute the next frontier with IIT Delhi.

This occasion brings an opportunity for all alums to assemble, interact and enjoy with each other and with the institute. There would be 100 of Alumni form overseas who will be the part of this enormous day. More than 1000 alumni and faculty along with their family members would be participating in the event.

There are prominent Alumni Chief Guests who will be the part of Alumni Day and will cherish their thoughts and experience to make IITians a path for India's growing economy and success:

· Mr H.S Bhartia, Chairman, Jubilant Group (1979 Alumnus,
· Mr Sachin Bansal, CEO, Flipkart- Entrepreneur perspective (2005 Alum)
· Mr Avinash Chander, Scientific Advisor to Raksha Mantri, Gol;, Secretary, Dept. of Defence Research & Development; DG, DRDO (1972 Alumnus)
· Mr Patanjali (Patu) Keswani, MD, The Lemon Tree Hotel (1981 Alum)
· Mr Shankar Narayanan, MD, Carlyle Group- Private Equity Investor perspective (1984 Alum); will focus how to strengthen the Institute and make it one of the world's best altars of technology.

The Alumni day will start at 10 am, with the inauguration session which will highlight on the topic "Taking IIT Delhi to the next level" in the presence of Prof. R. K. Shevgaonkar, Director, IIT Delhi; President, IIT Delhi and Dr Subodh Jindal, Chairperson, Alumni Day Organizing Committee.

To capture the interest and imagination of all participants, the day will be followed by an inspirational Discussion Sessions on the topics "IIT Delhi vision and Roadmap to achieve it", "Co-Creating innovation and Entrepreneurship Culture" and the concluding session with the felicitations.

Dr. Avinash Chander, the Scientific Advisor to Raksha Mantri, Gol; Secretary, Dept. of Defence Research and Development; DG, DRDO, who is a 1972 Alumnus of IIT Delhi would also enlighten his thoughts in the session, where he will highlight his vision on IIT Delhi's Roadmap to achieve the divergent success path. Defence Research India is a major reform of the present scenario when it comes to importing; sharing and discussing the same topic would create a strong impact to the alumni. Dr Chander joined DRDO in 1972 after completing graduation in Electrical Engineering from IIT. He is the chief architect of Agni series of ballistic missile systems; sharing his same experience with the alumni will fill in a pristine energy in them.

The sessions will focus on empowering industry partnerships on specific technology areas and how Alumni can collaborate with IIT Delhi to make meaningful innovations to create a feeling full impact on society. Innovation and Entrepreneurship being a key thrust area, IIT Delhi will focus on re-invigorating the innovation and entrepreneurship ecosystem.

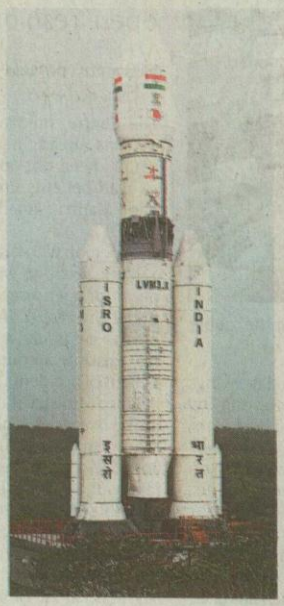
The Day will comprise of fun-filled activities, games, sports and events throughout the day. There will be an exhibition on top 25 trending startups by IIT Delhi students and Alumni who will demo and Exhibit their solution offering. A presentation of OCND and Entrepreneurship awards at the end of the session would take place. A Sumptuous Luncheon and a riveting Entertainment Programme shall be organized for alumni and their families to go with the intense sessions.

Alumni Day this year will add feather to its cap with the new initiative "Unnat Bharat Abhiyan" wherein the IIT Delhi will be adopting 10 villages and would work on its growth.

IIT Delhi Alumni Association's President, Mr Ashok Kumar says, "I am glad to announce the 'Alumni Day 2014'. We aim to ingrain the Entrepreneurial DNA in our students/ faculty and activate it with help of IIT Delhi Alumni. After last year's success we are sure that this mix of fun, fundas, food and friends will make it a day to cherish for alumni and their families. We are thrilled to invite the entire alumni community from across the globe and wish to make this event a grand success"

Business Line ND 18/12/2014 P-5

Today's GSLV launch, a critical test for the Indian space agency



ISRO has not enjoyed a great deal of success with its GSLV rockets

M RAMESH

Chennai, December 17

The Indian space agency's launch of its GSLV (geostationary launch vehicle) on Thursday will mark a critical turning point in its ambitious plans to launch heavier rockets with bigger payloads.

Steeping stone

In any rocket development, initial failures are inevitable. For instance, the Elon Musk-promoted SpaceX — the poster-boy of the space world today with its celebrated Falcon rockets and multi-billion NASA contracts — suffered three consecutive failures initially. Last year, Russia's Proton M rocket exploded destroying the three satellites it was carrying. Even NASA, the big dad of the space world, has had to contend with several catastrophic failures — the memory of Kalpana Chawla stands evidence.

Similarly, ISROhas launched eight GSLV rockets so far, some of which have failed; in the process it has used up six Russia-supplied cryogenic engines, leaving it with only one more.

However, while the technical success rate is not so bad, it is the time taken which is of concern. ISRO has taken 15 years to reverse-engineer the product, but is yet to establish its reliability convincingly.

The first GSLV went up on April 18, 2001, powered by a Russian-made cryogenic engine and was termed a success, even though the launch was aborted on the first attempt as one of the strap-on rockets failed to develop sufficient thrust; and the satellite's placement in orbit was imprecise. In the 13 years since April 2001, there have been just seven more launches and only two of them with Indian-made cryogenic engines. Two successive failures, in April and December 2010, appear to have discouraged ISRO. For three full years after that, there was no GSLV launch and it was only in January 2014 that ISRO launched the GSLV D3 with an Indian-made cryogenic engine.

The launch was only a partial success, because the GSAT-14 satellite it carried to the Geo-stationary Transfer Orbit — 35,700 km above India — was a play-safe 1,982 kg, not much heavier than 1,950-kg Edusat that was hurled up by another GSLV in 2004.

The GSLV is meant to carry payloads upwards of two tonnes, closer to 2.5 tonnes. The GSLV programme delay has cost the nation dear. The government sanctioned ₹3,550 crore for making 16 GSLV rockets, which works out to ₹222 crore apiece.

In contrast, the sanctioned launch cost of the 3.18 tonne GSAT-16 was ₹568 crore (the cost of the satellite was ₹297 crore). The launch costs of the 2.65-tonne GSAT-7 cost ₹479 crore, while the 2-tonne INSAT 3D took ₹477 crore. Clearly, not less than some ₹200 crore per launch could have been saved if the GSLV rockets had been ready earlier.

Out of kilter?

If eight launches in 14 years are disheartening, the immediate future does not appear very bright either.

The 12th Plan target for ISRO is 25 launches; but in the first 33 months of the Plan period, ISRO has completed only eight PSLV (polar satellite launch vehicle) and two GSLV flights.

It is hard to believe the target will be achieved, particularly because there is only one GSLV launch — the D6 — planned for 2015, a year when ISRO will be very busy with five PSLV launches.

ISRO rocket GSLV Mark-III successfully launched; PM Modi says yet another triumph of brilliance

By Biplob Ghosal | Last Updated: Thursday, December 18, 2014 - 11:33

http://zeenews.india.com/news/space/isro-rocket-gslv-mark-iii-successfully-launched-pm-modi-says-yet-another-triumph-of-brilliance_1516523.html

Zee Media Bureau/Biplob Ghosal

11:30 am: Congress leader PL Punia congratulates ISRO for GSLV) Mark-III's successful launch, says it's a proud moment for the nation.

10:00 am: Prime Minister Narendra Modi congratulates all the ISRO scientists for Geosynchronous Satellite Launch Vehicle (GSLV) Mark-III's successful launch. Here's what he said:

9:54 am: ISRO has successfully carried out human crew module experiment. The module has safely splashed down into Bay of Bengal off Andaman and Nicobar Islands, says Radhakrishnan.

9:53 am: The ISRO chief congratulates his team on the highly successful launch.

9:52 am: ISRO chief Dr K Radhjakrishnan confirms successful launch of GSLV III, terms it a very significant day for India.

Related Photo Gallery

GSLV Mark III successfully launched

Video of GSLV Mark-III launch:

9:47 am: Scientists rejoice as GSLV Mark-III successfully launched.

9:45 am: Main parachutes of the Crew Module Atmospheric Re-entry Experiment (CARE) module deployed successfully, says ISRO

9:40 am: CARE module in its tense atmospheric re-entry.

9:34 pm: The CREW module has been separated from the rocket.

9:30 am: ISRO's experimental mission to test heaviest GSLV Mk-III rocket and human crew module lifts off from Sriharikota.

9:00 am: ISRO all set to launch the next generation rocket.

12:05 am: ISRO reveals exclusive picture of GSLV-Mark III Wednesday night.

2:00 pm (Wednesday): UH25 propellant has been filled to the 2nd Stage - L110. N2O4 propellant filling of 2nd Stage is in progress.

9:00 am (Wednesday): The 24 and a half hour count down for the launch has commenced.

Though called a crew module, it will not carry any living being and is being sent up only to test its re-entry characteristics.

The 630 tonne rocket will be powered by liquid and solid fuel engines while the cryogenic stage/engine will be a passive one.

As per the plan, soon after the lift-off at Sriharikota, Indian Space Research Organisation (ISRO) would study the flight validation of the complex atmospheric flight regime of LVM 3 and would also test the ability of the CREW module to re-enter the Earth's atmosphere with thermal resistance, parachute deployment in cluster formation, aero braking system and apex cover separation procedures.

The CREW module would be separated from the rocket about 325.52 seconds after the lift-off at 126.16 km altitude. The specially made parachutes would help the module 'soft-crash' in the Bay of Bengal, some few hundred km from Indira Point in the Andaman and Nicobar Islands, which would later be fetched by Indian Coast Guard ships.

The module will splash down 600 km from Port Blair and 1,600 km from the space centre. The capsule will be recovered by an Indian Coast Guard or Indian Navy ship.

While the rocket cost ISRO Rs 140 crore, the crew module has taken another Rs 15 crore.

The crew module, looking like a giant-size cup cake - black in colour on top and brown at the bottom - weighs around four tonnes.

According to an ISRO official, it will be in the size of a small bedroom and can accommodate 2-3 people.

Realisation of 42.4 metre tall GSLV Mk-III would help ISRO place heavier satellites into orbit.

GSLV Mk-III is conceived and designed to make ISRO fully self-reliant in launching heavier communication satellites of INSAT-4 class, which weigh 4,500 to 5,000 kg. It would also enhance India's capability to be a competitive player in the multi-million dollar commercial launch market.

Indian Express ND 18/12/2014 P-13

Education reforms: HRD to call meet with states

EXPRESS NEWS SERVICE
NEW DELHI, DECEMBER 17

THE Human Resource Development Ministry plans to convene a meeting of state education ministers as well as secretaries in January in order to deliberate upon reforms in the higher education sector.

Responding to a question in the Lok Sabha, HRD Minister Smriti Irani said a meeting of state education ministers and secretaries has been convened on January 6 to discuss reforms in higher education.

"While UGC has endeavored to regulate higher education system in the country and promote quality and access, it was felt that the UGC could have done better, if it were strengthened and re-structured," Irani said.

The government has already set up committees to review the University Grants Commission (UGC) and the All India Council for Technical Education. The UGC has no mechanism to ensure a follow up on regulatory instructions and to enforce compliance with it.

"These limitations can only be overcome by a thorough review and amending the UGC Act, 1956, to meet the emerging challenges in the higher education sector," the minister said.

She said the government is considering a new scheme to train teachers and is also drawing up parameters for national ranking of universities.

Drones by IIT-Bombay grab attention at show

http://www.asianage.com/mumbai/drones-iit-bombay-grab-attention-show-091

The Unmanned Aerial Vehicle (UAV) or drone has always remained in the news for its use in natural calamities, in Aamir Khan's film 3 Idiots and by Fancesco Pizzeria in Mumbai to deliver pizzas. The UAV was again seen grabbing public attention in the 4th edition of the India Engineering Sourcing Show in Mumbai that began on Tuesday. Even Mumbai police use it to monitor big rallies.

Idea Forge's UAV, which is called NETRA, developed in collaboration with the Defence Research and Development Organization, (DRDO), has been used extensively by the armed forces, paramilitary forces and other security agencies. It had partnered with the National Disaster Response Force and played a crucial role in identifying survivors and assessing damage during the Uttarakhand floods last year. It was also deployed by the Gujarat government during the 2013 Bhuj floods. According to a press release, the drones have also been used by the National Security Guard, the Indo-Tibetan Border Police, etc.

NETRA is a completely autonomus UAV, which can be launched from a small clearing by the road side and made to fly over the area of interest upto 400 metres. Fitted with GPS and powerful sensors, it can fly on its own and return to the home base after completing the mission. It boasts of having the smallest auto-pilot in the world. During flight, the UAV sends continuous real time video of every movement on the ground. Its Vertical Take Off and Landing, (VTOL) mechanism makes it extremely user friendly.

Idea Forge was started by five IIT-Bombay graduates Ankit Mehta, Vipul Joshi, Ashish Bhat, Amardeep Singh and Rahul Singh way back in 2008. Though, the IIT technocrats are tight lipped about the price, market estimates put the cost of UAVs at Rs 25 lakh upwards.

Besides surveillance, the drones can be effectively used for aerial cinematography, replacing costly helicopter shooting, crowd management during festivals and fairs, the release said.

Even though the opportunity looks attractive, it may not easy doing business. The image resolution of the drone is still not as sharp as one would like them to be. Funding also continues to be a problem as most of the investors have no clue about the benefits of drones, other than publicity stunts pulled off by Amazon or Fancesco Pizzeria.

Students, alumni cheer as SPA Bill 2014 gets Parliament nod

http://www.hindustantimes.com/hteducation/chunk-ht-ui-hteducationsectionpage-otherstories/students-alumni-cheer-as-spa-bill-2014-gets-parliament-nod/article1-1297383.aspx

"I would like to expresses my gratitude towards the present government for passing the School of Planning and Architecture Bill 2014 which makes three SPAs institutes of excellence. This bill has given identity, endorsement and eminence to our studies and now we are able to apply for government jobs," says Triveni Prasad Nanda, former student, SPA, Bhopal.

Nanda, till now, had an uncertain future despite securing all-India rank 640 in the All-India Engineering Entrance Examination (AIEEE) in 2008 (replaced by JEE later) and all-India rank 5 in the Graduate Aptitude Test in Engineering (GATE) in 2013.

He graduated from the School of Planning and Architecture (SPA), Bhopal in 2013 but since the institute, established in 2008 by the Central government, didn't have degree-granting status, he was neither able to practice as an architect nor apply for a job.

"Once any student completes a five-year bachelor's of architecture course, he/she is supposed to get enrolled with the Council of Architecture (CoA) and get a registration number. Since SPA Bhopal and SPA Vijayawada didn't have degree-granting status, candidates admitted in 2008 and passing out in 2013, were unable to do anything because they could not get enrolled with CoA in the absence of any degree certificate," says Nanda.

Now since the bill has been passed by both houses of the Parliament, hundreds of students from these two schools now expect that there won't be any obstruction in the way of getting enrolled with CoA.

However, hundreds of students from other prominent architectural institutes continue to face problems as CoA is still refusing to enrol them, saying that the institutes from where the students had completed their courses were running without its approval.

Alleging that the study of architecture in these institutes was not at par with the CoA's minimum standards of education, a competency test had been conducted by the council. However, the Delhi High Court had imposed a stay on the announcement of the result of the test. Not only that, even the Central government and a recent Calcutta High Court judgment of held that the CoA had no power to conduct any competency test.

"There is a fight between AICTE and CoA on the question of getting approval. Students from AICTE-approved institutes are not being recognised by CoA," says an architecture student requesting anonymity. "I got admission to an institute which ran with AICTE's approval. I even appeared in CoA's competency test but now there is a stay on the announcement of its result. I hope MHRD takes note of this," says the student.

IIT Kharagpur Global Entrepreneurship Summit from Jan. 16

http://www.thehindu.com/news/cities/Vijayawada/iit-kharagpur-global-entrepreneurship-summit-from-jan-16/article6701359.ece

A Global Entrepreneurship Summit (GES) is being organised by Entrepreneurship Cell IIT Kharagpur and Flipkart during January 16-18, 2015.

The summit is tipped to be one of the biggest entrepreneurial platforms for academicians, new-age entrepreneurs, eminent business personalities, venture capitalists and the students to share their entrepreneurial endeavours and experiences and to pledge to take entrepreneurship in India to greater scales. The 2015 edition of GES would have lectures by eminent personalities, workshops focused on building entrepreneurial acumen of participants.

The conference will be followed by Connect the Dots, a discussion among the Entrepreneurship Cells in India about the Indian scenario and how best to go about promoting entrepreneurship in their respective campuses. Another event start-up camp, which will involve entrepreneurs and students, helps start-ups to recruit the finest talent among GES participants for internships/jobs while giving them an opportunity to meet the biggest VC and Angel Investors in India present on campus.

Colleges are requested to send delegations after requesting an invite from the entrepreneurship website. Participants should register at www.ges.ecell-iitkgp.org for the event. The accommodation of students attending for the three days of GES will be taken care of by IIT Kharagpur for which they will be charged nominally.

Business Line ND 18/12/2014 P-11

State ministers to meet on Jan 6 to discuss higher education reforms

OUR BUREAU

New Delhi, December 17

The Human Resource Development Ministry has called for a meeting of State education ministers on January 6 to discuss reforms in higher education, HRD Minister Smriti Irani informed the Lok Sabha on Wednesday.

She was replying to a question on the rising number of vacancies in universities across the country.

When members across parties flagged similar problems in their respective States, seeking further debate on the issue, Irani said the Centre will consult States as part of a continuous process to appoint teachers.

Teachers training

She further said the Centre is also considering a new scheme to train teachers.

Parameters are also being drawn up for national ranking of universities, the Minister added.

In reply to another question on whether the Centre is planning to revamp the University Grants Commission (UGC), Irani said the Centre has already set up committees to review the UGC and the All India Council for Technical Education.

"While the UGC has endeavoured to regulate higher education system in the country and promote quality and access, it was felt that it could have done better if it were strengthened and restructured," she added.

Hindustan Times ND 18/12/2014 P-10

In last 6 yrs, 14% Indians pursuing PhD abroad returned

Vanita Srivastava
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NEW DELHI: Only 14% of the Indians who went to the United States in the last six years to pursue their doctorates in engineering, science decided to return to India, recently released statistics indicate.

The survey, conducted by the US National Science Foundation, revealed that of the 15,401 Indians who were awarded doctorate degrees between 2007 and 2013, a staggering 86% stayed back to pursue work in the US. Likewise, 85% of the Chinese doctorate awardees preferred staying back.

India ranked third in both 2012 and 2013 with respect to the proportion of doctorate recipients with temporary visas intending to stay back. Iran and Nepal ranked higher than India.

The survey looked at India's brain drain in research, which was thought to have reduced following India's economic growth. While the number of doctorates awarded to Indians has increased from 809 in 2003 to 2,205 in 2013, the percentage of Indians staying back in the US has declined from nearly 90% to 84%, signaling a positive trend.

Over the last seven years, initiatives such as the Ramanujan and Ramalingaswamy fellowships and the £160 million India Alliance between the UK's Wellcome Trust and India's department of biotechnology have prompted over 500 scientists doing research overseas to come back to India.

Former director general of Council of Scientific & Industrial Research, R Mashelkar said: "Young Indians are not just looking at the physical income. They are also looking at psychic income which needs an intellectually stimulating environment."

> YOUNG INDIANS ARE NOT ONLY LOOKING FOR PHYSICAL INCOME... THEY ALSO NEED AN INTELLECTUALLY STIMULATING ENVIRONMENT.
> R MASHELKAR, former DG, CSIR

Business Line ND 18/12/2014 P-2

India's top B-school needs a hefty dose of funds

IIM-A taps alumni and corporates to invest in infrastructure, restoration

VINAY KAMATH
Chennai, December 17

India's premier B-school, IIM-A, is raising funds needed for a revamp of its infrastructure, for student life, and for faculty and research. Apart from capital grants from the Centre, IIM-A is looking to raise money from its well-connected alumni as also by inviting the corporate sector to invest in its campus by offering them naming rights for its buildings.

Ashish Nanda, Director, IIM-A, in a recent interview, said the B-school's classrooms have to be upgraded to modern-day smart class-rooms. Sports and recreation facilities need a makeover; there are plans to put in a swimming pool as well. Scholarships may be offered to students who graduate and opt for careers in non-traditional areas.

"We are encouraging our alumni to offer funds to cover loans the students may have taken for their management education," Nanda added.

Faculty chairs

The second prong of its fund-raising drive is to promote research through the creation of faculty chairs. "We have already raised funds for about 10 faculty chairs. These are funded by institutions such as ICICI, Nabard, the RBI and JSW. The ICICI Chair is in the area of strategy, the RBI Chair in finance and the Nabard Chair in agri-business, while JSW has sponsored a chair on inclusive innovation.


IIM-A Director Ashish Nanda

In addition some alumni, such as Chandrika Tandon, have offered funds for a fellowship in entrepreneurship and strategy. The funding will go towards raising faculty compensation and providing research funding. Bank of Baroda is supporting case research in finance and the financial sector," said Nanda. Top on the IIM's agenda is the restoration of its over 50-year-old red-brick buildings, designed by American architect Louis Kahn.

"We are hoping to take the help of public corporations that will support us with funding. We have initiated conservation and restoration to maintain the original beauty of the buildings. But the process is expensive. The Ministry of Corporate Affairs has said that if any organisation puts money in this, it can be treated as a CSR activity. We would give them the equivalent of 'naming rights for doing this," explains Nanda. The restoration alone is expected to cost ₹50-75 crore.

"People have come forward on their own to offer support. We will likely announce a fund-raising drive some time next year," he added.

Doctoral programme

Nanda plans to scale up the doctoral programmes as well. "Our doctoral programme is vibrant but clearly under-sized. It requires two things: one, a great deal of faculty attention and, two, funding support. We have approached the government and offered to scale up the programme. If the government can provide funding for students, we are willing to double our doctoral programme overnight," he said.

Times of India ND 18/12/2014 P-7

₹9,300 CRORE CHANGES HANDS IN MEDICAL RACKET EVERY YEAR

Annual MedEd seat sale worth the black money outflow in just 2010

Rema.Nagarajan
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New Delhi: The White Paper on Black Money in India, published in May 2012, estimated that deposits by Indians in all Swiss banks at the end of 2010 amounted to Rs 9,300 crore or about $1.5 billion. That much money, if not more, is changing hands in the black market of medical education in India every year.

Back-of-the-envelope calculations show that the 'sale' of MBBS and post graduate seats in medical colleges rakes in about Rs 10,000 crore or more in a year. And that's a conservative estimate. Here's the calculation.

There are a total of about 8,100 MBBS seats in the management quota in private colleges (approximately 30% of the 27,000 seats in such colleges). The price of each seat varies from about Rs 55 lakh in Kerala and some not-so-well-established colleges in Tamil Nadu and UP to over Rs 75 lakh in colleges in Maharashtra, Andhra and Gujarat. At a conservative average of Rs 60 lakh per seat, the money generated is Rs 4,860 crore.

Here's why this could be an underestimation. Scams exposed almost every year show that although the management and NRI quota is said to be 30%, in reality the number of seats sold is much higher. In many states, the permitted management quota is higher — in Madhya Pradesh, for instance, private medical colleges are allowed to keep 15% of seats for NRI quota and 44% for management, bringing the total saleable seats to nearly 60%.

In the Vyapam scandal in MP, 220 of 378 seats in the state quota or about 60% of the state seats were sold to ineligible students last year. "The state quota seats are filled by scorers hired by admission rackets. The scorers are later paid to vacate the seats, which are filled after the first counselling session for premium rates," explained Dr Anand Rai, the whistleblower in this scam, which exposed the involvement of senior politicians and bureaucrats in the medical admission racket. Similar rackets have been exposed in Karnataka and other states too, where the bulk of seats in private medical colleges were sold.

The sale of PG seats is at an even higher rate. Seats in coveted fields like radiology are said to touch Rs 3 crore, while seats in gynaecology and dermatology could be available for Rs 1.5-2 crore. In most places, seats are sold even before the results for the All India Common Entrance Test were declared. In some states with no regulation, almost all PG seats in the private sector are sold.

Similar calculations for MD and MS seats as for MBBS seats show that these would fetch another nearly Rs 2,500 crore. Thus, the 'market' for medical seats as a whole is in excess of Rs 7,300 crore even by the most conservative estimate.

There are other factors to take into account — for instance, in minority institutions almost 80% seats are management quota; in some states this quota is 40%; in most states there is little or no regulation of PG seats, so almost the entire lot gets sold off; in many states, the so-called state quota is diverted through various kinds of fraud and sold off. Factor all of this in, and the size of the market is actually probably over Rs 10,000 crore or $1.5 billion-plus, all of it in black money.

₹90 LAKH FOR MD SLOT

27,020 MBBS seats in pvt medical colleges

8,100 Management quota seats (approx 30%)

₹ 60 lakh Avg cost of management quota seat

₹ 4,860 crore total value of saleable MBBS seats

5,172 MD seats in private colleges | **1,550** mgmt quota (approx 30%)

- Approx **4,000 high-value MD seats** in clinical subjects
- **1,200 such seats in mgmt quota.** Avg value of these seats **₹90 lakh**

Value of high-value MD seats **₹ 1,080 cr** | Value of regular MD seats **₹ 87.5 cr**

₹ 1,168cr Total value of MD seats

Total value of MS seats — 744 seats x 1 crore plus = aprrox **₹ 750cr**

DM/MCh seats (super spl) — 360 seats x 1.5 crore = **₹ 540cr**

Total value of medical seat sales — 4,860+ 1,168+ 750+ 540 = **₹7,318cr at least**

In most places, seats are sold even before the results of the All India Common Entrance Test are declared. In some states with no regulation, almost all PG seats in the private sector are sold

Hindu ND 18/12/2014 P-17

Taj: the pollutants causing discolouration identified

Particulate carbon and fine dust particles cause browning of the marble

R. PRASAD

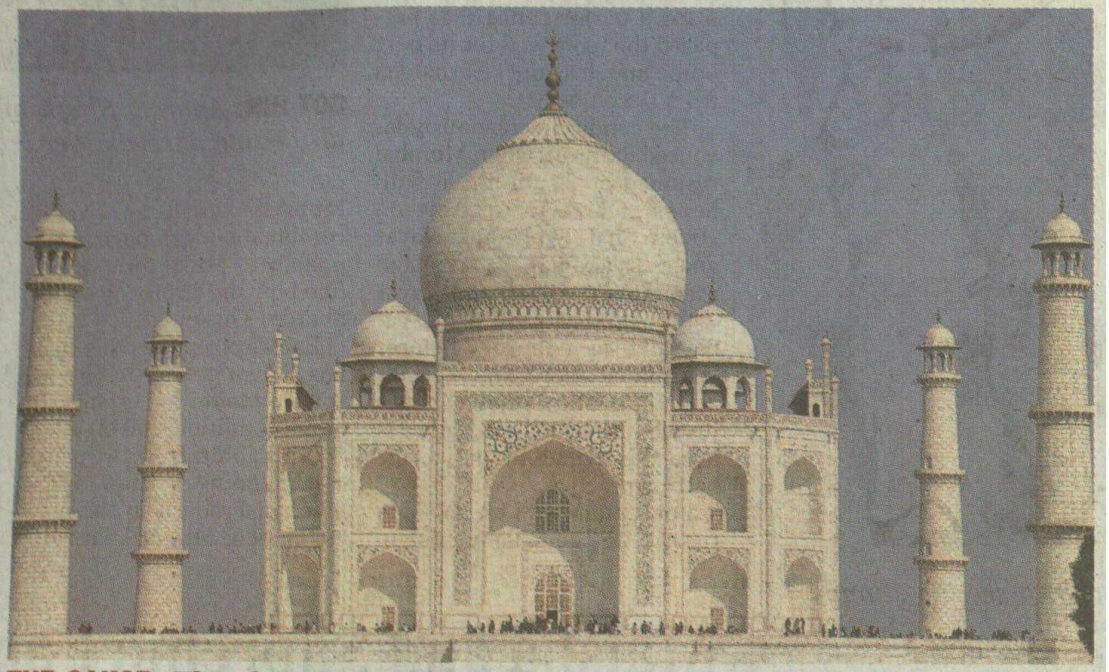
Finally, the specific pollutants in the air that are responsible for the discolouration of the white marble of Taj Mahal have been identified. Particulate carbon and fine dust particles that are deposited on the marble are responsible for its browning.

Carbon is of two types – black carbon and light absorbing organic carbon or brown carbon. The results from a study were published a few days ago in the journal *Environmental Science & Technology*.

Besides studying air samples collected from the area, the authors used marble samples on the building to collect the pollutants. They also undertook computer modelling to study the colour change brought about by reflectance of the particles.

Both organic carbon and dust particles have the ability to preferentially absorb light in the blue region of the spectrum. The absorption of blue light by these pollutants in turn gives the marble surface a brown hue.

"There is one group of organic carbon which absorbs light in the blue region of the spectrum and this is called brown carbon. Discolouration is because of what is happening to reflectance, and reflectance is in turn influenced by these particles," said Prof. S.N. Tripathi from the Department of Civil Engineering and Centre for Environmental Science and Engineering, Indian Institute of Technology (IIT), Kanpur. He is one of the authors of the paper.



THE CAUSE: *The absorption of blue light by the pollutants gives the marble a brown hue.* – PHOTO: R.V. MOORTHY

Role of dust particles

The ability of fine dust particles to produce the brown hue is a well known in North India. According to him, it is the presence of haematite in the dust that is responsible for the brown hue.

"If haematite is not present in the dust then the dust would be only scattering in nature," he said. Haematite is the ingredient that absorbs the blue wavelength of the spectrum.

Though the absorption of blue light by individual dust particles may be smaller than that by brown carbon, the copious amount of dust of two micron size found in the particulate matter makes the overall absorption much higher than that by brown carbon.

The study revealed that particles larger than two micron in size accounted for nearly 70 per cent of the deposited particle surface area. These relatively coarse particles are by default the dust particles.

Pure dust particles per se do not have the ability to stick to surfaces. "But what we see is a potpourri of particles. The organic carbon is very sticky," Prof. Tripathy said. Unlike the dust particles, carbon particles are in the 100 nanometre to 1 micron size. Burning of biomass like wood and dung, burning of trash and crop residue are the primary sources of brown and black carbon.

On studying the marble samples, the researchers found that black carbon produces a greyish discolouration, while brown carbon and dust produce yellowish-brown hues.

A combination of these two result in darker shades of yellow-brown. The sample targets were in place only for a brief period of two months.

"We found the colour of surrogate marbles matched well with model results. Modelling showed the combined effect of dust and carbon in discolouration of the marble samples," he said.