



NERD

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MANJUL BHARGAVA THE INDIAN MATH WIZARD



Manjul Bhargava, Photo by David Kelly Crow for the Office of Communications

Just when one of the proudest days of the year – Independence Day was nearing, we, as Indians got another great reason to inflate our chest in pride, as an Indian-origin mathematician won the Fields Medal, the most prestigious recognition given to a mathematician, often dubbed as “Mathematician’s Nobel Prize”. The man of honour – Manjul Bhargava.

The Fields Medal of 2014 was awarded to Bhargava “for developing powerful new methods in the geometry of numbers, which he applied to count rings of small rank and to bound the average rank of elliptic curves.”

A graduate from Harvard University and with a doctorate from Princeton University, he is currently working as Professor of Mathematics at Princeton University. Bhargava has many more laurels under his belt including Fermat Prize, Infosys Prize, Cole Prize, SASTRA Ramanujan Prize and many more.

A man of many talents, Bhargava is not only a genius mathematician, but also an accomplished tabla player, tutored under Zakir Hussain. He also studied Sanskrit from his grandfather, who himself was a well-known Scholar.

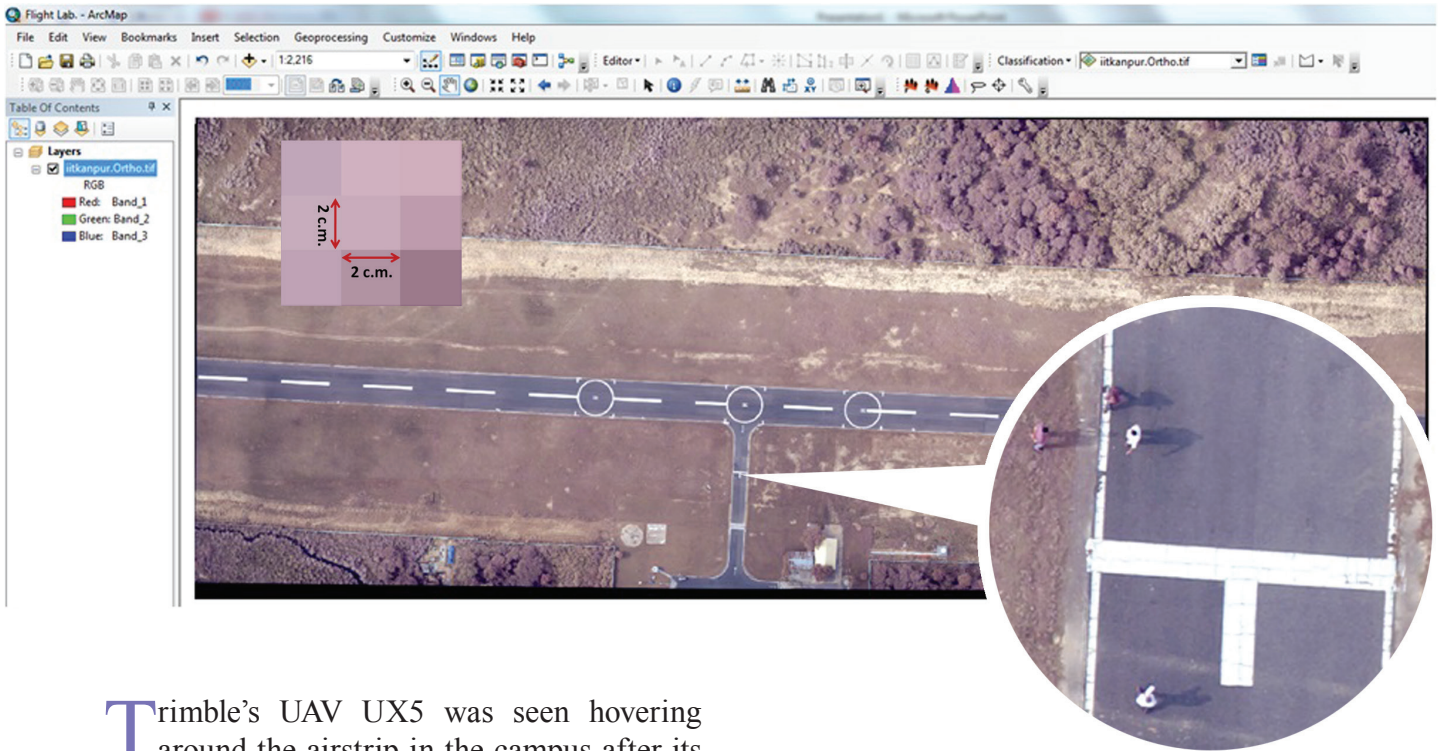
He has made numerous contributions to the field of mathematics, but he’s best known for Gauss Composition Laws, 15 and 290 theorems and Novel generalization of Factorial Function.

For more information, visit:
www.princeton.edu/research/news

*By Arpit Goyal
Chemical Engineering
IITK*

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Trimble's UAV UX5 appears in Earth Science Department's inventory



Trimble's UAV UX5 was seen hovering around the airstrip in the campus after its procurement by the Department of Earth Sciences of the Indian Institute of Technology Kanpur. Trimble's UAVs have already been applied to a variety of applications including distance ranging in volumetric calculations in forest monitoring and in archaeology.

Tailored to cater to the needs of Engineering, Cartography and Surveying professionals, the UAV is packed with a highly proficient 16.1 MP mirrorless APSC optical sensor that is customized by Sony Corp. The optical sensor has an additional NIR filter apart from the conventional RGB with an at ground resolution of 2.4-24 cm. The UAV is capable of flying at 75-750m with a maximum flight duration of 50 min.

The remarkable trait of UX5 is its all-weather capability. "The Department plans to use this for several ongoing projects related to terrain mapping, river monitoring using remote sensors, flood inundation mapping and various other applications", said Prof. Rajiv Sinha, Head of Earth Sciences at IIT Kanpur.

The set up comes with the Trimble Access Aerial Imaging application that provides advanced features for flight mission planning. The software provides entirely automated means for extremely accurate Digital Elevation Model-DEM generation using conventional photogrammetry with manual intervention for tie point selection. The Earth Science Department at IIT Kanpur carried out a trial run with this setup in the campus on 12th August 2014. With several other institutes and laboratories considering the acquirement of the UX5, the availability of airborne optical data and terrain maps would increase significantly.



For more information, visit:
www.trimble.com

By *Divyesh Varade*
Civil Engineering
IITK

NASA's 'Curiosity' rover picks up signs of life on the Red Planet



NASA has released collective evidence for potential existence of alien life on the Martian planet. NASA's 'Curiosity' rover collected multiple images on red planet which were analyzed by scientists. The 'Curiosity' rover has been on Mars since August 2012.

NASA's 'Curiosity' rover has acquired a pair of images 12 days apart. In the image acquired later, a rock-like structure was observed. For the fans of sci-fi and alien mysteries the image taken by the 'Curiosity' rover's MastCam delineates a possibility of identification of alien life. Although there is quite an uncertainty to explicitly depict and associate the structures to a specific kind of organism, certain theories have surfaced. In this regard the most popular is the structure corresponding to the thigh bone of an animal.

For more information, visit:
www.nasa.gov/mission_pages/msl/index.html

By **Kumar Manas Nethil**
Mathematics
IITK

IITK Student Research Convention 2014

Half 4 IIT Kanpur organized a two day student research convention on the 9th and 10th of August for the students of IIT Kanpur to encourage and discuss their research. It saw wonderful presentations and posters from students across departments, batches and programs. A healthy mingling of enthusiastic undergraduate and postgraduate enthusiastic researchers, as well as entrepreneurs, interspersed with inspiring talks. Prof. Ashutosh Sharma, Prof. Sanjay Mittal and Prof. BV Phani kept the enthusiasm of the students high! Prizes were distributed for best presentation, posters, idea, implementation and review. All present, wished for this one-of-a-kind event to continue over the years!

By **Sharbatanu**
Computer Science
IITK

India's Mars Orbiter on Course

India's Mars orbiter, India's first interplanetary mission, is running per schedule and is on course to enter Mars's orbit by September 24 as announced by ISRO on 12th August 2014. Mars Orbiter Mission, a Rs 450 crore project, was launched from Sriharikota in Andhra Pradesh on November 5 last year with on board Polar Satellite Launch Vehicle (PSLV) to aim to reach the Martian atmosphere by September 24. India is also considering development of another satellite Launchpad at Sriharikota to lift the launching frequency of Indian satellites. This issue was brought to consideration in the Lok Sabha.

India's MOM has completed more than 80 percent of its scheduled travel and has covered more than 540 million km. The mission payloads are described to be in good health and raring to go by September 24th. The antenna assembly of the Mars Orbiter Mission (MOM) is announced ready and to proceed in action with less than 20% of its travel to the red planet left to be covered. In June 2014, ISRO carried out the second Trajectory Correction Maneuver by firing the spacecraft's 22 Newton thrusters for 16 seconds. In the second week of August, scientists from ISRO have denied the possibility of another Trajectory Correction Maneuver, as the MO is on track for Mars's orbit insertion (MOI).

For more information, visit: www.isro.org/mars/home.aspx

By **Rajat Dhingra**
Mechanical Engineering
IITK

Floods in U.P., Govt. support inadequate



Houses submerged in the flooded water of river Ganga at Bakhshi Bandh. A scene on Aug. 1, 2013. Photo: Brijesh Jaiswal. – The Hindu

The slow onset of monsoon this year had led to the fears of drought, but now the situation has drastically altered. In U.P. floods alone have resulted in a loss of more than 89 people by statistics from ToI. Also it has come to light that nearly 1500 villages have been affected.

“Around 1.5 lakh people in 150 villages are affected in the district where relief and rescue work is being carried out” per Times of India. A special team has been constituted to assess the corresponding loss of lives and property. In some flood influenced districts several diseases have spread. While the government has assigned two helicopters in a district, the number is still short of the requirement being posed in such a case.

Flood mapping and rescue routing are crucial during such events. Most rescue routes are updated in navigation maps provided to the rescue teams using risk assessment based on flood maps. Numerous research institutes are brainstorming ideas to counter and study the monsoon floods. But, even though 12 National Disaster Response Force – NDRF teams have been deployed for search and rescue, they have their hands full and the research in the country is to no avail.

For more information, visit: www.nrsc.gov.in

By *Shivika Saxena*
Civil Engineering
IITK

Dr. K. VijayRaghavan enthalls!

Dr. K. VijayRaghavan, a distinguished Alumnus of IIT Kanpur, was invited over by Entrepreneurship Cell, IIT Kanpur for addressing the enthusiastic people of IITK on 22nd August, 2014. The Outreach Auditorium was all abuzz with excitement as the current Secretary to the Department of Biotechnology, GoI, a Padma Shree Awardee and the former Director of National Centre for Biological Sciences spoke on the inseparability of good science and entrepreneurship. Dwelling a bit on the history of such ventures, starting with Jagadish Chandra Bose, he went on to mention how ‘pure’ scientists started developing ‘applied’ bombs during the war. He further mentioned the role of academicians and ‘good’ scientists to get a sluggish government working. Pointing to the huge entrepreneurial potential in the fields of sanitation as well as maternal and child care, Dr. VijayRaghavan left the audience thinking and wondering over the various facets and integration of science, technology and entrepreneurship.

By *Sharbatanu*
Computer Science
IITK

UPCOMING AT NERD

SEPTEMBER

- Ethics Talk
- Science Research Ethics Competition

OCTOBER

- NERD Magazine Vol.7 Issue 2

NOVEMBER

- Science Communication and Public Engagement Talk (Scope Talk)

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