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IISER PUNE

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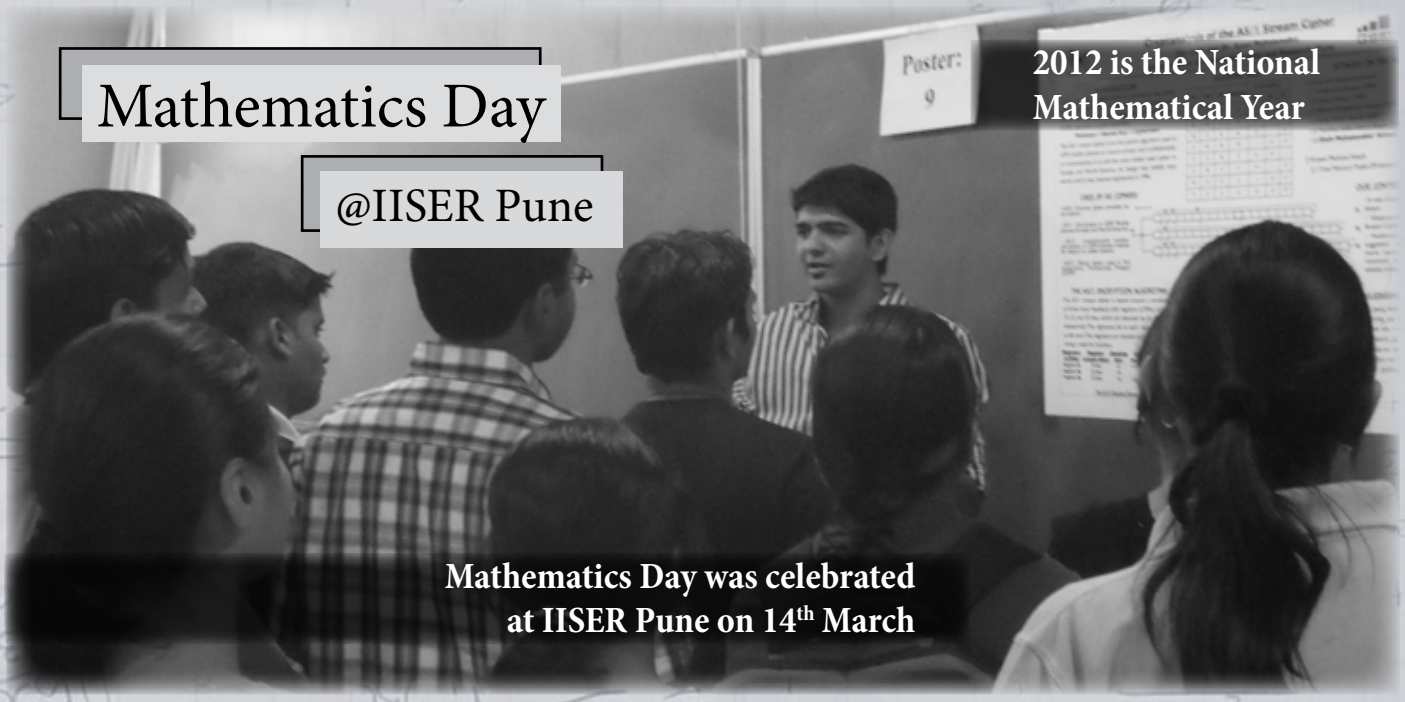
Mathematics Day @IISER Pune



2012 is the National Mathematical Year

Mathematics Day was celebrated at IISER Pune on 14th March

INSIDE THIS ISSUE

The year 2012 has been declared National Mathematical Year by Prime Minister Dr. Manmohan Singh. Accordingly, IISER Pune celebrated its first Mathematics Day on the 14th of March to celebrate the joy of numbers. The day was planned with multiple interactive and unconventional events spread throughout the day, and it was received well by the crowd.

The day began with the release of the Mathematics faculty profile booklet with their pictures along with a self-written abstract of their research interest. After going through these booklets over a scrumptious snack of chocolate cake and other assorted savouries, the throng made its way up to the lecture hall to get ready for Prof. Sridharan's colloquium.

Prof. Sridharan's colloquium was about the History of Mathematics. He took the audience through many eras and left an impression with his extensive knowledge of History, Mathematics apart. He first concentrated on the Greek era and spoke of a lot of Geometry. He demonstrated a rather beautiful method of construction of a two dimensional structure by moving it into the third dimension. Next, he spoke about Indian combinatorics. He explained how some Sanskrit and music scholars had a very mathematical, rather combinatorial, approach to their field. As a result, they arrived at Fibonacci numbers and other combinatorial formulae. The content of his talk on Indian combinatorics was truly fascinating and many people in the audience pondered on what he said well after the colloquium ended.

The colloquium, after a short lunch break, was followed by the poster competition. Students and researchers from IISER Pune and Pune University presented their posters with much fervour and the topics they chose were very interesting.

The movie, 'The Enigma of Srinivasa Ramanujan' was screened next. Mr. Nandan Kudhyadi spoke a few words about this movie he produced and directed. It was a nice feature film – short and informative.

Following the movie, Prof. Raghuram gave his talk on 'Glimpses into the

Continued on Page 3

Colour, Colour Everywhere

SHRUTI PARANJAPE

On the night before Holi, a bonfire was lit in front of HR4. It burned quite high and people were in good spirits all around. They sang and danced around the bonfire. And sounds of happiness floated up into the air for all to hear. (Yes, I mean they were VERY loud!)

The morning of Holi, as predicted, brought a LOT of colour, water and mud onto the grounds of IISER Pune. It was a fun day for those outside and a boring one for the namby-pambies who decided to stay indoors.

It began slowly and quite benignly. We put small *teekas* of colour on everyone. We gave people *jaadu ki jhappi*. We wished them a happy Holi. And then the fun began!

The "fountain" (also called "The Potential Well" by our nerdy friends) was filled with water. Every clean person who stepped out of the doors was dunked in a bucket of water and was smeared with a combination of random colours which almost always resulted in an unrecognisable face.

The most respectable gents and ladies turned into *'holi'gans* that day - as mugs, buckets, *pichkaris*, and such-like were used in plenty and colour seemed to be in infinite supply and demand.

The boys went mad. They tore each other's shirts off and ran about wildly. Of course, their shirts of cloth were almost instantaneously replaced by shirts of colour, much to the girls' relief.

One idiot brought colour with glass which started hurting underfoot. Another decided to push people into the fountain from behind. And yet another decided to dunk buckets of water onto people drying in the sun.

It was a day of love of a strange kind - a love which doesn't mind dunking, pushing, or smearing the receiver. Not to mention the shirt ripping.

On the whole, it was a perfectly amiable affair. It was, as I'd like to put it, "Mostly Harmless". ■

Prof. K. N. Ganesh continues as IISER Pune Director

Six years after he first stepped into IISER-Director shoes, Prof. K. N. Ganesh's directorial tenure has been renewed. We now have him as our Premier for another five years. This is welcome news to many an ear, considering the fact that IISER Pune has witnessed monumental development under his reign. In the duration of about a year, many major structures have sprung out of the earth. The entire campus is proposed to be ready… well, shortly. Let us hope the next five years see equal, if not more, growth and development in many more directions.

EMBO Director Visits IISER Pune

Maria Leptin

At IISER Pune you get used to seeing a lot of eminent scientists visit you and give talks. It starts to feel normal having famous people around all the time and yet, it creates a ripple when a person of the calibre of Maria Leptin, Director of European Molecular Biology Organization (EMBO), visits you. Her visit here from 19th to 20th Feb, was to strengthen our inter-institute scientific ties. She also gave a talk during her stay here.

Prof. Leptin started off her career as a group leader at Max-Planck Institute before she became a Professor at the Institute of Genetics, University of Cologne. Prof. Leptin, an elected member of EMBO and European Academia, was chosen as the Director of EMBO in the year 2010. She is also on the advisory boards of many academic institutes. Her major work focuses on gastrulation in Drosophila, which she was introduced to during her post-doctoral work on the role of integrins in development. Prof. Leptin also set up a group at Heidelberg, which works on the cell shapes in the respiratory system of Drosophila. Many people who attended the talk were of the opinion that this was something exciting and a new area to explore.

In her talk, she unravelled the breakthroughs in the past two decades in the field of development in a very concise and remarkable way. That was something that was expected from a scientist like her, but when you find out that her information lifeline (read laptop) had crashed before the talk, you know it is quite a task.■

Academic Buzz

1.Chennai Mathematical Institute internships in Mathematics
Link:http://www.cmi.ac.in/admissions/internships.php

2.Summer Workshop in Science Education, IISER Pune
Duration: 25th June to 5th July
Link:https://sites.google.com/site/sciediiserp
Deadline: 25th March

3.Summer Internships for PG/Research students by Ministry of Statistics & Programme Implementation
Duration: 2 months
Link:http://mospi.nic.in/Mospi_New/upload/schm_internship_15feb12.pdf
Deadline: 31st March

4.Center for Quantum Information and Quantum Computing, IISc Bangalore, Summer School Programme 2012
Duration: 14th May-15th June
Link:http://cts.iisc.ernet.in/CQIQC/SummerSchool2012.html

Corrections

In 'It's Left Through a Hole in The Air' (Feb Issue), Dr. Dey talked about the "need to ***contemplate*** (not ***consider***) the state of higher education in India." Also, the MIMAMSA 2012 winners pocketed ₹20,000 and not ₹12,000.

Mathematics Day @IISER Pune

Continued from Page 1

Langlands Program'. He spoke about L-Functions and how they formed a web of conjectures between Analysis, Number Theory, and Geometry. He began with an introduction to the L-function (in so-called 12th standard Mathematics). He went on to show the audience a few examples illustrating how the L-functions arose from these different branches of Mathematics. He then knit them together.

As Mathematics Day approached its end, results were announced for the poster competition. Mugs were given to all the participants. Honourable mentions and ₹1000 were given to Ashwin T. A. N and Sandesh Bhat J. R., Guhan Venkat, Hardik Gajera, and Ankit Dwivedi from IISER Pune. The title of best presentation and a cash prize of ₹5000 were given to Jay Shah, 5th year, IISER Pune. After an exhausting and fun Mathematics-filled day, the crowd dispersed with a head full of ideas to explore.■

Interview With An Innovative Young Biotechnologist

Dr. Harinath Chakrapani - Assistant Professor in the Department of Chemistry at IISER Pune, star cricketer of the Faculty cricket team, and recent recipient of the Innovative Young Biotechnologist Award. The Sentience Team caught up with him at Mendeleev Block. Here are excerpts from the interview:

ST: As an organic chemist, were you surprised when you got the Innovative Young Biotechnologist Award?
HC: Well, not really. I was pleasantly surprised a little bit. But the problems we work on are oriented towards Biology. It is a three year research grant. The proposal involved trying to develop new drugs to target tumours which have hypoxia. We estimate 60% of tumours have significant regions of hypoxia, and traditional radiotherapy requires oxygen, because oxygen is one of the best radio-sensitizers. Chemotherapy doesn't work very well either due to poor blood supply. Because of hypoxia, there is a selection of cancer cells which are more resistant to these drugs, they become more difficult to treat, and then they metastasize. What we are trying to do is to develop agents that can simultaneously introduce a chemotherapeutic agent and a radio sensitizer into the hypoxic regions. The molecule nitric oxide (NO) is the second best radio sensitizer after oxygen, it is freely diffusible across cells as it is a gaseous entity, and is also highly toxic to the cell. That was what the proposal was about.
ST: What are your thoughts on IYBA?
HC: IYBA is a grant and a good opportunity, a nice feeling to have, but it is not really such a big deal.
ST: You are being humble.
HC: I'm not being humble. I liked it that they liked my idea although it is not a hard-core bio-tech kind of problem. They were appreciative of the idea. I'm glad that they selected me for this grant.
ST: How do you find the students and the research going on here at IISER?
HC: I think a very important factor that determines how successful a researcher is, is motivation and hard work. In many cases, motivation and hard work will compensate for your intellectual abilities. So I think any student, in principle, is capable of doing very well in research.
ST: Many of the undergraduate students have this perception, because a lot of hard work is involved in organic chemistry, that at the undergraduate level you can only do the laborious part. What's your opinion on this?
HC: Of course, the students have to work hard - there is no doubt about that. Organic chemistry involves a little bit of labour. Some students really love it – they love working in the lab, they love doing stuff. Some people don't. I think that's a personal choice. I don't think organic chemistry is any tougher or easier than other fields.
ST: So what about your hobbies?
HC: We play cricket as a part of IPL. We should be practising more often though (*laughs*). I also love to read a lot – non-academic stuff, non-fiction mainly. I was also part of the Loyola Times during my BSc.
ST: And music..?
HC: Music, yeah. I love music. In particular, I really like music by the South Indian composer – Ilaiyaraaja.
ST: What kind of food do you like?
HC: I was in the US for 10 years. We were 4-5 students living together, taking turns to cook. We got used to all kinds of cooking. Anything vegetarian is fine. Even this is a luxury, whatever you get in your hostel. I would any day go for hostel food than my own cooking or my roommates' cooking. (*laughs*)
ST: What do you think about the extracurricular activities in IISER?
HC: There are certain challenges in being in a new institute. Infrastructure and human resources are two of them. We have only so many faculty or students who can do stuff. I see the students involved in quite a range of extracurricular activities like music, sports, SPIC MACAY. I really like it that students are getting involved in teaching kids here – DISHA and the like. I am quite inspired and sincerely would like to support this.
ST: Did you want to become anything other than an organic chemist earlier in life?
HC: The earliest thing that I wanted to be was a railway driver. Then I wanted to become a pilot – something to drive, take control. Thankfully, I didn't end up doing that. I was interested in science; I can't say I was interested in research. All I knew was that I was not ready for the responsibility of a job. So the choices were BSc, MSc and PhD. So, PhD gets you five years, and BSc+MSc is five years. So ten years after school, you don't have to work (*laughs*). I was also interested in Chemistry. I really like Chemistry. My inclination was more towards organic chemistry. So I decided to give it a shot.
ST: So you didn't dream of becoming a cricketer?
HC: Cricketer? No, not really. I used to play a lot of cricket. I never thought that I would end up playing any cricket. It is very, very tough. I am a bit overweight. So I know my limitations. Like being a pilot, you can't really do it if you are on the heavier side. So, nature makes some choices for you (*laughs*). ■

Giving Them A New Direction

KRISHNA ANUJAN

Over the past two weeks, IISER seems to be brimming with posters and publicity campaigns of Disha's newest and most publicized event, 'Spread the Smile'. Sentience takes a peek into this novel initiative.

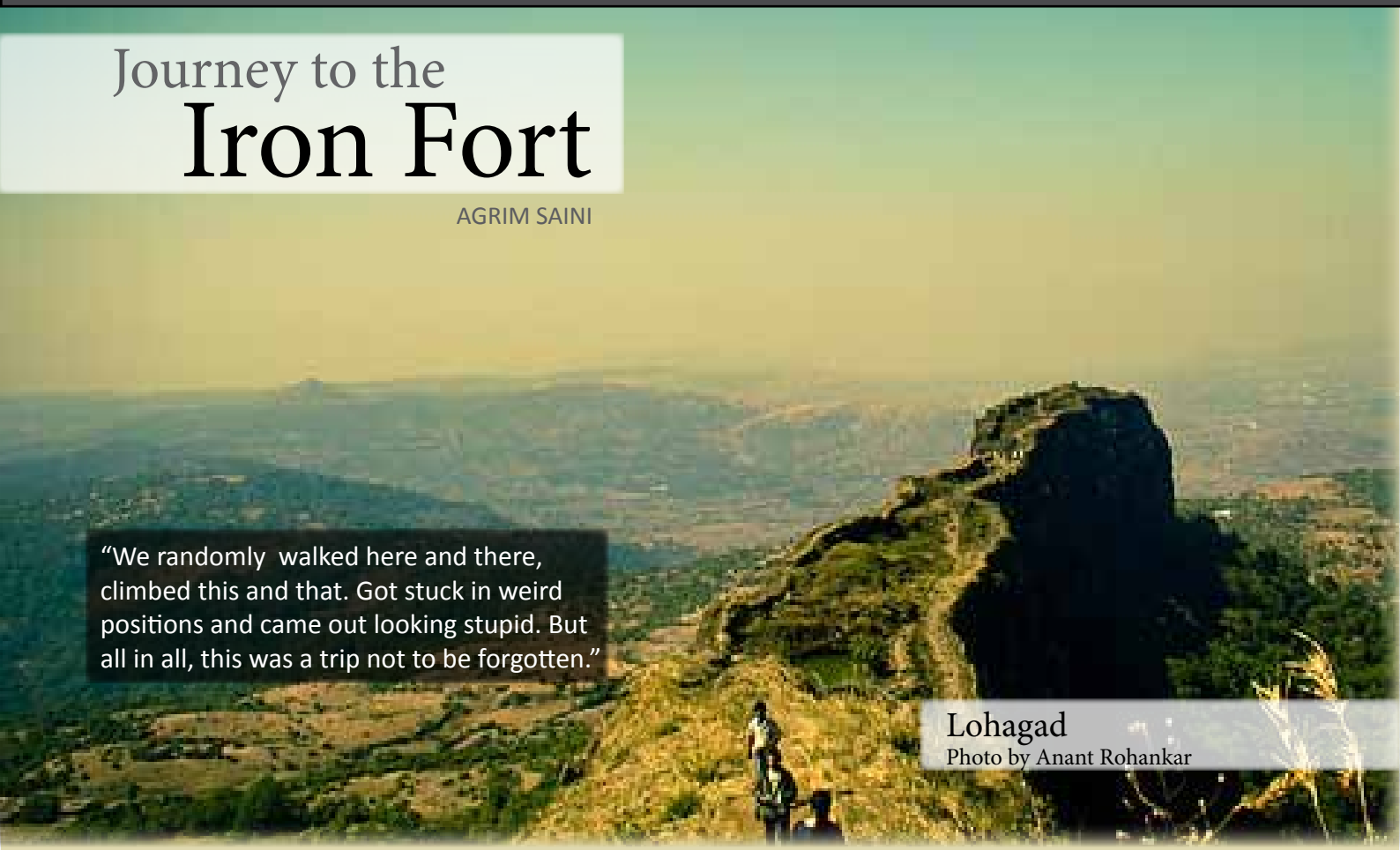
A general perception of social work or activity is that it requires selflessness and the ability to give without expecting anything in return. 'Spread the Smile' is an initiative to prove this wrong, to show that there can be a lot of fun and learning in organizing and conducting an event and to show that there is greater joy in giving than receiving. These ideals are implemented in simplistic ways over the period of a lazy weekend. Interestingly, many students volunteered forgoing their usual Saturday night parties (or alternatively study groups and coffee) to organize a fun weekend for school students in four villages. These volunteers, after a day of planning and preparation for the various sessions to be conducted in different places, left for the four villages, namely, Salumbre, Kusgaon, Asde, and Mangdhari-Kolwadi-Katawadi early in the morning of 10th March.

A target audience of students from 6th to 9th standard was shown experiments and fun science games in their schools. This interactive and power-packed session was followed by a discussion on various projects that the kids were about to embark upon for a period of three weeks. The most positive indication is that they came up with all the topics on their own and these were also quite relevant to their lives. They decided courses of action on data collection and presentation of these topics. The excited volunteers then played sports and games with them until sundown. After sunset, a casual and fun session of documentary screenings took place following which everyone retired in the peace and quiet of a village night. The volunteers woke up as the day dawned (on this unusual Sunday morning) and caught up with the village children on a field activity. The session, which was on basic cartography, where they had to make maps of their village, turned out to be quite a learning experience for everyone, even the volunteers. When they returned to IISER, each of them had memories and, more importantly, lessons to share with the rest of the group.

This programme continues for the following two weekends as well, namely, 24th-25th and 31st-1st and is open to anyone interested in joining this initiative to put a smile on every face. Disha keeps registration open during the week until Wednesday for all those interested for the same week. Register for this unique experience at *www.iiserpunedisha.wordpress.com.*■

Journey to the Iron Fort

AGRIM SAINI



"We randomly walked here and there, climbed this and that. Got stuck in weird positions and came out looking stupid. But all in all, this was a trip not to be forgotten."

Lohagad
Photo by Anant Rohankar

After getting helically wrapped around the axes in the mid-semester exams, an excellent plan was suggested - to go out for an adventurous trek to Lohagad. It was spur-of-the-moment, so we didn't expect many people to participate. But we were surprised to see that fifty-one people showed up in the morning, bright and fresh. We hired a bus, and this was the beginning of the fun. We all were fully charged for an *antakshari* challenge between boys and girls. A volley of multi-lingual songs was fired from both sides. The *antakshari* held interest for the first leg of the trip, but the flow ebbed when we stopped at *Ajay Ka Dhaba*. The rest of the trip was spent sleeping, sight-seeing, chatting, and clicking pictures. Since the trip was unplanned, we only knew the name Lohagad and we were quite ignorant about its location. With the blithe optimism of youth, we expected the driver to get us there, but he turned out to know even less than us. So at Lonavala, we asked around for directions from the locals and eventually managed to find our way to Lohagad. It seemed anticlimactic at first, with a small village, a couple of shacks selling snacks, and two tumbledown forts at a considerable height. For lunch we had the culinary staples - *misal pav, wada pav,* and home-made *poha* - which were surprisingly filling. Then the overly exuberant people of our batch started climbing the hill. For the more laid-back, there was the alternative route, humble stairs, which many people chose. We, however, followed the great Mallorys of our batch and started climbing after them. We all thought that our fiery enthusiasm would triumph over ease of locomotion. In the process, we got separated into many different small groups, with each group climbing at their own pace, and soon separated from each other. Stairs ignobly won the day as none of us managed to reach the fort. The people who used them enjoyed themselves at the comfort of the top, while the heroic people struggled through cactus bushes with no water, enjoying themselves equally (if not more). They were happy that they had blazed their own trail and were enjoying their adventures.

Finally, after all these incidents, it was time to return. Different groups were trickling down slowly, and the irate bus driver and the batchies were waiting for us at the base. After a long anxious period, all the fifty-one were again together for the return trip. We were much more subdued on the way back as all of us were very tired.

This first trip of the whole batch was a really big hit and every single person played a part in making it so. On that day we all decided that we would keep going out for such wonderful trips in future to maintain the unity and integrity of our batch.■

Your Cell, The Electro-Pop Artist

MEERA BESSY

Sonocytology is a recently developed technique within nanotechnology research which uses a scanning tunnelling microscope to record the vibrational movements of cell walls and amplifies those vibrations so that humans can hear them.

Yeast cells vibrate approximately at 1000 Hz, and most cells vibrate within the frequency range of human hearing, though with far less amplitude. So any vibration that has a frequency from 20-20,000 Hz can be heard by us as sound, if amplified sufficiently!

Prof. Gimzewski, with his graduate student Andrew Pelling, used an Atomic Force Microscope in 2004 to record the mechanical motion of yeast cells on nano scales. Instead of dragging the probe over the surface, like in the scanning tunnelling microscope, he held the AFM probe stationary on the surface of yeast cell so that oscillations of its rigid cell wall could be traced. He was surprised to discover that yeast cells vibrate with a fixed frequency. Using a computer program, he converted the vibrations recorded by the AFM into electronic sound.

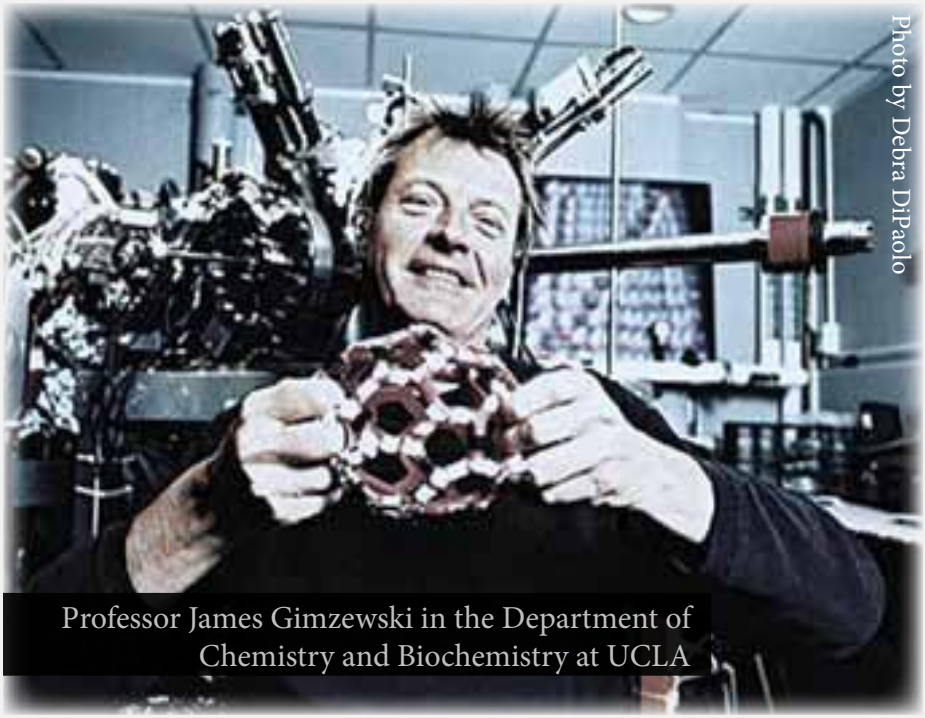


Photo by Debra DiPaolo

Professor James Gimzewski in the Department of Chemistry and Biochemistry at UCLA

Prof. Gimzewski originally used a program called Awave. When he ran Awave on the lab computer and turned on the speakers an ethereal noise filled the lab. Beginning the experiment with the noise produced by yeast, he recorded the vibrations they make at different temperatures and in different solutions. When he added sodium azide, a chemical that shuts down cellular metabolism to the yeast, the resultant noise sounded like radio static. He believes this sound is a faithful representation of the Brownian motion of molecules since sodium azide stops all ATP driven nano-mechanical activities. When he doused the yeast in alcohol, the pitch of vibrations increased. He describes it as screaming. He speculated the screaming is the sound of molecular pumps working overtime to expel the alcohol.

Prof. Gimzewski tells reporters that if yeast were the size of humans, the sounds would be close to the volume of ordinary conversation. He compares listening to the vibrations of yeast to standing outside a factory and hearing the humming beat of machines operating inside the factory walls, pointing out that during industrial revolutions, trained mechanics could diagnose what was wrong with a machine just by listening to it. Extending and concretizing this analogy between cells and machines, he is now attempting to apply sonocytology to clinical diagnostics, listening for differences between healthy and cancerous cells.

> "Prof. Gimzewski believes that sonocytology has potential diagnostic operations because cancerous cells metabolize ATP more quickly and therefore vibrate at a higher frequency."

Sonocytology is preferable to other techniques for rendering cellular interiors because it is non-invasive, using dyes, fluorescent markers, or quantum dots. He argues that the synchronised movement of motor proteins cannot be observed by traditional cytological methods.

Prof. Gimzewski believes that sonocytology has potential diagnostic operations because cancerous cells metabolize ATP more quickly and therefore vibrate at a higher frequency than non-cancerous cells. He hopes that eventually, clinicians will be able to detect cancer at an early stage listening to them. One huge obstacle to medical applications of sonocytology is the fact that mammalian cell membranes are much less rigid than yeast cell walls.■

Of Fours, Sixes, And Catches

AAMOD DESAI

Photo by Pravu Dhal

The extravaganza of the IISER Premier League (IPL) concluded with a photo-finish finale on Sports Day, celebrated this year on Sunday, 18th of March. The three month long tournament was no short on excitement, fervour and fair contest and leaves us with more than a couple of memories! The competition had five more teams in the fray than the previous edition and 48 games in total, yet we had the same two teams - Slayers '07 & The Rascals making it to the final!

The super-six stage witnessed the eviction of Shaurya '10 & IISER United from the competition. With the final berth at stake, the semis were tight games, as expected. The first semifinal had the Faculty facing off against Slayers '07. Despite a Man of the Match performance by Dr. Pavan Kumar, Slayers '07 emerged victorious on the batting of Sandeep Gupta. The second semi-final, the match between The Rascals and Alchemist, turned out to be a cracker of a contest. A tantalizing finish, where Upendra Singh took a composed catch off the last ball, ensured that the game was worth the hype and anticipation. Vasumitra Singh and Upendra Singh were jointly rewarded with the Man of the Match mementos in their victory by one run.

In comparison, the final lacked the excitement and turned out to be a one-sided affair with The Rascals comfortably winning the match by 7 wickets with 11 balls to spare. Nishant Singh's entertaining 33(18) ensured a smooth win for The Rascals. Ankur Paliwal had bowled superbly with figures reading 4-0-15-3, deservedly earning Man of the Match. He also bagged the Bowler of the Tournament award for his consistent bowling performance throughout the IPL. Dr. G. V. Pavan Kumar of Faculty bagged the Best Batsman award, while Upendra Singh and Anurag R. Mishra of The Rascals were adjudged Best All Rounder and Best Fielder respectively. Prof. K. N. Ganesh did the honours in the prize distribution ceremony for IPL and Kreeda Jung.

Kreeda Jung had enthusiastic participation across all organized disciplines. The Volleyball team led by Anilkumar Tolamatti emerged winners. Sangamesh Sarangamath, Golu Parte, Abinand Reddy, Shailendra Kushwaha, Raju Lunkad, Shanu Dengre, Yovhan Landge were other members of the side. Anurag R. Mishra, Siddharth Chopra, Upendra Singh, Ashok Choudhary, Sourabh Bhide, and Laltlanzuala Chawngthu formed the side that won the Street Soccer competition. In the Table-Tennis event, Kaustav Dey was the winner. Kreeda Jung also hosted virtual games this year. The Homicides comprising of Prashant Sharma, Montu Patar, Sharad Joshi, B. Prashanth Kumar, and Shirish Kulhari won the Counter Strike competition. The Age of Empires contest was won by the team of Jeeten Patel, Ravishankar, T. Bhargava, and Anirban Chowdhury.

The Sports Club has done a fine job with regards to organization and execution of the Kreeda Jung and the IPL. The participants too deserve a word of appreciation for maintaining the spirit of competition. The Sports Day marks the end of formal sports contests for the year, leaving most of us wanting for more!■

Fractals, Coastlines, And Suchlike

SHRUTI PARANJAPE

A fractal is a mathematical set that has a fractional dimension that exceeds its topological dimension and may not be an integer. Fractals show self-similarity. This means that they look the same no matter how much they are resolved.

An analogy is the parallel mirror phenomena. No matter how many images you go "into", you'll have the same image in front of you. Another common analogy used is the following. Imagine you're looking at a picture of yourself looking at this picture. Then the picture frame which you are looking at in the picture will have another one in it and this will go on infinitely.

Fractals like the Koch snowflake, the Mandelbrot fractal etc. are very symmetric. This is problematic when we try to model natural fractals like clouds and coastlines. How can one call these fractals?

If one starts measuring the length of a coastline with a yardstick then the ultimate length measured depends on the size of the yardstick. The shorter the yardstick, the longer the coastline is measured to be. Phrasing this differently, one can say that the number of steps decreases as the size of the yardstick increases.

On plotting these two on a log-log scale, the magnitude of the slope gives us the dimension. Looking at one of the simplest cases, for a straight line,

N = L / S

where

N is the number of steps

L is the total length

S is the size of steps

Thus, the formula gives us dimension = 1 which is consistent with our prior convention.

So now that we've seen that coastlines have fractional dimension, we know that they are fractals. Can these be approximated by fractals like the Koch snowflake? This question can easily be answered by answering a simple question. How many coastlines in an Atlas show symmetry? The answer is most definitely close to none.

2D fractal shape of a Mandelbrot set

Thus, to properly generate and study coastlines, we must generate fractals with a type of self-similarity called statistical similarity. This basically means that they are randomly generated fractals which show self-similarity when one takes an average of many resolutions.

There are various ways of creating such Plasma or Coastline fractals. The simplest method is called the midpoint displacement algorithm. We begin with a rectangle whose vertices are assigned various "heights". We divide this into four sub-rectangles.

Let the height values of the new rectangles be the mean values of the corners of the parent rectangle. But here's the catch! When computing the middle height, one should add a small error that depends on the size of the rectangle. (The standard is to let the error be proportional to the size of the rectangle and some constant. The constant controls the "roughness" of the fractal; a bigger constant results in more valleys and mountains.)

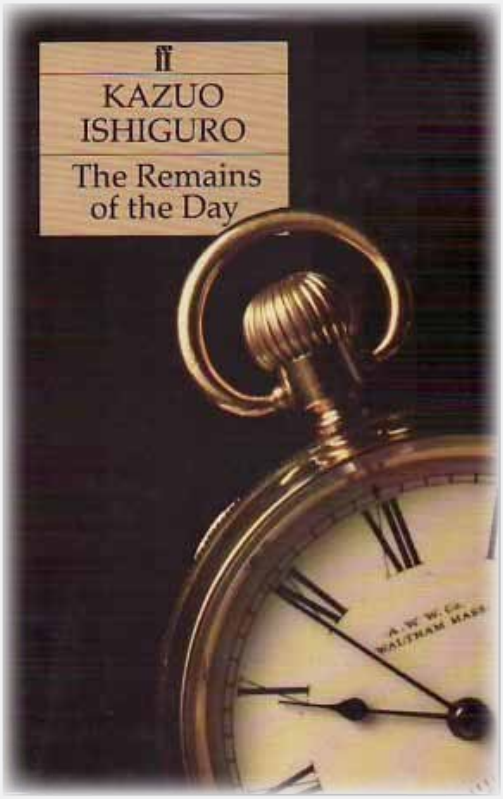
The computer keeps iterating and subdividing these rectangles until the difference is not noticeable. At this point it stops, the "heights" are converted into saturation values and the "random" fractal is displayed. When we try to magnify this fractal, the computer calculates more iterations until the change is unnoticeable again.

Since this can happen an infinite number of times, the fractal has infinite detail. Hence, artificial "coastlines" have been "made" and studied. This is done by methods like the midpoint displacement algorithm which render fractals having statistical self-similarity.

While I know that this article was neither very deep nor very informative, I hope it spiked your interest in this fascinating topic of Mathematics. ■

The Remains of the Day

AVANI GOWARDHAN



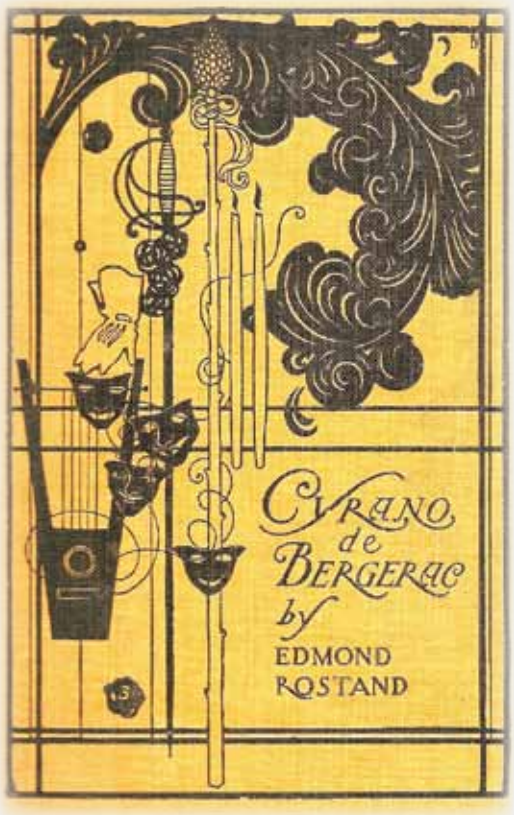
This book tells of a road trip by Stevens, the aging butler of Darlington Hall in the days of his fading glory in the post-War era. Though a simple journey, it is interspersed with his memories, back when Darlington house was frequented by 'great men' of the day - the Lords, the politicians - the policy-makers of the world.

Now past his prime, unsure of his place in the new world order, he reflects on his life. Examining numerous incidents in painstaking detail, he begins to put together Lord Darlington, the man he faithfully served for decades. Slowly but surely, a tarnished image of Lord Darlington comes forth - an honourable gentleman of the old school, easily mislead by wily politicians, who had no place in the new world. The emotions that Stevens strives to suppress, to become the epitome of professionalism on which he prides himself, shine through his rumination on the past. His repressed doubts about his employer, his love for the housekeeper, his pride and respect for his father whom he looks up to as an idol are all obvious through his memories. Ishiguro has done a fantastic job of depicting the quintessential English butler, one of the bastions of the great houses of England, trapped in the past because he has no place in the present.

"I can't even say I made my own mistakes," he laments. "Really -- one has to say -- what dignity is there in that?"■

Cyrano de Bergerac

KRISHNA ANUJAN



Mix well a scientist's imagination, an artist's creativity, a poet's lyricism, a musketeer's bravado and the most exorbitantly (and grotesquely) large nose, and voila! You have Cyrano de Bergerac, the eternal romantic and idealist. Edmond Rostand's French play on the pioneer of romantic science fiction is no less invigorating than a splash of cool water on a sweltering summer's day. The characters are vivid and larger than life, the satire stark and pricking, the dialogue flowery yet endearingly humorous, and the scenes and storyline absurdly creative and refreshing. This masterpiece is a slap on the face of all cynics and skeptics of love (I admit to have been one) as the witty idealist, Cyrano duels in verse and pines and pens for the woman he loves. However, his disfigured nose makes him, in his own eyes, unworthy of the fair maiden's affections. A personal favourite is the monologue where he demonstrates to a cheeky young man how to describe his nose adequately in at least twenty different tones; for example, Admiring: What a fine sign for a perfume shop! Or Rustic: That doesn't look like a nose. It is either a large cucumber or a small watermelon!

With his six ways of getting to the moon, he is no conventional Romeo but a remarkably intelligent thinker as well. Before you run off to the bookstore for your very own copy, be sure that you are ready to melt into this tale and empathise with this hero who will then surely nose his way into your all-time favourites.■

Conservation seems to be the need of the hour as ecologists hyperventilate at the rate of extinction of species. One such species in the IUCN Red List is the lesser known and sparsely studied group of *Homo sapiens, Homo sapiens mathematica.* Common name: Mathematicians. An apocalyptic Noah's Ark is bound to sink for want of a viable female specimen of this species. In the event of IISER's celebration of the expertise of this subspecies, namely Mathematics, Sentience takes a peep into their morphology, behaviour and occupational peculiarities. The female specimen, due to extreme rarity does not feature in this discussion.

Centuries ago, when shepherds and goatherds were mourning their losses to panthers and wild cats, a silent (literally) mutant invented counting! It caught on as in those days most humans had ten fingers. In the present day, however, such math is useful only in case of insomnia or if any of your sheep are Ninja warriors. This mutation (however deleterious) has survived in the human population by chance or by divine intervention (after all, God does play dice) and we find a few specimen thriving currently. Amongst this tribe however, strict hierarchies exist as the elite are constituted by the Pure Mathematicians, the Number Theorists and the Algebraic Geometers, the Second Estate comprising Algebraists, the Third of Statisticians and the Fourth Estate (the paparazzi) comprising Applied Mathematicians and Apple iStore Geniuses. The King of the tribe is a comrade who goes by the name Perelman. His excessive mutation brought about the solution to one of the Millenium Problems, the Poincare Conjecture, and he then with a sudden realization that his Atlas Shrugged, escaped into oblivion and began farming.

Morphologically and behaviourally, this rare subspecies is easy to spot as they generically remain bespectacled and (more often than not) are timid, introverted and dress tastelessly (as opposed to, say, Biologists). The fact, though, remains that the foolproof way of confirming identity is to flash a card that says $e^{i\pi} + 1 = 0$ and observe the mixture of emotions erupting on the face of the specimen. The sadistic alternative would be to flash another card that says $\infty - \infty = 0$ and watch them writhe in pain, vexation and terror. Apparently, the above equation is one of the Unforgivable Curses in Mathematica. Another characteristic is the relative ease with which this population spells out the Greek and Latin alphabet while they flounder at basic English. The only English they happen to be familiar with is R, i, S, Q, U, e and a sparse few other letters. There are a few exceptions of course, since a lot of fraternity resides in Russia and much of their literature remains indecipherable and in Russian and German. There have been allegations that they are, in fact, a select group of mutants chosen by lab mice to research the Question to the Ultimate Answer of Life, the Universe and Everything. So far, the only reasonable question that has surfaced is 'What is seven times six?'.

As idealistic conservationists, we strive for the conservation and propagation of this species. In return, we normal human beings are left to deal with our own meagre arithmetic issues as they live in a different dimension they call their own. In this dimension, they have created a whole new world complete with blackholes and baby universes, devoid of lowly thoughts and feelings, which they ride atop poor unfortunate creatures like goats and dogs (for further reference, check the IMSc. faculty website). Literature in this universe (their contribution for the benefit of the normal universe of course) takes a sad note as the verses mostly constitute the first ten Natural Numbers interspersed with mundane domestic tasks (see 'One, two, buckle my shoe' or 'Five little ducks went out to play'). The most original paper in the whole of Mathematics is the Medieval composition 'Sing a song of sixpence'. The implications of this song in various areas such as Analysis, Topology and Combinatorics have not been fully researched yet and a Fields Medal is awaiting such breakthroughs.

Further proof that Mathematicians have their nasal appendages at higher elevations is the so-called TDC 202: Mathematical Inquiry Course at IISER Pune. The course structure envisages inquiry into Mathematics in the right way, by asking relevant questions. The most pressing question that this course managed to evoke in the minds of the victims is whether the co-ordinators and lecturers are aware of the above mentioned aim. The Mathematics involved in the coursework was disjoint and stochastic. To sum it up, the course ended up being complex, the Mathematics was real while the Inquiry was imaginary. At the end of a half-semester, the reward was what seemed like a question paper pulled out from old Olympiad files, only with half the time limit.

Despite all this, the average *Homo sapien* bears responsibility of being courteous to these beings because of our obligation to their well-meant research for the Question to 42. This is written in public interest and the information is to be used only for practical purposes (no citations, please). The lesson to keep in mind is that this subspecies of androids are mostly harmless. Any specimen found should be treated like a normal human (with no expectation of such interaction in return). The persons mentioned in this article are purely factual and any non-resemblance to any Mathematician living or dead is purely coincidental. ■

geneEXPRESSION

the students' corner

New Scientist

SHARVAREE VADGAMA

This month, New Scientist answers some of the questions that might have caught you unawares at some point in your life. You may have given some thought to it and then maybe it was just laughed at by others.

Why is it that when people walk together, they often subconsciously start to walk in a synchrony?

Desmond Morris, Zoologist and specialist in Human Behaviour, says that the reason people start to walk like each other is that they have a subconscious need to show their companion that they agree with them.

Other studies suggest that we adopt the mannerisms of our companions very well, especially that of our superiors, such as crossing legs in a particular fashion, or moving hands while expressing ourselves.

The next time you walk alongside anyone, walk out of step. And then start a conversation. Soon you will see that you will fall into step!

Why is it that if you tickle yourself it doesn't tickle, but if someone else does, you cannot stand it?

The feeling of sudden physical contact, the lack of control, and whether the 'tickle' will hurt you or not cause tension in most of us. When you try to tickle yourself you are in complete control of the situation. There's no need to get tense and therefore no reaction.

When you pour liquid quickly from one container to another, it happens to fall right. It does not happen when you pour it slowly. Why?

When a carton of liquid is tipped during pouring, the free surface of the liquid in the container is raised relative to the opening creating a pressure difference between free and open surface. This forces the fluid to flow from the container. In addition to this, surface tension draws the fluid towards the walls of the container. At high pouring speeds, the pressure force is much greater than the force due to the surface tension and the fluid flows into the other container.

Inspired from the New Scientist magazine's ever popular column 'Last Word' which is now available in the form of a book 'Why don't Penguins' feet freeze?' ■

Foodie Corner

AASHAY PATIL

Parantha is an important part of a traditional Indian meal and I am sure most of us like *Paranthas*. **Chaitanya Paranthas** is a good place where you get different varieties of *paranthas*. Try their *Peshawari Aloo*, Cheese Onion, and *Gobi Paranthas*, among others - all prepared in typical North Indian style, and served with butter, curd, *chutney*, and pickle. The *paranthas* are huge and hence they are very filling - one *parantha* will be more than sufficient for an average person. The prices are very reasonable for the size of their *paranthas*. *Paranthas* range from ₹55-95, depending on the variety.

Regular vegetarian and non-vegetarian delicacies like combos (*paranthas* with curry), *biryani*, *Punjabi thali*, and Chinese dishes are also available but I won't recommend them as *Paranthas* are the best thing here. For those with a sweet tooth, their fruit custard is worth a try. You should definitely try their awesome, gigantic Patiala *lassi*. It is best to go and dine at their F. C. Road store- where you can have *paranthas,* hot and fresh. However, if you can't, they also give home delivery at an extra charge of 10-15%. ■

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