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SENTIENCE

We make you news.

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Fruit Flies When You Are Having Fun!

Prof. Jules Hoffmann came to Pune as part of his tour of India, which planned to commemorate the 25th anniversary of the Indo-French Centre for the Promotion of Advanced Research. While in Pune, he gave a lecture regarding his brilliant work in Immunology at the IUCAA Auditorium in Pune University.

Prof. Hoffmann is a research director and member of the board of administrators of the National Center of Scientific Research (CNRS) in Strasbourg, France. Together with Bruce Beutler and Ralph M Steinman, Hoffmann received the 2011 Nobel Prize in Physiology or Medicine for “their discoveries concerning the activation of innate immunity.” This general statement represents some of the groundbreaking work in Immunology in the last century. Hoffmann and colleagues showed definitely in 1996 that mutations in the Toll gene resulted in susceptibility to fungal infection in *Drosophila*. This was extremely exciting, because until then the Toll pathway had been very extensively studied as the major dorsal-ventral patterning pathway in the embryo i.e. the pathway that determines your human equivalent of front and back. Its mammalian homologues, the Toll-like receptors, were discovered by Beutler. This has been one of the most important discoveries in Immunology, opening the way for a flood of research with *Drosophila* as the model organism. At a time when most of the research focussed on adaptive immunity in humans, while innate immunity was relegated to the background as ‘understood, and not



Prof. Jules Hoffmann

particularly important’, this discovery was a revelation.

His talk at the IUCAA Auditorium was attended by hordes of students, so many that an extra hall had to be appropriated to accommodate the students. The talk was a general one, starting from how he came across and subsequently got deeply interested in his field of research. Then, he spoke of the major breakthroughs in the field of Immunology, both prior to and during the course of his career, particularly those involving the innate immune system in *Drosophila* that shaped and influenced his research. He also told us that addressing the anti-microbial defence in *Drosophila* had provided great insight and possibilities in Immunology research. Though there still was a long way to go in order to fully establish the workings of this system, the current data available about two of its com-

ponents (the Spatzle-Toll cascade Imd cascades) indicated a very prominent role of the innate immune response in the overall defence mechanism of an organism. At the end of the talk, he briefly spoke about his work in the field which fetched him the 2011 Nobel Prize in Physiology or Medicine along with Bruce Beutler and Ralph M Steinman concerning “discoveries concerning the activation of innate immunity”.

Following the lecture, Prof. Hoffmann also visited IISER for an hour-long interactive session with the students which was indeed an enlightening experience. He delighted the audience with humorous and insightful answers to various questions. On a lighter note, he listed the pros and cons of winning a Nobel Prize. The visit and interaction with one of the iconic figures in Immunology was one of the highlights of the semester.

Schedule Ridiculed

The IISER bus, unfailing, convenient and yellow, has been an unappreciated angel for the students. Ever since the initial IISER Tempo traveller and its suicidal driver retired, these wayfinders (named Marcopolo) along with an eclectic bunch of drivers have been monumental in assuring that most students get to most of their classes, labs and the mess in time. With the imminent realisation of the dream campus with everything between four walls, the fate of these buses hangs by the thread. In their possibly final days of glory, the service is disintegrating to an ill-planned nuisance.

There have been incidents in the recent past when drivers have refused to budge unless students who are standing in the bus disembark. Crowding in the buses has always been an issue especially during the peak hours of post lunch and post-lecture timings. The obstinacy of the drivers, although with good intention and keeping safety protocol in mind, at such times, causes quite a lot of inconvenience.

A closer look at the bus schedule

reveals thoughtless and ill-informed decision making, not to mention colourful spelling. For instance, two buses ply from Sai Trinity to HR-4 in the wee hours of the morning both at 8:00 and 8:30 while there are no buses between 1:15 and 1:45 after lunch from HR-4 when huge batches of students throng the main entrance rushing to get to their first-year labs. Those pitiable souls who missed the 1 pm bus from Sai might as well miss their lunches as the next bus is only at 1:45. But then again, they might have had an elaborate breakfast given the continuous (not to mention empty) bus services in the morning. Also noticeable is the fact that two buses from HR-4 at 5:15 and another at 5:20 have been scheduled in the evening when there are many classes that end at 5:30. The weekend buses are biased against dine-outers with a vengeance as no buses ply back to the main campus from Sai after 5 pm. The good thing about the weekend buses, however, is their phantasmagorical nature, 'If driver on leave, that time

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Hindi Hai Hum!

The Sunday of September 16th saw the usually lazy IISERite up early and dressed in neatly pressed kurta and pyjama, amongst other forms of traditional attire - everyone ready to spend the day celebrating Hindi- India's official language. *Hindi Diwas* is celebrated every year on September 14th to commemorate the adoption of Hindi as our official language. This year, two days later, with an equal (if not greater) amount of enthusiasm, IISER also honoured Hindi. At 2 o'clock, students as well as faculty gathered in the multipurpose hall of HR-4, where a series of events and competitions had been organised to let everyone exhibit their fluency and com-

mand over the language. It started off with a poetry recitation competition, where participants recited a variety of different poems, amongst which the most popular ones were those by Harivansh Rai Bachchan. Some even presented their own compositions! This was followed by a round of '*chutkule*' which had everyone in stitches. Next, to heat it up, there was a stimulating and intense debate on the Kudankulam nuclear power project.

After a small break for tea and biscuits, an extempore competition on Anna Hazare's revolution and many other interesting topics was held. Following this was a very entertaining '*antakshari*' competition, where

Mission 'M'possible

After a long-drawn battle as to whether Mimamsa would happen or not, the decision has finally been made. Mimamsa '13 saw its first ray of hope when the core question-making group of each subject came up with a set of 8-10 questions. These were thoroughly analysed and subjected to intense scrutiny, to make sure that they lived up to the standard set by Mimamsa in previous years. Finally, it was decided that with time and mind-power, Mimamsa '13 can be a success. The dates were set and the task-force for Mimamsa was put into action under the guidance of Dr. Sutirth Dey. The preliminary round of Mimamsa will be held on 13th January '13 across the nation, and the finals on the 16th-17th February '13 at Pune. The centres for the prelims are Pune, Mumbai, Delhi, Kolkata, Chennai, Hyderabad and Bengaluru. Several tasks of publicity and outreach have been assigned to groups under the guidance of the old hands. The website is expected to be up and running in a week. So IISER, gear up to host India's toughest science quiz, for the buck stops here!

PAPIA BERA

the participants as well as the audience enjoyed singing the golden oldies with the audience stumbling over most of the lyrics. The final event was '*paheliyan*', where a very enthusiastic audience answered riddles posed by the organisers.

The event concluded with the distribution of prizes and speeches by Dr. Rama Mishra and Mr. Ramashankar Byas. The day ended with everyone understanding that *Hindi Diwas* is not celebrated to exert the dominance of Hindi over other languages. Rather, it's a day on which we can take a break from our usual English-filled lives and appreciate the fact that – *Hindi Hai Hum!*



ROAD ROLLERS



FOOTBALL SEMIS FACE-OFF
ROADROLLERS v/s FRESHERS FC
4-1

Players in the limelight:
Anurag Mishra (2 goals)
Siddharth Chopra (2 goals)
Aamir (the only goal by Freshers FC)

FINAL SHOW-DOWN Will
Kick Off With
SAB KE BAAP trying to flatten
ROADROLLERS

(...Coming Soon)

VOLLEYBALL SEMIS
SERVE-VOIRS b+ MESS TEAM
(3-2)
AIRBORNE b+ BALLBUSTERS
(3-0)

Sporty faculty

The undergrad monopoly over the sports events at IISER has been challenged by Dr. Anirban Hazra. With his active participation in the football events, he has gained popularity and breached boundaries. Sentience applauds his enthusiasm!

Freshers treated well!

Treats seem to be accompanying the adrenalin and sweat in the air, as the Freshers FC (2012 batch) managed to bag a victory (against *Faltu*), a loss (against the *Roadrollers*), and TWO treats from the 2009 batch players!

VOLLEYBALL FINALS
SERVE-VOIRS emerge victors,
beat AIRBORNE (3-1)!

Coming up next month : Football Finals Results, Table Tennis Results

Korbo Lorbo Jeetbo



Shattering the popular perception that IISER houses only nerds and geeks whose maximum physical activity quota per day is a direct function of the distance from the lab to the lecture hall, the Inter-IISER Sports Meet has sprung to life in Kolkata. The first Inter-IISER event of any kind, IISM is all set to add new dimensions to scientific and national integration.

This year, IISM is hosted by our sister institute, IISER Kolkata, and is scheduled to be held on their campus grounds from the 13th to

16th of December. What they lack in publicity and glamour, they make up for in an impressive line-up of events ranging from athletics to organised games like football and basketball. Although there was an uproar against the initial chauvinistic rule that only male students are allowed to participate, this was soon amended by giving their feminine counterparts the opportunity to compete, provided they register in sufficient numbers. (So girls of IISER, rise to the occasion and get ready to battle it out!)

Over the last couple of weeks, the playgrounds have begun to fill up gradually and practice is in full swing. It is refreshing to see a positive response to this meet. Let the enthusiasm stay afloat and may many laurels be won!

Academic Buzz

SIDDHARTHA DAS

1. Microciencia-2012 — Exploring the Potentials of Microbes for Bioscience, Biotechnology & Medicine, SRM University, Chennai

Duration: 17th-18th December

Link: <http://goo.gl/Diwma>

Deadline: 20th October

2. National Workshop on Reliability, Survival Analysis and Industrial Statistics, Department of Statistics, University of Pune

Duration: 9th-10th November

Link: <http://goo.gl/fca46>

Deadline: 25th October

3. Winter School on Astronomical and Cosmological Surveys, TIFR, Mumbai

Duration: 10th-17th December

Link: <http://goo.gl/3Khjl>

Deadline: 31st October

4. International Conference on Quantum Information and Quantum Computing (ICQIQ), Indian Institute of Science, Bangalore

Duration: 7th-11th January

Link: <http://goo.gl/W6uON>

Deadline: 1st November

5. Workshop on Design and Analysis of Experiments, SQC & OR Unit, Indian Statistical Institute, Kolkata

Duration: 19th-23rd November

Link: <http://goo.gl/tA8ze>

Deadline: 15th November

6. Advanced Training in Mathematics Workshop (ATMW) 2013: Development of Mathematics in India, IIT Bombay

Duration: 6th-16th February

Link: <http://goo.gl/eIUFG>

Deadline: 15th November

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Interview With Dr. Suhita Nadkarni

Dr. Suhita Nadkarni, the new addition to the meritorious list of Biology faculty, seems to be all over the grapevine. Sentience takes a peek into her life.

Area of research :

My research comes under the umbrella of computational and theoretical neuroscience. It is research, sans, a wet laboratory. The equipment is mostly powerful computers and sometimes (more and more rarely these days) paper, pen and potentially a large waste paper basket. I think there is a lot of value to doing computational neurobiology. There is a lot of knowledge that can be gained by putting the diverse data together in a theoretical framework. My thesis used computational modelling. I have taken a scenic route to Biology but everyone does not have to take that route. There is value to developing a solid core in a subject. Unless courses are carefully designed, there's the danger of being the jack of all trades and the master of none.

Mathematician turned biologist or vice versa?

Well, my Ph.D is in Physics. I think at some point you stop trying to fit yourself into a box and the boundaries between subjects become artificial. Biology benefits from a certain quantitative viewpoint. The wheels of my lab here in IISER are slowly getting oiled. As we get on our feet, I am getting tingly fingers to start working with my lab on a couple of research problems that are lined up. One looks at Alzheimer's disease early on before any of the structural changes in the brain associated with disease take place. Of course the the ultimate goal would be to find therapeutic targets that arrest the disease long before any of the irreversible decline in mental or physical health takes place. The other looks at astrocytes, the

non-neuronal cells of the brain that were mostly relegated to house keeping duties until recently, as active dynamic partners to neurons. The main objective would be to quantify how these cells play a role in learning and memory formation.

Reason for return to India :

I went to the USA to pursue my Ph.D. After I finished my PhD I stayed on to do a Postdoc in San Diego, considered by many as a mecca of research in neuroscience. My time there was some serious fun, both academically and in terms of life experiences. I was



very clear about returning home after my training. The reasons were the usual mix of personal and some idealistic. However, over the last few years the excitement in Indian sciences was inescapable. The opportunities in terms of scientific funding for your projects, working with top class scientists and students are difficult to surpass. IISER is especially cool because I think it has very good leadership, it is democratic and all the faculty I have met so far seem to be deeply invested in the institution's progress as well as their own scientific goals. I think it's a great time to come to be back home .

Criticism on IISER :

It's a new institute, with all the assets and flaws that go with it but it's been carefully nurtured. I think it's impor-

tant to get enthusiastic students. It is a big responsibility to keep their enthusiasm up, captivate their imagination and their interest, every now and then. They shouldn't come out disenchanted by it all, by the time they leave. And most importantly, they should have learnt a scientific way of thinking and solving problems.

Expectations from Karavaan :

It is great that a tradition has been started and it is being kept up. It seems that it is not going to be as wild and crazy as I remember Youth Festivals to be. You guys are much more mature and thoughtful, that's a big improvement from our generation! My expectation of it is that everyone gets to have fun. It should provide a platform for the students to express their talents and find a niche apart from their academic pursuits, to make student life richer. I suspect that IISER has a very diverse student community from various backgrounds. I hope everybody gets a chance to be involved at some level or the other

Courses :

Starting this week I'll teach Neurobiology I and the next semester I'll be teaching Neurobiology II. And then eventually I hope to set up advanced courses in quantitative biology and modelling.

Projects and expectations from students :

Yes. So, this December, we're going to try and recruit students from diverse backgrounds and not just biology. I am also recruiting project students. There are some projects that can be done within the time frame. I expect that students should be willing to spend some time, especially if they are new to computational neuroscience.

Sentience wishes her all success!

Musical Bliss

HARINI S and SHREE SRUTI V R

The semester's first Carnatic concert and IISER's long-time dream of holding a *veena* concert was fulfilled with two back-to-back concerts held on a weekend, featuring Dr. Jayanthi Kumaresh on the *Saraswathi veena* and Vedavalli *mami*, the legendary Carnatic vocalist.

The Thursday of September the 20th dawned on IISER with great excitement for SPIC MACAY volunteers and Carnatic music enthusiasts. Clad in a crisp white sari, Dr. Jayanthi Kumaresh, a *Saraswathi veena* player par excellence, held the audience's rapt attention from the very first minute she walked in. She was accompanied by Shri Tumkur Ravishankar on the *mridangam* and Shri Tiruchy Krishna on the *ghatam*. She started the evening with a small piece in the *raagam* 'Suddha Saveri'.

Though she rendered many different pieces, the star of the evening was the main piece which comprised of *Raagam*, *Thaanam*, and *Pallavi* set to the *raagam* 'Dharmavati', followed by the *Tani Avartanam* by the *ghatam* and the *mridangam* artistes. The percussion duet displayed such brilliance that all we could do was to bow down to the performers. Though she meant to end the concert with that particu-



Dr. Jayanthi Kumaresh performing at IISER

lar rendition, the audience requested an encore which she rendered very playfully. It was a piece in the *raagam* *Kaapi*, which, with a folk base, showed to us the side of Carnatic music that is integrated with the local folk music. With her fingers, she created magic that reduced many a soul to tears and created an atmosphere that many present considered to be divine. Apart from the music, she engaged us with small bits of information about the three instruments of the evening. On the whole, the concert emotionally touched everyone and the feelings it inspired would be etched on their minds forever.

The magic of the evening was still fresh in our memories, and received an added impetus with the second concert of the week, where Vedavalli *mami* enthralled us with her voice at the NCL auditorium. She started off with a general invocation dedicated to Lord Ganesha. With her music, she filled up the entirety of the NCL auditorium. Her ability and vast experience gathered over five decades transfixed the audience for the entire night. The very experience of sitting through her concert made us all feel like the luckiest people on earth. This was the perfect ending to the best musical week at IISER.

The Great Migration

After months of jumping around and speculating whether or not we would shift into the new hostels, most students received an unexpected jolt when the lists were put up assigning the rooms and setting deadlines to shift into the new hostel. After some dirty confusion, a few tears and sighs of relief, these mature young adults decided on their future roommates. Next came a tug-of-war between the rooms facing outside and those facing inside. There was a clear discontent among those with rooms facing inside and those near the bath-

rooms. Innumerable rounds of calm, composed discussions in rooms, the fountain area and the big balcony resulted in us finally, actually, shifting. The great migration, reminiscent of wildebeest, started off with the '10 and '11 BS-MS batch boys, followed by the boys of '09 batch and the girls of '09, '10 and '11 batches. With daggers at their throats, everyone shifted quickly, but occasionally snuck in to use their personal bathrooms with hot water and usable toilets back at HR-4. Though the distant lecture halls and mess were lamented, things got

much better in the new hostel, and the facilities were soon appreciated. The ample space, Philips lamps, sensor lights and comfy chairs are good enough reasons to smile. The new canteen just widened our grins! The limited access to wi-fi and juggling between Sai, HR-4 and the new hostel (some have seriously considered using a pair of roller-blades) is a cause for concern. But hey, nothing like few adjustments to a brand new home! Besides, the cheer for the daily dose of Mexican waves of shouting in the hostel is the icing on the cake!

Carnival Calls



The energy levels are still high, the meetings are still on. Karavaan 2012 preparations are in full swing.

This year, the stage is planned to be set up on the now-restricted football ground. The event may be relatively smaller in scale, but the recently set up IISER website makes it look world-class. With the creative brilliance put in by the design-

ers, the site leaves viewers dazzled (and not just because of the golden dots sauntering across the screen).

The sponsorship brochure is also ready to coax potential sponsors into parting with some money from their hoards. With excellent design once again, and rather witty event descriptions, it is quite a delightful read.

The last week saw people, singly and

in groups, training hard to perform in the auditions for the IISER showcase, which were held during the past few days and judged by faculty and club heads. People who missed the auditions or were rejected must not lose heart, however. They can still showcase their talents in the various competitions and events the Karavaan team promises to offer, and hopefully avail themselves of the various attractive prizes they have to offer!

All those people who had ideas for events and performances in their heads and couldn't share them with the relevant clubs at the right time however, will have to store them there till the next Karavaan (and share them on time then) as the events, logo and t-shirt designs have nearly been finalised. However, they can contribute to Karavaan '12 by joining the sponsorship and publicity team, always in need of manpower, and by using their contacts to spread the word about Karavaan as far and as effectively as they can.

So let's keep our fingers crossed till the K-Day and hope that all that's been going well ends well.

Mocks, Talks And Docs

The Science club has received an influx of new blood with the advent of this semester. The lack-lustre organisation has given way to a dynamic new team that has given popular science talks with great regularity this semester, which have been eagerly attended by the first years who soak up the knowledge like centuries-old parchment. The talks range over fascinating topics like solar energy to mutational robustness, which truly indicate the inter-disciplinary outlook at IISER.

Meanwhile, the hallowed walls of IISER have been adorned with the "Science Bulletin" noticeboards, which contain fascinating snippets

of the latest science articles.

Joining the ongoing hubbub over the Nobel prizes, the Science Club is organising a series of talks on them. They have roped in Prof. Shashidhara, Dr. Umakant Rapol and Dr. Thomas Pucadyil to give talks on the Nobel prizes awarded this year in Physiology or Medicine, Physics and Chemistry respectively, on the coming Friday, 19th October.

To appeal to those less socially responsible, the Science Club is one of the few opportunities we have where we can give talks on interesting and known topics without fear of reprisal (grades or egos). For any professional, be it academia or a professional

workplace, presentation skills are indispensable. The public speaking skills of most students are disgraceful, and one of the less-realised deficiencies of IISER is the lack of a public speaking forum. The students compound these errors by ignoring the few options open to them, the most prominent of which is the Science Club.

With the best will in the world to do so, the Science Club cannot proceed without great participation from all of IISER community. So, if we want it to be a fine, upstanding symbol of IISER's philosophy and ideals, rather than have it limp along painfully and be a general embarrassment to IISERfolk, we need to put our best efforts into it.

Science, The Hands-On Way

HARSHAVARDHAN JOG

On the evening of September 24th, the Resource Team of Disha alongwith Dr. Anirban Hazra organised a special talk-cum-demonstration by Mr. Amit Morarka, who is a physicist at the University of Pune. Holding a Masters from Pune University, he works in experimental physics and says that whatever he has learnt, it has been by doing it himself, rather than by studying it from a book. The students present were treated to a demonstration of some of his creations, which were as amazing to watch as they were informative and educational.

The first thing he showed us was a rectifier and transformer circuit that he had designed himself (after several severe electric shocks!). He had used things like an ignition coil from a Bajaj Scooter in his circuit. He said he was going to use this circuit, which provided a voltage of 5000-10000V, for all his demonstrations.

His first demo was that of a cathode-ray tube. The amazing thing

about his design of the cathode-ray tube was that he had used a syringe as the vacuum pump and its needle as the cathode! He showed us cathode rays, the anode glow and Faraday dark space, as well as the concepts illustrated by them. For example, we discussed the effects of increasing voltage on the anode glow and the Faraday dark space.

In the next model, he placed two strips of metal at a certain distance from each other and applied a high voltage across them. He then lit a candle between the plates and we witnessed the flame of the candle split in two! The flame, after splitting, touched the plates and made a crackling sound while burning the plates. We discussed this for some time, learnt the reason, then moved on to the third demo.

Here, he had three thin wires, one joined to the cathode and two placed very symmetrically and about 1-2 mm away from the cathode wire and connected to the anode. He also had

a disc magnet attached to a handle. When he started the pulse DC, the current jumped from the cathode to the anode, but only to one of the wires. When he moved the magnet below the three wires, some of the current started going into the other wire. This demonstrated the effect of the magnet on the current (Lorentz force). We also ignited a candle using the current, and Amit said we could even make popcorn using it!

After this, we returned to the cathode-ray tube and tried an experiment even Amit hadn't tried before. We disconnected the anode and kept the cathode connected. It was observed that the tube still works! Amit said he learnt something new even after 10 years of doing the same experiment!

Amit will be coming to IISER again to show us more of his creations and help us learn science the hands-on way. So those of you who missed it may attend next time, and those who attended it already may have the fun again!

Schedule Ridiculed

Continued from Page 2

also run on these days'.

Even though the bus drivers are perpetually complaining about students dirtying the buses and leaving the windows open to dust, sleet and rain, they are a helpful lot especially when it comes to the myriad articles lost in the bus and almost always found. It is unfair to grumble and lose your temper at the innocent soul when you are at a disadvantage because of the erratic bus schedule.

We appeal to the general public, anyone in fact, who can tell time as well as spare some, to volunteer and revamp the schedule so that a proposal can be submitted to the administration. Hopefully, life will revert back to normalcy in a reasonable timeframe.



Heaps of garbage dumped on the stairway in the new hostel

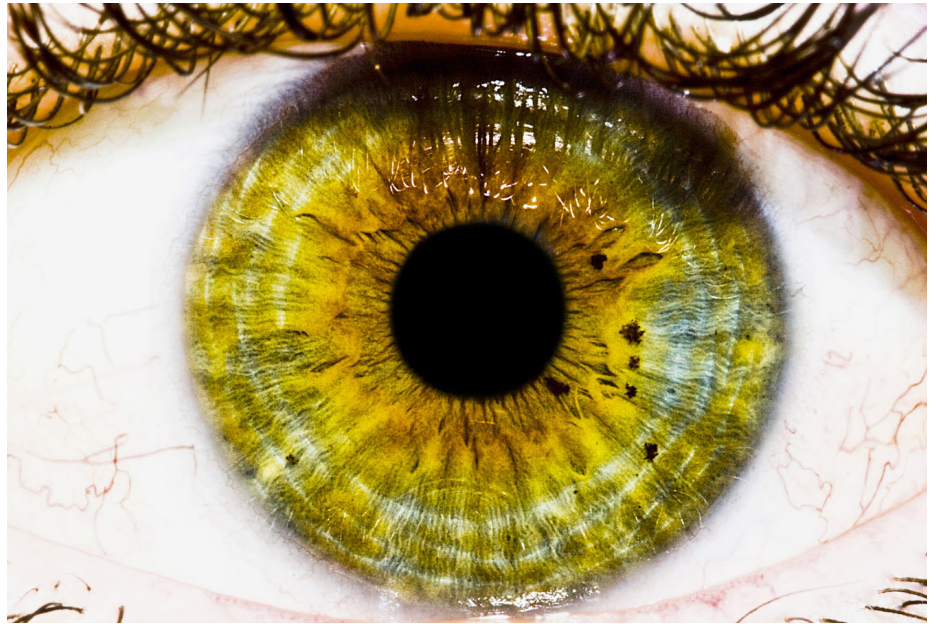
Pigment Of Imagination

SAHANA SRIVATHSA

Countless poems and novels describe how the mesmerising beauty of someone's eyes captivated the poet and had the victim besotted for months. A person's eyes are said to reflect their soul, which is why, while you can deceive anyone with a few cleverly strung words, it's more difficult to lie with your eyes. Looking deep into the human eye, we discover why some of us are blessed with stunning eyes in lovely shades while most have dark brown irises merging into the pupil.

It all starts with the melanocytes which are a group of cells present in the stroma of the eye. They contain the pigment melanin in the cytoplasm, which is responsible for imparting colour to the iris. This is in contrast to the rest of the body, where the melanin is secreted from the cells in varying amounts, which is why there are so many anti-tanning products and fairness creams for your skin, but your eye colour remains constant and unchanging throughout your lifetime. While the number of melanocytes is constant throughout a species, the quantity and quality of melanin varies from individual to individual. Melanin is synthesised in specific cells known as melanosomes, where two different forms of melanin, namely eumelanin, the darker brownish pigment, and pheomelanin, the lighter red yellow pigment, are synthesised.

Human irises are found in a riot of colours, which include various shades of brown, green, blue, hazel, grey, violet and even red. Initially, the inheritance of eye colour was considered to follow a simple Mendelian inheritance. But in the last couple of years, closer observation of more than two phenotypes has revealed that eye colour has a more complex inheritance system. The initial belief that the allele coding for brown dominated over those for blue and green, where green preceded blue, is correct. However, there exist two genes, both pre-



sent on the same chromosome-15, coding for eye colour. Present on the same chromosome, the two genes show linkage to a large extent, which is why the inheritance pattern was initially considered as simple Mendelian. One of the genes, *HERC2*, affects only the nervous system and the pituitary gland, but within the DNA

“producing an array of spectacular shades of eye colours.”

sequence of this gene lies an intron sequence which is the promoter for the second gene *OCA2*. The latter is responsible for the maturation and transfer of melanosomes and the production of each type of melanin. Thus, it decides the quality and quantity of melanin. Single Nucleotide Polymorphisms, or mutations at one base, in the promoter region for this gene cause the phenotype to change from brown to blue as the amino acid arginine is replaced by glutamine. The *HERC2* gene demonstrates epistasis, and there is an incomplete dominance of the protein produced by the second, causing a mix of the phenotypes producing an array of spectacular shades of eye colours.

When more melanin is present,

the amount of visible light absorbed is naturally more, so the little light which is reflected appears brown. When the melanin production is low or non-existent, the colour of the eyes appears to be violet or red. The reflection of the red blood cells in the eye produces the red colour, and when a little melanin is produced, the red color mixes with the blue producing a stunning violet shade. The initial blue-eyed mutation is speculated to have started in the Scandinavian countries.

Heterochromia is a fairly common genetic disorder where the two irises are of different colours, or one part of the iris is a different colour from the rest. This is mostly caused due to excess pigmentation. However, the next time you find yourself staring into someone's eyes, it's probably not wise to mention this article.

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3. Phenotypes and Genotypes for human eye colors - P J Morris
4. Biochromy: The Natural Colouration of Living Things- Denis Llewellyn

Money. The cogs of the modern world's wheels are fuelled by the glint of shiny metal. Unavoidable is any common man's association with it and the significant impact it has on his sorrows. After the fourth year, a regular-sized, regular-brained IISERite looks around and finds that all his friends who decided to take up the Engineering stream have comfortably settled into plush office chairs and lavish paycheques. He (probabilistic approximation) looks back at the road not taken and sees the glitz and the glamour at the end and sighs. The road he has taken seems leech-ridden and unending in comparison.

The very first batch of IISER, the guinea pigs of the programme, so to speak, felt the first pangs of this insecurity and decided to set up a Career Development Centre with the help and active involvement of a few members of the faculty. The CDC, as it was fondly called, had a well-laid out structure, aims and a slightly sloppily-drafted brochure. The last-mentioned item, the brochure, was something I unearthed in my disorganised disk-space recently. This document is a calculated move to lure potential investors in IISER's human enterprise. It speaks idealistically of IISER's aims, mottos, infrastructure and highly selective entrance criteria. Juxtaposed with glowing images of the campus and its residents, it was successful in the past years to ensnare companies like Shell and Hey! Math. In simple words, CDC is the dysfunctional placement cell of IISER Pune. Not much has happened since the visit, and quite frustrated return, of Shell Inc. and this has caused much panic in the student community.

The Career Development Centre aimed to be 'the interface between the institute's students and the world of employers'. Another academic year is almost halfway through and soon it will be time for a batch of IISER students to leave the campus and seek shelter elsewhere. Though IISER

aims to be resolute in its approach, and to train students to be good scientists, staunchly refusing to set up placements with R&D departments of companies, all of us cannot aim to be so highly idealistic. For various reasons, professional or personal, we end up looking for jobs, for employment, financial security. Or maybe we prefer the lure of glamour over the joy of science. The smooth functioning of this cell will ensure easier and more effective communication between the student community and the future employers.

The primary need, in fact, is not to revive the CDC in its full-fledged form, but to set up, at least, bare minimum counselling facilities on the options after the BS-MS programme and even a PhD. For most students vacillating between different fields of interest and life options, it would be a real boon if someone with a degree assured them that they have other choices

CDC Career in Deep Crisis(?)

available. Even a PhD student would be at her (again with the probabilistic approach) wits' end by the time her thesis defence is completed and a job offer might be a well-deserved relief. Many R&D companies offer moderate-to-high pay packages for lab technicians and researchers. If a career in science is not what you have in mind, it is high time that you focussed on your area after your MS. Management, finance, enterprising, theatre and media are some of the popular alternative career choices afloat in IISER these days. A counselling or career guidance centre will help such students to look at the institutes offering courses on these and look for funding and scholarships. Many of us are bent on doing a PhD, but are seriously considering a break after the course before applying for a PhD. The counselling would shed some light on the advantages and disadvantages of

such a decision.

The fact remains that no one was deceived into joining IISER as the purposes of its research-oriented programme were stated explicitly during the various sessions, beginning with the academic counselling, when nervous parents posed questions and exchanged worries about their children's futures. However, during the course of the programme, if students, for various reasons, decide to take up a non-research career, they should actively associate with other like-minded students to set up a facility for fulfilling such needs. A disorganised and ill-informed placement programme will only deter companies from recruitment. The ideal situation would be for the current fourth-year students to take up the revival of this cell considering the abundance in manpower as well as their diverse interests. They could collaborate with the senior batches of IISER and those already working in R&D of various companies to secure contacts and set up a permanent facility. They also have sufficient time before they are caught up in the maze of research questions.

All said and done, the student enticed by the shimmer of the corporate roads should not sink his heart in deep sorrows, as the path of science is not bleak at all. The incomprehensible courses, the dire need to excel and to be innovative might drive you insane during the period of your five years at IISER, but instead of letting the thirst for curiosity quench from inside you, it would help if you look back from time to time and remember the sentimentalist in you who wanted to do good science once upon a lifetime. That person may seem unfathomable distances away, but who knows, you might realise that when the neon bulbs in the fancy worlds die down soon, your road just begins to illuminate with a glow like none other. Persevere, and you shall be rewarded.

Life Ascending

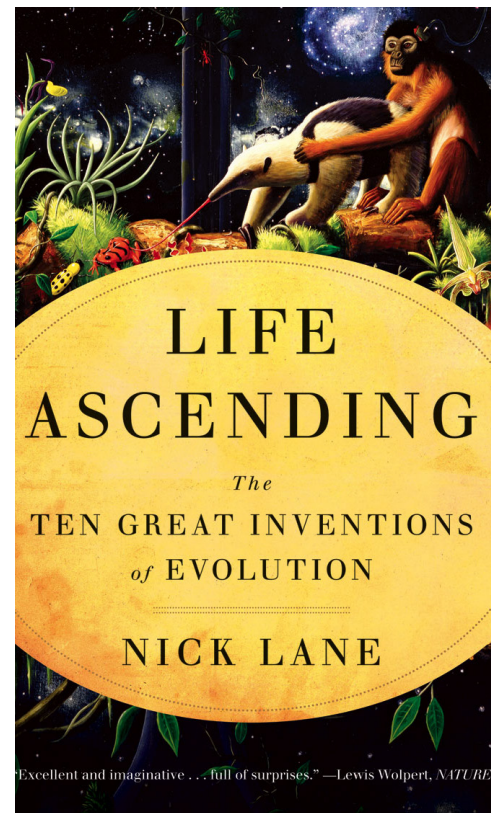
DARSHINI R

Fresh out of 12th grade and interested in biology, the first (and only) book I've taken out of the IISER library was a book about evolution. 'Life Ascending' quickly made me glad that I decided to read it, for it was like a continuation of all that I had learnt in the 11th and 12th grades. It answered so many questions that were 'not in syllabus' (according to the CBSE board) back then, and read more like a novel about how amazing our planet is and how evolution utterly transformed it.

The book is divided into chapters; one for each evolutionary 'invention' that Dr. Lane thinks impacted the Earth in a manner that changed life itself. Photosynthesis, the evolution of the complex cell, hot blood, sight and death are five of the ten 'inventions' explored. He illustrates processes and technical terms using diagrams, analogues and meta-

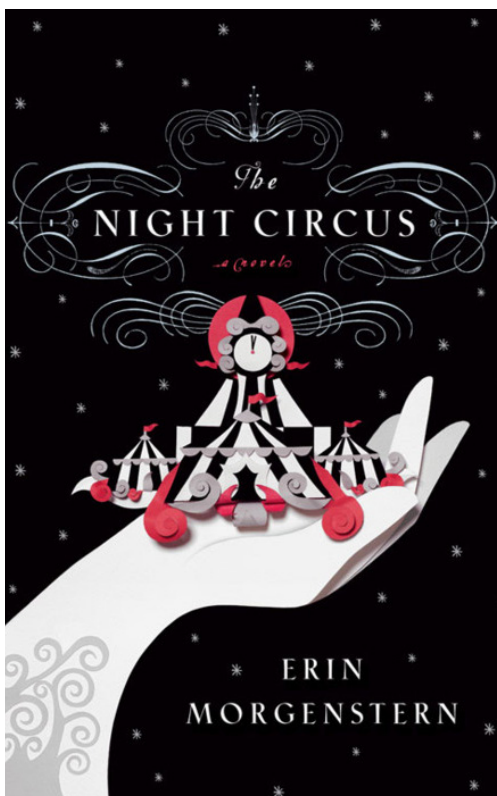
phors, allowing anyone who reads the book to take away some new knowledge and insight from it, whether they've studied biology or not.

What I liked most about the book is how infectious Dr. Lane's enthusiasm for science is. He's poured it into every page, and that very enthusiasm grabs you when you start reading the introduction. He talks about how inscrutably beautiful the world and its creatures are, and how science is an attempt to understand that beauty. He concludes on a similar note, and this, I feel, makes the reader genuinely interested in what he has to say. He talks straight to the reader, attempting to make us understand why he loves what he does, and that makes the book special. I can't recommend it enough to people interested in the history of life and how it has come to be what it is.



The Night Circus

SAUDAMINI V



The Night Circus, written by Erin Morgenstern, is a tale of magic and fantasy, of two people united by rivalry and by love. The author narrates a simple story embellished with beautiful imagery, of two individuals unknown to each other, bound by an inescapable contract and pitted against one another in a most unlikely arena. Morgenstern captivates you by her narrative, as you find yourself weaving back and forth through time, places and people, only to find yourself back to the very beginning. The prose is sheer poetry, it flows gently in places, gushes as a waterfall in others, taking you by surprise as it disappears without warning only to appear somewhere in the past. The plot, the characters are belittled, however, by the imposing presence of the the Night Circus that leaves you

simply spell-bound.

"The Circus arrives without warning.
No announcements precede it...
It is simply there when yesterday
it was not."

You see the monochrome tents of the Circus, you smell the caramel in the air and you hear the crowd shuffling in the soft grass, yet your imagination finds itself dissatisfied. The Circus dazzles you, awes you, terrifies you. Despite the breathtaking sights and smell, you are never at ease throughout the book; ever aware of a dark undercurrent.

Read this book for its narrative, the magic and the Circus that challenges your fancies and as it ends, leaves you wishing for more, leaves you disappointed.

geneEXPRESSION



the students' corner

To Be Human Is To Err

SHRUTI PARANJAPÉ

Utopia. How many times have we come across this word and floated past it without a second thought. But is it really as light a word as all that?

When you say it, you feel fancy. "I dream of a utopian society – one free from crime, injustice, discrimination and distrust." Many big words in that sentence. Is that really what you want, though? What will a truly utopian society be like? One devoid of injustice and discrimination – a society where everyone tells the truth and has equal opportunities.

Since people love simplicity, let's look at the simplest definition of a utopian society – one in which everyone does the right thing. Where the right thing to do in any situation is the thing that will lead to the most happiness. Skipping the usual discussions of what happiness is, let's assume that you have a list of the right things to do under various circumstances. If everyone always did the right thing under every circumstance, then you'd know exactly what they'll do under every circumstance. In other words, total predictability.

Another prominent item on the wishlist is "Equal opportunities for everyone." So why doesn't this happen? Children born into different families have different opportunities because their families belong to different economic backgrounds and their parents have different talents. The most obvious, slightly communist solution is "Equality of labour". Everyone, regardless of what they do, gets the same pay.

Say this is achieved without any strikes or riots. The second issue to deal with is the varying talent of parents, since parents play a huge role in the upbringing of a child. The

only way to deal with this is to have a society with equally trained people. But then again, what about beauty and other hereditary things? So it comes down to this - everyone has to be more or less equally beautiful,

"Without error, without mistakes, and biases, and the little, unpredictable, uninvited bursts of negative emotion, humans aren't human."

healthy, athletic, etc. to the point that it doesn't change the opportunities of their child.

But was that what you wanted? A predictable society with similar people?

What went wrong during the course of this article? I did not consider what it means to be human.

In the course of creating a discrimination-free and morally-upright society, I lost the essence of being human. Maybe he who said "To err is human" meant it a little differently. Maybe it wasn't meant as a way to console ourselves when we make mistakes. Maybe it means that error is the essence of being human. Without error, without mistakes, and biases, and the little, unpredictable, uninvited bursts of negative emotion, humans aren't human.

I'm not saying that our present day society is perfect and that we should let injustice and discrimination thrive. Far from it. Society is bursting at the seams with terrible things that should not happen. The only thing to

work towards is abolishing injustice and discrimination socially, and the only thing to promote is morality and truth. And while we do so, there'll be many pessimists who say, "You're never going to achieve a utopian society." That's when you say "Maybe I don't want to", and get back to helping the society.

They're right though. A truly utopian society is so improbable, that you can think of it as impossible. And all I'm saying is that maybe that's not a bad thing at all.

The journey is sometimes way better than the destination.

PHOTO OF THE MONTH



Clicked by:- Sharvaree Vadgama

gene EXPRESSION



the students' corner

Messy Dynamics

The invasion of a certain year is predicted by the Lotka-Volterra model. The formula is

$$\beta_{ij} = \alpha_{ij} / a_{jj}$$

where α_{ij} is the effect of j^{th} species on i^{th} one, and a_{jj} is the effect of species j on itself.

Invasion criteria is that $\beta_{ij} > 1$, meaning that $\alpha_{ij} > a_{jj}$, which implies that the j^{th} species is affecting the i^{th} species more than they're affecting themselves. β_{ji} is defined similarly. If $\beta_{ij} > 1$ is fixed, the dynamics of the system will depend on β_{ji} , i.e. if it's greater or less than 1.

Let the 1st year be defined as species A, and the 2nd year as species B.

The classes of species A finish at 12:30 pm, while the species B have classes early in the morning, which are over well before 12:00 pm, except freak circumstances. So, this is not a limiting quantity.

Species B can have food anytime after 12:00 pm, but their eating time is limited by the mess opening time, i.e., 12:30 pm. Species A resume classes at 2:00 pm, while species B resume classes at 1:30 pm. So species A have an hour and a half in which to have lunch. Species B have to eat food in the one hour interval they have.

Species A and B come to partake lunch at 12:30 pm. Since species A have lesser effect on each other (because they have more time avail-

able) as compared to their effect on species B (because they have shorter time available), we have the following inequalities :

$$\alpha_{21} > a_{22}, \text{ and so } \beta_{21} > 1.$$

When the resources common to both are limited, i.e. the mess lunch hours and space, it leads to competition, and depending on the other dynamics i.e. β_{12} , coexistence is possible. But most probably, extinction of species B will occur (three out of four cases in Lotka-Volterra Competition Model lead to exclusion).

Conclusion: Species A is invading species B, indirectly.

Discussions: If coexistence has to occur, either mess needs to open before 12:30 pm or classes need to happen later than 1:30 pm for species B.

Author's Disclaimer: Many premises were considered while reaching the conclusion, which the author believes are not false according to his immediate knowledge. Anything wrong can be corresponded to the author via the editors.

Editors' Disclaimer: Sentience is not responsible for any logical inconsistency or non-trivial implicit assumption made in the above article.

The 2nd years shall be missed. Amen.

QUATER

Foodie Corner

AASHAY PATIL

One of the downsides of living away from home is that you miss home-made food. As is clearly evident, South Indians constitute a majority of the IISER population (conservative estimates peg the number at 50%). Hence, understandably jaded by eating Thursday's breakfast item in the mess (which they call *Uttapam*), they must be longing to savour some of their favourite culinary delights.

One such restaurant with 'authentic' (I am not a South Indian, this word is based on the reviews by my friends) South Indian cuisine is **South Indies**. It has a potpourri of dishes from all four South Indian states. It is also a good place for non-South Indians who think that South Indian food starts with *idli* and ends with *dosa* or *uttapam*.

For starters, I would suggest *Mokka junna miriyalu fry* (deep fried babycorn marinated in spices). For main course, the items you should definitely try are *Neer dosa*, *masala podi appam*, *veechu parota* and the *Udipi Kai Kuruma*. It has a slew of attractive desserts as well, but I haven't tried any. There are also attractive lunch and breakfast buffets and special attractions during South Indian festivals like Onam. The restaurant is slightly on the expensive side, but is worth a visit, both by South Indians and non-South Indians.

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THE SENTIENT BEINGS

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