



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, तिरुपति  
Indian Institute of Science Education and Research, Tirupati



# DEWANI 2017



# Editorial note



“I open at the close”

The words emblazoned on the golden snitch resonate with our creative abilities. It is said that it is only under tremendous stress and pressure does something as black and dull as coal turn into an object of beauty and adoration, a diamond. Such is the story of Dhwani 2017. But this is only the beginning.

‘Dhwani’, a Sanskrit word, means sound, echo or voice. Indeed it is a fitting name for our student managed annual magazine. Enclosed in these pages, between the covers and on it, lie the sounds and voices of the 120 students in the form of writing, pictures and art. It contains club reports, event reports, personal anecdotes, poems, prose, sketches and photographs. Among other things in this year’s edition of the magazine, we have a special section that will definitely appeal to the smartphone generation. We hope you will enjoy it.

Dhwani 2017 is bigger, better and far more informative (and entertaining) than its predecessor. Getting it to be this way was no easy job, but this time unlike last year we were more organised. We had a plan. The enthusiastic students from both the years formed the editorial team. The team was divided into 5 committees, the article compilation committee, the proof reading committee, the arts committee, the technical committee and the organising committee. Each committee was assigned specific tasks and was given flexible deadlines. In the end we made it. We didn’t take the path we planned on going, there were diversions, roadblocks and U-turns but we persevered and moved forward to our final destination.

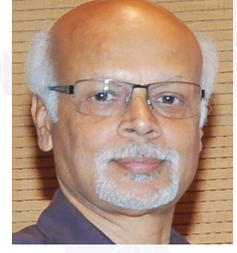
None of this would be possible without the support of the Director, the Dean, the faculty, administrative staff, the printers, and all of those who have helped in whatever little way to make this magazine a success.

So we present to you, oh reader, the culmination of a united effort, the manifestation of a grand idea, the sound, the voice-

## DHWANI 2017



# Director's Message



I am glad to know that the second edition of Dhvani, the student magazine of IISER Tirupati is being released on the occasion of 2nd Foundation Day of IISER Tirupati. Students are the heart of IISER Tirupati and apart from academic excellence, they come with lot of creative, literary, and artistic talents. Imparting complete education by Institute involves unearthing these talents, nurturing and encouraging them. The IISER Tirupati student magazine “Dhwani” allows unabated expression of such talents of students. Let it be expressed in a bold, courageous and imaginative manner, in whichever language, whichever form – prose, poetry, photos, paintings, or cartoons. Not just the students, “Dhwani” should be a medium for expression of creative feelings of the complete IISER Tirupati community including the faculty and the staff.

“Dhwani” should become the proud trumpet of IISER Tirupati; may its sound be heard loud, far, wide and forever.

My best wishes



K.N. Ganesh.

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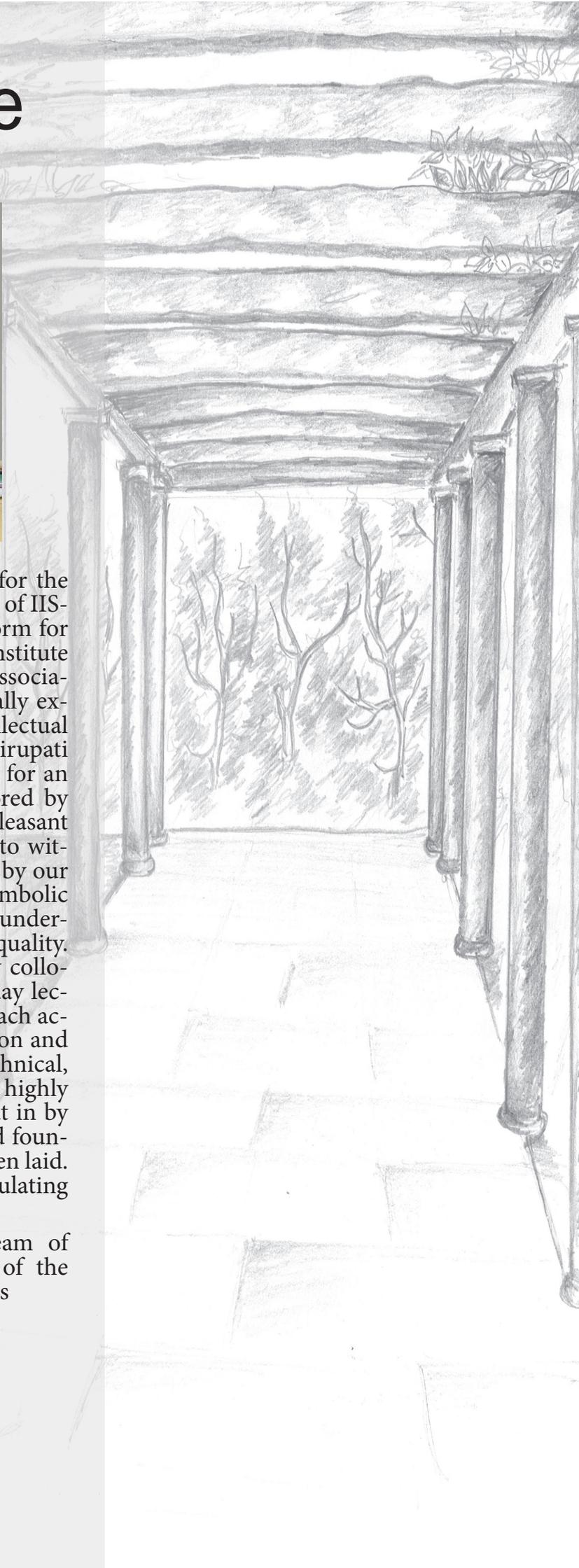
# Dean's Message



It gives me great joy to write these few lines for the second edition of “Dhwani”, a students’ magazine of IISER Tirupati, which provides an important platform for the bright and inquisitive young minds of this institute to express their creative talents. In the short association I have had with this institute, I am personally extremely impressed by the very high level of intellectual atmosphere that exists on the campus. IISER Tirupati is a home to highly motivated students aspiring for an exciting career in science, nurtured and mentored by equally motivated and committed faculty in a pleasant and friendly eco-system. It has been a pleasure to witness the enthusiasm and commitment displayed by our students and faculty in carrying out activities symbolic of IISERs, viz. scientific research and teaching at undergraduate and postgraduate levels of the highest quality. The level and quality of participation in weekly colloquia, science quizzes, student projects, science day lectures, scientific models for science day and outreach activities all stand testimony to this. The cooperation and help extended by the administration, library, technical, kitchen, house-keeping and other support staff is highly commendable. Thanks to the untiring efforts put in by the mentoring institute, IISER Pune, a rock solid foundation for a world-class scientific institute has been laid. Personally I am grateful to be a part of such stimulating and challenging environment.

I would like to congratulate the entire team of Dhwani for bringing out the second edition of the magazine which I am sure will provide joyous reading to all.

-Sudha Deshmukh.



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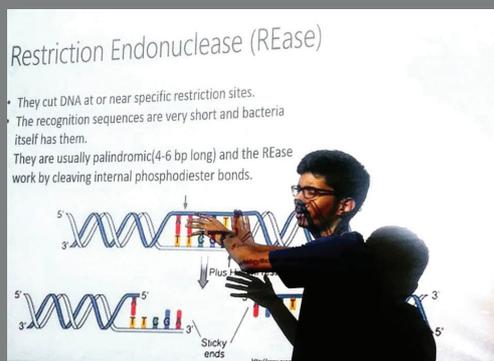
# Shemushi

Shemushi is IISER Tirupati's Quiz Club. Every Wednesday students eagerly gather in Classroom 1 by 8:30 pm to take part in quiz events. Quizzes are conducted on interesting topics like Contemporary Science, Mythology, Fashion, Literature after 1800, Cricket, Indian Scientists, etc. Each quiz also contains questions from Current Affairs of the previous week. We began our year with an interesting Independence Day Quiz which introduced the club activities to the freshmen and gave them a glimpse of Quiz Club activities. There was a Mega Science Quiz on Science Day, which was purely based on Science. The winning teams were rewarded with cash awards. There was a General Open-House Quiz conducted by Quizmaster Urmila Laksmanan from Karnataka Quiz Association on 20th November. The members of the Quiz Club are Abiya R, Akhila Ajith, Karthick Srivatsan, Mrugank Devendra Dake, Narola Harsh, S Nihar, Ranadeep Roy and VC Thamarai Valli guided by Dr.Raghunath Ramabhadran.



-Abiya R

## Bio-wissen



Every Wednesday evening, interesting talks are delivered on topics related to biology by students as well as faculty. These talks are followed by interesting discussions. The club is best for students who wish to explore the subject beyond the limits of the syllabus. We have had Dr. S. Sridhar From IMSc and Dr. Arnab Gupta from SN Pradhan Centre for Neuroscience, who lectured on patterns in biological excitable media and ATP7B, respectively. We also had Dr. Anutthaman Parthasarathy among us who spoke about unusual enzymes in the anaerobic world. There have also been discussions and talks on the ABO system of blood grouping, Mass spectroscopy, coral bleaching and restriction and anti-restriction modification

systems. This club is successful because of the efforts of Dr. Vasudharani Devanathan.

-Jalaja

## Science Club

Every Tuesday evening, talks on interesting topics are given in the science club. We had talks on topics across various disciplines like Bird Counts, The Measurement Problem, Sky islands, Physics of Table Tennis, Congruences Classes, Sine and Sn functions, Radio Astronomy, Murphy's Law and Anthropic Principle, etc. Both students and faculties enthusiastically participate in the science club activities.

-Abiya R

## Sports Club

IISER Tirupati Sports club conducts sports events and games during the semester and is aimed at encouraging students to take up sports as a part of extracurricular activities and also, just to have fun sometimes. We believe that sports and exercise play a vital role in our shaping our personality and maintaining our health and thus, an active participation on the part of students is encouraged.

The Sports Week is held every semester in which students form teams amongst themselves and play football, cricket, basketball, and other games including chess. The Sports Club also engages in the formation of the college sports teams by conducting selection trials for various sports. These sports teams represent IISER Tirupati at various tournaments including the Inter IISER Sports Meet (IISM). The club had sent a strong 60 member contingent to IISM 2016 held at IISER Kolkata and is immensely proud of their performance which resulted in IISER Tirupati winning 6 medals- 2 Gold, 2 Silver, 2 Bronze. The club also invites other colleges like IIT Tirupati to its events and has conducted cricket and football matches with them. The club believes in teamwork and would like to thank the students for their amazing enthusiasm and active participation. The club would also like to thank Dr. Subhash and Dr. Raghunath for their support.

The club's activities have been very exciting till now and it hopes to keep the excitement going.

-Adithya and Anubhav

## Unnati

The first outreach effort from students and faculty members of IISER Tirupati took off on Science day, 2017. School children from Karakambadi visited our campus, and the science experiments/models on display were explained to them. They were briefed about science and research and the IISER mandate by our faculty, following which they were asked to write an extempore essay on "What is science For you?". BS-MS students motivated them to consider science as a career option by discussing their path to IISER. In the same spirit, caps with the IISER logo and English dictionaries were given as a takeaway. Seedlings of different plants were also given to encourage them to go green by



the members of Unnati and Prakrithi. Soon, we would like to go to the school to explain our models/experiments and discuss science with the students. In parallel, we plan to empower them in computer usage to ease online application systems followed by Government scholarships schemes such as KVPY and INSPIRE.

-Aditya Kulkarni

## Movie Club

The movie club at IISER Tirupati usually screens a movie once a week. The adopted method is to stream movies from online providers like Netflix, Hotstar and Primevideo. Every week the movie club student coordinators come up with a movie based on recommendations and availability and it is screened. We have screened a variety of movies like Zootopia, Coraline, The Wolf of Wall Street, Good Will Hunting, Talwar, Nueve Reinas as well as some regional movies like Bangalore Days and Nannaku Prematho. We also did a 'The Lord of the Rings' screening on three consecutive days just before the Inter IISER Sports Meet. It goes without saying that the Movie Club is one club which will never lack for an audience.

-Kaushal Pillay

## Arts Club

The Arts Club was started with an aim to create a platform for fun and enjoyment amidst the stress of studies. It tries to bring out the hidden singer, actor, painter and dancer in us. The club contained other sub-groups like the music team, the drama team and the dance team.

The club is active in organising major events like Foundation day, Onam celebration, Independence Day. We also organised small scale events during the semester. Recently some games like Lagori, KhoKho, Langri pani were held and many boys and girls actively participated in it.

Although the club started late, a lot of people have shown interest.

The club hopes for active participation and to do crazier stuff.

-Shubham Sinha

## Prakrithi

“ Be the change that you wish to see in the world.”

-Mahatma Gandhi

Protecting the environment is the primary requirement for the existence of humanity. A clean and green environment is the need of the hour, and each one of us has a responsibility towards it. Our eco club “PRAKRITHI” was started with the aim to spread awareness amongst the students about the importance of protecting the nature and preserving life. The activities of our club are aimed at helping students get closer with nature. These include bird-watching sessions and other excursions. We’ve initiated vegetable farming in campus and also distributed vegetable saplings to school students. We hope to achieve a lot more in the future and to play our part in protecting nature.

-Harikrishnan C P

## The Lit Club

The Literary Club at IISER Tirupati meets every week, usually on Tuesdays. Membership of the club is open to all. The club conducts debates, JAM sessions, and discussions on passages or verses- where all members are invited to share their myriad and extremely interesting interpretations. All events are not so serious, though- the club also spends evenings playing games like Pictionary and Charades! In addition, the Literary Club also hosts a blog at [www.itsalmost12.wordpress.com](http://www.itsalmost12.wordpress.com), wherein the members’ contributions are put up on a regular basis. Moreover, we at The Lit Club have begun an initiative that we call the ‘Stud Library’- essentially a student library, where all students are encouraged to contribute and read books (preferably not textbooks, though!)

-Revathy Menon

# ITAC-Astro Club



ITAC is IISER Tirupati Astronomy Club. It was started on 11th September 2016. Depending on the weather, there are Skywatching sessions arranged on every weekend (mostly Fridays). A workshop was organised on “Basic Astronomy and Telescope Making” in 2 parts during 11th - 12th September 2016 and 4th -5th February 2017. It was jointly conducted by IISER Tirupati and IUCAA Pune, during which we had hands-on sessions on telescope making and assembling. Informative and highly motivating lectures on various topics related to astronomy were given by Dr. K.P. Yogendran (IISER Tirupati), Dr. Nirupam Roy (IISc, Bangalore), Mr. Samir Dhurde (IUCAA, Pune) and Mr. Tushaar Purohit (IUCAA, Pune). There were interesting sky-

watching sessions and a workshop on Grinding of mirrors and polishing to help build our own telescope that instilled enthusiasm amongst students interested in Astronomy. Some of our members are active participants in the Indian Sky Watching Array Network, which provides hands-on experience to students through their direct and active participation starting from the design stage to research using the array network. Some students also had hands-on training in Radio Astronomy from Gauribidanur Radio Observatory (October, December) and Ooty Radio Telescope (In summer) under the guidance of Prof. Avinash Deshpande from Raman Research Institute, Bangalore. On 3rd March 2017, we had an amazing lecture on Pulsars by Prof. Avinash Deshpande followed by interactions with students. On Science Day, we organised a skywatching session and talks on Basics of Astronomy. All the events were arranged and coordinated under the valuable guidance and support of Dr. Bhas Bapat and Dr. Sudipta Dutta.

-Abiya R

# The Math Club

“Mathematics is the most beautiful and most powerful creation of the human spirit.”

-Stefan Banach

It is no wonder that there are students interested in studying the subject of Mathematics in further depth than what is being thought in course lectures. For these students, there is a solution that the IISER Tirupati has come up with- ‘The Math Club’. In this club founded by Dr. Subhash, students read about a particular topic that interests them and present it on a weekly basis to other students who are willing to learn about the same. Students who are interested in presenting to a general audience are also welcome to do so and there have been three such talks till now. Students have been reading about some interesting topics like Sequence and Series, Group Theory, Metric Spaces, Four-Square Theorem, Differential Geometry, etc. The math club is growing year after year with increasing student participation and more activities in store for the future.

-Karthick Srivatsan

# AN ACCOUNT OF MR. FRESHER 2016

It was 14th August and my only objective was to have fun and be a part of the Freshers' day. We were asked to perform if we were interested in performing and since I had a flair for singing I wanted to do something. I heard some girls were gonna sing and being extremely shy, I sent Dibya (my roommate) to talk to them.

Apparently, I had to give an audition to Aisha and Revathy to get selected. Dibya and Aditya also joined me and we formed a group. After 5-6 hours of drama and practice, we finally came up with a 6-minute performance!

We gathered in the seminar hall for the event and I was very nervous as it was my first performance. There was a large crowd of students and teachers and it was very scary! Revathy, Aisha and I performed in the beginning. It was a mash-up of Bol do na zara, Jashn-e-Bahara, etc. I was relieved to hear the audience clapping. After another performance by Aditya, Dibya and Revathy, it was time for the seniors to announce the nominees for Mr and Ms Fresher title. The first name that came was Dibya's. Then the impossible happened. The next name was MINE. Then Aditya, Anushesh and Rohit also got selected. From the girls, it was Akhila, Gayathri, Sweta, Mizna and Meera. Again I had to face the crowd. Did God forget that I was shy?

We were sent to the last row and had to 'ramp walk' up the stage to all sorts of comic music that the seniors played. When all of the contestants were on the stage we were made to take a pledge to thoroughly embarrass ourselves in front of everyone. We then had to dance to some crazy music. The audience were literally dying of laughter while we showcased our weird moves. After all these elimination rounds only Dibya and I were left, along

with Meera and Gayathri. The next competition was to speak on a given topic and also tell others why I wanted to be Mr Fresher. I thought, "Oh, come on! FIRST Mr Fresher of IISER Tirupati, that's gonna be fun!"

We next had a 'Treasure Hunt' in which everyone participated. We grouped up and based on a number of vague clues, we went through the institute searching for our treasure. As far as our team was concerned, we could not even find the first clue.

We then went to the basketball court wherein the announcement was to be made of the Mr and Ms Fresher competition. My heart went supersonic as the audience cheered and my joy knew no bounds when they announced that it was me. ME! THE FIRST MR. FRESHER OF IISER TIRUPATI! Meera won the title of Ms Fresher. We got a sash and a gift and all the students were busy taking pictures. I felt like a celebrity! I felt awesome! During dinner, Meera and I cut the Mr and Ms Fresher cake while all of my friends asked for a treat. Then we danced to the sick beats of the DJ on the basketball court and that night was unforgettable.

It was one of the best and most memorable days of my life and all the credit goes to the seniors who took the pain of arranging all this for us. I learnt one important lesson, that the uncertainty principle is not only applicable to quantum systems but also to life. You can't predict anything with 100% certainty. The past is gone and the future is yet to come. So let's have all the fun we can while we are in the present. I hope we will be able to give our new juniors a better and grander freshers' party next year and hope this tradition continues forever.

-Tushar Ranjan Satapathy.



# VISIT TO SATISH DHAWAN SPACE CENTRE

We got ready by 7.30 in the morning and got onto the bus to go to our destination. Google maps showed 2 hours 19 minutes of travel time. We had 2 buses, 50 people per bus, and we transited through highways surrounded by fields, hills, dried up rivers, and villages. The bus in which I was sitting had a tyre punctured in the middle of nowhere and we were delayed by about 20 minutes.

We crossed the Pulicat lake and saw pelicans or should I say one lone pelican! Finally, we reached the island of Sriharikota. It is called SHAR (Sriharikota High Altitude Range). It is the place where breakthroughs in space missions have taken place, and where history is made every day. It is here that the famous Chandrayaan and Mangalyaan missions took place.

It was a high security area with check posts at every point. Mobile phones, cameras, laptops, tablets or to say, no electronic devices were allowed in. Food too was not allowed. We went to the library building where we submitted all our belongings and headed to the auditorium where we were shown a movie on India's progress on the field of astronomy and space missions. It was around 1 when we had our lunch-roti, rice, sambar and an exceptionally tasty chutney!

Next we were taken to the mission control building. The building was on an elevated area and looked just like the Star Trek USS Enterprise without its propeller. More precisely it was like a UFO on a hill. We had to take off our shoes before entering, as there were a lot of sophisticated devices inside. It had rows of computers with various names- Mission executive, Chairman, Launch Authorisation, Programmers and many more. We were told about the various functions of various instruments and also intimated about the critical role each member in the room played.

Next we moved on to the Second Launch Pad (SLP) which was this humongous structure which supports the vehicle during its launch. It was awesome to view such a thing from so close. We also visited the First Launch Pad (FLP) which was quite similar. During the whole journey we saw tanks labelled as "explosives" and speculated them to be rocket fuel!

We also got a glimpse of the beach which was being patrolled by the navy. We could not go there due to lack of time. We concluded our visit by visiting the "Space Museum" which housed various models and prototypes along with informative bulletins.

On our way back to the institute we stopped at the Pulicat Lake to treat our eyes with the colourful view of sunset. The rest of the trip was quite uneventful as I slept in the bus dreaming about sitting in the launch vehicles and getting launched to some distant planet.

-Dibya Saha.



# VIJYOSHI

2k16

Every year Indian Institute of Science, Bangalore conducts its national level science camp where the crème de la crème of intellectuals gather for some intense scientific discussions and seminars. This year the dates of the camp were from the 3rd to the 5th of December. 25 out of 70 IISER TPTians were selected and I was one among them. We boarded the Sheshadri express on the 2nd which took us to Bangalore. No sooner did we get off the train than our front cameras got busy. There was a bus waiting for us at the station which took us to the campus from where we registered ourselves. The KVPY (Kishore Vaigyanik Protsahan Yojna) office which is in charge of this camp gave us a t-shirt, a bag, a pen, a writing pad and a bottle of water. After that, we had our lunch at the IISC canteen also known as Prakruti. Our accommodation was at ISI (Indian Social Institute) which was about 17 minutes from the IISC campus.

## DAY 1

We were served breakfast at the campus. All our events for the day were to take place in the J.N. Tata auditorium. There was an inauguration followed by speeches by Prof. G. Mugesh (Convener, KVPY) and other officials of IISC. Of all the lengthy speeches the only thing that I remember is that Vijyoshi came from the 3 words- Vigyan, Jyoti and Shivir.

The first lecture was by professor Rajesh Gopakumar whose lecture was titled “String Theory and Quest for Quantum Spacetime”. He delved into the realm of physics and discussed how the string theory provided a way to connect the quantum world to the vast relativistic realms of space-time. 1 hour 15 minutes of his interesting lecture seemed to pass off in minutes.

We had a photo session after the lecture for which we gathered at the open auditorium on the roof of the J.N. Tata auditorium.

The second lecture was by renowned mathematician Prof. K. Sandeep who spoke about differential equations. I am not a “math guy” but still I found his talk quite interesting, so you can well imagine how good the lecture was.

After a hearty lunch, we moved on to the third lecture which was on the bacteria *Helicobacter pylori*. The talk was given by Prof. D.N. Rao who spoke about RM systems, anti-RM systems, Microbiota, Microflora we harbor, etc. Thank god that I was reading Anna Collens “10% Human” a few days back.

This was followed by tea and a session on experiments by Prof. Anil Kumar who described science with the façade of a magic show. His lecture was interrupted frequently by the roaring applause of the audience who were dumb-struck with the awesome tricks he showed.

At the end of the day, my friends and I decided to go and explore the city. We went to Chung Wah, a Chinese joint for dinner. After dinner and fooling around in the streets of Bangalore we booked an Uber and accompanied the girls back to their hostel. The girls had forgotten their way and we were stranded on a dark highway with a cranky Uber driver ranting away in Kannada. Kudos to the guy who invented Google maps.





## DAY 2

The schedule was quite the same. We had some time after breakfast, we decided to explore the 400 acre campus. It took us around an hour. Luckily our legs were with us when we reached the seminar hall for the talk titled “Toss of a Coin” by Prof. B.V. Rajarama Bhat. He spoke about probability, Kolmogorov formula amongst other things.

There was an experiment session by the students of IISC featuring a Gyroscope, Helium spectrum, chromatography, etc.

After lunch, we were enlightened about “Chemical Communication in Biology” by Prof. P. Balaram. His narration reminded me of Morgan Freeman describing astronomy-flawless and professional. His keen sense of humour grabbed the attention of the 500+ young audience sitting there.

The next session was the best session of my life. It was an experimental session entitled “Chemistry is Fun” by Prof. Uday Maitra. He actually proved the title to be true. He was enthusiastic, wore a tie with the periodic table on it, but at the same time he was also very cautious. With the help of his assistant, he went on lighting hydrogen filled balloons, demonstrating thermochromism, elephant toothpaste, properties of heavy water and the most fascinating were the reactions of chemiluminescence which took the whole audience by awe. By the end of his session I fell in love with his brain.

After serving the high tea, the IISC students presented a cultural program showcasing various dances like Bharatnatyam, Kathak, Odissi. There was a singing performance as well.

We returned to our hostel and then set out to the streets of Bengaluru once again. We walked past the Chinnaswamy stadium, the Hard Rock café, M.G. Road, a humongous iPhone 7 billboard. We had our food from the Burger King located at Shivajinagar.

We hailed an Uber back to the hostel at 11pm. This time the not-so-cranky driver was kind enough to lend us his aux cable and we literally turned the cab into a happening club...full on bass.

## DAY 3 (A.K.A. THE LAST DAY)

It was same as the others. I did not pay much attention to the lectures as I was half-asleep owing to last night’s tiring explorations. However, one of them was by Prof. Sriram Ramaswamy on active matter. The other was on natural acoustic communication network in various animals, especially crickets, by Prof. Rohini Balakrishnan.

We also had a laboratory visit to the various research labs in the campus. I was lucky to be allotted the biological department and learned a heck about cytometry, doing research on mice, etc.

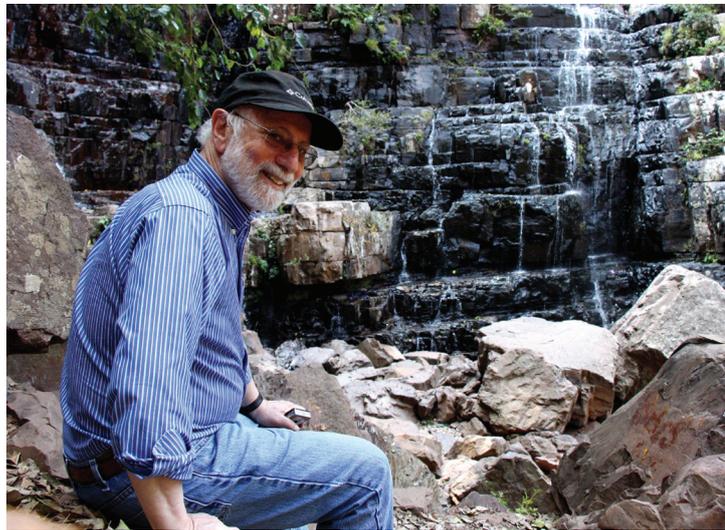
The camp ended with us collecting our certificates and group photograph and bidding our newly made friends goodbye.

My friends had their train the same day only but my flight home was on the next. We still had some time before their train left and so we decided to visit the nearby Sankey Tank. Then we parted our ways.

Right now, I’m fighting off the turbulence flight 6E 433 is facing by keying in this article and sipping on the overpriced can of coke at 35k feet above the Bay of Bengal..

# Interview with Dr. Steven T. Manson

Prof. Steven T. Manson is a distinguished atomic physicist who had made rich contributions to quantum collision physics, atomic and modular processes, atomic astrophysics and atomic and molecular spectroscopy. His works provide deep insights into the electronic structure of some atoms and understanding relativistic and many body processes in atoms. He is a theorist who works very closely with experimentalists. His expertise is sought to adjudge research proposals the world over. He also serves the board of referees for some of the most prestigious research journals including the Physical Review and the Physical Review Letters



Q: How do you like Tirupati?

A: The food is great, the hotel is great, the heat is not. It would also be better if there were more flights into Tirupati so it would be easier to get to.

Q: What drew you to physics?

A: I liked the idea of things being right because they agree with experiment irrespective of who says it. It doesn't matter who says it, it matters who's right. I like the idea of facts, of absolutes, and also liked the idea of it being completely international. That is very cool and leads to an understanding that goes completely across cultures. Science is science and no matter what your philosophy or religion says, it should be the outcome of a particular experiment, and if your religion or philosophy predicts something different it is wrong.

"If it was easy, it would have already been done."

Q: What are you exactly working on right now?

A: What I primarily work on is the interaction of radiation with atoms and understanding what happens, how it happens and why it happens and from that being able to devise cases which have not been looked at before.

Q: You've been teaching for a long time. What advice would you give to the younger generation of scientists?

A: One of the first thing I would say is go for it, it's fun, it's a great life. Each day you do something new, and it's not easy, if it was easy, it would have already been done. It's an intellectual challenge and there are rewards.... and you get to travel to different places.

Q: What do you do in your free time?

A: I like to watch movies and I read a lot, mostly history, non-fiction, because it interests me. I enjoy traveling. Most of the places I travel, I travel because of professional reasons and places we went to only because we were interested. Like about 8 years ago we went to Antarctica. We saw icebergs that would

dwarf this building! We saw penguins which were really funny. I've been to Nepal, seen Everest. We have 4 grandchildren. They are great fun because you enjoy them with no responsibility.

Q: When you compare academic teaching and research which do you enjoy more?

A: Overall I think I'd say research, because it is an intellectual challenge. But let me tell you, when I was a kid I wanted to be stand-up comedian but I didn't think I could make a living out of it so I went into physics. However, when I teach classes, I can tell jokes, not only that, each year I get a new set of students and so I can tell the same jokes.

"Science is science and no matter what your philosophy or religion says..."

Q: While growing up did you have any figure you idealised or looked up to in the field of science?

A: There were people, but nobody I knew personally, but the image of Einstein was a powerful one, he was a real smart guy and his job was to think. Holy cow! He got paid to think! Think about that! Nobody in my neighbourhood got paid to think, they got paid to work. He was a guy who got paid to think. That seemed incredibly cool!

Q: What does happiness mean to you?

A: Happiness is a journey not a destination. You are the happiest when you work toward a goal. When you achieve the goal, happiness is very transitory. Like for those of you who are sports fans, when your team wins, you feel elation for about 30 milliseconds and it's gone. However, rooting them on in the game is much better. So think of happiness as a journey.



# IISM 2016

To recognize the sporting talent within, all the IISERs participate in an annual sporting extravaganza, conducted by one amongst them, that goes by the name of INTER IISER SPORTS MEET aka IISM. IISM 2016 was held at IISER Kolkata, and IISER Tirupati participated for the first time.

We were all excited and pumped up, ready to represent our institute at the event and thus began the formation of our first football team, first basketball team, first volleyball team, first table tennis team, first badminton team, first chess team and first athletics contingent. The feeling of being the first both lifted us up and weighed us down as we had no idea where we stood. 60 enthusiastic students (both boys and girls) were part of the contingent which travelled to Kolkata to play. We were accompanied by Dr Vasudharani and Dr Subhash who were the faculty coordinators of the contingent along with members of the administrative staff – Mr Nagarjuna, Mr Ramesh and Ms Nikhilashri without whose efforts the trip would not have been possible. We left for Kolkata on December 7th in a train and reached by nightfall on 8th and were allotted hostel rooms thereafter. The weather was cold but the atmosphere was exhilarating. The place was buzzing with activity as students from all IISERs were already there, wearing their multicolour tracksuits, bearing the IISER name and logo, practising for the upcoming competitions. The playing areas were ready and with all the lighting, we felt like we were part of some mini-winter Olympics. So, the meet kick-started on the 9th of December, 2016 and the teams and individuals clashed against each other for ultimate glory. The next four days were full of action, struggle, pain and joy. The sporting displays were a delight to watch and we soon realized that there was no holding back here. We supported our own boisterously and the experience of being part of a unit was amazing and one to remember. In the team sports, we played and performed as best as we could; though it was not enough all the time, but it was the experience we took back with us so that we could fill the gaps and return stronger next year. Our hard work and talent finally bore fruit as it was in athletics that IISER Tirupati shone and won its first ever medals in IISM. We won 6 medals in total: 2 Gold, 2 Silver and 2 bronze. Revathy Sajeev came out on top in 100 meters running and also bagged a silver and a bronze in 200 meters and 400 meters respectively, and Thamarai Valli won gold in 200 meters running and a silver in long jump. The two teamed up with Akshara Vincent and Akhila Ajith to win a bronze in 4×100 m relay event. The meet concluded on 12th December, 2016 and the medal distribution ceremony took place later that day. It all ended with a DJ night and a special dinner for the hundreds of participants. IISER Kolkata proved to be a wonderful host and we congratulate them for their immense hard work in organizing such a big event.

Even though we went back home with sore muscles, we had a wonderful time competing with the very best among the IISERs and are eagerly waiting for the next edition of IISM to showcase our skills once more and play.

-Anubhav.



# BIRDWATCHING FOR THE GREAT BACKYARD BIRD COUNT

It was a warm morning on Saturday, the 18th of February 2017. Most of us would have been in bed, sleeping away the weariness accumulated over the long week of work—but on that morning, two ecologists, a biologist, a mathematician, a high-energy physicist, a Siberian Husky and bunch of excited undergraduates were awake. Why? To count birds of course.

The 20 scientists (and would-be scientists) from IISER Tirupati were participating in the GBBC. The Great Backyard Bird Count is an initiative by the Cornell Lab of Ornithology and National Audubon Society to encourage the citizens of the world to collect data about wild birds. It takes place over a span of 4 days, and in 2017, it was between the 17th and the 20th of February. About 160,000 people from over 130 countries counted more than 5600 species of birds.



Our troupe of amateur birdwatchers led by ecologists VV Robin and Nandini Rajamani went out to a plot of natural scrub forest in Yerpedu 30 km away from the temple city of Tirupati. We reached there while the sun was still low in the sky. As soon as we deboarded the bus, we could immediately see and hear the rich diversity of birds. We could identify the loud black crows that sat on power lines that ran along the road, a flock of egrets flying over some trees in the distance, a kite flying way overhead, koels calling in the direction we planned to go. For those birds that we couldn't readily identify, we used the binoculars and bird books we were all readily armed with.

We first encountered a strange little bird that was flying vertically up and down over a little area, chirping while doing so. It was a bushlark. Its peculiar flight pattern was a little dance it did to attract mates, or to stake its territory, or both. As we moved onward we saw a bunch of red-vented bulbuls, a tree with about 7 black drongos on it, a few barn swallows too. Some birds were harder to see, like the Indian robin, Eurasian collared dove, spotted dove and the Indian roller. We think we saw an uncommon bird too—a Jerdon's Bushlark.

I guess the most exciting part was the "wild goose chase". Someone spotted a rather large bird. At first glance, it looked purple. That was all we could see before it decided to fly away to a grove of mango trees. We were all running frantically behind it, trying to direct each other's gaze toward this strange bird. All of us assumed different positions on the ground, spread out in a circle around it. We were so close. But it was all in vain, the bird was too fast, the mango leaves too many, our legs not agile and our eyes strained. It got away. I guess that which is most beautiful dislikes being seen. It was okay, the many mangoes that we plucked weighed our bags down and lifted our spirits again.

We came back to the institute after about two hours of birding. We all ate breakfast together at one table talking about all the birds we saw—a total of 14 species—and the things we went through to see them. Birding brought us all together and taught us so much. We all left the canteen with great stories to tell and experiences and knowledge to share. We felt accomplished and proud for being a part of a worldwide initiative to go out and see our feathered friends who live closer to us than we realize.

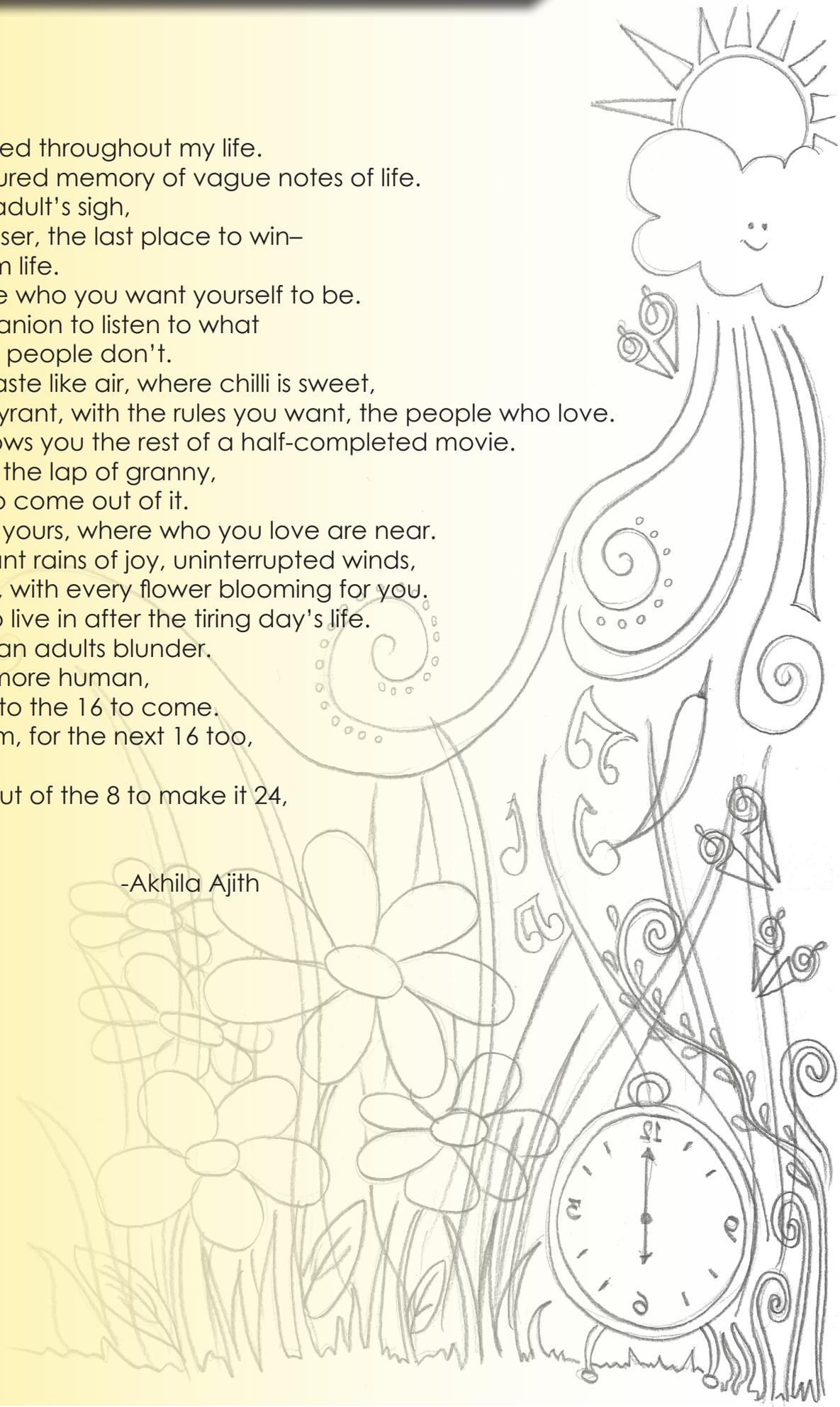
As far as me and my undergrad buddies were concerned, and I'm sure they'll agree with me when I say, it was definitely a great way to spend a Saturday morning.

-N S Chiranjeevi

# Monologue of a Professional Dreamer

I dreamed, I dreamed throughout my life.  
The dreams- a treasured memory of vague notes of life.  
A child's reality, an adult's sigh,  
The last resort of a loser, the last place to win-  
Everything back from life.  
The La La land, to be who you want yourself to be.  
The peaceful companion to listen to what  
the heart says, while people don't.  
Where ice creams taste like air, where chilli is sweet,  
Where you are the tyrant, with the rules you want, the people who love.  
The place which shows you the rest of a half-completed movie.  
Where you sleep on the lap of granny,  
who vowed never to come out of it.  
Where all the love is yours, where who you love are near.  
The place of incessant rains of joy, uninterrupted winds,  
With all exams yours, with every flower blooming for you.  
The perfect place to live in after the tiring day's life.  
The child's wonder, an adults blunder.  
A thing to make us more human,  
An 8 hr preparation to the 16 to come.  
If you live your dream, for the next 16 too,  
You are the one.  
If you never come out of the 8 to make it 24,  
You are the wind.

-Akhila Ajith



# SMALL THINGS ARE NOT THAT BAD

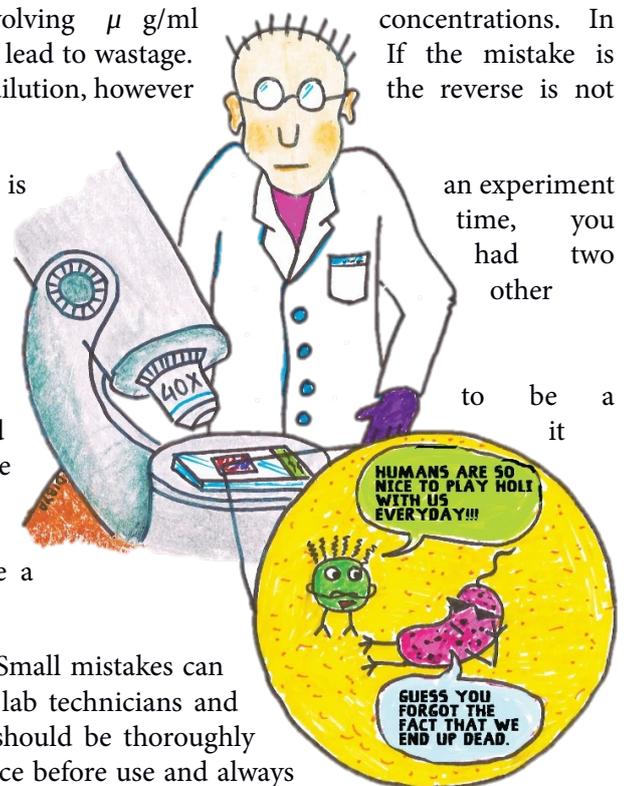
**W**e started our BIO112 (practical) course with Microbiology. I guess that's because the skills we learnt in this course were important in other branches of biology too. We started off with the physics of microscopy. We learnt how to assemble a compound microscope and I feel that it is always better to start from the most basic microscope and then move on to the high-end ones. This way, we will have no problems adapting to other lab environments. The first experiment we did was the Hanging Drop experiment wherein we observed microscopic life thriving in the lake water near our institute. We could see *Daphnia*, *Volvox* and a lot of diatoms.

Next was the preparation of culture plates by streaking and spreading. We also did Total Viable Count (TVC). The sample we used was *E.coli* and the medium was MacConkey and LB Broth. What I learnt from the experiment was the need to handle a lot of things at a time – managing a Petri plate with its lid slightly opened and the cotton plug of the autoclaved Erlenmeyer in one hand while you pour hot melted agar on the plate with the other hand and all this inside a Laminar Flow Chamber that's been thoroughly wiped with Ethanol and irradiated with UV. Maintaining a sterile environment should be a microbiologist's mantra, and a microscope his best friend! If you sneeze or talk while doing an experiment, you will see results going haywire.

While doing TVC, I did not get consistent readings. Now when I look back, I realise that it's because I did not learn to pipette properly- another art which every biologist must try to master. Learning to prepare solutions is another important thing because you will always encounter situations where you have to prepare buffers and media of a particular composition with a limited amount of reagents. In such cases, it is necessary to calculate volumes which ensure minimum wastage and maximum accuracy. I have encountered preparations involving  $\mu$  g/ml concentrations. In such scenarios, dilution plays an important role and any mistake will lead to wastage. If the mistake is that of a 'high concentration' then it is always possible to rectify it by dilution, however the reverse is not very easy!

Gram staining is another landmark in microbiology experiments. It is to distinguish bacteria based on the structure of their cell wall. Over time, you learn lab-hacks and feel curious to try them. In my case, I always had two other versions of an experiment- one using the teacher's method and the other would be my method (be careful if you are handling dangerous chemicals). The problem that most of us faced during the microscopic observation was - "Is it violet or red or purple?". It used to be a complete mess. What I did was, just after the ethanol wash, I observed under the microscope. If any stained structure was visible, the sample had gram-positive specimens otherwise, it should be gram-negative (provided I did not wash off the sample!). Then after the safranin staining, if the number of stained structures increased, it must be a mixture of the two types.

Working in a lab is fun but at the same time, one must be careful. Small mistakes can create havoc and it is always profitable to follow the advice of the lab technicians and teachers. Attention should be paid to small details and log books should be thoroughly maintained. Most importantly, never forget to tare your digital balance before use and always wear your gloves!



- Dibya Saha

A normal human on an average sleeps around 8 hours a day i.e. we spend one-third of our lives sleeping. Research also suggests that sleep helps in memory improvisation, concentration and proper and well-sustained bodily functions. Thus sleep becomes an important part of our life.

The sleep-wake cycle becomes linked to the day-night cycle through our first few years of life. This makes it one of the many circadian rhythms of our body. A research conducted on human subjects who were made to live in caves and had no clue about time actually found a sleep-wake cycle of about 25 hours in humans i.e. our biological clock ticks a bit slower than day-night cycles. However, the error is accounted for by the light signals that enter our eye. This circadian rhythm is partly under control of an extensive group of cells called suprachiasmatic nucleus which is located just above optic chiasm in the hypothalamus.

Brain's EEG (Electroencephalogram) recordings have shown that while awake brain shows a low-amplitude electrical activity and as we progress through our sleep the EEG becomes flat initially and then amplitude increases and frequency decreases as we move through various stages of sleep.

Research also suggests that one of the reasons why we sleep is to restore energy. Adenosine levels in the brain increase through the day which is probably what makes us feel sleepy. Through the sleep, the brain's ATP is restored back and this is probably the reason why sleep makes us feel refreshed. So it's quite sensible to say that sleep is one of the best forms of meditation.

As we enter sleep, we gradually the neurons controlling inhibited. Heart rate, blood ities are slowed down. If mostly remember frag- rarely occur during this significantly during changes drastically and of body muscles). Only systems and those con- lysed. This stage of sleep sleep. Active dreaming occurs

stage, subjects (even those who Surprisingly ATP levels fall during this stage. Heart rate and breathing become highly variable. Failure of limb muscles to paralyse during REM leads to "Periodic Limb Movements of sleep" or "REM Behavioral Disorder" in which subjects exhibit spontaneous leg or hand movements or some even walk while asleep. Men often have an erection during this stage. As the night progresses, the duration of SWS decreases while that of REM increases.

Infants sleep around 18 hours per day and spend most of their time in SWS. As children mature, they spend less time asleep and less time in deep SWS. Older adults often sleep only 6-7 hours a night and spend very little time in SWS.

Obstructive sleep apnea is a condition in which as a person enters SWS, the airway muscles to the thorax relax to the extent that the airway is closed and the person never enters SWS due to breathing difficulties. One of the major symptoms of this is daytime sleepiness. However daytime sleepiness can also occur due to other causes as alcoholism, drug addiction, late night parties or sleepless nights, narcolepsy etc. Narcolepsy is a condition in which the sleep modes are not switched properly and patients often have hypnagogic hallucinations (dreaming while still awake) or cataplexy (paralysis of body muscles while awake).

-Mrugank.

#### #References:

1. Neuroscience BNA Science of the Brain ([www.sfn.org](http://www.sfn.org))
2. Brain Facts (A primer on the Brain and Nervous System) [www.brainfacts.org](http://www.brainfacts.org)



# UNKNOWN

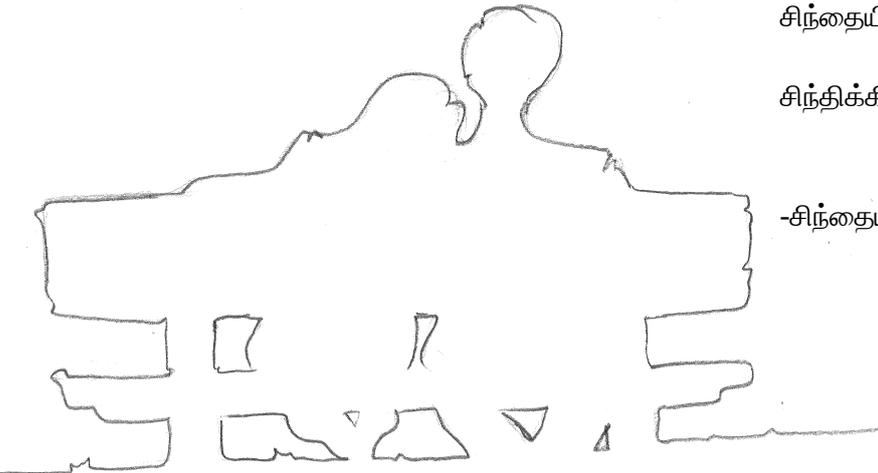
As men told his story,  
his ancestors- always a mystery  
So, he kept pursuing his origins,  
his father's father,  
But till now he is the descendant,  
of an Unknown  
who descends through monkeys and donkeys.  
Last time I checked, his story  
began with a single-celled one.  
Anyways, he still remains  
the son of an Unknown...

-Akshay Dhan



## Sandhitha Velaiyil

The poem is about how beautifully love plays with one's thought. It's about a little girl with an over thinking mind.



## சந்தித்த வேளையில்...

சந்திக்கையில் சந்திக்கவில்லை,

சந்திக்கையில் சந்திக்கியலவில்லை;

சந்திக்கையில் சந்தித்திருந்தால்,

சிந்தையிலின்று சிந்தையின்றி யிருந்திருக்கலாம்

சந்திக்கிறேனின்றி..

-சிந்தையிலுனை சந்தித்திருக்கும் சிறுமி.

# The Making of a Nobel Laureate: Yoshinori Ohsumi

**B**eing a science student, I would like to write about a Nobel laureate, the man who won the 2016 Nobel Prize in Physiology and Medicine, Yoshinori Ohsumi for his work on autophagy. Before beginning, I would like to say that it's not about the prize but the recipe (hard work, patience, luck, and perseverance).

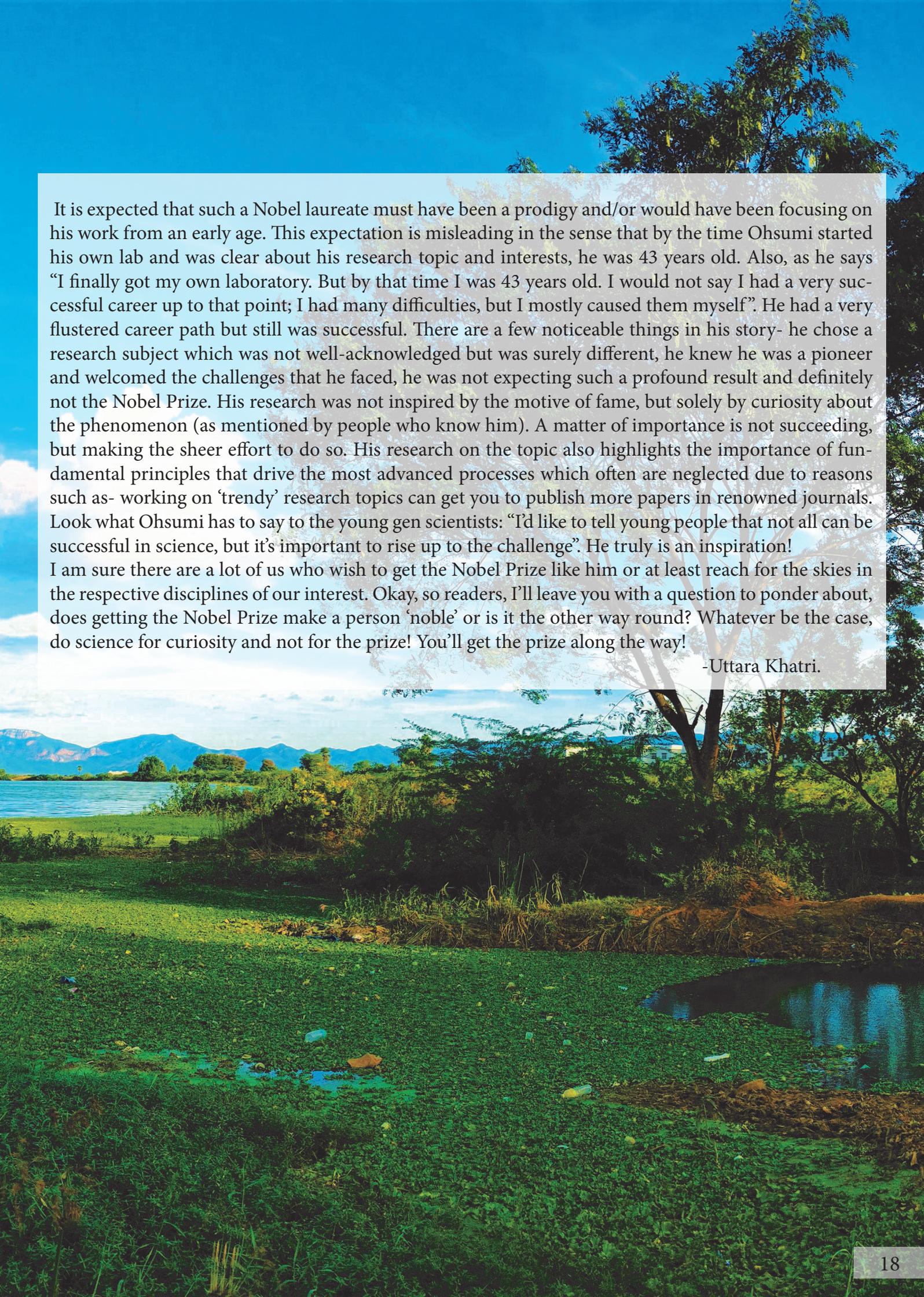
This was how it began. A boy was born on 9th February 1945 much towards the ending of the World War II in Fukuoka on the island of Kyushu in Japan. He was a sickly child, the youngest of four brothers. His mother was a TB patient and was bedridden for a long time. Fortunately, his childhood was spent amidst nature- collecting insects, watching stars. During his high school, he was particularly interested in chemistry. He did his undergraduate and graduate study at The University of Tokyo on topics in chemistry, but he quickly discovered that chemistry didn't attract him because the field was already quite established. But he was lucky, I think, because the early 1960s was a golden age for molecular biology. He decided to work on that instead, and as a graduate student, he worked with Dr. Kazutomo Imahori on proteins in *E. coli*. Later, he took on a postdoctoral position with Dr. Gerald Edelman at The Rockefeller University in New York. After experiencing failure in various topics, he decided to work on DNA duplication in yeast. That was a huge leap for him that also introduced him to yeast cells. Finally, on getting a position as a junior professor in Yasuhiro Anraku's lab at the University of Tokyo, he returned to Japan.

In the 1980's he began his research on autophagic processes in his own lab along with two graduate students. Here is some insight into his work.

Macroautophagy (literally, self-eating) is an evolutionarily conserved process common in eukaryotes, wherein the cell recycles its own components/parts by engulfing it into a double-membrane bound cytoplasmic vesicle, and later transporting to the lysosome for degradation. At that time, not much about the process was known and Ohsumi had to begin from the scratch. He induced random mutations in yeast cells that lacked vacuolar proteases, identified the first mutant unable to accumulate autophagic bodies; and named this gene autophagy 1 (APG1). In 1993, he published his formative discovery of 15 genes of key importance for autophagy in yeast.

During the following years, Ohsumi cloned several ATG genes and characterised the function of their protein products. He unravelled the mechanism by which stress signals initiate autophagy and protein complexes promote successive stages of autophagosome formation. Additionally, Ohsumi and colleagues were pioneers in identifying mammalian homologues of corresponding ATG genes in yeast, thereby expanding the scope of its studies.

Ohsumi's pioneering work generated an enormous interest in autophagy and has led to a remarkable increase in the number of publications related to the subject since the early 2000's. Autophagy is linked to many serious diseases such as cancer and some neurological disorders and Ohsumi's work was a path-breaker in these fields.



It is expected that such a Nobel laureate must have been a prodigy and/or would have been focusing on his work from an early age. This expectation is misleading in the sense that by the time Ohsumi started his own lab and was clear about his research topic and interests, he was 43 years old. Also, as he says “I finally got my own laboratory. But by that time I was 43 years old. I would not say I had a very successful career up to that point; I had many difficulties, but I mostly caused them myself”. He had a very flustered career path but still was successful. There are a few noticeable things in his story- he chose a research subject which was not well-acknowledged but was surely different, he knew he was a pioneer and welcomed the challenges that he faced, he was not expecting such a profound result and definitely not the Nobel Prize. His research was not inspired by the motive of fame, but solely by curiosity about the phenomenon (as mentioned by people who know him). A matter of importance is not succeeding, but making the sheer effort to do so. His research on the topic also highlights the importance of fundamental principles that drive the most advanced processes which often are neglected due to reasons such as- working on ‘trendy’ research topics can get you to publish more papers in renowned journals. Look what Ohsumi has to say to the young gen scientists: “I’d like to tell young people that not all can be successful in science, but it’s important to rise up to the challenge”. He truly is an inspiration! I am sure there are a lot of us who wish to get the Nobel Prize like him or at least reach for the skies in the respective disciplines of our interest. Okay, so readers, I’ll leave you with a question to ponder about, does getting the Nobel Prize make a person ‘noble’ or is it the other way round? Whatever be the case, do science for curiosity and not for the prize! You’ll get the prize along the way!

-Uttara Khatri.

# An Encounter with Fear

The omnipresent feeling experienced by all! There is no Caesar, no Napoleon, nor Achilles who have never felt the pangs of fear. It is a very natural emotion that makes us more human. A person with little fright is not the greatest of humans- s/he is more of a god or a beast than a human being. Fear does not only include different kinds of phobias, it is also the feeling that warns you as to what is good and what is bad. As a person with the acutest form of stage fright, I often felt frozen legs, heavy thumping heart and shivering hands, whenever I face a crowd of more than 10. The only resort for me was the emptiness that my closed eyes gave, a temporary self-made delusion, which helped to complete the weird 'job'. Sometimes when I really wanted to do something, my legs, my hands, and my voice failed me, and then the efforts of my heart failed too. Many times I wanted to ask a question to a teacher in class but refrained from doing so thinking of it to be too stupid to ask. Sometimes I would gather courage and ask, but always end up in a mess, never satisfying myself. I used to feel that those eyes were waiting to judge me for every word I utter. In school, as a Sanskrit student, I was often pushed to the stage for a recital of the Gita as a part of the daily assembly. Somehow this was crucial in helping me get on to the stage, but not any further. Then came June 5, when I was told to deliver a speech on Environment Day- it was some sort of an accelerator- it helped me to get on to the stage again, and all of this happened when I was not yet 14. This experience proved to be handy on many occasions later on when I told myself- "If you could face 7000 pairs of staring eyes, you can do it easily!" But that changed when I was 17 as the stress to perform 'the best' and heavy competition just took that confidence away from me. I refrained myself from doing things that I wished to do, people I wished to talk to. I had never been able to make a presentation or speech, sing a song or give a recital, with myself feeling contented. But now, I am regaining that lost confidence step by step. This article too is an effort to break the mould! Now, I am totally comfortable speaking to a group of strangers as nothing affects me now. I'm sure I may not be the only one experiencing the stage fright, many around me would have had a similar experience. I think all we need is the will to go forward. Fear is much more than a feeling, it is a companion that guides us through difficult times.

-Akhila.

# You and Me

You came into my life uncalled for,  
you gave me joy,  
you gave me hope.

Now you've left me unsaid,  
never did I know you'd be gone forever,  
neither did you leave a clue,  
nor did you give me a cue.

At one time we were inseparable,  
but life took us on two different paths,  
when did we lose our connection? I don't remember.

Now looking back on the path I've travelled,  
I thrive for what we were back then,  
the days and nights we've spent.

Going back in time,  
I see YOU and ME, walking down the aisle,  
walking down the pavement,  
with that smile, that laugh,  
those gleaming eyes, those shiny eyebrows,  
my days are incomplete without 'em.

Never did my eyes stand a day without you in front,  
my ears without your voice reverberating,  
my nose without the smell we carried.

All of it now just a memory.  
Memories.

The more you want to forget them,  
the more you remember them.

What if we had never met?  
What if we didn't know each other?  
What if you weren't the same YOU to ME?  
Everything would have been different.

Everything.  
The happiness at the beginning,  
the grief at the end.  
Everything.

You are the only YOU I've had,  
I'll have and I can have in this life.  
No one can play the role you played in my life,  
never can anyone replace you.

I wish you were there by my side throughout my life,  
I wish you were there with me forever in my life,  
I wish you were there for me for the rest of my life.  
I wish.

-Jitheesh.



## SCIENCE GIVES WINGS TO ALL YOUR DREAMS

Dream, whatever you want to dream,  
Go, wherever you want to go,  
Think, whatever you dare to think,  
For science gives wings to all your dreams.

It's all that we see, or it seems-  
Science has got some reason to show  
The truth behind every blind.

Be it the beauty of stars in the sky;  
Or the reason for birds to fly  
Naughty crocodiles, faking cry-  
Science will show you the reason why!

Running waters' cunning flow-  
Stunning beauty of fireflies' glow  
One can always wonder, why?- that's why  
Science gives wings to your dreams to fly.  
Up above the sky, high and high!

Want to dream of seeing stars?  
Or to peek into the reddish Mars-  
Why worry when Hubble is there?  
Further or nearer, you can see it fair!

For the mystery lies before our eyes-  
All one should do is to ask- what and why,  
Since science gives wings to your dreams to fly,  
And plenty of answers to your 'whats and whys'.

Ask your questions, why or how?  
Answer with reason and just- thus,  
All you should do is to search and find-  
For the mysteries of nature do never die.

Dream, whatever you want to dream,  
Go, wherever you want to go,  
Think, whatever you dare to think,  
For science gives wings to all your dreams.

-Abiya R

Revathy

# ഉയരങ്ങൾ കീഴടക്കി ത്രിവർണ്ണം

## Uyarangal Keezhadakkki Trivarnam

-Jikson P Mathew

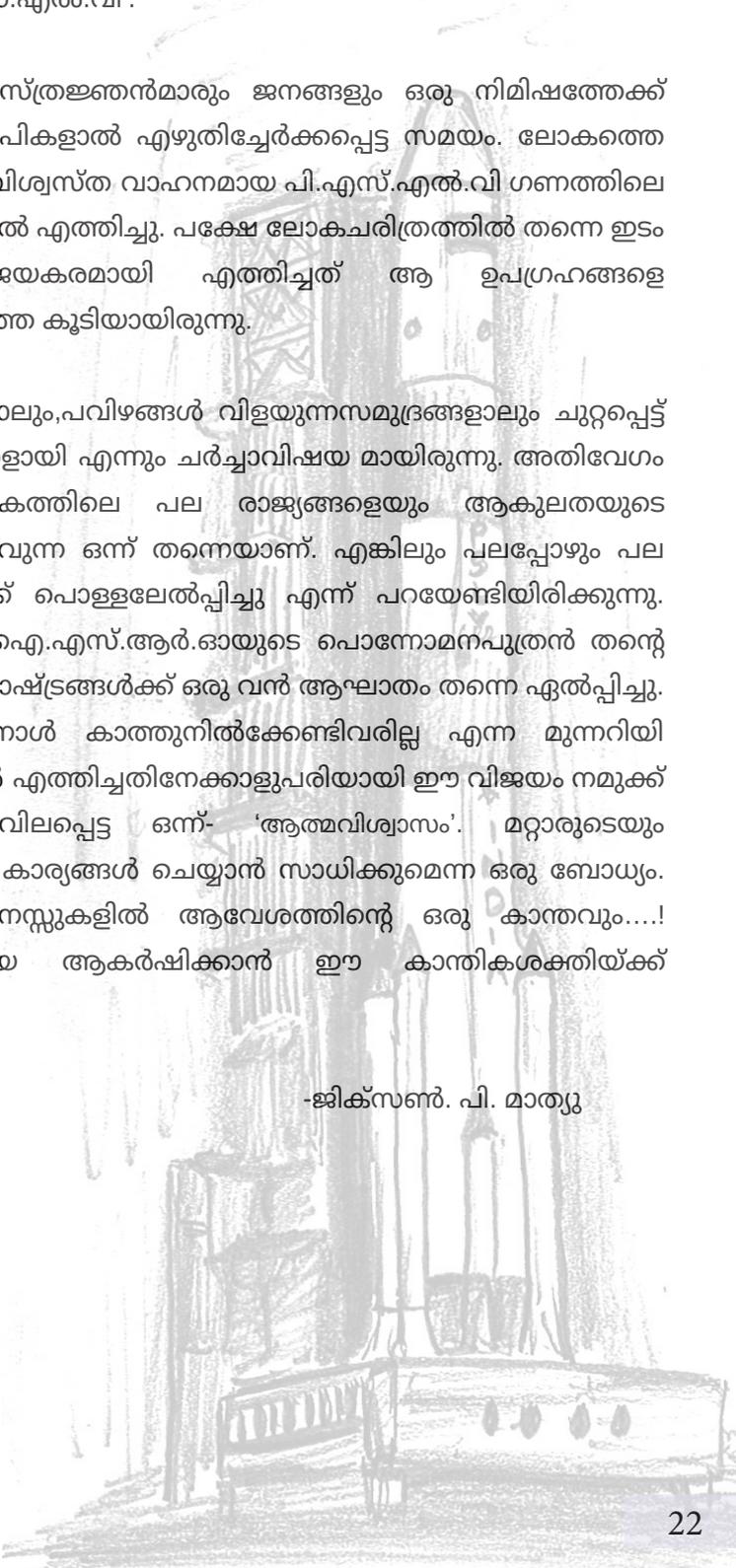
The article puts forward the pleasure and joy that had arisen in the mind of each citizen when PSLV had successfully placed its huge load (largest in the world) in the orbit... The historical success of PSLV has inspired thousands of young Indian minds...

2017 ഫെബ്രുവരി 15, ഇന്ത്യൻ ജനതയെ ആകമാനം പുളകം കൊള്ളിച്ച ദിനം. ഭാരതത്തിന്റെ യശസ്സ് വാനോളമുയർത്തിയ സുവർണ്ണ ദിവസം. ലോകരാജ്യങ്ങൾക്ക് മുഖിൽ ഇന്ത്യയുടെ ശിരസ്സ് ഉയർത്തിപ്പിടിച്ചുകൊണ്ട്, ത്രിവർണ്ണത്തെ നെറ്റിത്തടത്തിൽ പതിപ്പിച്ച് അവൻ കുതിച്ചുയർന്നു- എന്നും എപ്പോഴുംഭാരതത്തിന് അഭിമാനം മാത്രം സമ്മാനിച്ചിട്ടുള്ള, ഇന്ത്യയുടെ പൊന്നോമന, ഭാരതജനതയുടെ അഭിമാന താരം, ഐ.എസ്.ആർ.ഓയുടെ വിശ്വസ്ത പുത്രൻ- 'പി.എസ്.എൽ.വി'.

ഇന്ത്യൻ സമയം 09:28, ഭാരതത്തിലെ ഒട്ടുമിക്ക ശാസ്ത്രജ്ഞന്മാരും ജനങ്ങളും ഒരു നിമിഷത്തേക്ക് നിശ്ചലമായ സമയം, ഇന്ത്യയുടെ ചരിത്രത്തിൽ സ്വർണ്ണലിപികളാൽ എഴുതിച്ചേർക്കപ്പെട്ട സമയം. ലോകത്തെ വൻകിട ശക്തികളെയെല്ലാം ഞെട്ടിച്ചുകൊണ്ട് ഇന്ത്യയുടെ വിശ്വസ്ത വാഹനമായ പി.എസ്.എൽ.വി ഗണത്തിലെ പി.എസ്.എൽ.വി-സി 37, 104 ഉപഗ്രഹങ്ങളെ ഭ്രമണപഥത്തിൽ എത്തിച്ചു. പക്ഷേ ലോകചരിത്രത്തിൽ തന്നെ ഇടം നേടിക്കൊണ്ട് കുതിച്ചുയർന്ന ആ വാഹനം വിജയകരമായി എത്തിച്ചത് ആ ഉപഗ്രഹങ്ങളെ മാത്രമായിരുന്നില്ല, മറിച്ച് ഓരോ പൗരനിലുമുള്ള അഭിമാനത്തെ കൂടിയായിരുന്നു.

ആകാശം ചുംബിച്ചു നിൽക്കുന്ന ഹിമാലയസാനുക്കളാലും, പവിഴങ്ങൾ വിളയുന്നസമുദ്രങ്ങളാലും ചുറ്റപ്പെട്ട് കിടക്കുന്ന ഭാരതം, ലോകരാഷ്ട്രങ്ങൾക്കിടയിൽ കുറച്ചുനാളായി എന്നും ചർച്ചാവിഷയമായിരുന്നു. അതിവേഗം വളർന്നുകൊണ്ടിരിക്കുന്ന ഇന്ത്യയുടെ വികസനം ലോകത്തിലെ പല രാജ്യങ്ങളെയും ആകുലതയുടെ മുൾമുനയിൽ എത്തിച്ചിട്ടുണ്ട് എന്നത് നിസ്സംശയം പറയാവുന്ന ഒന്ന് തന്നെയാണ്. എങ്കിലും പലപ്പോഴും പല പ്രതിസന്ധികളും നമ്മുടെ വികസനത്തിന്റെ വേഗതയ്ക്ക് പൊള്ളലേൽപ്പിച്ചു എന്ന് പറയേണ്ടിയിരിക്കുന്നു. ഇവയ്ക്കെല്ലാം ഒരു മറുപടി എന്നോണം കുതിച്ചുയർന്ന ഐ.എസ്.ആർ.ഓയുടെ പൊന്നോമനപുത്രൻ തന്റെ സൃഷ്ടാവിന് തന്നിലുള്ള വിശ്വാസം കാത്തുകൊണ്ട് ലോകരാഷ്ട്രങ്ങൾക്ക് ഒരു വൻ ആഘാതം തന്നെ ഏൽപ്പിച്ചു. ഇന്ത്യ ലോകരാഷ്ട്രങ്ങൾക്കിടയിൽ എത്താൻ അധികനാൾ കാത്തുനിൽക്കേണ്ടിവരില്ല എന്ന മുന്നറിയിപ്പുകൂടിയായി ഈ വിജയം. ഭാരതത്തിന്റെ പേര് ഉന്നതിയിൽ എത്തിച്ചതിനേക്കാളുപരിയായി ഈ വിജയം നമുക്ക് നേടിത്തന്ന മറ്റൊന്നുകൂടിയുണ്ട്, മറ്റെന്തിനേക്കാളും വിലപ്പെട്ട ഒന്ന്- 'ആത്മവിശ്വാസം'. മറ്റാരുടെയും സഹായമില്ലാതെ ആർക്കും ഇതുവരെ ചെയ്യാൻ പറ്റാത്ത കാര്യങ്ങൾ ചെയ്യാൻ സാധിക്കുമെന്ന ഒരു ബോധ്യം. അതോടൊപ്പം വളർന്നുവരുന്ന ഭാവിതലമുറയുടെ മനസ്സുകളിൽ ആവേശത്തിന്റെ ഒരു കാന്തവും....! ശാസ്ത്രലോകത്തേക്ക് ഇന്ത്യയുടെ ഭാവി തലമുറയെ ആകർഷിക്കാൻ ഈ കാന്തികശക്തിയ്ക്ക് കഴിയുമെന്നതിൽ യാതൊരു സംശയവുമില്ല.

-ജിക്സൺ. പി. മാത്യു



# Serge Haroche

## @IISER Tirupati

Now, who is Serge Haroche? Let us start from the beginning. He was born in a Jewish family with Sephardic and Ashkenazi origins, in the beautiful city of Casablanca in Morocco (as someone interested in geography and origin of different ethnic groups, I mention it here!). At that time Morocco, and therefore, Casablanca were under French protectorate. In those hard days of world war, none would have even thought, that someone born there could become a person who people will look up to several years later. He started his schooling in Casablanca and in his early childhood, he was raised learning Russian and French, which he managed until his elementary school where he lost his fluency in Russian. After Morocco's independence, his family moved to France, which was more a cultural choice for the family. As his parents were educated in the French system, they also transferred the same to Serge and his siblings. Although it was more natural to move to France, it was not natural to get adjusted to the damp and dark winters of Paris contrasting the sunny Mediterranean Casablanca weather. Nevertheless, life goes on and one learns to adjust and years passed in his new homeland. As a student, he was interested in Literature, History, Mathematics and Physical sciences. He marveled at the fact that he was able to compute the escape velocity of rockets with the elementary calculus he knew. He still remembers the three books that he avidly read at that time. To understand the depth and beauty of quantum theory -Quantum Mechanics by Albert Messiah, he got introduced to the subtle world of atomic magnetic moments by Anatole Abragam through his book Principles of Nuclear Magnetism and Feynman's Lectures on Physics, which he considers, was a revelation. Physics was only one side, he says!! The other side at that time was his "by chance" meeting with Claudine Zeligson, his childhood friend at a Latin quarter café. She had moved to Paris to study English, Psychology and Sociology. Their relationship resumed after 15 years and they married after a year. He cites that her constant support and intellectual stimulation had been a crucial part of his scientific career.

He quoted that enthralled by the mysterious beauty of the quantum world, it did not take him too long to decide that he wanted to become a quantum physicist. His adventure started during his doctoral days with Prof Claude Cohen-Tannoudji on the dressed atom formalism. After his Ph.D. to pursue his , dreams he moved to Stanford



as a postdoctoral fellow. He fondly remembers how his personal investigator Prof. Art Schawlow would say "to succeed in research, one doesn't need to know everything about everything, it's enough to just know a few things that other's don't". To try out another lab in the USA he moved to Yale and started working there and for some time the family had two lives, one in Paris and one in U.S.A. As this is not a sustainable solution, in early 1990's he moved back to Paris when he had ideas about manipulating and observing photons non-destructively and preparing Schrödinger cat states of light developed. His hard work and his interest led to great research findings and his research slowly rose to crescendo leading to a Nobel Prize.

Now, what brings me to write about this: During the national science congress in Tirupati in January-2017, seven Nobel laureates from various disciplines and different geographical locations, were invited. They all traveled to the small town, which is primarily popular for Balaji temple and the ladoo. Nevertheless, the temple city suddenly became a scientific town with several scientific sessions and Nobel lectures. We wanted few

of them to visit our institute and interact with students; in particular Prof Ada Yonath and Prof William Moerner (being a biologist it was more natural for me to have them in our institute). While waiting to meet them, I heard someone ask in the hotel reception about how long it will take to reach Pondicherry. The pretty lady at the reception did not manage to answer and we volunteered to answer instead, without recognizing the man next to us was Prof Serge Haroche. But in a minute my neurons fired, some vague memory and I thought it was the Nobel Laureate himself with his lady Mrs. Claudine Haroche. Gaining courage, we asked, excuse me, "Are you Prof Haroche? Kindly pardon me for my ignorance". He smiled and gently nodded. We gained more courage and requested him if he can visit our institute and address the young science enthusiasts in the campus. After a short discussion in French with his lady, he answered, "yes we will come, but I don't know how to arrive there", "How far is your institute?" While it was unbelievable to me that he accepted our invitation, we said "it's not far...and we will organize your visit from here"! The Haroche's kindly accepted and we finalized their program for the next day. We tried reaching the other NL's and unfortunately due to their minute-to-minute schedule they couldn't manage to visit us.

The next day, we were preparing for their visit and most of us were very excited because this is going to be our first Nobel Laureate's visit to the campus. As a very good host, we went to pick them and arrived at the institute with a convoy of vehicles (he was a Government of India guest of honor and therefore accompanied by a convoy all the time). The Haroche's were simple, humble and approachable and they made us feel very comfortable throughout the conversations. They were greeted by Dr. Rao and taken for an institute tour taking a careful look at every room, trying to understand the laboratory set up-be it Biology or Chemistry or Physics. At the end of the tour, they were brought to the lecture hall, which was filled with young minds from IISER and IIT. After a quick and crisp introduction, he started his lecture, which was kept very simple-like an interesting discussion. Lecturing and interacting with students like a tutor who has been teaching them for years. It must have been an exciting moment for all our student's that day, some of them got very motivated and continued the discussion with him on quantum physics which spilled over to some philosophical thoughts too. Science and philosophy discussions are interlinked-once initiated; it gets amplified landing up in an extravagant discussion.

As a tradition we invited our guests to plant a sapling in our campus, which they did with full enthusiasm. Even after an exhausting day, they still wanted to go back to the lecture hall and discuss with the students. He said, "let's discuss more, I like these young minds here". There was a feeling of completeness in me that our efforts did not go waste and as much as we were excited to have them, they were also excited to be with us!! He promised to visit us again on different scientific occasions at IISER. This is real simplicity!! After the high tea, he wanted to go back since his lecture at the science congress was very early next day and we dropped him back to the hotel and wished him a "Bon Voyage". Prof Serge Haroche, 2012 Nobel Laureate in Physics, currently lives with his family in Paris and is affiliated to Collège de France and École Normale Supérieure in France.

- Vasu.





## நானும் அரக்கன்

*Naanum Arakkan*

-B Jithen Chandar

Thoughts of a guilty man who tries to prove that he is not one among those demons out there, but fails eventually

தமிழ் வழி நெடில் பெற்ற கர்வம்  
சிரம் ஏறிய நிலையில் நாழிகை- இன்பம்  
பெரிதென எண்ணி பெண்மை வதைக்கும்  
அரக்க குலத்தில் பிறந்த நயும் அரக்க  
னல்லவோ ? என மங்கை அவள்  
உரைத்ததுபோ லிருந்தது

இல்லை ! என அறைகூவல் விடுத்தேன்  
காரணம் தேடினேன் தோழி  
நதியும் மதியும் மழையும் காற்றும்  
இசையும் தமிழும் பெண்ணென உரைத்தேன்  
வாண்ணை திறனும் கவியும் மானம்  
காத்திடுமோ ?

பெண்ணியம் பேசினேன் தோழி  
பங்குனித் திங்கள் விளக்காய் போனது  
கண்ணியம் தவறிய அரக்கன் செயலால்

இவை நோக்கின்  
நானும் அரக்கன் தானோ ?  
இல்லை பொறு தோழி !  
அரையாடை உடுத்தியதும் ரௌத்திரம்  
பழகாததும் உன் தவறல்லவோ ?

பச்சிளம் சிறுமியை கொண்டு புதைக்கும்  
அரக்கனும் இவ்விடம் உண்டு  
அரையாடை கோலம் தான் காரணமா ?  
இல்லை சில திங்கள் குழந்தை தான்  
ரௌத்திரம் பழகுமோ ?

உணர்ந்தேன் தோழி  
பிறக்கும் பொழுதே ஈறைந் திங்கள்  
பெண்மை வருத்தி உயிர் பெற்ற  
நான் பிறப்பால் அரக்கன்

சிரம் தாழ உரைக்கிறேன்  
ஒரு நாள் விடியும் காத்திரு தோழி  
அதுவரை அரக்கன் அரக்கன் நான் !

-பா .ஜித்தேன் சந்தர்



# ഓണം

Onam is an important festival in any Malayalee's life. A year feels incomplete without celebrating it. Here, the writer describes her experience of celebrating onam away from Kerala, here at IISER Tirupati.



ഓണം... ഓരോ മലയാളിയുടെയും മനസ്സിൽ സന്തോഷത്തിന്റെയും സമൃദ്ധിയുടെയും സ്മരണകളുണർത്തുന്ന സ്വരം. കളിയും ചിരിയും ഓണപ്പാട്ടും ഓണസദ്യയും എല്ലാം നിറഞ്ഞ സൗഹൃദത്തിന്റെയും ആനന്ദത്തിന്റെയും ഓർമ്മകളാൽ മനസ്സിൽ പൂക്കളങ്ങൾ വിരിയുന്ന ദിനങ്ങൾ... ജാതിമതഭേദമന്യേ ഓരോ മനുഷ്യനും ഒരുപോലെ സന്തോഷിക്കുന്ന നന്മയുടെയും സൗഹൃദത്തിന്റെയും ദിനങ്ങളാണ് ഓണനാളുകൾ. സുഹൃത്തുക്കൾക്കും സഹോദരങ്ങൾക്കും ഒപ്പം പൂക്കൾ പഠിക്കാൻ പോകുന്നതും, അതു കഴിഞ്ഞ് വന്ന് പൂക്കളമൊരുക്കുന്നതും, പിന്നെ എല്ലാവരും ഒരുമിച്ച് വിവിധങ്ങളായ കളികളിൽ ഏർപ്പെടുന്നതും, ഉച്ചയ്ക്ക് വാഴയിലത്തുവിൽ പത്തുപതിനാറുകൂട്ടം കറികളും വിളമ്പി സദ്യയുണ്ണുന്നതും, പായസം കുടിക്കുന്നതും, എല്ലാവരും ഒരുമിച്ച് സൗഹൃദസംഭാഷണങ്ങളിൽ ഏർപ്പെടുന്നതും.... അങ്ങനെ ഒത്തിരി കാര്യങ്ങളുണ്ട് ഓണത്തെക്കുറിച്ച് വിവരിക്കാൻ. ചെറുപ്പംതൊട്ട് കടന്നുപോയ എല്ലാ ഓണനാളുകളെയും അപേക്ഷിച്ച് ഒരു പ്രത്യേകതയുണ്ട് ഇക്കഴിഞ്ഞ ഓണത്തിന്. കാരണം ഇത്തവണ ഓണം ആഘോഷിച്ചത് കേരളത്തിനു പുറത്ത് അങ്ങു ദൂരെ... അത്ര ദൂരെയൊന്നുമല്ലെങ്കിലും ഇങ്ങ് ഐസർ കുടുംബത്തോടൊപ്പമാണ്. എല്ലാവരും തമ്മിൽ നിന്നും വ്യത്യസ്തമായൊരു ഓണം...

ഓണത്തിന് അന്ന് അവധി ഒന്നും കിട്ടിയില്ലെങ്കിലും തലേന്ന് രാത്രിതന്നെ പൂക്കളെല്ലാം ഒരുക്കി രാവിലെയായപ്പോഴേക്കും പൂക്കളം റെഡിയാക്കി. അന്നുണ്ടായിരുന്ന ബയോളജി പരീക്ഷയും വൈകുന്നേരത്തെ ബയോളജി സെമിനാറോടും കൂടി ഇവിടുത്തെ ഔപചാരികമായ ഓണാഘോഷം സമാപിച്ചു. പക്ഷേ ഞങ്ങളുടെ ശരിക്കുള്ള ആഘോഷം തൊട്ടടുത്ത അവധി ദിവസമായിരുന്നു. അന്നെല്ലാവരും നല്ല മലയാളിത്തനിമയുള്ള വസ്ത്രങ്ങളണിഞ്ഞാണ് ഓണസദ്യയുണ്ണാൻ എത്തിയത്. നമ്മൾ മലയാളികൾക്ക് ഒരു പ്രത്യേകതയുണ്ട്. കേരളത്തിനു പുറത്തെവിടയെങ്കിലുമാണെങ്കിൽ നമ്മുടെ മലയാളിത്തനിമ നന്നായി ഉയർത്തിക്കാട്ടാൻ ശ്രമിക്കും. 'ഇതാണ് ഞങ്ങളുടെ ഓണം' എന്ന് മറ്റുള്ളവരെ കാണിച്ചുകൊടുക്കുമ്പോൾ കിട്ടുന്നൊരു നിർവൃതി...മലയാളികൾ മാത്രമല്ല എല്ലാവരും ഒരുമിച്ച് ഒന്നുപോലെ സഹകരിച്ച് ആഘോഷിച്ച ദിവസമായിരുന്നു അന്ന്.

ഞങ്ങളോടൊപ്പം അന്ന് പ്രകൃതിയും നന്നായി സന്തോഷിച്ചെന്നു തോന്നുന്നു. കാരണം അന്നു വൈകുന്നേരം നല്ലൊരു മഴ പെയ്തു. പക്ഷേ അതുകൊണ്ട് അന്ന് നടത്താനിരുന്ന വടംവലി മത്സരം മാറ്റിവയ്ക്കേണ്ടി വന്നു. ആ സങ്കടം ഞങ്ങൾ കസേരകളി കളിച്ചു തീർത്തു. തുടർന്ന് വിവിധതരം കലാപരിപാടികളായിരുന്നു. ഒത്തിരിയേറെ നല്ല കലാപ്രതിഭകളും ഗായകരും ഐസറിൽ ഉണ്ടെന്ന് അന്നെന്നിക്കു മനസ്സിലായി. ഏറ്റവും ആകർഷിച്ചത് സീനിയേർസിന്റെ വകയുണ്ടായിരുന്ന ഗ്രൂപ്പ് ഡാൻസാണ്. ഞങ്ങളെല്ലാവരും അന്ന് നന്നായി ചിരിച്ചു. ആഘോഷങ്ങൾക്കെല്ലാം ഒടുവിൽ 'ഡി ജെ നൈറ്റ്'... അങ്ങനെ ഒരു ഓണം കൂടി കഴിഞ്ഞു. പക്ഷേ അവിടെ തീരുന്നില്ല... ആ ദിവസത്തെ മധുരസ്മരണകൾ കോർത്തിണക്കി വരുവാനിരിക്കുന്ന ഒത്തിരി നല്ല സുഹൃത്തുക്കൾക്കും കൂടി ഒപ്പം അടുത്ത ചിങ്ങം കൂടുതൽ മനോഹരമാക്കണമെന്ന പ്രതീക്ഷകൾ ബാക്കിയുണ്ട്.... അതിനായുള്ള കാത്തിരിപ്പും.....

-അക്ഷര

# I wish I were a butterfly!

I wish I were a butterfly;  
So that I could fly;  
From time to time, across time;  
From colour to colour, spreading colours;  
From street to street, chased by fleets;  
From home to home, taking kids my home;  
I wish I were a butterfly.

I wish I were a butterfly;  
Kissing all the flowers and flying across the sky;  
Dancing on petals and hoping to fly high;  
Skipping on the vines and slipping from the petals;  
Bathing in the sun and breathing on the leaves;  
Talking in whispers and singing with my wings;  
I wish I were a butterfly.

I wish I were a butterfly;  
Fighting towards my way;  
Even from the first day;  
Flying up and above to reach high and high;  
Making new friends each and every day;  
Catching new colours from flowers on my way;  
I wish I were a butterfly.

I wish, I wish, and I wish to be a butterfly;  
To live a colourful life;  
To take a beautiful flight;  
To dance with little flies;  
To talk with big birds;  
To live, fly, dance and talk with flowers;  
I wish I were a butterfly.  
-Bouncy little butterfly lover.

-Abiya R

# Adhura

The prose describes the author's feelings of incompleteness. The author tries to convey the effects of an important loss that has caused him a feeling of inadequacy.

-Aditya Sharma.

## अधूरा

चाहता हूँ कि बोल दू लेकिन कैसे कहूँ, मुझे में कोई हिम्मत नहीं रही। ऐसा क्यों होता है कि हम किसी से उम्मीद लगाते हैं और उम्मीद पल भर भी नहीं लेती आँसू बन बिखरने में। सोचता हूँ कि जो था उसको एक मीठा सपना समझ भूल जाऊँ लेकिन सपनों के हर एक पल वास्तविक रूप में मेरी आँखों के आगे खेलते रहे, तो मैं बेबस हो जाता हूँ।

अच्छा है कि मेरी मुस्कराहट ने मेरा साथ नहीं छोड़ा। मैं हँसता हूँ क्योंकि मुझे लगता था, यह तो कभी होना ही था। अभी जब हो ही गया तो क्यों मैं उन पलों को याद करूँ? भुलाना कितना मुश्किल है ना। वे आए थे और चले भी गये लेकिन इतना प्रभाव छोड़, इतनी तीव्रता से निकले कि मन मानता ही नहीं, वे चले गए।

आखिर चाहता क्या हूँ मैं, मुझे समझ नहीं आता। वे मेरे सामने हैं पर मैं उनके पास नहीं। क्या वे कभी मुझे देखते भी हैं? क्या वे कभी मेरे लिए सोचते भी हैं? मैं परवाह करता हूँ, क्या वे मेरी फ़िक्र नहीं करते? एक समय था जब उनकी आँखों में मेरे लिए प्यार दिखता था लेकिन अभी उनकी नज़रों को भी देखने का मौका नहीं मिलता। क्या हम इतने दूर हैं कि आप हमें, "कैसे हो तुम?" भी पूछना न चाहे? नींदों को खोजता हूँ लेकिन ख्यालों से भर जाता हूँ। राते तन्हाई से भर जाती हैं। मैं इस दुनिया से बेखबर आपको सोचता हूँ। शायद मैं सोचना चाहता हूँ क्योंकि कभी लगता है कि मैं इस समय के लिए रुकता हूँ ताकि मैं रात की इस खामोशी में आपकी मीठी आवाज़ को सुनने की कोशिश करूँ। आपकी आँखों, आपकी मुस्कराहट, आपकी बातों को याद करूँ। क्या हालत है मेरी, मैं कैसे कहूँ, किससे कहूँ? आपके जाने से मैं अधूरा रह गया हूँ।

- आदित्य शर्मा

# 16-ന്റെ ഓർമ്മക്കുറിപ്പ്

## Pathinarinte Ormakkurippu

-Ardra

The poem is about the atrocities against women by shedding light on the spine chilling incident that took place in Delhi a few years ago.

മഹാനഗരം ഉറങ്ങാൻ തുടങ്ങുന്നു.  
 വിരിയാൻ കാത്തുനിന്ന നിശാഗന്ധികൾ കൺതുറന്നു.  
 വഴിവിളക്കിന്റെ മങ്ങിയ വെളിച്ചത്തിൽ,  
 തെരുവുനായകൾ തളർന്നുറങ്ങുന്നു.  
 ഇരുളിന്റെ മൗനത്തെ കീറിമുറിച്ചു കൊണ്ടൊരാ  
 ചരക്കുവണ്ടി പാഞ്ഞുവന്നു.  
 ഒടുവിൽ.....  
 ആ നന്നുത്ത രാത്രിയുടെ ഓർമ്മകളിൽ,  
 അവളുടെ ഒടുങ്ങാത്ത നിലവിളികൾ.....  
 പുതിയ പുലരികൾക്കായ് ,  
 അവൾ കാത്തു വെച്ച സ്വപ്നങ്ങൾ  
 പ്രഹരമേറ്റ ശരീരവും മുറിവേറ്റ മനസ്സും,  
 ആ സ്വപ്നങ്ങളുടെ മരണം നിശബ്ദമായ് ,  
 നിസ്സഹായമായ് നോക്കി നിന്നു.  
 അവളിൽ നിന്നുതിർന്ന കണ്ണുനീർത്തുള്ളികൾ  
 നിണബിന്ദുക്കൾ,  
 അടയാളങ്ങളായ് പാതയിൽ പതിഞ്ഞിരുന്നു.  
 ഉറക്കമുണർന്ന തെരുവുനായ്കൾ  
 അവൾക്കൊപ്പം കരഞ്ഞു.  
 ആ രാത്രിയുടെ മൃഗം മനുഷ്യനായിരുന്നു.  
 ദാഹമകറ്റിയ കഴുകന്മാർ  
 കാർമ്മേഘങ്ങൾക്കിടയിൽ മറഞ്ഞു.  
 നഗരം പുതു പുലരിയെ പുണർന്നു.  
 ആയിരം ദീപങ്ങൾ അവൾക്കായ് മിഴി തുറന്നു.  
 ആഴിയായ് അവ കൈകോർത്തു നിന്നു.  
 പുലരികൾ വീണ്ടും വന്നു.  
 ഭീതിയുടെ നിഴലിൽ രാവുകളും.  
 കാലങ്ങൾക്കപ്പുറം ചിതലരിച്ച കടലാസുതുണ്ടിലെവിടെയോ  
 നിർഭയം അവൾ മയങ്ങവേ,  
 വീണ്ടും ഇരകൾ പിറക്കുന്നു.....  
 നിഷ്കരുണം!

- ആർദ്ര



# Dil Hai Chhota Sa Chhoti Si Asha

*“The best part of you is the child in you.”*

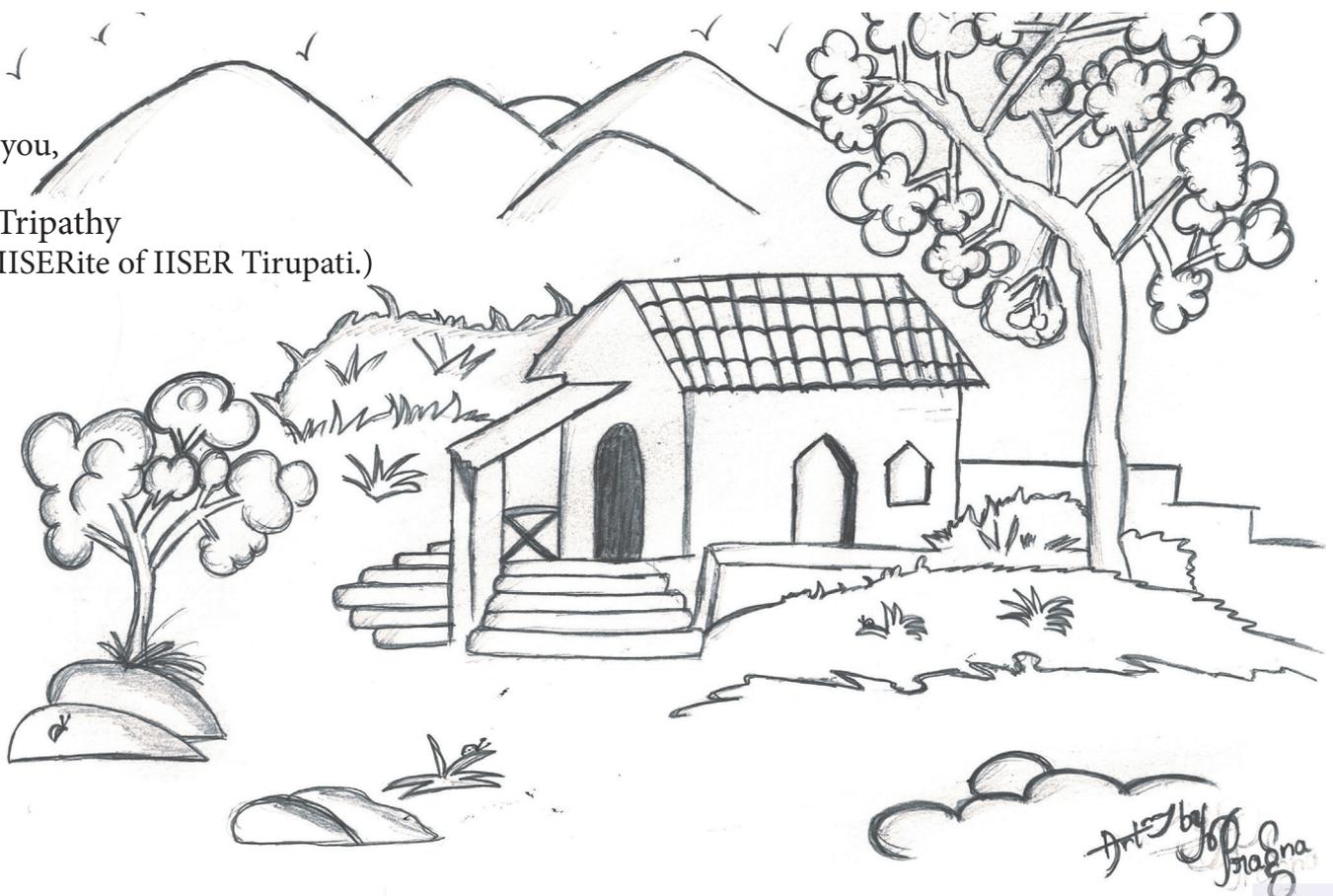
- I wish I could travel back in time. I really miss them– my childhood moments- where mother’s lap meant the safest place I ever knew, and father’s shoulders meant the highest place that could be reached. When every smile came straight from the heart and most words were spoken out from nowhere. When parents’ fingers meant the only support and family members, the only important beings that existed. When storybooks were the only source of sleep and cute teddies, the best friends to play with. When imagination had no limits, and jealousy and hatred had no place in life. When competition meant who got more dirt on one’s clothes and success meant getting the most number of chocolates among the siblings. When the worst possible scenery was father’s red eyes and rainbows the best and luckiest ones.
- I wish I were a kid again. I have turned 18+ now. A citizen of India, eligible to vote (and just 4 more years till I become eligible to marry!) and capable of taking the decisions of my life. That’s where the most difficult part lies– taking decisions of our own life. It is always easy to blame others’ decisions for our failures in life, but to blame ourselves– that’s really, really hard. So, a lot of thought has to go into taking any decision in life. And to choose a career is one of the most difficult decisions in life. One needs to critically analyse whether to follow one’s passion or necessity before taking the final step.

I am in IISER now, determined to acquire knowledge. I don’t know where this knowledge will lead me to, but I always want to be a ‘good human being’. A ‘good human being’- that’s it. That’s my aim in life. Moral Science is my favourite subject and ethics, an integral part of my life.

After all, science teaches ‘why we are?’ and Moral Science teaches us ‘how we should be’!

My idol always tells me, *“Every literate knows who C.V. Raman was but even the illiterate know who Gandhiji was.”*

Thanking you,  
Yours,  
Bhabesh Tripathy  
(A proud IISERite of IISER Tirupati.)





# Unnati

## Outreach Program of IISER Tirupati

“Inreach” is how it all began! That curious group of microbiology students from St. Xavier’s college, Kolkata looked like they didn’t want to leave the campus! They were on a tour of our IISER campus guided by Vasu, and they seemed to thoroughly enjoy it. Asking questions ranging from “how does a fume-hood work” when on a tour of the Chemistry lab, to “is there a possibility to participate in research here”, they spread their effervescent eagerness to all of us hosting them here.

This visit by the St. Xavier’s college students to IISER Tirupati marked the formal beginning of Unnati’s outreach programme. “Unnati” loosely translated into English refers to “Progress”. More tightly done, it means “upliftment”. Both are the core goals of Unnati.

Unnati was conceived as early as in Fall 2016. It’s active operations gained momentum in Spring 2017. Faculty members headed by Vasu, and including Subhash, Lakshman, and I along with a core group of students brainstormed in many sessions, regarding the values, objectives and anticipated outcome of the outreach program.

The big-picture was crystal clear. We at IISER Tirupati have been very fortunate and privileged to work with the best of facilities on offer in our Country. Millions of folks out there can’t say the same thing. Can we uplift their lives and enable their progress, no matter in whatever miniscule way we could afford to? Our collective emotions said indeed “Yes we, can!”

But where to begin? Followed by the visit by the St. Xavier’s students we wanted to reach out at a more fundamental level. The Zila Parishad High-School at Karakambadi, a few kilometers away from our institute provided the perfect platform. A visit over there, convinced us that we could make a sincere attempt to engage the enthusiastic school kids with Science. The Headmaster Mr. Anand embraced us with open arms.

These students were then invited to our “Science Day” at IISER Tirupati. As



part of it our BS-MS students demonstrated various models and explained the scientific basis behind them. In addition Durga Prasad, Sachin Rathod from similar backgrounds as the school kids, and Neetu Abraham gave rousing talks on what it is for them to be in IISER, and how they made it here. They turned out to be extremely well received and heart-rending. The pictures attached, bear testimony to the keenness, porosity and the genuine joy seen in these young minds!

An essay competition was then organized, wherein the kids were asked to write on “What is Science For You” in their native language or English. Some wonderful essays displaying their originality more than made-up for the interesting grammar perennially expected from school-kids.

These school-kids spurred our IISER students too. Many have volunteered now to go to the High-School itself, and not merely explain some Science, but also equip these budding minds with some life-skills! These small steps are hopefully prescient of the giant leaps we expect Unnati to take in the coming years.

- Raghu.



## Me, Oh, Me!



**Y**ou don't know me unless you are me.  
You don't know how I feel unless you are me.  
You don't know who I am unless you are me.  
You don't know what I'm going through unless you are me.

You won't understand ME because you are not ME.  
You will never get to know me,  
Because I'm the only ME around here,  
Don't ask me why I'm ME,  
Because I was born ME.

There's no other person I've known better than ME in this world.  
That's because I'm the only person I've spent my entire life with.

Am I the only ME in this world?  
Or are there others as well? I don't know.

Did you wonder why there're so many 'MEs' in this poem?  
It's just because ME is the only person that I care about in my life.

-Jitheesh

# ഒരു പാഴ്ത്തുണി

*Oru Pazhthuni*

-Aisha.

The story draws a parallel between the life of a silkworm and that of a women destined to live the life of an unwanted person in this wide wild world. Like a silkworm emerging from the cocoon she weaved her dreams with great expectations but life turned the table in her life changing her destiny from being a beautiful cloth to be adored by all to an unwanted piece of cloth.

ഏതോ ഒരു ചിത്രശലഭത്തിന്റെ കൊക്കുണിയിൽ നിന്നും സൃഷ്ടിക്കപ്പെട്ടതാണ് എന്റെ ഈ ശരീരം. പലപ്പോഴായും സ്വപ്നങ്ങൾ വിചേരിക്കപ്പെട്ടപ്പോൾ, അറിഞ്ഞോ അറിയാതെയോ ജന്മം തന്ന ചിത്രശലഭത്തെ ഞാൻ ശപിച്ചിട്ടുണ്ട്. ജീവിതമെന്ന വഴിത്താരയിൽ എന്റെ സ്വപ്നങ്ങളും ലഭിച്ച വാഗ്ദാനങ്ങളും പാഴ്വാക്കുകളായ് മാറിയപ്പോൾ ഞാനിതാ വെറുമൊരു പാഴ്ത്തുണിയായ് തരംതാഴ്ത്തപ്പെട്ടിരിക്കുന്നു. പീഡനങ്ങളും പരീക്ഷണങ്ങളും സ്ഥിരവികാരമായ് മാറിയിട്ടും എന്തേ മരണം മാത്രം എന്നെവന്ന് വിളിച്ചില്ല? എന്തേ ദൈവമെന്റെ രോദനം കേട്ടില്ല? തഞ്ചാവൂരിലെ നെയ്ത്തുകാരന്റെ കൈകളിൽ അന്ന് ഞാൻ വെറുമൊരു നൂൽക്കെട്ടായിരുന്നു. തന്റെ കലയെയും കഴിവിനെയും ജീവിതമാർഗമാക്കിയ അദ്ദേഹം തന്റെ ജോലിക്കിടയിലെന്നോ ഈ ശരീരമെനിക്ക് ദാനം തന്നു. തന്റെ പുതുസൃഷ്ടിയിൽ സംതൃപ്തനായ് അയാൾ എന്നെ തൊട്ടുതലോടുവാനും മറന്നില്ല. ആ സ്പർശം എന്നെയൊന്ന് മയക്കിയിരിക്കാം അതാവുമ്പോൾ വിൽക്കപ്പെടാനുള്ള പെട്ടിയിലേക്ക് മാറ്റിയത് ഞാനറിയാതെ പോയത്. പിന്നീട് കണ്ണു തുറന്നപ്പോൾ പട്ടണത്തിലെ ഏതോ ഒരു കടയിൽ ഞാനും മറ്റു തുണികളെപ്പോലെ ഒരു കാഴ്ചവസ്തുവായ് മാറിയിരിക്കുകയായിരുന്നു. ആദ്യമൊക്കെ മടുപ്പായിരുന്നു, പിന്നീട് 'ആരെങ്കിലുമൊന്ന് കൊണ്ടുപോയിരുന്നെങ്കിൽ' എന്നായി. അങ്ങനെ ആ ദിനവും വന്നെത്തി, എനിക്കും ഒരു ഉടമയായി. അന്ന് ബില്ലടച്ചപ്പോഴുള്ള സ്റ്റേപ്പർ തുണ്ട് ഇന്നും എന്റെ ശരീരത്തിൽ നിലനിൽപ്പുണ്ട്. പക്ഷെ ആ അനാഥത്വത്തിൽ നിന്നുമുള്ള മോചനം എനിക്ക് വേദന മറികടക്കാനുള്ള ത്രാണി നൽകി. പിന്നീടാണ് ഞാൻ സ്വപ്നങ്ങൾ കണ്ടു തുടങ്ങിയത്. പൂശിയ സുഗന്ധദ്രവ്യങ്ങളുടെയും, ചുളിവ് നിവർത്തിയ തേപ്പുപെട്ടിയുടെയും ലാളനം കണ്ടപ്പോൾ എന്റെ സ്വപ്നങ്ങൾക്കും ചിറക് മുളക്കുകയാണെന്ന് എനിക്ക് തോന്നിതുടങ്ങി. ആഘോഷവേളകളിലും സദസ്സുകളിലും ഞാൻ നിറസാന്നിധ്യമായി. പക്ഷെ കാലം, അതു മാറുമ്പോൾ പലതും മാറുമെന്ന യാഥാർത്ഥ്യം ഞാൻ പിന്നെയൊന്ന് തിരിച്ചറിഞ്ഞത്. അന്ന് ചുളിവ് നിവർത്തിയ തേപ്പുപെട്ടിതന്നെ ഇന്നിതാ എനിക്കൊരു തുള തന്നിരിക്കുന്നു. ഒരു ഷോർട്ട് സർക്കുട്ട് തന്ന തീപിടിത്തത്തിൽ എന്റെ പാതിശരീരവും കരിഞ്ഞുപോയിരിക്കുന്നു, അങ്ങനെ ഞാൻ വീണ്ടും അനാഥത്വത്തിലേക്ക് പടിയിറങ്ങുന്നു. ഇന്ന് ഞാൻ വെറുമൊരു പാഴ്ത്തുണിയാണ്. ആരും തിരിഞ്ഞുനോക്കാനില്ലാതെ ചിമ്മിണികോലുകളിലും അടുക്കളകോണുകളിലും എന്നെ നിങ്ങൾക്ക് കാണാം. ജീവിതമെന്ന പരീക്ഷണം എന്നിലിതാ ഒരു ഭീരുവിനെ സൃഷ്ടിച്ചിരിക്കുന്നു. അവൾ ചോദിക്കുകയാണ്, 'എന്തിനെന്റെ ചിത്രശലഭമേ നീയെന്നിടീ ജീവിതം തന്നു? എന്തിനെന്റെ നെയ്ത്തുകാരാ ഈ ശരീരം തന്നു?'

-ആയിഷ

# ESSENCE OF FRIENDSHIP

Feelings of joy and love, moments of sharing shoulders in support, being together for everything in this crazy world and making my face cheerful and bright together creates a miracle called 'friendship'- one of the most precious and beautiful stones in the golden crown of life.

It is a priceless gift from god. Life without friends means life without a soul. Friends are the ones who can change us, remove all fear of loneliness, and fill our life with care and happiness. Once they enter our heart, they will be with us forever, even after our last breath. Time and distance can never spoil the 'true colours of love' that they give us.

A constant source of love. Blessed hands which can wipe our tears away. A treasure of solutions to our problems. They are siblings from other parents formed without any bond of blood but strongly tied with an imaginary thread of love. They can motivate us, help us to achieve our dreams, and lift us from the darkness of grief.

Friends are like small twinkling stars in the sky that are always present during the night to accompany the moon. Even though the moon doesn't appear on some days, the stars will be there waiting for the arrival of their best buddy-the moon. From the sight of twinkling stars, we can remember the joyful days and the wonders we created with our friends once upon a time.

Friends are like a cold breeze from the sea of care and affection which surround us and remind us of 'HEAVEN' in this world. Their love and affection teach us to live with courage even in an unknown territory of strange faces and make us confident enough to say that we are not alone. The ray of mutual faith and trust, which strikes our heart, will glow forever.

Dedicated to all my friends: It is your friendship that I will always cherish in my life and it is the source of my smile. I am sure that your friendship is above anything else for me.

-Riya.

# WHAT IF I AM TO INTERVIEW STEPHEN WOLFRAM, A COLLEAGUE OF RICHARD FEYNMAN?

Neethu: Morning sir.

Stephen: Yes, morning, have your seat.

N: Thank you. Sir, I am from India, an undergraduate student of IISER Tirupati. I know you are a great friend of Dr. Feynman. I just wanted to interview you about your relationship with him.

S: Well Neethu, talking about Mr. Feynman and that too, to passionate students like you actually enthral me. So dear, proceed.

N: Thank you. Sir, Feynman was a noble prize winner, the man who highlighted the phrase, "There is a lot of space at the bottom". What do you feel about him?

S: A man who plays games with physics to discover the unrevealed, he's the fastest human calculator I have met, great at heart, simple in his lifestyle, the one who always welcomed challenging problems in life. That's Feynman to me.

N: What does he say when a crisis arises?

S: That's a good question. Well, he said "You know, you and I are very lucky. Because whatever else is going on, we have always got our physics".

N: Oh wow! That's amazing. Was he a very determined person?

S: Actually not when it comes to achievement. He didn't see physics as a career. I think at least in the years that I knew him; he was driven by the pleasure of doing it.

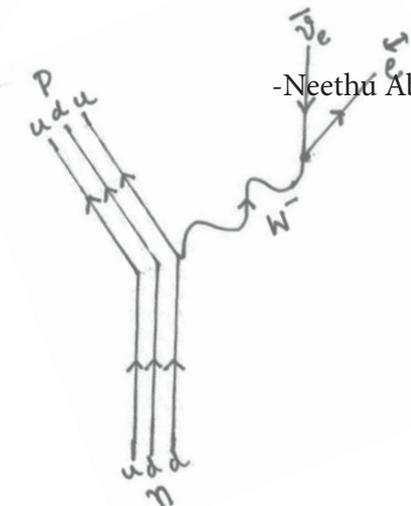
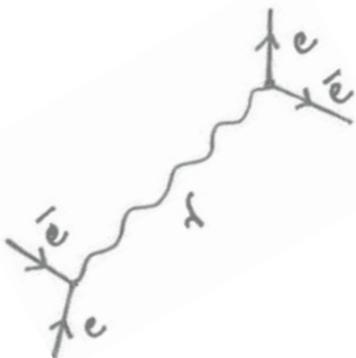
N: What message do you have to give to the students like me?

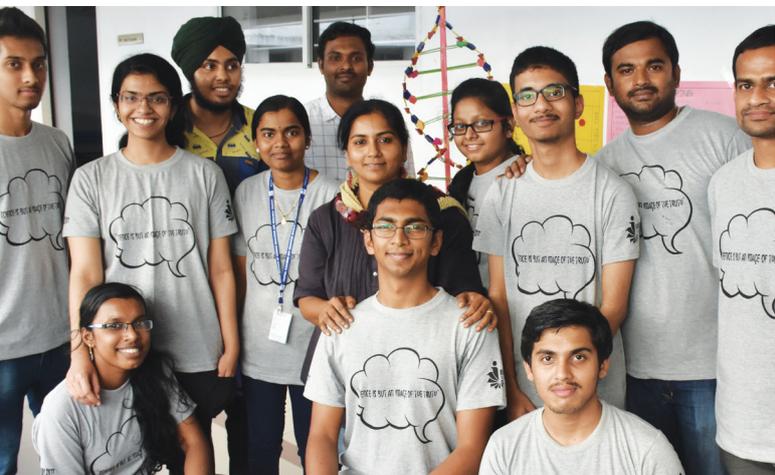
S: Now, we guys are passing on the candles to you, and your turn has begun. And let me tell you, don't expect to make a mountain out of a molehill. Just do it, for the fun of doing it. Be fascinated by the things occurring around you. And OPEN YOUR MINDS TO DISCOVER THE UNKNOWN.

N: Thank you sir, it has been a pleasure talking to you.

S: Take care. Hope to meet you again.

-Neethu Abraham.





#TiINOW



#Selfie