



KALPA 2008



IISER PUNE

भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, पुणे

INDIAN INSTITUTE OF SCIENCE
EDUCATION AND RESEARCH, PUNE



Vision

- Create research Universities of the highest caliber in which teaching and education will be totally integrated with the state of the art research.
- Evolve undergraduate and post-graduate teaching in an intellectually vibrant atmosphere of research.
- Make education and careers in basic sciences more exciting through excellence in integrative teaching and learning of sciences

Mission

- Create quality education and research in basic sciences that will nurture curiosity and creativity
- Combine undergraduate and postgraduate teaching with cutting edge research in frontier areas.
- Provide entry into research at a younger age through flexible borderless curriculum and research projects
- Forge actively strong relationships with existing universities and colleges and network with laboratories and institutions
- Establish advanced research laboratories and central facilities to encourage interdisciplinary and collaborative research across disciplines

Our Values

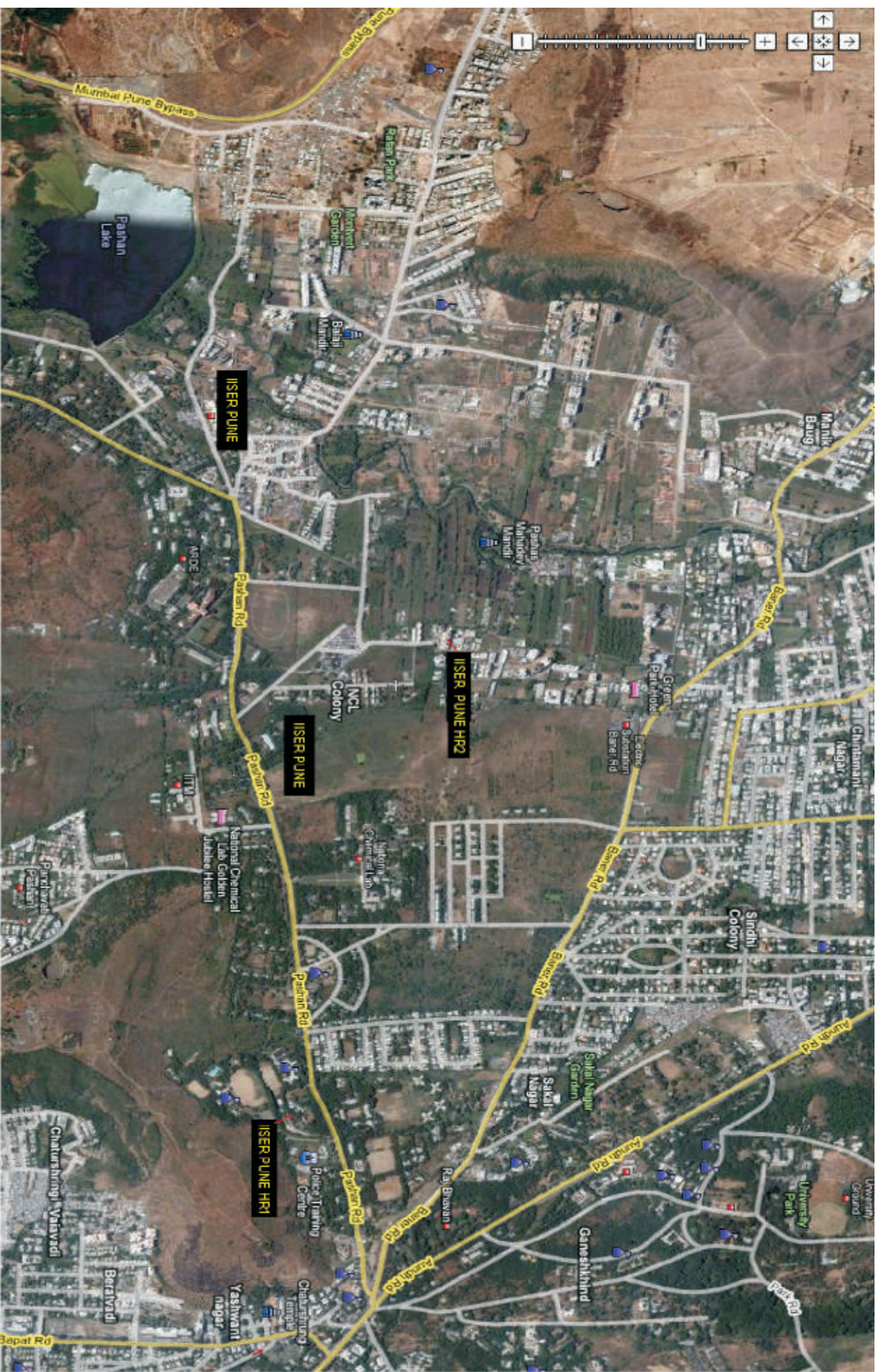
- Dedicate to learn, teach and serve the society through excellence in education, research and public service
- Celebrate the spirit of academic excellence
- Create learning and working environment based on integrity, fairness, dignity and professionalism to provide equal opportunities for everyone
- Encourage creativity of students, faculty and staff, recognising individual and collaborative achievements
- Strive to develop tolerance of diversity in community, free of all acts of discrimination and harassment
- Respect, support and value the civil and respectful expression of individual beliefs and opinions
- Develop and encourage sense of environmental responsibility
- Teach and learn Science as we practice and practice science as we learn and teach



YOUNG MINDS



YOUNGER MINDS



Latitude : 18° 32' N

Longitude : 73° 48' E

Elevation : 1925 Ft

Courtesy : Wikimapia

KALPA

2008



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, पुणे

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, PUNE

where tomorrow's science begins today

Campus - I : 900, NCL Innovation Park, Dr. Homi Bhabha Road, Pune 411 008.

Tel.: 020 - 2589 8021 / 23

Campus - II : 1st Floor, Central Towers, Sai Trinity Building, Garware Circle, Sutarwadi,
Pashan, Pune 411 021. Tel.: 020-25881724 / 25

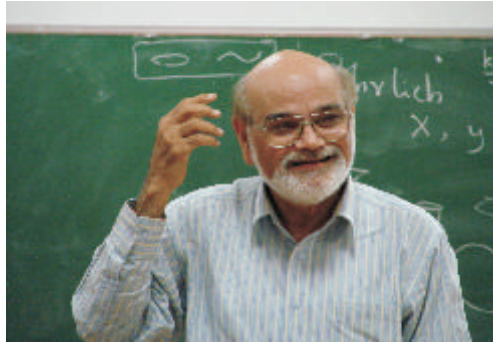
www.iiserpune.ac.in

The Chairman & Members of Board of Governors, IISER, Pune

- 1. Prof. N. Kumar,**
Chairman BoG, IISER-Pune &
Homi Bhabha Distinguished Professor
Raman Research Institute, CV Raman Avenue, Bangalore - 560080

Members

- | | |
|---|---|
| 2. Shri R.P. Agrawal, Secretary,
Dept. of Higher Education,
Ministry of HRD, Govt. of India, Shastri
Bhawan, New Delhi-110001. | 10. Dr. P. S. Goel, Secretary, Govt. of India
Ministry of Earth Sciences
1 st Floor, Mahasagar Bhawan, Block No.12
CGO Complex, Lodhi Rd, New Delhi - 110003 |
| 3. Prof. K. N. Ganesh
Director, IISER, Pune
National Chemical Laboratory Campus,
Pune-411008 | 11. Chief Secretary,
Government of Maharashtra
Room 518, 5 th Floor, Mantralaya,
Mumbai 400032 |
| 4. Prof. S. Sivaram
Director, National Chemical Laboratory ,
Pune | 12. Prof. D. Chatterjee
Molecular Biophysics Unit, Indian Institute of
Science, Bangalore - 560012 |
| 5. Prof. P. Balaram
Director, Indian Institute of Science,
Bangalore-560012. | 13. Prof. R. Parimala
School of Mathematics
Tata Institute of Fundamental Research
Homi Bhabha Road, Mumbai 400005 |
| 6. Prof. S. Dattagupta
Director, IISER, Kolkata
IIT Kharagpur Kolkata Campus,
Kolkata 700091 | 14. Prof. Arup Kumar Raychaudhuri
Director,
S. N. Bose National Centre for Basic Sciences
Salt Lake, Kolkata 700098 |
| 7. Prof. S. G. Dhande
Director, Indian Institute of Technology,
Kanpur - 208016 | 15. Prof. K. Vijay Raghavan
Director, National Centre for Biological
Sciences, TIFR, UAS-GKVK Campus,
Bangalore 560065 |
| 8. Dr. G. Madhavan Nair
Secretary, Department of Space
Antariksh Bhavan, New BEL Road,
Bangalore 560094 | 16. Shri Sanat Kumar Ray
Financial Adviser & Joint Secretary,
MHRD, Dept. of Education, Govt. of India
Shastri Bhawan, New Delhi 110001 |
| 9. Dr. Anil Kakodkar
Department of Atomic Energy,
Govt. of India, Anushakti Bhavan
Chatrapathi Shivaji Maharaj Marg,
Mumbai 400001 | 17. Shri Basavaraj Swamy
Registrar & Secretary,
Board of Governors,
IISER, Pune, |



Message

"My Dear Students of IISER Pune,

Once again the Annual Day is upon us, and here is my wishful thought for you. The Annual Day is a convenient point of time at which to review and to rejoice the idea of IISER that has now become yours for ever. Let it constantly inspire you and your Kalpa with creative thoughts that may inform your endeavours.

With all my best wishes

N. Kumar

Chairman, BoG,
IISER, Pune



From the Director's Desk

Dear Friends

I am very delighted to present the second issue of IISER Pune magazine, KALPA 2008. We are about to complete the second year, with 4 semesters of academics soon and the year 2007-2008 has added many colours to IISER Pune. In this letter, I am happy to present some of the worthy progress we have made in 2007-2008.

IISER Pune Sai Trinity Campus :

The singular achievement this year has been the starting of the second IISER campus at Sai Trinity building with a leased space of 45,000 sq.ft. The two lecture halls, Raman and Ramanujan halls, 4 tutorial rooms, library, administrative area, physics research and teaching labs, computer hall and state of the art biology laboratories to house about 40 undergraduates and 40 research students at a time, faculty offices and a cafeteria are all in place and provide a good ambience for everyone to work. The chemistry labs at NCL Innovation Park campus is undergoing remodeling for initiating research. Though some of us have to shuttle between two places, the total space available for IISER is good enough to carry most of the activities for the next 3 years, by which time, the main campus should be ready. The establishment of all the above facilities in new campus took less than 3 months, thanks to the hard, punctual and non-compromising quality of project management work by CPWD Pune division. IISER Pune is highly indebted to CPWD Pune team for their effort and contributions to IISER Pune. I should place on record the commitment and passion shown by Prof L S Sahshidhara in constantly monitoring the progress, spending several hours amidst the dust and paint at odd hours and leaving no stones unturned to ensure everything goes as per our plans. The creation of these facilities at short time has given IISER Pune a very good opportunity

to fully carryout the teaching activities and initiate research programmes. I sincerely hope that research publications would start flowing from IISER Pune this year.

IISER Faculty :

Another important aspect of this year is the appointment of new faculty at IISER Pune. There has been tremendous response and interest from extremely competent candidates for faculty positions and though it is very tempting for us to offer positions to many of them in order to not lose excellent faculty, we need to go slow and pace it with the research infrastructure available at present. Several candidates have already visited IISER Pune for giving seminars and interact with faculty and students. We are already reaching a stage where not only the best are chosen, but start exercising some choice on their research areas to bring balance in terms of academic requirements and areas of futuristic research potential.

Academic activities :

All the academic courses - lectures and practicals, have been completed on schedule and many courses have been taught by the newly joined faculty. Some changes in terms of course contents have been effected for the benefit of students. We are ably assisted by some visiting and adjunct faculty from outside. Students feedback are constantly sought to better the teaching programmes. The new laboratories in physics and biology are not only the state of art, but also are scaled up to accommodate more students. The chemistry laboratories are also being modernized. We are also in the process of reexamining the course contents along with those effected by IISER Kolkata and Mohali. We strongly believe that IISER should have this flexibility to tune the course structure and contents to the best of our

students' abilities and needs. Our library now has close to 3000 hard copy text books and 3000 on-line text books and subscription to major research journals. We also have a collection of more than 100 textbooks on CDs. The IISER website has also been revamped recently to make it attractive and functionally informative.

IISER main campus :

There has been very good progress in setting up the main IISER Pune campus. CSIR/NCL has now officially handed over 98 acres of land for creating IISER Pune campus. Through advertisement of a global notice which attracted some of the best architects and project management consultancy groups and based on merit, we have short listed a few ones for the next level of competition selection. We have appointed a highly competent project engineer who is joining IISER shortly to involve in the process of campus creation. Hopefully in KALPA 2009, we should have the first photograph of the new IISER Campus!. It will have the latest academic facilities for teaching and research setup for interacting in a multidisciplinary manner. The new campus would be aesthetically appealing, nature friendly, functional, incorporating intelligent building management systems combined with structural concepts to enable fast construction, using latest building technology, with environment friendly materials, without sacrificing flexibility to accommodate changes/ modifications, if required at a later date. The campus will have all modern energy saving and eco-friendly features such as water recycling, rain water harvesting, solar/wind power, compact fluorescent lamps and green buildings.

Student and Faculty Housing :

One major problem which IISER Pune confounds today is that of student accommodation. It was not easy to find students residences for the 2007 batch and all of us spent more than two months to identify a suitable place. Foreseeing this situation, in the very first year, IISER Pune approached MHRD to permit us buy a full building of 25 flats which could be used as students hostel followed by faculty housing. Unfortunately we did not succeed to do so and during this year 2008, with anticipated admission of 80-100 students, hopefully we will find solution to this problem. The hostel construction is underway, but will not be available for this year. If even at this stage MHRD allows us to purchase flats, it would be an ideal way to address the problems of both students

as well as faculty housing. Fortunately enough, we have been supported to lease housing for faculty, but given the estate situation in Pune city, the rents are too exorbitant. This is also true for renting the students accommodation, but buying flats would be not only a timely solution of economic sense, but also a good investment for future and saves some land in main campus.

Administration :

Now IISER Pune has a full fledged administrative system, with the Registrar setting up the systems of rules and practices. All the staff in administrative section are working on contract basis and deserve credit for the hard work done to clear the files efficiently. However, the smooth streamlining of various procedures, to the immediate interests for IISER, is taking some time due to lack of enough manpower and unanticipated situations. However this will be overcome at the earliest for everyone's good, with more staff joining. The purchase activity is in full swing with IISER securing DSIR certificate for customs duty exemption and appointment of a clearing agent. This year, IISER will be equipped with both essential minor and major sophisticated instruments such as NMR, mass spectrometer, microscopes etc.

With young faculty and enthusiastic students around, I am happy to see that a number of extracurricular activities have been initiated for students to challenge their imagination.

I would like to place on record my deep sense of appreciation to all IISER faculty including visiting and adjunct, all students and administrative staff for their unstinted support amidst trying circumstances to place IISER interest always first. I wish to thank the Chairman and Members of Board of Governors for their constant, critical, valuable and visionary advice in steering IISER Pune and for supporting all new initiatives. MHRD colleagues have always assisted IISER Pune in extending important support with an understanding necessary for the newly establishing institutions. I should acknowledge the helpful advice and suggestions of Directors of IISER, Kolkata and Mohali. Thanks are due to the members of various selection and evaluation committees for their invaluable inputs. At IISER Pune, all of us are living through an important period with awareness that it is destined to become the "History" of IISER and that, what we do today will stand in time for the future to judge us.

- K. N. Ganesh

Contents

Sr.	Particulars	Pg. No.
	Editorial	vii
	Acknowledgement	viii
1.	Auspicious Moments ! Official transfer of 98 acres of land from CSIR/NCL	1
2.	Annual Day 2007	2
3.	IISER @ Sai Trinity	4
4.	IISER Pune Library	6
5.	IISER Hall of Residence - II : Our New Home	6
6.	Hearty Welcome to IISER	7
7.	Faculty, IISER, Pune	9
8.	Academic Activities of Faculty during 2007-08	11
9.	Visitors	17
10.	Glimpses of 2007-08	18
11.	Congratulations !	20
12.	The Intoxicating Hours of Colloquia at IISER, Pune	21
13.	Colloquia / Seminars in IISER Pune during the Academic Year 2007-2008	24
14.	Events at IISER during 2007-2008	27
15.	About knowledge, the Sage speaketh...	29
16.	A Mystical Musical Trip with.... SPICMACAY	30
17.	Chess in Check	31
18.	The Story, anyone ?	32
19.	Making of a 3D Sudoku	37
20.	There's No Place Like Home	40
21.	POBE @ JNCASR, Bangalore	41
22.	The Pretty Face of Microbiology : Our Experience at 48th Ami Conference	42
23.	Reunion	43
24.	When Time Stood Still	45
25.	The Speed of Light	46
26.	Some Journeys Never End	48
27.	At NCBS	49
28.	Nanorobots enabled Diagnosis & Molecular Machines	52
29.	Carzania	54
30.	The Catenary	56

Sr.	Particulars	Pg. No.
31.	Signaling just the 'second' way to communicate	57
32.	Hold On	58
33.	Tortoise in standing	59
34.	The Ultimate Soapbox	60
35.	Fermat's Last Theorem down the ages	61
36.	Search	62
37.	GMB	63
38.	The War	64
39.	Books	65
40.	Elusive Happiness	66
41.	Empty Benches	66
42.	The Three Friends and a Sneeze	67
43.	Forlorn... Forward...	68
44.	Three Stages of Life - School, College, Business	69
45.	To My Fellow Traveller	70
46.	Debates on Science, Scientists and Scientific Research	71
47.	भारतातील औषध निर्मिती उद्योग - आज, काल आणि उद्या...	72
48.	अहिंसा	74
49.	समझ	75
50.	आराधना	75
51.	येथे कर माझे जुळती	76
52.	माझे आजी-आजोबा	77
53.	भारतीय कालमापन पद्धत आणि खगोलशास्त्र	78
54.	पायरसी - एक प्रवृत्ती	79
55.	Our Sincere Thanks to CPWD Team	81
56.	IISER Family 2007 - 08	82

Editorial ...



Nobody gets an Oscar for the Best Nothing. But the uncontroversial Oscar Wilde lazily said 'Work is the refuge of people who have nothing better to do.' Going by that line of thought, nothing in KALPA is work. It is fun. A collection of the light-headed aspirations of budding scientists trying to shake their knees and twitch their vocal cords. A break from having to get up each day with a worry about how the flies will behave in the lab, or how the algorithm will crash recursively. A call for freedom from the Japanese work ethic of Karoshi (literally, being worked to death) and Inemuri (sleeping on the job, showing commitment to work). All exam-bound students wonder whether their gurus are patrons of this sacrilege. As they wear their gauntlets on the battlefield, they get wounded, poked and provoked; only to rub into their brows the lesson: Never surrender (Unless it's a strategic play towards final victory). All the truths were hidden from us at dawn, but we bite and scratch to get that grain of sand which brings with it the wisdom of our time. We fail for the future. Beg the impossible. Slave for the truth. And its beauty.

Here's a labor of love...

*The lionesses' merciless pride
 Cornering juicy lifeless hide
 Pack of chuckling hyenas ride
 On joy of overpowering tide
 To bring lost labor to their side
 Hymns and jungly gospels chide
 Hungry breathless beasts who almost died
 "Fruits or not, duty you must abide
 Your heart, gut and gumption bona fide
 Yearn for more - a pitiful suicide
 Go forth! Tarry, not! Let this be your guide
 Few mortals cross this divine divide
 Spread these gavels of love far and wide
 Work be your worship, my pride."*

For the younger ones: A pride of lionesses (say, in the Pride lands) pursue and kill their prey (deer, zebra, bison...). However a huge pack of hyenas overpower them in a bloodless coup by a battle of numbers. The lionesses are hungry and broken (in faith, justice). The forest murmurs and feeds them psalms, strengthening them to salvation. Hey! The poet was not a hungry stomach, though. Only a hungry mind.

Probably the only thing left (of me) is a mug shot, eh?

It's easy to verse... but to serve... with ties to sever?

Yours labouringly,
Sisir C. Anand
 The Editor

Acknowledgement

It gives me immense pleasure to shower my gratitude on all those who helped infuse life into the second issue of KALPA. My spectrum of thankfulness starts with our director, Prof K. N. Ganesh, who extended the luminous adventure I undertook as the editor of KALPA last year. I am deeply indebted to Dr G. Ambika who sacrificed valuable time and spent late evenings helping me daub red, blue and green to the KALPA canvas, starting from the empty palette.

The second issue had to surpass the first with bright colors, and only time will pass that verdict. While you, the respected reader, judge, I would like to thank Bedartha for his majestic illustrations; Kapil, Gaurav, Sumit for revisions in the Hindi articles; Sushant & Girish for taking initiative towards contributions in Marathi; Arpit & Girish for photography; and Surojit for compilations. Special appreciation disperses to Dr. Sutirth Dey for polarizing the cultural landscape at IISER.

Let me thank the integral and most vibrant part of the spectrum: the faculty, students, administrative and supporting staff who make IISER breathe and run, without whom, KALPA would be colour blind.

Auspicious moments ! Official transfer of 98 acres of land from CSIR/NCL



AGREEMENT

The Agreement entered into on the 17th Day of August Two Thousand Seven.

B E T W E E N

“The National Chemical Laboratory a constituent Laboratory of the Council of Scientific and Industrial Research (CSIR), a Society registered under the Societies Registration Act, XXI of 1860 whose office is situated at Dr. Homi Bhabha Road, Pune 411 008, (hereinafter referred to as “NCL/CSIR”).

And

“Indian Institute of Science Education and Research, an Institution registered under the Societies Registration Act, 1860, and under the Administrative control of Ministry of Human Resource Development (MHRD), Govt. of India, whose office is situated at 900, NCL Innovation Park, Dr. Homi Bhabha Road, Pune 411 008, (hereinafter referred to as “IISER”).

WHEREAS MHRD approached CSIR/NCL with a request to allocate about 100 acres of land at the NCL Campus for setting up the “Indian Institute of Science Education and Research (IISER)” with a vision to establish a world class Research University for integrative and borderless Science which will combine high quality research and innovative teaching at the undergraduate, post graduate and doctoral level.

WHEREAS CSIR considering the fact that the setting up of IISER in the proximate vicinity of NCL/CSIR will provide an excellent opportunity to close the gap between research and higher education and will benefit NCL/CSIR in creating a talent pipeline from education to research. Furthermore, new research collaboration would lead to greater interdisciplinary research in both the institutions and thus paving the way to twin the research capabilities of NCL/CSIR and IISER combining advanced scientific research and education in the area of basic sciences.

WHEREAS considering all the mutual benefits that NCL and IISER would derive, the Governing Body, Council of Scientific & Industrial Research(CSIR) has approved handing over the possession of around 100 acres of land from National Chemical Laboratory(NCL) Campus to IISER at Pune. The terms and conditions of handing over of the possession of the land from NCL to

IISER are as detailed hereinunder :

- That the CSIR/NCL hands over possession of 100 acres of land to IISER at Pune.
- That the title of the land will vest with NCL/CSIR.
- That the IISER shall construct building over the said land with its own funds.
- That the CSIR/NCL shall extend necessary help to IISER for obtaining necessary permission from the concerned authorities for construction of the building.
- That the electricity & water charges shall be borne by IISER.
- That the maintenance of the buildings and land shall be the responsibility of IISER.
- That the open well, currently in use by NCL for meeting its water requirements and which is located in the land being provided to IISER be handed over to the possession of IISER. This well will be shared by both NCL and IISER .
- That the taxes, if any, shall be borne by IISER.
- That all the expenditure in setting up of IISER would be solely borne by IISER and no cost shall be borne by CSIR/NCL.
- That in the event of closing of IISER the vacant building and its land shall revert to CSIR/NCL.
- That at all times, the judicial possession of the said land shall be of the NCL/CSIR. The NCL/CSIR has only handed over the possession of 100 acres of land in their premises to IISER Pune.
- That IISER, Pune shall not assign, transfer or part with the said premises or any part thereof, in any manner whatsoever, at any point of time, to other party for any other purpose.

The Agreement entered into on the 17th Day of August Two Thousand Seven.


**Director,
National Chemical Laboratory, Pune**


**Director,
Indian Institute of Science Education
and Research, Pune**

Date : 17th August, 2007

Place : Pune

Witness

1. 
(Signature, Name and address)

2. 
(Signature, Name and address)

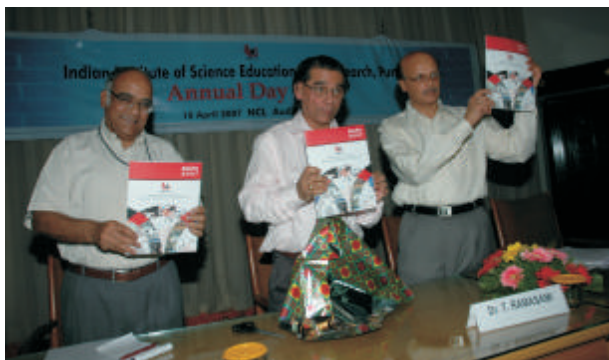
Annual Day 2007

IISER Pune celebrated its first Annual Day on 10th April 2007.

Dr. T. Ramasami, Secretary, Department of Science and Technology and officiating Director General, CSIR graced the occasion as Chief Guest.



Prof. K. N. Ganesh, Director, IISER, then formally welcomed the Chief Guest and the audience to the function. Dr. Sivaram, Director, National Chemical Laboratory, voiced his thoughts on being associated with IISER since its inception. Following this, Dr. Ganesh presented a report - 'Glimpses of IISER' - he built on the IISER developmental stages from a neonate to an energetic toddler (in just 10 months). He also outlined the visions that the institute holds for the future. This was followed by some remarks and reflections by faculty & students. Ajit and Lakshmi Priya gave colorful accounts of the student life and



Let KALPA be

passion at IISER, while Dr. Ambika mused about the nurture of students by the faculty. Sisir edited out the details of how KALPA came into being and thanked

all for being in it with him, for them. And finally KALPA 2007 was let out into the light of the day by Dr. Ramasami.



Dr. Ramasami, while addressing the gathering expressed his hope that the young crowd at IISER would grow at a much rapid pace & reach the heights of other long-standing institutes in just ten years. M. S. Vidyathan proposed the vote of thanks. Bedartha and Shambavi compered the function.

After the siesta, a professional troupe of Kathak artistes recounted the everlasting tales of Indian Mythology with pomp and show.




मूलभूत विज्ञान आणि संशोधनासाठी अकराव्या योजनेत पाचशे कोटी

IISER gets into expansion mode

Currently, we have seven full-time faculty members. We plan to increase the strength to 100 in five years. The idea is to recruit 20 faculty members each year.

K. N. Ganesh (Director)

The article continues with details about the institute's expansion plans, including the recruitment of faculty and the development of infrastructure. It mentions that the institute has received a grant of Rs. 500 crore from the Government of India for the 11th Five Year Plan. The director, Prof. K. N. Ganesh, expressed his vision for the institute to become a leading center for basic research in India.

IISER @ Sai Trinity

With the beginning of the new semester on 7th January 2008, IISER moved to a new building, the Central Tower of Sai Trinity complex. Currently, the building houses the administration, the lecture halls and library, and the departments of physics and mathematics, and biology, spread over three floors. The department of chemistry continues to be housed in the NCL Innovation campus of IISER.



The lecture halls at IISER new campus, aptly named Raman Hall and Ramanujan Hall, can accommodate 120 and 80 people respectively. The spacious library hall, with a seating capacity of about 40, has been provided with computer facilities for browsing through the online journals, e-books and other related computer-based resources.

The campus also provides basic refreshments to the occupants through the canteen. In the complex, there is also a breathing space provided in the form of a garden, which stretches around one end to the other on the first floor.

The administration section, which is also located on the first floor, consists of director's and registrar's offices and offices of other essential administrative staff. Academic and administrative meetings are held in the two boardrooms in the administration section.



The second floor houses the Physics and Mathematics departments. There are two teaching laboratories for physics each with the capacity of 40 students. Teaching laboratories are equipped with sophisticated instruments. Besides

teaching laboratories, physics department has four research laboratories and a dark room for optics related experiments.

The biology departmental facilities include the laboratories for teaching and research and central instrumentation. The teaching lab is designed for accommodating about 50 students simultaneously, while the research lab can cater to the requirements of about 40 students. The labs

are equipped with the state-of-the-art facilities for life science research. The common instrumentation facility, strategically placed between the research and teaching labs, allows for the access of the equipments for both research students and undergraduates. The fly lab, the microscope facility, the tissue culture room have been specially designed for carrying out world class research in various specialized fields of biology.

There is also a special instruments laboratory, which will accommodate highly specialized facilities such as a real-time quantitative PCR (Polymerase Chain Reaction), flow cytometer, multimode plate reader, to name a few. Some of the instrumentation available in the laboratories includes PCR machines, spectrophotometers, water purification system, centrifuges of varied capabilities, electrophoresis apparatus, microscopes and other basic requirements for carrying out molecular biology

research. In addition to the laboratories, exclusive area for media preparation and other related activities has been designed.

The computer laboratory is designed to provide high class computational facility with mathematical and scientific packages and broadband internet facility with forty computers of latest configuration. Printing and scanner facilities are also available in the student's computer lab. All the floors have one or two tutorial rooms, with a seating capacity of approximately 20, which is an ideal place for group meetings, and as classrooms for specialized courses. Faculties are provided with office space in their respective departments.



maintains a comfortable temperature and is also optimized in terms of energy consumption, has been provided for the whole campus. A stabilized power supply, essential for the smooth functioning of all sophisticated equipments, has been ensured.

The new campus with all the modern facilities was constructed in the record time of three months and it will remain as IISER

campus for the next three years till the new and permanent campus comes up in the 98-acre land provided by NCL.

Centralized air conditioning, which automatically

- Compiled by Neelesh Dahanukar & Dr. Gaytri P.



IISER Pune Library

The IISER Library (Pune), started in 2006, functions as a library, documentation and information centre catering to education and research in basic sciences. It has a collection of about 3000 books in the areas of pure science viz. Physics, Chemistry, Biology and Mathematics. The Library collection is expanded regularly in consultation with IISER faculty members and students, on a monthly basis.

The library resources are mainly around 3000 books, 150 Popular Science Books, 50 Audio-visual materials, 26 Science Journals (print version) and 7

e-journals. The collection of Springer e-books from 1999 to 2007 in four modules of basic sciences is available to the students and faculty for reference.

We are subscribing to e-journals from Nature Publishing Group, CellPress, all e-journals from Science Direct and Scopus, with access to back volumes of journals under Science Direct. The Library has installed LIBSYS library software for library activities and Web-OPAC for online searching of the library documents.



IISER Hall Of Residence - II : Our New Home

- Surojit Sural

All this started early in August, 2007, (a few weeks before the second batch joined IISER Pune) when the five- storeyed building, Avanti Heights was officially named the IISER Hall of Residence-II (HR-II is the more popular name). Located at Someshwarwadi, this massive edifice is just twenty minutes' walk from the institute. The 25 rooms in this building house 46 first year students, 4 research scholars and 4 faculty members. Dr. Sutirth Dey, being the warden, is the busiest person around who is always troubled a lot by our problems as well as our mischievous deeds.

The atmosphere here is absolutely charming and the students, most of whom are out of their houses for the first time, have already built up an intimate relationship with this place. We have a lot of stuff to

do besides studies in our leisure time. Other than watching TV, most of us are seen involved in indoor games like carrom and chess. Not only the traditional ones, we also have inter-hostel events of computer games too. However, during the cricket matches, all of us can be tracked down in the TV room and we bet that neighbours do not have a good time then due to our shouting and screaming.

The hostel is a very good place to interact with our batch mates. Not only it helps in our academic progress but also it makes us know each other better. Our common schedule and the pre-planned bus time-table make us more punctual in our daily life. In a nutshell, the past few months have seen HR-II being slowly emerging as the 'NEW HOME' for the IISER Pune family.

Hearty Welcome To IISER



Prof. L. S. Shashidhara



Dr. A. A. Natu



Dr Rama Mishra



Dr S. Vijaykumar



Dr T. S. Mahesh



Dr Sudarshan Ananth



Dr Aurnab Ghose



Dr Mayurika Lahiri



Dr. Sutirth Dey



Dr. P. Gayatri



Dr. V.G. Anand



Dr. Hosahudya Gopi



Dr. Shivprasad Patil



Dr. Partha Hazra



Dr. M. Jayakannan



Dr. Alope Das



Basavaraj Swamy (Registrar)



Administrative and Supporting Staff

Standing (from L) Ms. Pradnya Gokhale, Ms. Beena Pillai, Ms. Nayana Shirole, Ms. Varsha S.Dugam, Mrs. Aashka Patwa, Mr. Sanjay Gomale, Mr. Vilas Salunkhe, Mr. Mialvel Mari - Sitting (From L) Mr. N.G.Narawane, Mr. M.V. Joglekar, Mr. K. Natrajan, Mr. Gopalkrishnan Marar, Mr. Basavaraj Swamy, Mr. A K Pandey, Mr. V. V. Sinha

Faculty, IISER, Pune

1	Prof. Krishna N. Ganesh	Director
2	Prof. R. Ramchandran	Sr. Professor & Co-ordinator
3	Dr. G. Ambika	Associate Professor
4	Dr. Vikram Sharad Athalye	Visiting Faculty
5	Dr. Ramkrishna G. Bhat	Assistant Professor
6	Dr. T. S. Mahesh	Assistant Professor
7	Mr. Neelesh Dahanukar	Visiting Faculty
8	Dr. Sucheta Koshti	Visiting Faculty
9	Dr. A. A. Natu	Visiting Professor
10	Dr. V. G. Anand	Assistant Professor
11	Dr. Hosahudya N. Gopi	Assistant Professor
12	Dr. S. Vijaykumar	Visiting Faculty
13	Dr. Alope Das	Assistant Professor
14	Prof. L. S. Shashidhara	Professor & Coordinator
15	Dr. Rama Mishra	Associate Professor
16	Dr. Sutirth Dey	Assistant Professor
17	Dr. P. Gayatri	Visiting Faculty
18	Dr. M. Jayakannan	Assistant Professor
19	Dr. Aurnab Ghose	Assistant Professor
20	Dr. Mayurika Lahiri	Assistant Professor
21	Dr. Sudarshan Ananth	Assistant Professor
22	Dr. Partha Hazra	Assistant Professor
23	Dr. Shivprasad Patil	Assistant Professor
24	Dr. Souvik Datta	Assistant Professor (to join)
25	Dr. Prasad Subramanian	Assistant Professor (to join)
26	Dr. Apratim Chatterjee	Assistant Professor (to join)
27	Dr. M. S. Santhanam	Assistant Professor (to join)
28	Dr. Girish Ratnaparkhi	Assistant Professor (to join)

Participating Faculty

1.	Prof. S. S. Deshpande,	University of Pune
2.	Prof. Milind Watve,	Abasaheb Garware College, Pune
3.	Dr. Ashok Thorat,	Institute of Advanced Studies in English, Pune
4.	Dr. Arjun Jadhav,	Institute of Advanced Studies in English, Pune
5.	Dr. B. B. Nath,	University of Pune
6.	Dr. Sourav Pal,	NCL, Pune
7.	Dr. Sujatha Bhargava,	University of Pune
8.	Prof. S. P. Gejji,	University of Pune
9.	Mr. Pratip Shil,	University of Pune
10.	Ms. Archana Achlere,	University of Pune
11.	Dr. Sanjeev Galadide,	NCCS, Pune
12.	Dr. Tushar Vaidya,	CCMB, Hyderabad
13.	Dr. Vijay Kumar Sharma,	JNCASR, Bangalore
14.	Dr. Sitabhra Sinha,	IMSc, Chennai
15.	Dr. Kishanu Ray,	CCMB, Hyderabad
16.	Dr. B. V. Goswami,	IITM, Pune
17.	Dr. R. Krishnan,	IITM, Pune
18.	Prof. Y. Joshi,	Pune

Administrative and Supporting Staff

1	Mr. Basavaraj Swamy - Registrar	9	Mr. Vilas Salunkhe
2	Ms. Pradnya Gokhale - Documentation Officer	10	Mr. K. Natrajan
3	Mr. Mialvel Mari	11	Mr. M. V. Joglekar
4	Ms. Varsha S. Dugam	12	Mr. Sanjay Gomale
5	Ms. Nayana Shirole	13	Mr. I. S. Sayyed
6	Mr. N. G. Narawane	14	Mrs. Aashka Patwa
7	Ms. Beena Pillai	15	Mr. V. V. Sinha
8	Mr. Gopalkrishnan Marar	16	Mr. Shailesh More

List of Students

Batch - I

- More Sushant Nivasrao
- Sisir C. Anand
- Rishabh Verma
- C. B. Ajit
- Lakshmi Priya M. E.
- Nitin Singh Chouhan
- Rajesh Kumar Yadav
- Parivesh Priye
- Avi Prasanna
- Anand Pathak
- Adimoolam Santhosh Arvind
- Haritha Rao
- Madhuresh Sumit
- Smrati Kumar Katiyar
- Sheetal Kumar Jain
- Bedartha Goswami
- Kumar Saurav
- Ruchi Gupta
- Ankur Gupta
- Shashank Agrawal
- Harpreet Singh
- Abhijeet Kumar
- Prakhar Arora
- Shambhavi Vashishtha
- Vedant Pande
- Arpit Yati
- Kapil Kumar Gupta
- Susheel Kumar
- Prabhdeep Singh
- D. Pravarthana
- Shishir Suresh Chourey
- Hemant Kumar Verma
- Lokeshwar Bandhu
- Rakesh Gaur
- S. Ajay Subramanian

- Kale Girish Ravindra
- Vivek Anand
- Ashutosh Priyadarshi
- Hutashan Vajpeyi
- Varun Kumar Rishi
- Subhajit Das
- Stanzin Dadul
- Gaurav Chauhan
- Navi Prasad

Batch-II

- P. Rahul
- Sandeep Gupta
- M. Dinesh Kumar
- Behloul Sabir
- Danveer Singh
- Surojit Sural
- Dharmraj Robins Chourasia
- Shadab Alam
- Anuj Kumar More
- Sameer Parihar
- Rohit Kumar
- Rahul Kumar
- Karan Kapoor
- Akshaa Vatwani
- Manvendra Sharma
- P. Vivekananda Reddy
- Abhijit Awadhiya
- Kunal Sinha
- H. Guhan Venkat
- Neha Agrawal
- Anuradha Bhukel
- Anuj Bisht
- Darshan Joshi
- Sarthak Parikh
- Apeksha Tare

- Anup Mahesh Savale
- Vivek Krishna Pradhan
- Srija Bhagavatula
- Amitosh Sharma
- Prashant Agrawal
- Mohammed Zuhair
- Ayesha Fatima
- Thomas Kurian
- Hemant Katiyar
- Neelesh Soni
- Manoj Sahu
- Shashwat Antony
- Ankit Dwivedi
- Jay Shah
- Joola Madhuri
- R. Vinay Yadav
- Ankur Sharma
- Mohit Raghuwanshi
- Mark Ashish
- Swati Venkat
- Ajinkya Deogade
- Ashutosh Agnihotri
- P. Venkata Raghu Tej
- Vibham Shukla
- Abhinav Kumar
- Kartik Hambardikar
- Kumar Brajesh Prasad
- Sandeep Suman
- Madhur Mangalam
- Piyush Agrawal

Research Scholars 2007-08

- Ms. Savita Singh
- Ms. V. Resmi
- Mr. Anurag Sharma

Academic Activities of Faculty during 2007-08

Research Publications :*

1. **Aloke Das**, J. S. Miller, Erwin D. Poliakoff, R. R. Lucchese and John D. Bozek, "Vibrationally resolved photoionization dynamics of CF₄ in D²A₁ state", *J. Chem. Phys.* **127**, 044312 (2007)
2. Raffaele Montuoro, R. R. Lucchese, John D. Bozek, **Aloke Das** and Erwin D. Poliakoff, "Quasibound continuum states in SiF₄ 5a₁⁻¹ photoionization: Photoelectron-vibrational coupling", *J. Chem. Phys.* **126**, 244309 (2007).
3. Simultaneous and Sequential Synchronisation in Arrays- **G Ambika** & K Ambika- **European Physical Journal** **37**,347-352(2007)
4. An algorithmic computation of correlation dimension from time series- K P, Harikrishnan, **G Ambika** & R Misra- **Mod Phys. Lett B** **21**,129-138(2007)
5. Resonance Phenomena in discrete systems with bichromatic input signal- K P harikrishnan & **G Ambika**- *Eur. Phy. J.B*, **61**, 343-353 (2008)
6. **Ghose, A.** and Van Vactor, D. (2008) Regulating receptor PTP activity. In R. A. Bradshaw and E. A. Dennis (eds.). *Handbook of Cell Signaling*. Elsevier, Inc. (*In Press*)
7. Ferrocene-Linked Thymine/Uracil Conjugates: Base pairing Directed Self-Assembly and Supramolecular Packing. Patwa, A. N.; Gupta, S.; Gonnade, R. G.; Kumar, V. A.; Bhadbhade, M. M.; **Ganesh, K. N.** *J. Org. Chem.* **2008**, **73**, 1508-1515.
8. PDZ domain-mediated dimerization and homeodomain-directed specificity are required for high-affinity DNA binding by SATB1. Purbey, P. K.; Singh, S.; Pavan Kumar, P.; Mehta, S.; **Ganesh, K. N.**; Mitra, D.; Galande, S. *Nucleic Acids Res.* **2008**, 1-16.
9. Cyanuryl peptide nucleic acid: synthesis and DNA complexation properties. Vysabhattachar, R.; **Ganesh, K. N.** *Tetrahedron Lett.* **2008**, **49**, 1314-1318.
10. **Gayathri, P.**, Balaram, H., Murthy, M.R.N., Structural biology of plasmodial proteins, *Current Opinion in Structural Biology*, 2007; **17**(6), 744-754
11. **Gayathri, P.**, Banerjee, M., Vijayalakshmi A., Azeez, S., Balaram H., Balaram P., Murthy, M.R.N., Crystal structure of triosephosphate isomerase (TIM) from *Methanocaldococcus jannaschii*, *Acta Crystallographica Section D*, 2007; **63**(2), 206-220
12. Amrutha, S. R.; **Jayakannan M.** Probing the -stack Induced Molecular Aggregation in -Conjugated Polymers, Oligomers and Their Blends of Poly(phenylenevinylene)s. *J. Phys. Chem. B.* **2008**. **112** (ASAP Article).
13. Deepa, P.; **Jayakannan, M.** Solvent Free and Non-isocyanate Melt Transurethane Reaction for Aliphatic Polyurethanes and Mechanistic Aspects. *J. Polym. Sci. Polym. Chem.* **2008**, **46** (in press)
14. Anilkumar, P.; **Jayakannan, M.** A Single Molecular System Based Selective Micellar Templates for Polyaniline Nano-materials: Control of Shape, Size, Solid State Ordering and Expanded Chain to Coil-like Conformation. *Macromolecules*, **2007**, **40**, 7311-7319.
15. Amrutha, S. R.; **Jayakannan, M.** Structure Control of -Conjugated Polymers for Enhanced Solid State Luminescence: Synthesis, Liquid Crystalline and Photophysical Properties of New Bulky Poly (p-phenylenevinylene)s and Oligo-Phenylenevinylenes bearing Tricyclodecane Pendants, *Macromolecules*, **2007**, **40**, 2380-2391.

* Some of the publications are from research work done by the faculty prior to joining IISER, Pune.

16. Anilkumar, P; **Jayakannan, M.** Fluorescent Tagged Molecular Probe and Structure Directing Agent for polyaniline Nano-materials via self-assembly Process *J. Phys. Chem. C.* **2007**, *111*, 3591-3600.
17. Jinish Antony, M.; **Jayakannan, M.** Amphiphilic Azobenzenesulfonic Acid Anionic Surfactant for Water Soluble, Ordered and Luminescent Polypyrrole Nano-spheres. *J. Phys. Chem. B.* **2007**, *111*, 12772-12780.
18. **Jayakannan, M.**; Deepa, P., Melt-transurethane Process for the preparation of Polyurethanes. **USPTO 2007/0117950 A1**, May 24, **2007**. Assigned to CSIR-INDIA.
19. Deepa, P.; **Jayakannan, M.** Solvent Induced Self-organization Approach for Polymeric Architectures of Micropores, Hexagons and Spheres based on Polyurethanes prepared via Novel Melt Transurethane Methodology. *J. Polym. Sci. Polym. Chem.* **2007**, *45*, 2351-2366.
20. Factorizing numbers with the Gauss sum technique: NMR implementations, **T. S. Mahesh**, N. Rajendran, X. Peng, and D. Suter, *Phys. Rev. A* **75**, 062303 (2007).
21. Spins as qubits: Quantum information processing by nuclear magnetic resonance, Dieter Suter and **T. S. Mahesh**, *J. Chem. Phys.* **128**, 052206 (2008).
22. NMR implementation of adiabatic SAT algorithm using strongly modulated pulses, Avik Mitra, **T. S. Mahesh**, and Anil Kumar, *J. Chem. Phys.* (in press).
23. Kharat, S. S., Khillare, Y. K. & **Dahanukar, N.** (in press) Allometric scaling in growth and reproduction of a freshwater loach *Nemacheilus moreh*. *Electronic Journal of Ichthyology*.
24. Padhye, A. D., Paingankar, M., **Dahanukar, N.** & Pande, S. (2007) Season and landscape element wise changes in the community structure of avifauna of Tamhini, northern Western Ghats, India. *Zoos' Print Journal*, **22** (9): 2807-2815.
25. Jadhav, B. V., Raut, R. N. & **Dahanukar, N.** (2007) First report of prespawning and spawning behavior in *Ichthyophis* (Amphibian: Gymnophiona). *Zoos' Print Journal*, **22** (8): 2804.
26. **Bhat, Ramakrishna G.**; Kumar, N. S.; Pinto, B. M. Synthesis of phosphate derivatives related to the glycosidase inhibitor salacinol *Carbohydrate Research*, **2007**, *342*, 1934-1942
27. Pinto, Brian M.; Kumar, Nag Sharwan; **Bhat, Ramakrishna G.**; Liu, Hui; Nasi, Ravindranath; Chen, Wang; Mohan, Sankar. Preparation of salacinol analogs alditols as glycosidase inhibitors. *U.S. Pat. Appl. Publ.* **2007**, 35pp. US 2007244184 A1 20071018
28. Pinto, B. M.; Kumar, N. S.; Liu, H.; Nasi, R.; Chen, W.; Mohan, S.; **Bhat, Ramakrishna G.** Glycosidase Inhibitors and Methods of Synthesizing Same. **US Patent 11/621466**, Filed, January 9, **2007**
29. Choudhury, A. R.; **Bhat, Ramakrishna G.**; Guru Row, T. N.; Chandrasekaran, S. Weak Csp³-H...F-C Interaction Overshadows the Strong CbC-H...O:C Hydrogen Bond: Structure of Pentafluorophenyl Prop-2-ynyl Carbonate. *Crystal Growth & Design* **2007**, *7*, 844-846.
30. KLT relations from the Einstein-Hilbert Lagrangian, **Sudarshan Ananth** and Stefan Theisen, *Phys. Lett. B* **652**, 128(2007), arXiv:0706.1778 [hep-th]
31. Proof of ultra-violet finiteness for a planar non-supersymmetric Yang-Mills theory, **Sudarshan Ananth**, Stefano Kovacs and Hidehiko Shimada, *Nucl. Phys. B* **783**(2007), 227, hep-th/0702020
32. Makhijani, K., Kalyani, C., Srividya, T. and **Shashidhara, L.S.** (2007). Modulation of Decapentaplegic gradient during haltere specification in *Drosophila*. *Developmental Biology* **302**, 243-255
33. Anuradha, A., Annadurai, R.S. and **Shashidhara, L.S.** (2007). Actin cytoskeleton as a putative target of the neem limonoid Azadirachtin A. *Insect Biochemistry and Molecular Biology* **37**, 627-634.
34. Rao, P.R., Makhijani, K. and **Shashidhara, L.S.** (2007). Human APC sequesters β -catenin even in the absence of GSK-3 β in a *Drosophila* model. *Oncogene* doi: 10.1038/sj.onc.1210890.

35. **Dey, S.** and Joshi, A. 2007. Local perturbations do not affect stability of laboratory fruitfly metapopulations. *PLoS ONE* 2 (2), e233.
36. **S Vijaykumar**, M. Mahajan and R. Rama-Block sorting: a characterization and some heuristics- *Nordic Journal of Computing*, (in press)
37. **Vikram Athalye** - Evolution of coherence of Jaynes Cummings eigenstates in the presence of occupancy measurements, *arXiv.org.07103662.v1(2007)*

Papers presented in Conferences

1. "Mode-specific photoelectron dynamics in polyatomic molecules using synchrotron radiation"-**Aloke Das**, E. D. Poliakoff, John D. Bozek, and R. R. Lucchese, Trombay Symposium on Radiation & Photochemistry (TSRP), Yashada Pune, Januray 7-11, 2008.
2. "Photoelectron-vibrational coupling in polyatomic molecules using synchrotron radiation"-**Aloke Das**, E. D. Poliakoff, John D. Bozek, and R. R. Lucchese, , International conference on perspectives in vibrational spectroscopy (ICOPVS), February 24-28, 2008.
3. Effects of drug therapy in virus immune dynamics- **G Ambika** & Neelesh Dahanukar- NCNSD2008, PRL, Jan 3-5,2008
4. A direct algorithmic computation of correlation entropy from time seires- K P Harikrishnan, **G Ambika** & R Misra, NCNSD 2008
5. Bifurcation structure of synchronised systems- Bedartha Goswami & **G Ambika**- NCNSD2008
6. Virus Immune Drug Dynamics- **G Ambika** & Neelesh dahanukar- International conference on Recent Developments in Nonlinear Dynamics RDND2008- Feb 13-16,2008
7. An algorithmic computation of mutifractal spectrum from time series- K P Harikrishnan, **G Ambika** & R Misra-RDND2008.
8. Coherent control for NMR quantum information processing- **Mahesh T S** Eleventh Workshop on Quantum Information Processing, New Delhi,December 17-21, 2007
9. *Multivariate analysis of viral genomes*.-Karve, S. & **Dahanukar, N.** (2007) 48th Annual Conference of Association of Microbiologists of India, December 18-21, 2007. pp. 186.
10. *Factors that govern the diversity of bacteria in freshwater ecosystems*. -Sumit, M., Damle, A. & **Dahanukar, N.** (2007) 48th Annual Conference of Association of Microbiologists of India, December 18-21, 2007. pp. 267-268.
11. *Changes in the morphology and fitness of Aspergillus grown under stress conditions* -Chouhan, N. S. & **Dahanukar, N.** (2007). 48th Annual Conference of Association of Microbiologists of India, December 18-21, 2007. pp. 237.
12. *Isolation and characterization of an oil degrading oligotolerant actinomycete*.-Verma, H., Damle, A. & **Dahanukar, N.** (2007) 48th Annual Conference of Association of Microbiologists of India, December 18-21, 2007. pp. 322
13. 'Analysis of Stable flight formation of LISA'- **Sucheta Koshti**-International conference on Gravitation & Cosmology (ICGC-07), IUCAA, Pune (Dec. 17-21, 2007)

Invited lectures by faculty :

Prof K N Ganesh

1. Editing PNA structures for DNA/RNA binding selectivity, *A.V.Rama Rao Foundation Lectures in Chemistry JNCASR 22 May 2007*
2. Nanobiology, Nanotechnology Symposium, Alexandria, Egypt, 2 September 2007
3. Oligonucleotides and their analogues: Applications, *Advanced Centre for Cancer Therapy and Radiation (ACTREC), 18 September 2007*
4. Nano DNA From Templated Assemblies to Ferrocene Conjugates, *IUMRS-ICAM Symposium, 2007 Bangalore, 8 October 2007*
5. Designed DNA and PNA Analogues for Assembling Functional Nanostructures, *BASF Symposium on Nanotechnology, Singapore, 22 October 2007*
6. DNA Chemistry and Applications, JNCASR Frontier Lectures, Amritsar 25 October 2007
7. Supramolecular mimics of DNA base pairing: *Indo-German symposium on frontiers in Organic Chemistry, IIT Kanpur, 27 October 2007*
8. Property Editing of Peptide Nucleic acids (PNA): gem-dimethyl, cyanuryl and 8-aminoadenine PNAs, *Nucleic Acids Symposium, Tokyo, 20 November 2007*
9. Nucleic acid - metal ion interactions, *Symposium on Bio-inorganic Chemistry, IIT Bombay, 27 November 2007*
10. Chemical Sciences: Excitements: National Chemical Laboratory, CSIR Programme for Youth Leadership in Science, (CPYLS), 29 November 2007
11. Excitements in Chemical Sciences: The new Age of Molecules, Gujarat Science City, Ahmedabad, 23 January 2008
12. 4-Aminoproline collagen analogs: Synthesis and biophysical studies, *Symposium on recent trends in Collagen at CLRI, Chennai, 24-25 Jan 2008*
13. Nano DNA: Templated assemblies of Gold/Silver nanoparticles on DNA towards function, *Symposium on DNA Nanotechnology, National Centre for Biological Sciences, Bangalore, 12 February 2008*

Prof L S Shashidhara

1. On the evolution of insect wings- "Annual Faculty meeting", TIFR, Mumbai: 31st August-1st September 2007
2. Downstream of a Hox gene, "Expanding the toolkit of *Drosophila*", Janelia Farm of Howard Hughes Medical Institutes, Virginia, USA: 7-10 October 2007
3. On the Evolution of Insect Wings, "73rd Annual Meeting of Indian Academy of Sciences", Thiruvananthapuram, India: 2-4 November 2007
4. On the evolution of insect wings, "Annual Faculty meeting", JNCASR, Bangalore: 19th-20th November 2007
5. Pattern formation during growth and development Mechanisms of Pattern formation: a discussion meeting. Orange County, Coorg, India: 6-9 December 2007
6. *Drosophila* homologue of ataxin-2 binding protein-1 functions as a context-specific cofactor of Ci/Gli, the key mediator of Hedgehog signaling "Model Organisms and Stem Cells" NCBS, Bangalore, India: 23-25 February 2008

Dr A A Natu

1. Towards new Antifungals , ABC technologies conference (Basel , January 2007)
2. Academia Industry Interface (KTHM College Nasik , December 2007 , DY Patil University)Pune, March 2008)
3. IISERs and their Roles in Higher education , in Marathi (Shivaji University Kolhapur ,December 2007)
4. Nature , Nurture and Human Medicines (College of Pharmacy Pune , January 2007)
5. Advances in Pharmaceutical research (KLE University Belgaum ,November 2007)
6. Role of IISERs in Indian Education system Nagpur University and (Nagpur University November 2007 and NM University Jalgaon August 2007)
7. Advances in Drug Discovery (IIM Ahmedabad (June 2007)
8. Emerging Global trends in Pharmacy (K. M. College of Pharmacy Mumbai , June 2007)
9. Generation of Antifungal Libraries (G. College ,Pune January 2008)
10. Applications in mass Spectrometry (NCL Pune May 2007 and SICART Anand September 2007)

Dr G Ambika

1. Noise Induced Resonance Phenomena- Physical Research laboratory,, Ahmedabad, June4, 2007.
2. Synchronisation in discrete systems- National Institute of Advanced Studies, Bangalore , Nov1, 2007.
3. Fractals- Maharajas College, Kochi- Feb 18,2008

Dr Mahesh T S

1. Designing NMR experiments using Artificial Intelligence National Magnetic Resonance Society (NMRS) Meeting, New Delhi, January 16-19, 2008
2. "Quantum computers: Sooner or Later", Jan 2008, Fergusson college, Pune.

Neelesh Dahanukar

1. "Statistical methods for protein structure determination" at Abasaheb Garware College, Pune, on 13th October 2007.
2. "Mathematical modeling" at Sinhgad College, Pune, on 5th January 2008.

Membership of Committees :

Prof K N Ganesh

1. **Member, Advisory Committee on Nanoscience, Department of Science and Technology, New Delhi**
2. Council Member, National University for Education Planning and Administration, New Delhi
3. **Member, Board of Governors, Indian Institute of Science Education and Research, Mohali**

Prof Natu A A

1. Hon Advisor to German Academic Exchange Service, Bonn
2. Member , Scientific Advisory committee , ICMR Institute of Herbal Medicines

3. Member of Senate, SVNIT, University Surat
4. Member, Board of studies, D Y Patil University, Pune
5. Convener, Bureau of Indian Standards, Delhi
6. Fellow of Maharashtra Academy of Sciences
7. Board of Directors, Tonira Pharma Ltd., Vadodara

Participation in Conferences / Seminars / Workshops

Dr Aloke Das

1. Spectroscopy and Dynamics of Molecules and Clusters (SDMC), Mahabalipuram, Chennai, February 22-24, 2008.

Dr G Ambika

1. International workshop on Complex Dynamics of Physiological Systems: from heart to Brain(CDPS2007) -12-14, Feb, 2007 at Presidency College, Kolkata
2. Workshop on Nonlinear Dynamics-IMI, Dept of Mathematics, IISc, Bangalore- Oct-Nov 2008
3. National Conference on Nonlinear Systems and Dynamics-NCNSD, PRL, Ahmedabad, Jan 3-5, 2008
4. International Conference on Recent Developments in Nonlinear Dynamics RDND2008- Feb 13-16, 2008

Dr Aurnab Ghose

International Symposium on "Model Organisms and Stem Cells in Development, Regeneration and Disease at NCBS, Bangalore (February 23-25, 2008).

Dr Mahesh T S

1. The Eleventh Workshop on Quantum Information Processing, New Delhi, December 17-21, 2007
2. National Magnetic Resonance Society (NMRS) Meeting, New Delhi, January 16-19, 2008

Dr Sucheta Koshti

Seminar at the International Cosmology School & Workshop, Tehran, Iran (Jun. 2-8, 2007) on 'Minimum flexing of LISA'

Dr Mayurika Lahiri

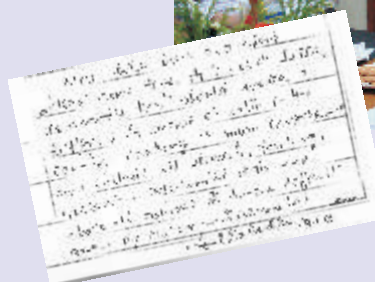
International Symposium on "Model Organisms and Stem Cells in Development, Regeneration and Disease at NCBS, Bangalore (February 23-25, 2008).

Visitors



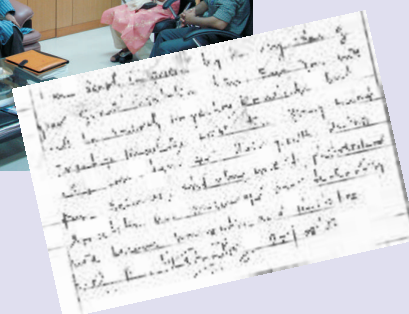
Prof D Balasubramanian, L V Prasad Eye Hospital , Aug 29,2007

Dr Anil Kakodkar, Chairman of the Atomic Energy Commission of India and the Secretary to the Government of India, Department of Atomic Energy, Jan 3,2008



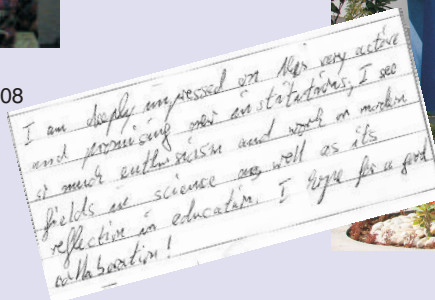
Prof N Kumar,Chairman,BoG and Prof N Sathyamurthy, Director, IISER, Mohali, Jan16, 2008

Prof U R Ananthamurthy , Chairman, FTI, Pune ,Aug 25,2007



Prof V P Nair, City University of New York and Prof N Dadhich, Director,IUCAA, Pune ,Jan 14,2008

Prof Juergen Kurths, University of Potsdam, Germany, Jan 10,2008





Prof K N Ganesh with
Prof Jung-II Jin, President, IUPSG

Prof K N Ganesh participated in the Asia Science Forum 2008 meeting at Seoul, Korea on Feb 29, 2008. This meeting is an extension of the joint initiative of Korea-Riken(Japan) to other Asian countries to promote interdisciplinary collaborations and higher education. IISER, Pune is expected to play a lead role in this endeavor.



Power behind us



Strategies, policies, decisions...



The journey has started

Glimpses of 2007-08



IISER Campus - I



A day in the TV room



A day out in wilderness



Homely abode in nature's lap



Diwali at our doorsteps



Glimpses of 2007-08



Never ending energy inputs...



We are always together.



Congratulations !!! Congratulations !!! Congratulations !!!

1. Lakshmi Priya M. E. was awarded the CNR Rao Foundation prize for the best academic performance in Semester II in 2007



2. The following four students of Semester II secured the perfect GPA of 10.0 in Spring 2007.



1. More Sushant Nivasro
2. Sisir C. Anand
3. C. B. Ajit
4. Lakshmi Priya M. E.

They were awarded Appreciation prizes by the faculty of IISER.

3. In the Fall Semester 2007, C. B. Ajit and Sisir C. Anand of Batch I and Mohammad Zuhair and Surojit Sural of Batch II secured the perfect GPA of 10.0. Congratulations for their exemplary performance!!

4. Eight students from IISER Pune have been selected for the KVPY scholarship after a written test and interview in the SB Science stream from the Department of Science and Technology, New Delhi.

- 1 Anup Mahesh Savale
- 2 Apeksha Tare
- 3 Sandeep Gupta
- 4 M M Mohammed Zuhair
- 5 P. Venkata Reghu Tej
- 7 Shadab Alam
- 8 Surojit Sural

5. Lakshmi Priya M. E. was selected under the SP stream of KVPY based on her project "Set of subsequential limits - an analysis"



6. More Sushant Nivasrao (first row, extreme right) bagged the first prize for Best Model/Simulation at the International Genetically Engineered machines (iGEM) competition held annually at Massachusetts Institute of Technology in 2007 form among 56 teams from around 20 countries. He participated along with the team from NCBS, Bangalore (where he did his summer project) under the guidance of Dr Mukund Thattai.

The Intoxicating Hours Of Colloquia At IISER, Pune

- recounted by Surojit Sural

Many eminent scientists and professors visited IISER Pune in the academic year 2007-2008 who enlightened the minds of the students by their compelling and stimulating scientific talks.

The very first colloquium after the advent of the fall semester was by **Prof. R. Ramachandran**, Senior Professor of Physics, IISER Pune, on 22 August, 2007. The talk was titled '**How we at last found the A-toms**', in which he explored the development of the concept of atom through the ages, right from the origin of the word 'atom' to the present scenario in the era of particle accelerators. The students were introduced to Baryons and Mesons, the strongly interacting particles which form the basis of particle physics. He also talked about the massless quantum string to describe which a 10 dimensional space is required!



On 29 August, 2007, there was an enchanting talk, '**The Eye**' by **Prof. D. Balasubramanian**, Director of L. V. Prasad Eye Institute, Hyderabad. Dr. Balasubramanian, who is an ex-President of the Indian Academy of Sciences, lucidly explained the structural and functional features of the human eye, using his model of the eye. He introduced us to the recently developed biomedical techniques like stem cell grafting which are used for artificial culturing of the cornea, a great boon for the visually challenged community. He stressed upon the drastic revolution in the methods to deal with age related visual disorders like cataract and presbyopia in India.

Dr. G. Ambika, Faculty of Physics, IISER Pune gave

a colloquium titled '**To Fractals with Love**' on 10 October, 2007. The word 'fractal' which means 'fractional dimensions' has been an object of fascination for centuries. She showed us many fractal diagrams which were developed by mathematicians like the Pythagorean trees and Pascal's triangle. The diagrams depicted a variety of fractals, right from the ones used in art to the recently developed quantum fractal carpets. She also talked about the fractals found in nature, the ones in the ECG data of a human heart.

'**What can we Learn from Insect Societies**', this was the title of the talk on 24 October, 2007 by **Dr. Raghavendra Gadagkar**, the famous evolutionary biologist from IISc, Bangalore. He told us a lot of interesting facts about the social insects like ants, honeybees and termites. "Why do honeybees make hexagonal compartments in their hives?", "What do the different dances of honeybees signify?", these were the questions posed by Dr. Gadagkar, which he left for us to ponder over. He insisted everyone on possessing the scientific temperament to ask questions and then trying to answer them. That is how science advances in the world. Later he stressed on 'Swarm Intelligence', the very exciting phenomenon which answers the question included in the title itself.

"Don't ask what Math can do for Biology...ask what Biology can do for Math", these were the words with which **Dr. Prabhakar Vaidya**, an eminent scientist from the National Institute of Advanced Sciences, Bangalore, began his seminar with on 25 October, 2007. The title was '**The Coming Marriage of Biology & Math**' and Dr. Vaidya talked about the joint evolution of these subjects in the mid-twentieth century. He gave examples of physicists like Francis Crick, who used Fourier transformation to decipher the DNA double helix. He also explained the very recent interactions between these branches which has lead to the use of differential equations to study the dynamics of cancer. Later, Dr. Vaidya shared the joys of cryptography, one of his pastimes, with the students.

Dr. M. S. Valiathan, FRCS, FRCP, FNA a renowned cardiac surgeon, talked about the history of

Ayurveda, starting with the stories of Charaka, Susruta and Jivaka (Buddha's physician). He pointed out the scientifically sound parts of historic literature in medicine, which were common knowledge before Galen. The training of students for removing kidney stones involved the student being able to successfully remove the seeds of the jackfruit without rupturing the shell. He then pointed out avenues for research in Ayurvedic medicine with the ASIIA initiative. Distinctly, the need of control groups for the declaration of a treatment/remedy as a success has been relaxed. The physiotherapeutic effect of rare earth elements used in Ayurvedic medicines is one of the hotshot fields.



With the beginning of the spring semester, **Dr. Jürgen Kurths**, Chair, Nonlinear Dynamics at the University of Potsdam, Germany, visited IISER Pune on 10 January, 2008 and gave a talk on '**Synchronization in Complex Networks and its Application to Brain Dynamics**'. Dr. Kurths laid importance to the fact that the word 'synchronization' which means sharing a common property in time, is not just a state, but, a process of adjusting rhythms due to interactions. It can be observed in our day to day life, right from the lateral oscillations of the London's Millennium Bridge to the onset of the Indian monsoon each year. Afterwards, he talked about the synchronization which explains the dynamics of the collective firing of neurons in the brain.

Prof. V. Parmeshwaran Nair, a Professor of Physics at the City College of CUNY, New York, talked on '**Liquid Helium & Quantum Chromo Dynamics (QCD): Feynman's Last Problem**' on 14 January, 2008, in IISER Pune. He discussed about the approach of Richard P. Feynman, the very famous Nobel Laureate, to the problem of the mass gap in QCD by applying his very famous analysis of

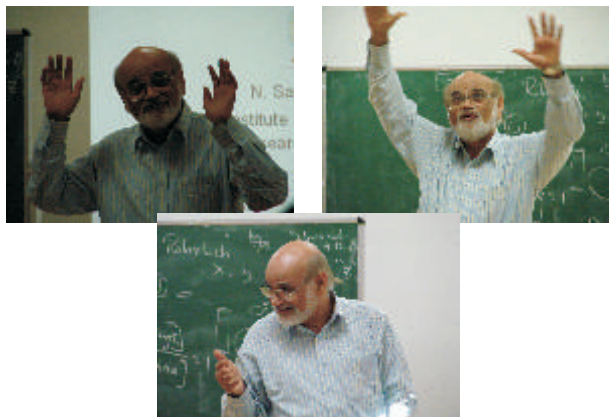


superfluid Helium using the properties of wave functions. Dr. Nair told us about the new state of matter called the quark-gluon plasma, also referred to as the colour liquid, which forms due to the collision of nuclei. He left an unanswered question, "How may infinite dimensional spaces have zero volume?"



The Director of IISER Mohali, **Prof. N. Sathyamurthy** visited IISER Pune on 16 January, 2008. The title of his seminar was '**Van der Waals interaction: a current perspective**'. First, we were introduced to various forms of this force, the dispersion forces, the hydrogen bonds and many more. He introduced the concept of 'Supramolecular Approach', a technique used to deal with the problems related to atomic and molecular clusters. Prof. Sathyamurthy, in the later part of his seminar, showed us the structures of many exciting molecules like the endohedral fullerenes (molecules in a cage) and the cyclodextrins (doughnut-shaped molecules) used in drug-delivery systems.

"Why stars do not blind us?" Here's an interesting concept from wave optics introduced to us by Prof N Kumar. When the area of image of star subtended on our eye becomes of the order of wavelength of light then this area does not decrease further even if the star is taken further away. Hence after this stage the



power received by our eyes from the star decreases however since the image area remains constant the intensity also decreases. Stellar distances are so large that intensity of stars falling on eyes is harmless. Thus we can watch stars safely!

On 23 January, **Prof. K. Varadrajan**, a senior scientist at the University of Calgary, Canada, gave a colloquium on '**Exact sequences and the Five Lemma**'. The basic concepts of a subring and a submodule were introduced by him before he used these to define an exact sequence. Instead of using the computer and projector, Prof. Varadrajan used the conventional chalk and blackboard to prove the five lemma in the category of modules. The five lemma, which gets its name from the five functions of which it is formed, is also valid for the category of groups, but with a slight modification.

Dr. Satish Ogale, a scientist at the Physical and Materials Chemistry Division in National Chemical Laboratory, Pune gave an extremely vivacious talk on '**Advanced Materials & Emerging novel Applications**' on 30 January, 2008. Dr. Ogale began with the unbelievable advances in the field of material design which has led to the wonders of engineering in this era. He stressed upon the research in the nanoscale which has developed single molecules to nanotransistors. Dr. Ogale, who is also a Ramanujam fellow, talked about the new reflective display of flexible computer screens which will make reading much more enjoyable. Biomimetics, the branch in which scientists try to copy things in nature has led to the invention of artificial muscles, artificial flying insects, biosteel (made of spider's web) and many more incredible gadgets in the last few decades.



On 28 February, 2008, two eminent scientists were invited to deliver talks on the occasion of National Science Day. The first colloquium was by **Prof. Ajit Khembhavi** from IUCAA, Pune on '**Black Holes in our Galaxy**'. He talked about the predictions of the theories proposed by Einstein and Chandrasekhar which explained the most astonishing astronomical phenomena in the universe. He also mentioned a lot of interesting facts about the great black hole at the galactic centre of our Milky Way galaxy. The second colloquium of the day was by **Dr. Apoorva Patel** from IISc, Bangalore. The title was '**Quantum Computation: Concepts & Prospects**'. "Because the nature isn't classical, damn it..." these words of Richard P. Feynman themselves depict the underlying potential of this field. However, the speaker stated that the main problem lies in Very Large Scale Integration (VLSI) of quantum computing hardware. He showed a model which was based on this concept and also talked about other possible applications in cryptography, pattern recognition, etc.

There were many more colloquia, job talks and seminars by the faculties and visitors in IISER Pune which were equally exciting but these were among the special ones which revolutionized the minds of the listeners and compelled the students to think beyond their curricula.

Colloquia/Seminars In IISER Pune during the Academic Year 2007-2008

Speaker	Topic of Seminar	Seminar Date
Dr. Sampath Srisailam, Clinical Genomics Centre, Toronto, Canada	'NMR & Structural Genomics-a tool for structural and functional analysis'	15 June, 2007
Dr. Avinash Sonavane, Max Planck Institute, Germany	'Micro-RNA: Novel class of regulatory genes'	15 June, 2007
Dr. Alok Das, Louisiana State University & Lawrence Berkeley National Laboratory, Berkeley	'Photoelectron vibrational coupling: Resonant and non-resonant molecular photoionization process'	2 July, 2007
Prof. Jayanta Kumar Bhattacharjee, Indian Association for cultivation of Science, Kolkata	'Convergent Story of a Divergent Viscosity'	5 July, 2007
Dr. Balasubramaniam Padmanabhan, RIKEN Genomic Sciences Centre, Japan	'Structural Basis for Proteins involved in Epigenetics and in protein degradation'	11 July, 2007
Dr. Jayaraj Jayaraman, Simon Fraser University, Canada	'Generation of high-antioxidant carrot roots by metabolic engineering'	11 July, 2007
Dr Meena Sakharkar Nanyang Technological University, Singapore	Fusion genes: Rhetoric and Reality	2 Aug., 2007
Dr. Challa S. Sastry, University of British Columbia, Vancouver	'Multiresolution Methods & Applications'	10 Aug., 2007
Dr K. A. Subramaniam IISC, Bangalore	Stream Insect Communities in Space and Time	19 Aug., 2007
Prof. R. Ramachandran, IISER Pune	'How we at last found A-toms?'	22 Aug., 2007
Dr. Colin Benjamin, Centre de Physique Theorique, France	'Hanbury-Brown Twiss correlations in Hybrid Superconductors'	28 Aug., 2007
Prof. D. Balasubramanian, L. V. Prasad Eye Institute, Hyderabad	'The Eye'	29 Aug., 2007
Dr Sulagna Banerjee Dept. Of Molecular and Cell Biology, Evans 4 Boston University Medical Campus, USA	"Glycosylation and genome organization: The story of protists"	6th Sep., 2007
Dr Jitendra Kumar Thakur Dept. of cell biology, Harvard Medical School and MGH Cancer center, USA	Fungal Analogs of Metazoan Nuclear Receptors	6th Sep., 2007
Girish Ratnaparkhi, University of California, USA	'The Making of Fly : The first three hours'	12 Sep., 2007
Dr Vasanta Subramanian, Department of Biology and Biochemistry, University of Bath, Bath, United Kingdom	Embryonic stem cells, Human Disease and Regenerative Medicine- Hype or Hope	13 Sep., 2007
Prof. Bhanu Pratap Das, Indian Institute of Astrophysics, Bangalore	'Parity violation in atoms and the search for the unification of the fundamental forces'	19 Sep., 2007
Dr. Arnab Mukhopadhyay, University of Massachusetts Medical School, USA	'Caenorhabditis elegans as a model system to study aging'	20 Sep., 2007

Speaker	Topic of Seminar	Seminar Date
Dr M S Santhanam, PRL Ahmedabad	Isochronal synchronization in delay coupled systems	25 Sep., 2007
Dr Mahesh Sankaran Institute of Integrative & Comparative Biology, University of Leeds, UK	'Species diversity and ecosystem functioning in a changing world'	1st Oct., 2007
Dr Jayashree Ratnam Institute of Integrative & Comparative Biology, University of Leeds, UK	"Ecological and social correlates of decision-making in a group-living primate, the bonnet macaque"	1st Oct., 2007
Dr. G. Ambika, IISER Pune	'To Fractals with love'	10 Oct., 2007
Dr. Ashish Upadhyay, BITS Pilani	'On Classification & Geometric realization of some combinatorial 2-manifolds'	12 Oct., 2007
Dr. Raghavendra Gadagkar, IISc, Bangalore	'What can we learn from Insect Societies?'	24 Oct., 2007
Prof. Prabhakar Vaidya, NIAS, Bangalore	'The Coming Marriage of Biology & Math'	25 Oct., 2007
Prof M S Valiathan, FRCS, FRCP, FNA	Ayurvedic Biology	31, Oct., 2007
Dr. Jaydeep Majumdar, Helsinki Institute of Physics, Finland	'Inflationary Universe and String Theory'	14 Nov., 2007
Dr Santanu Ghosh University of Texas at Austin, USA	The Yeast Plasmid: An Impostor Chromosome	14 Nov., 2007
Dr. Kapil Paranjape, Institute of Mathematical Sciences, Chennai	'What is Pi?'	21 Nov., 2007
Dr Dibyendu Nandi Montana State University, USA	'The Sun's Magnetic Cycle: Current State of our Understanding'	30 Nov., 2007
Dr Sekar Ramachandran Dept. of Chemistry and Chemical Biology, Cornell University, USA	Biochemical and Biophysical studies on Vertebrate Visual Transduction	30 Nov., 2007
Dr Annagiri Sumana Tufts University, Boston, USA	Queen Power: dominance hierarchy and chemical signals in an insect society	30 Nov., 2007
Dr. Prasad Subramanian, Indian Institute of Astrophysics, Bangalore	'Forbush decreases and Space Weather'	11 Dec., 2007
Dr. Kishore T. Kapale, Western Illinois University	'Superresolution: Quantum tricks to beat the diffraction limit'	26 Dec., 2007
Dr. Sukanta Panda, Institute of Theoretical Physics, Madrid	'Radio Detection of Ultra High Energy Cosmic Rays'	9 Jan., 2008
Dr. Jürgen Kurths, University of Potsdam	'Synchronization in Complex Networks and its Application to Brain Dynamics'	10 Jan., 2008
Dr. Subhanshu Dasgupta, University of Toronto	'Coherent Control of light with matter & vice versa'	10 Jan., 2008
Dr. V. P. Nair, City College of CUNY	'Liquid Helium & Quantum Chromo Dynamics (QCD)'	14 Jan., 2008
Dr. Achamveedu Gopakumar, TPI, FSU-Jena	'Gravitational Wave Astronomy: New Developments from Jena'	15 Jan., 2008

Speaker	Topic of Seminar	Seminar Date
Prof. N. Sathymurthy, Director, IISER Mohali	'Van der Waals interaction: A Current Perspective'	16 Jan., 2008
Dr. Sudarshan Ananth, IISER Pune	'The Forces of Nature'	16 Jan., 2008
Dr. Shivprasad Patil, Wayne State University	'Novel AFM Techniques'	17 Jan., 2008
Dr. Shouvik Datta, University of Oregon	'Experimental Evidence of Configurational Relaxation of Oxygen defects in Hydrogenated Amorphous Silicon-Germanium Alloys'	17 Jan., 2008
Dr. Apratim Chatterji, University of Oregon	'Electrophoresis of highly charged colloids'	17 Jan., 2008
Dr. U. Deva Priyakumar, University of Maryland	'Computational Studies of Base flipping in DNA 2'	21 Jan., 2008
Dr. Pratik Sen, RIKEN genomic Sciences Centre, Japan	'Structure & Dynamics at Unique Physiological Environments: A Femtosecond Surface Sum Frequency generation and fluorescence Up-Conversion Study'	21 Jan., 2008
Dr. Bhoomi Shankar Ramamoorthy, University of Liverpool, UK	'Main group organometallic chemistry utility of ligands containing P-N, P-O motifs for developing novel structural architectures'	21 Jan., 2008
Prof. K. Varadrajan, University of Calgary, Canada	'Exact Sequences and the Five Lemma'	23 Jan., 2008
Dr. Satish Ogale, National Chemical Laboratory, Pune	'Advanced Materials & Emerging Novel Applications'	30 Jan., 2008
Dr Balaji Prakash Dept of Biological Engineering, IIT - Kanpur	Structural and biochemical studies on a unique set of GTPases reveal their roles in Ribosome Biogenesis and Assembly	30 Jan., 2008
Dr P. Gayathri, IISER Pune	'Structure of Macromolecules: an X-ray crystallographic perspective'	6 Feb., 2008
Dr. A. Ghose, IISER Pune	'Driving and navigating in brainland'	13 Feb., 2008
Dr. Jayakannan, IISER Pune	'Making of Plastic Polymers'	20 Feb., 2008
Dr Subhendu Rakshit, Univ Dortmund, Germany	Ice Fishing for Neutrinos	29 Feb., 2008
Dr Prasad Purohit, SUNY, Buffalo	"A Random walk thorough moving domains of gating mechanism in a ligand-gated ion channel"	29 Feb., 2008

Events at IISER during 2007 - 2008

-compiled by Sisir C Anand

IISER celebrated its **Cultural Day** on April 7th, 2007. It was hosted jointly with the NCL community at the NCL Auditorium. Dr Ambika recollected the events of the past year to open the evening. The evening started with a serene and refreshing Diya Dance, which drained all the leftover tension from the audience's hectic day and settled them into the mood. Songs, dances and skits brought out the youthful exuberance in them. Vivek compered, reducing the audience to peals of laughter with merciless shayirees. The students stole the audience's undivided attention and their evening. They were able to pull off this heist thanks to the coordinator-cum-choreographer Mrs Chandana Ghosh and her team.

The frolicsome foursome of Nitin, Hemant, Anand, Lucky danced fluently and heavily to Koi kahe kehta rahe, Dhoom Machale... The duo Ankur & Ruchi aroused the audience with a comic version of Ye dil... Nitin & Shambhavi, recreated the mystery of Krishna and his Gopis, Radha kaise na jale...

Stanzin & Bedartha sang 'No one knows what it's like...' to pass on a message about underprivileged children in Africa and war-torn bands of Iraq, Kosovo and Israel (compiled by Subhajit) Sumit then sang Dekha na hai re socha na... with great aplomb, while Shashank entertained with the numbers Hum kis gali jaa rahe hain... , Neele neele ambar par... Ankur drowned the audience with Dooba Dooba rehta hoon... and came up quickly with a sprightly number Gum sa koi... when backstage faced some technicalities. Girish gave the home crowd an upbeat with a Marathi song.

A skit themed on the evolution of science through the ages, foreseeing into the future was staged. Bedartha wrote the script which was finally directed by Rishabh.

The evening ended on a note of gratitude by Bedartha and dinner at the NCL Guesthouse.

Bedartha Goswami and Susheel Kumar represented

the SPICMACAY IISER Pune Chapter at the 30th Annual **SPICMACAY convention** held at Jammu from 16th - 21st June, 2007. Renowned exponents of arts and music performed at the event: Ustad Fahimuddin Dagar, Pt. Shivkumar Sharma, Naina Kinodia (Painter), Purulia Chhau (Folk Dance : Bihar and Orissa), Kalamandalam Raman Kutty Nayar (Kathakali)

On **Independence Day**, the national flag was hoisted by Prof K. N. Ganesh. Faculty and students together sang the national anthem and sweets were distributed.

On **Gandhi Jayanthi**, faculty and students remembered Gandhiji and undertook his pledge. Sisir gave a small talk on the great soul, and brought out the impact of his ideals on science. The Registrar, B. Swami, then recalled that October 2nd would be henceforth known as International Day of Peace (as recognized by the U.N.). Prof. Ramachandran then inspired students to perform community service, saying it was an integral part of education. Finally the autobiography of Mahatma Gandhi 'My experiments with Truth' was distributed to all the students asking them to emulate his ideals as appropriate.

The **IISER Quiz Club** organized a quiz for the students of IISER, Pune. A written preliminary round was conducted on October 31st. The final round was on November 1st. The event saw active participation from students of both years. After a closely contested prelim, which saw its own share of drama, four teams representing the cream of the IISER quizzing community were selected. Following three tightly fought rounds of questions, the team of Ayesha Fatima and Swati Venkat won the quiz. Ajay was the quizmaster.

IISER and NCL cohosted the **Nobel evening** on November 2nd to help deliver to students the academic background of the works that won the Nobel Prizes

The speakers were:

1. Dr T. S. Mahesh on 'Giant Magnetoresistance' (Physics Winner)
2. Dr C.S. Gopinath, NCL, Pune on 'Chemistry on Solid Surfaces' (Chemistry Winner)
3. Dr. Sanjeev Galande, NCCS, Pune on 'Gene modification in Mice' (Biology Winner)
4. Dr B N Goswami on Global Warming & Climate Change (Peace Winner)

After the talk the Oscar winning documentary "An Inconvenient Truth: A Global Warning", by Al Gore was also screened.

The **Chess Contest** was held on the eve of Diwali. Held in a knockout format, the contestants had to give their best at their first attempt. All being amateur, there was no scope for one to predict the strategies of the opposition. Thomas Kurien beat Sartakh Parikh to emerge victorious.

Diwali was celebrated with great enthusiasm with the students of both hostels coming together to light up HR1. Students and guards designed a rangoli (shubh laabh). Crackers thundered while rockets zoomed as the skies turned hostile.

Turn-Coat Competition on A turncoat contest held in a format where the speaker had to defend the motion "Science should be done for the benefit of the society" for two minutes and then trade sides and oppose the motion for the next two. Darshan Joshi stuck to the format, exclusively, and beat the challenge of 10 odd contestants, few of them being spot entries.

IISER celebrated **Republic Day** with the traditional flag hoisting followed by a small parade of our security guards who receive all the tribute for maintaining order and keeping us out of harm's way.

A **Short Story** contest inspired by a photo: A man projected onto the screen was having the shock of his life. What was the cause? Students mustered into oneiric and mystical worlds as they connected the dots strewn around in the room in the photo. Ninety

minutes worth of nacreous tales. Sisir C. Anand stained the arena with his victory. Darshan Joshi, with horror, came second. And, with a Baywatcher, Shambhavi Vashishtha, jogged in third.

On 3rd February, a **Counter Strike Tournament** was held. Beast, Neo, Arp, Kaal, Chusle, Sutia, Can't I Kill You, Catch me if You Can were tagnames of these seasoned virtual soldiers fighting their war on terrorism, from both sides. Hemant, Subhajit, Vivek, Karan and Reddy were the Purple Hearts, in the war where many virtually die to play.

3D Sudoku was organized by Girish as he showed his excellence in the world of nines, by adding another layer to the coffee-break Sudoku. Contestants had to pass a preliminary round of Sudokus to have a chance to beat the 3D Sudoku. Vibham Shukla finished with a flourish in both rounds. Karan and Anup too ran the Nine-a-thon commendably.

The entries for the **Director's Special** were screened on 5th March in Raman Hall:

The students were challenged to make a documentary 'The Lighter Side of IISER' stringing together still photos, accompanied by background music and subtitles. The trio of Vivek, Parivesh and Shambhavi levitated to top, by portraying the sheer contrast of the weekday and the weekend. Stanzin, Subhajit, Madhuresh, and Avi rang in the Speed of Sound, counted off daily events One by One and was the runner-up crowd puller. 'Tribulations of Titrations' by the duo Girish and Ajay brought in enchanting perspectives of how students look at their weekly practicals, with Rahman's 'Pray For Me Brother' fuming in the background. Anup, also directed to the front the comic rituals that burden the student's day.

Students were also challenged to make a piece of fiction. Arpit, Shashank, Kapil, Lokeshwar and Anand reincarnated a desperate soul from his ashes and rose to clinch victory. Sisir revealed how Latin the trials of marriage were, through his foot shadows, for a losing cause.

**Our Sincere Thanks
To
CPWD Team for their assistance in developing IISER facilities at SAI Trinity Campus**



(LEFT) Members of the Civil Construction team
(From left) Mr. M. P. Jaeel, Mr. P. K. Dixit, Mr. Y. S. Rajput, Mr. A. K. Dey



(RIGHT) Members of Electrical Construction Team.
(Standing) Mr. Shiv Kumar, Mr. G. R. Tripathi



Mr. Y. S. Rajput, Mr. A. Pandey, Mr. Harish Kumar Bangar, Mr. Ranjeev Sao, Mr. B. B. Patil

IISER FAMILY 2007 - 2008



ENLIGHTENED MINDS



WORKING MINDS



PENSIVE MINDS

.....About Knowledge , the Sage speaketh.....

- Sisir C. Anand

Dr U R Ananthamurthy, Jnanpith Awardee (Kannada) is among the most eminent literary icons in India. Having presided over Sahitya Academy (1993) and presently chairing Film and Television Institute of India (FTII, Pune), he is also a renowned orator.

Under the auspices of SPICMACAY IISER PUNE Chapter, he was invited to give a talk at NCL Auditorium on 25 Aug, 2007.

Given the young and academically oriented audience, he picked knowledge and wisdom as the theme of his talk. He stated that there are two types of educated people: the pandithas who learn whatever they come across and have the generosity to admit they need to learn much more, and the rishis who have the courage to experiment and discover new things.

He emphasized that the effect of teaching prevails only when knowledge is created while it is being imparted in the classroom. He banished objective exams having multiple choice questions (MCQs) as a false indicator of the students' grasp over their disciplines. The student learns to answer quickly without thinking much. Answering quickly doesn't mean one's bright. Rather ponder over the question long enough to weed out flaws. Else thinking, being a vital process in learning, loses emphasis there, he said. The information passed on during the lecture has been converted to true knowledge only if the

teacher's intentions, the students' activities and the exams' assessment match.

Then he spoke about the creativity one needs to be a successful rishi. Just like ragi stays fresh longer than rice, he said a student needs to be simple but fresh.

While the Ambanis would envision the year 2037 as one when malls flood the urban landscape like mushrooms and result in whole scale destruction of individuality, he foresees the future as years of Great Fatigue. Fatigue due to the loss of creativity and individuality. He then surprised the audience by shifting the spotlight in year 2037 to the poorest people. The poor would sustain

only by using outdated and crude methods, and within them there lies hope for a rebirth. The scientists, he prophesies, will then quit working in the acropolises and come back to the plebian masses to research and learn the way the older generations had lived.

Fatigue results in a disinterested pursuit of knowledge. Work should emphasise on joy rather than success. These were his take home messages at the end of the talk.

He continued the talk with a jovial Q&A session and entertained probing questions.

Dr. S. Sivaram, Director, NCL, then handed him a token of appreciation on behalf of the audience.



A Mystical Musical Trip With ...SPICMACAY

- Harita Rao

A wonderful evening accompanied with some pleasant music, what could anyone possibly long for, if not this? Yes....guessed it right!! Here I am to discuss yet another event organized by **SPICMACAY- IISER Pune Chapter**. The age old traditions & customs of our country are fading away with time. **SPICMACAY** i.e. "Society for Promotion of Indian Classical Music and Culture Amongst Youth" which by now most of us are quite aware of, with some of our friends being voluntary members for its cause, has made it possible for the younger generation to explore & connect to the rich cultural heritage of the country.

In order to reach the youth and motivate them **SPICMACAY** organizes cultural programmes all over the country by inviting renowned artists to come and perform. The number of programmes surpasses 2000 a year. This was the third time for such an event to be held in our institute. A small gathering with all the fellow students & faculty members and a mesmerizing musical experience.....with **Pt. Ronu Majumdar** on flute accompanied by **Pt. Ramdas Palsule** on tabla, both of them being well known artists for their expertise in their respective fields.

What the artists say about SPICMACAY....

Music is a very important element in our society, ever since mankind existed - it lifts spirits, it inspires, it is divine and soothes the mind and soul. In the current day scenario music is losing its appeal, the reason being that the media does not promote the right kind of music. Although the modern day music is derived from the music of the olden days, but still there is a need to preserve the traditional forms of music. **SPICMACAY** serves as bridge between the artists and the common public

by providing the artists a platform to perform, to share and to deliver the rich and heterogeneous cultural tapestry of our country to its youth.

About the CONCERT.....

Indian music is conceptualized with time. Ragas (in Sanskrit "*Raga*" is literally 'colour' or 'mood') which refer to melodic modes used in Indian classical music are held in different time of the day i.e. **prabhat** (dawn), **sandhya** (dusk), **raatri** (night). Some ragas are also prescribed a season. During the monsoon season, for example, many of the *Malhaar* group of ragas, which are associated with monsoon, are performed.



Since it was evening time the artists decided to perform an evening raga- *Raag Bhopali*. It is a very common raga and has been embraced by lighter musical styles such as *ghazal*, film music, etc. When the music began, its effect was so calming that it drove me off to a state of trance, relaxing my mind, body & soul. Mesmerized by the music, lost in my own world, I was brought back to



reality by the sound of claps. By now all us were charged up & everyone started cheering 'Once more, Once more...'. This was followed by a bandish in *Raag Hamsukhdwani*. On the request of the audience, the artists performed a few more pieces such as sang a bhajan composed by Tulasi Das ' *T h u m a k C h a l a t Ramachandra*'. Finally, the programme came to an end with the bhajan ' *Ganga,*

Jamuna Teer Chalo Man' which was very true in literal sense as the enticing time spent with the artists, listening to the divine music invoked a spiritual connection with ' *The Almighty*' as taking a dip in the holy water does.

Chess in check

- reported by *Avi Prasanna*

A chess club was started in IISER in November, 2007. As of now we have 16 passionate members in the group with active participation from students of both batches.



Our very first event was organized on the eve of Diwali on 8th and 9th of November, 2007 at the IISER Hall of residence. We kept the proceedings of the competition very simple. It was a knock-out tournament which was divided in four rounds. The opponents were decided randomly. a good number of students turned up for the competition and subsequently a lot more joined us as spectators.

We are planning to make this an annual event with the aim being to recognize the best talents in this game who can represent us in other tournaments.

PRELIMINARY ROUND

MATCH	PLAYER 1	PLAYER 2	WINNER
I	HARPREET	ARVIND	ARVIND
II	MD. ZUHAIR	PARIVESH	MD. ZUHAIR
III	THOMAS	ANKUR	THOMAS
IV	RISHAB	RAGHU	RAGHU
V	AJIT	LUCKY	LUCKY
VI	ABHIJEET	GIRISH	GIRISH
VII	DINESH	SARTHAK	SARTHAK
VIII	AVI	BEHLOOL	AVI

QUARTER FINAL

I	AVI	THOMAS	THOMAS
II	RAGHU	GIRISH	GIRISH
III	SARTHAK	MD. ZUHAIR	SARTHAK
IV	LUCKY	ARVIND	LUCKY

SEMI FINALS

I	GIRISH	THOMAS	THOMAS
II	LUCKY	SARTHAK	SARTHAK

GRAND FINALE

THOMAS KURIEN	v/s	SARTHAK PARIKH
WINNER :		THOMAS KURIEN
RUNNER UP :		SARTHAK PARIKH

CORPORATE CHESS

- Sartakh Parikh

Think chess is getting boring for you, or, that given the old school rules stand, there are lots of people way ahead of you that you would take ages to win your first game?

Here's a way out of that scary rainy day, when you finally get stuck indoors with no source or reserve of power and only a chess board to dictate your fears.

Simple, you need as many chess sets as half the number of people grounded indoors. I bet, by the time you are through one round of this exciting game, the mob would be hustling to dethrone you from your roost. To be on the safe side gather as many sets as possible, or keep these rules a secret. To be on the lighter side, you could also drive the reigning chess fanatic in your community crazy by inviting him to witness this corporate battle. Wait, maybe this become a wildfire in your forest of thoughts, and you would settle for any set of 8 by 8 wiggles making the fateful 64 and any medley of 32 small trash items (with duplicates, to replicate the chess army).

The rules are simple,

The three Laws of Corporate Chess

All chess rules hold, but,

1. Every piece (A) has got a second life (don't shoot to the virtual world, yet). When killed by another piece (B), the victim (A) returns alive on the same square, while murderer (B) is sent to the gallows (removed from the board). (B) never gets a second life as it never plays again.
2. If killed during its second life, the once-reborn victim (A) dies permanently. There's no third life.
3. The KING can kill anyone (exempt from rule 1) and has only one life.

The Story, anyone?

A short story contest was held on 29th January, 2008 at IISER. The contestants had to come up with the tale hidden in the photograph below. Why don't you try weaving one yourself before you look at our winners?



(Reproduced with permission from Matusciac Alexandru.

The photo is hosted on the web at http://photo.net/photodb/photo.tcl?photo_id=6481403)

THIRD PLACE **PICTURE PERFECT** **- Shambhavi Vashishtha**

If today I am alive then I think it is to tell my story. Oh my God, what a TV freak I am but lemme not mention it now. First I should let you peek at my daily routine.

Morning at 6, I wake up, you won't even believe how! I put a timer all set in my TV and get up a notch before the show "MORNING JOGGERS" gets underway. I think that just watching slim girls jog would help me lose weight.

Then at seven I take a bath. But you should not forget that I have a TV there too. What is the use of taking bath if the TV is not switched on and there are no beach girls running to and fro in series?

Ha, Ha ! After bath I have my breakfast, in my private room which has a centre table which happens to be my first TV. Rather it is that TV on which I saw an English movie, the very first time. Some sort of emotion is attached to the TV and so I gave it the central place.

When viewing the old TV got difficult, I bought a new

one. But just like plates change, but not the appetite, the TV got changed but the taste of programs still remains the same. My room might seem to have a weird setting to you but barring the central table, everything is as normal as it gets. There's a lamp, a side table, a window (which I seldom open) and door (my gateway to heaven!!). Oops! I forgot to introduce to you, my second soul mate, the SOFA on which I leisurely lie and watch my first soul mate churn out programs for me.

All this used to be my routine. By now you must have guessed how each minute of my life used to be so careful.

I was not the same always. There was a time when I used to have a proper wife, a son, daughter and even a pet dog JACKIE to boast of. We were a happy small family. Every weekend we had an outing. Sometimes we caught movies in theatres and had dinners outside. Life was PICTURE PERFECT. Did I tell you that I was a clerk at PUNJAB FUNDS? I had a love marriage and my wife was also a clerk at the same place. Ah! Those were the golden days, her hair was lengthy up to the waistline, she was slim, slender and I never thought I would ever get married to her. She

was just so beautiful and as lovely as her name SNEHA!! But somehow we came to talking terms and I hit the bull's eye. I married her.

Within a year we had SILKY, my daughter. I was on cloud nine but my family members were not very particularly happy about it. They wanted a boy and so a season of tension started. Pressure mounted on me to the extent that next time SNEHA got pregnant, I got the baby checked, in her womb itself, DAMN! It was a girl again and we got her aborted. Two times in a row the same thing continued until ARYAN arrived into our lives. Life again seemed to be on track, PICTURE PERFECT! Post delivery, SNEHA got infection-prone but we were so immersed in celebrations that we paid less heed. My wife got weaker day by day and one day she died. ARYAN was four and SILKY was ten then.

SILKY, my child was good at handling cooking and managing ARYAN even while she was ten. JACKIE, the pet was a hell to manage but somehow she learnt to cope up. JACKIE was a darling to ARYAN and anything dear to him was dear to her as well.

Don't ask about me, as to what I was up to all this time. I was already in a state of depression. To deal with it, I started to drink and watch TV continuously. It was during this time I got attracted to young lasses on television and this madness grew to astronomical proportions. I even started taking leave from office, just to watch TV!

One day, a couple of years after SNEHA left me for good; I was watching some show with girls in two-piece clothing. ARYAN was playing at the terrace with JACKIE and SILKY was engrossed in her conversation with the neighborhood girl. The girl had brought her truck-sized dog, BUZOO with her. Suddenly I heard voices of dogs fighting and ARYAN and SILKY were shouting. Jackie and BUZOO didn't seem to like each other very much. The girl was helpless and ARYAN was calling for me on top of his voice. But then the show was at a critical point so I thought I would go there two minutes late after I was done with the climax. THUD! BHOOM! BHADAM! Screams were there all over, I rushed outside... my son, my darling ARYAN had fallen from the roof in an attempt to save Jackie...

Blood was streaming everywhere, I lost consciousness but people were raising Aryan from the ground and I have no idea how and when we reached the hospital.

But the damage was done, doctors had already declared my son DEAD...

ARYAN left my SILKY half dead. She was a brilliant student before Aryan died but after his death she was like as if there were no hopes. Me? I was further pushed into depression. Like the worst father ever, I didn't care for my daughter but she always cared for me. She cooked for me, washed my clothes, and even did part times. I was more interested in TV and chose to sink SILKY into oblivion. In remembrance of my son I made the TV, I was watching the day when ARYAN died, my center table which is coincidentally the one on which I watched my first English movie.

You must be thinking why center table? So that I can always KICK it. Stupid? May be yes but then I had to blame someone.

My interest in TV rather girls was rising exponentially and unfortunately my daughter was aware of it and she had something in mind... she made her own video like that of other girls whom I used to watch, she somehow managed to slip that into my TV player...

I watched it... I was dumbstruck. Suddenly acute pain awoke in my left hand. I was on the ground and then everything went black.

I opened my eyes in the hospital. Severe heart attack it was. But the bigger blow was yet to come, my daughter, SILKY, thought I would ameliorate and become a better person but when she saw I had a heart attack she somehow managed to bring me here all alone, brave girl!

She went home alone that day, with burden on head, responsibilities on her shoulders and tears in her eyes. She was heavy under all this and then she decided to be free, she decided to break the boundaries, she decided to fly, and she decided to end her life...

And she was gone... PICTURE PERFECT, isn't it?

But, the root of all this, is still alive and that's me. And as I said I am alive to write my heart down so here it is:

"Darling Silky, my sweet heart, my angel, a daughter like you is a boon to a father like me. My angel you deserved a picture perfect life but this is what you have got. I know I am responsible but baby I remember the first touch of your finger, when you were born till this very moment and I am taking that feeling with me even after my death. Will you give me permission to keep that PICTURE PERFECT moment with me???"

I love you Silky."

SECOND PLACE

WHO IS THE KILLER ?

- Darshan Joshi

"Come on guys, hurry up! It's already 10 past 6.", a well built man of 55 said sharply. He was only of average height but stood in his doorway and ordered the fellow laborers like he was their tall master. "You careless fellow, handle that box with utmost concentration. It seems you guys are going to force me to miss the show!"

Mr. D'Souza mostly called as Errolle or Ero by his friends and relatives had just bought a new color T.V. set for Rs. 20,000. His old "Dip" Mr. D'Souza & his wife used to call the old T.V. which they had bought on their 1st wedding anniversary as Dip was out of order. However, most importantly, it was Saturday and he was supposed to watch a Horror movie. So, during the week he had collected the required amount of money and finally got the job done.

Mr. Errolle D'Souza worked for an insurance company and so it was easy for him to gather the money. Mr. D'Souza had been a sincere employee of "All India Insurances Pvt. Ltd.", atleast, for the last two decades.

Unfortunately, a couple of years ago Ero lost his dear wife and ran into depression. He had no close relatives. On the suggestion of friends he approached a doctor. And the doctor made him watch horror movies on weekends so that its impact might make him forget his depression. The therapy did work and so Mr. D'Souza did not delay in getting the new T.V.

"Good job guys. You placed it exactly where I wished it to be. Still half an hour to go! Now I have to hurry up." At last the new T.V. had replaced Dip. Ero gave the laborers their wages hurriedly and they happily went away.

Quickly Ero changed the outfit and after moving the 2.5 kg dumbbells some half a dozen times the way they should be, he just threw them carelessly near his big comfortable foam chair. Ten minutes were left and he started gathering his companions drinks, pipe and tobacco. Ero ran into serious addictions after his wife's death. Even the doctor could not cure it.

"Oh no! Where do I keep all these things?" questioned Ero to himself. His small tea poy had broken last Saturday when one of the dumbbells

slipped from his shivering hands and targeted that fragile structure. Now he saw 'Dip' and pulled it near chair and arranged his companions on a nice small table cloth. He even kept two empty jars to throw tobacco and to spit!

The movie as usual started at 7 and Ero's Saturday night journey began. He used to drink so much that on Sunday morning he would fail to open the door for Mrs. Stella who prepared meals for him. But after some forgetful days Ero gave her the key and on Sundays Ero used to wake up only when she splashed a mug of cold water on him.

The movie started. The night outside was horrible as it was raining very heavily and the thunder roars were very frightful. Today, Ero was extra emotional because the new TV reminded him of how his early married days were and how he managed, with great difficulty, to get a costly T.V. for his wife's entertainment. "O! dear Shirley, I miss you! I miss you so much!" Ero exclaimed as he stared at 'Dip' beneath.

But as the movie started Ero felt relaxed. As usual everything was normal for sometime and Errolle nicely sucked in the whiskey in his regular style. In between he smoked the pipe. "Bang!" a sudden noise pierced Ero's ears and in fright, the drink drained from his mouth and fell on his white sleeveless outfit which he had just washed last night. For half an hour he continued to watch and then he remembered he had to sign some urgent papers. So, he got up and from his old, crooked handbag fetched a handful of papers and an antique pen.

Today some how the movie failed to make an impression on Ero. He lighted the lamp just near the door. The lamp was also antique and its lamp shade was in disorder. But Ero didn't care to see it. He then stared for a moment at his wedding photo clicked some 30 years back. Then drawing some more drinks from the first column of the shelf he returned to his seat.

"Oh! My reading glasses," Ero had forgotten to bring his spectacles and so he got up once again & fetched it from the same shelf near the door.

It was lightning and thundering outside. The climax of the movie was so frightening that Ero was stunned and stared at screen so unconsciously that he didn't even notice that one of his signed papers flew from his hand. He tried to control his rapidly knocking heart by holding his left hand to it. Within a few minutes he was in his usual Saturday night condition with T.V. on, drinks & tobacco scattered and lying

down, a cigarette hanging on his lips.

Mrs. Stella often advised Ero to at least put away the cigarette from the mouth while sleeping. But it happened without any discontinuity.

It was bright Sunday morning. The sun was climbing high. And Mrs. Stella a punctual maid opened the door with the aid of key at 11 sharp. Ero was in his regular half-body reclined position. So, Mrs. Stella didn't make an effort to call him. She silently switched off the T.V. and splashed water on Errolle's face.

"Come on Mr. D'Souza, wake up it's 11 am," she screeched. But, Ero failed to move. "Mr. D'Souza I have to splash another mug of water, then!" And she really did so but Ero didn't respond. She moved his body. Ero's body rested on chair icy cold and unmoved. Mrs. Stella didn't make any delay to conclude that Ero was on his journey to meet his wife.

But then the question remains who was responsible for Ero's death- the doctor, the movie, addictions or ... his love for his wife? The killer whoever it may be had killed Ero with a whisker!

FIRST PLACE

Mr Livingstone : The Living Stain

Sisir C. Anand

Everybody hates stains. Thanks to the straining research of 'whiter than the whitest-white' detergent companies, some stains stay longer than others. Longer, I say, because only hard stains deserve to stay. Else, the canvas of the world would be too bleached that there would be no story to be told other than a clean one or else, it would be too over-stained that the story would get lost in the insignificant details.

I am a virginal stain. A stain radiating grace and elegance. A youthful and flowery one. And unique, that if you spot me you would never doubt my intentions. I'm that stain which reveals the story bit by bit, second by second, of how I got there.

Clearly no one but me knows the story of the old man in the picture you are staring at. It's a long story and let's say you have about an hour to listen to me.

What, you wonder is the old man staring at?

Well, flip over and I'll tell you.

The stain in line

The reception was excellent. Those days were VHS though, not HDTV. It was a magnificent mansion where the two souls were bound for life, at least by their church.

He, my friend, is Mr. Livingstone.

Have you still spotted me?

I hope not. Given that you are stuck to a snapshot of his life, with irrelevant details, it's hard. Harder to ignore still. Keep listening.

Mr. Livingstone...! Pretty long name. It tires me to repeat it again and again. For my sake let's call him Mr. Lone.

Lone was a guy who loved to get himself stained as a kid. His mother was the angriest in the neighborhood. She was valiant too, She fought hard against my kith and kin. Grease, Mud, Ink, Paint. After all he was an innocent child playing children's games in his stain-free world. Why should he worry about us?

It was his attraction towards stains that got me a glorious peek into his otherwise mechanical life. He was adept with his hands. Any gadget in his hands would be tortured with spanners and wrenches and tapes and... Stories of torture are never short and these poor gadgets never stopped speaking the language they were meant to speak once they went through him.

It was by sheer luck that I met with him. It was not a 'love-at-first-sight' encounter. He stank horribly. My relatives were so impressed by him that his clothes told a dirty story diluted by sweat and blood. But I needed him. My friends scoffed at me seeing me with Lone: they gave me a guilt-free pass to loneliness in their kingdom of stain-mongers. I was stranded. My friends deserted me. And he helped me. How could I not repay him? You tell me...

That moment didn't last long, however. What he's watching right now in this frozen moment is his 'kiss-the-bride' episode after he had exchanged the vows. The bell tolls. Half an hour left. For you. I'll stay here forever, in my dimensions...

Now you know what he's watching...

But where am I?

See that lamp in the corner with the crooked lampshade. That's my doing. Ours actually. Violent animals...

The lamp with a pointless stand

That lamp was a gift for his wedding from his mother-in-law. She provided the ornate carpet on the floor, the laces you see on top of the TVs and much more which you don't see because they are having their time at the pawnbrokers.

This room was a well decorated room. A room with every view of what we did together.

Now the room is dying. He sits on a rotten upholstery infested with rats. The ivory laden table has given way to an old TV which he failed to repair, and its owner failed to retrieve.

He is bald. Dressed in the only two garments left in his wardrobe and drunk by the empty wine bottles on the shelf, he is a picture of poverty. It depends where you hail from though. However, he's a fading picture of his former nobility.

The lamp... That's what made me just a stain. See those papers lying on the broken TV. Those were love letters from his wife. Neatly written and perfumed by the fragrance he had gifted her. Only, they were not addressed to him. They were to a man she met on a one-night stand and they were only stopped by the lamp-stand.

Heavy, the way she cheated on him. It drove him to smoke his suspicious heart out. Yet, he had a spirit left in his soul. Heavy, that was how the lamp-stand fell when it hit her skull.

That was the only time he was afraid of stains. Lone, the stain man had turned into an autist's tantrum over those warm red stains.

I am a cold stain. Colorless. All the colors I have are dust and soot. Probably that's why you haven't spotted me yet.

A mechanic wouldn't find it that difficult to dispose off defective machines. His wife, brain-dead, was never found.

Anyone who asked her whereabouts got his teary reply of how she ran away.

Her fiancé is now in court. Right now. Fighting hard against the tide of fabricated evidence. She's dead but she still loves him.

The powdery stain remover

Now that you are woven into this story let me tell you about Lone's secret. Killing her didn't remove his love for her. Her history left an indelible stain on the

love court of his brain. Her smells and songs had tattooed their dark painful inks into the skin of his being.

Those wine bottles on the shelf were long emptied. He searched for the 'nepenthe' to deliver him from her stains. But stains like those, let me warn you, are hard to remove.

As usual, our lovely mechanic has a solution to everything. That solution is brewing in the tumbler. The slow poison of dementia. He has procured the recipe for Alzheimer's. A dose every week and within a year your mind will be spotless, dancing in the eternal sunshine of freedom in the pursuit of happiness.

Well, what his doctor did forget to tell him was not to put the powder on a shelf sharing rat poison. Ah! Now you almost know.

The Dead Stain Walking

There. He's in pain, clutching at his chest as his heart slows down to beatlessness. The poison acts quickly without conscience. Rats or humans, the poison is not burdened with thoughtful stains.

In a few minutes, he'll be dead. Maybe, his wife in her living will had conspired long back by placing the rat poison in the medicine cabinet. Look closely for more impact. Those glasses he's wearing... without them he'd be blind. She hoped someday he'd... and he'd...

Well it worked out, but not the way she wanted.

Well her time run out before his and as your time runs out let me tell you who I am, if you haven't found me yet. I'm not a trivial stain on his unpolished shoes lying in the corner. Nor am I a stain on the door which hides everything outside the room. Not the fantastic stain on his vest too.

I'm right there on the wall. See that black and white portrait of the couple. Well the lady's me. And I was his wife.

And now I'm a dead stain with a story. Thank you for tuning in to my frequency.

I've to rescue my fiancé.

Can you help me? Help him?

Well, the photographer saw a man shocked after winning the lottery. What did you see ?

Making of a 3D Sudoku

- Kale Girish Ravindra

As we all know, Sudoku is one of the most famous puzzles in the world. Even in India we have millions of fans giving their best to solve a Sudoku that they get in their daily newspaper. But all these Sudokus are 2 dimensional in nature, i.e. all the digits are confined to a plane. Then how many of them have seen a 3D Sudoku? (I know what most of you will do after hearing this new word, you will 'Google' it to see what it is, but what you will find is 'Sudokube' or 'Sudoku cube' which is something similar to Rubik's cube in looks and that's not precisely what I mean by 3D over here.). So let's see how it is done.

Background for the beginners

Let me first describe in short what a Sudoku is. Sudoku is a puzzle in which we generally have a 9X9 structure (see adjoining figure). The general rule is that each of the columns, rows and the blocks should contain the digits 1 to 9.

		COLUMNS								
		1	2	3	4	5	6	7	8	9
1										
2		1			2				3	
3										
4										
5		4			5				6	
6										
7										
8		7			8				9	
9										

In a puzzle we will be given certain number of clues. The number of clues, carefully placed, decides the difficulty level of a puzzle, obviously lesser clues for higher difficulty. There is a debate going on in the mathematical community on the least number of clues needed to have a unique solution, but we are least interested in that debate, here.

Moving forward

3D Sudoku is a three dimensional extension of 2D Sudoku i.e. we are extending our ideas from a 9X9 square to a 9X9X9 cube. Let's talk in terms of a valid Sudoku solution, since making a puzzle out of a

solution is no big deal. The first requirement for a 3D Sudoku solution is to have a set of nine distinct 2D Sudoku solutions. By 'distinct' Sudoku solutions what I mean is that, if we superimpose any two puzzles then the arrangement of the digits in the two puzzles should not match at any place. Then we need to choose the solutions in sets of three so as to get a 9X9X3 structure. This structure should have special properties as described and depicted below

1	4	7						
2	5	8						
3	6	9						

Consider the 3X3 block which is formed using the 3X1 columns from three distinct Sudoku solutions. This 3X3 block is similar to a 3X3 block in 2D Sudoku i.e. it should have all the nine digits. The same rule applies for other parallel and perpendicular 3X3 blocks as well. Now we will stack three of such 9X9X3 Sudoku to get a 9X9X9 Sudoku.

But..., (And this is a really big BUT) we need to manually find such distinct Sudoku solutions from a gigantic set of solutions. Another way can be to use the same 2D Sudoku solution and make it undergo some transformations after which we end up generating a distinct Sudoku solution. If we can find 8 such transformations then we are done.

The transformations

There are four different transformations which we can use separately or in suitable pairs to get the required 8 transformations. Here one should note that these transformations are to be applied on all the nine blocks in order to get the next distinct Sudoku. The transformations and illustrations are given below.

1) $C1 \rightarrow C2 \rightarrow C3 \rightarrow C1$

1	2	3	→	3	1	2
4	5	6		6	4	5
7	8	9		9	7	8

2) $C1 \rightarrow C3 \rightarrow C2 \rightarrow C1$

1	2	3	→	2	3	1
4	5	6		5	6	4
7	8	9		8	9	7

3) $R1 \rightarrow R2 \rightarrow R3 \rightarrow R1$

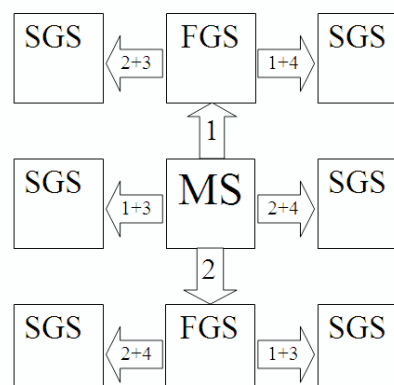
1	2	3	→	7	8	9
4	5	6		1	2	3
7	8	9		4	5	6

4) $R1 \rightarrow R3 \rightarrow R2 \rightarrow R1$

1	2	3	→	4	5	6
4	5	6		7	8	9
7	8	9		1	2	3

The penultimate step

Now I will introduce a terminology that is necessary for proceeding further. Since the product Sudoku is a 3D Sudoku one might face problems in presenting it on a piece of paper which is two dimensional. So we will present it as a set of nine Sudoku arranged in a particular order. From earlier discussion it must be clear that we are using only one Sudoku to generate the others, the one Sudoku may be called as mother Sudoku or MS in short. This mother Sudoku can be transformed using the two column transformations given above to produce two first generation Sudoku solutions or FGS in short.



The remaining six Sudoku solutions can be obtained using appropriate transformation. We will call the second generation Sudoku solutions or SGS in short. Refer to the figure for clarifications. The numbers on the arrows indicate the corresponding transformation in the list of transformations given earlier. The set of three Sudoku solutions given in a row is very specific and it should not be altered for obvious reasons.

The moment of creation

Now that we have 3D Sudoku solution we can go for creating the puzzle itself. Let's first consider how many possible 3D Sudoku solutions can be obtained from a mother Sudoku. The earlier structure of the 3D Sudoku solution can varied to form 107 other 3D Sudoku solutions (inter-row shuffling will produce 6 combinations and intra-row shuffling will produce 18 combinations). So we already have 108 3D Sudoku solutions, starting from a mother Sudoku solution. Now if you have enough time to spare you can manually delete the clues in the solution so as to convert it into a puzzle. If you don't have time, you can easily code in a computer program to do it for you (you need to create it because no such program exists for a 3D Sudoku, though it does exist for 2D Sudoku).

Probably you can imagine how many 3D Sudoku puzzles are possible starting from a mother Sudoku. An example of a 3D Sudoku is given below. This puzzle was put up as a question in the final round of IISER Sudoku competition (so now you know who the organizer was). The time taken by the winner was 1hr 27 min 53 sec. Try your best to solve it. The puzzle has a unique solution

		7			8			
			3					1
		5	1				4	8
					4		2	
6		9		1		3		4
	2		6					
7	3				6	1		
4					7			6
			8			4		

Layer 1

		9			3		1	
	5				1	4	8	
	7							
	9	6	1				4	3
2					6			
				4		2		
		4		7			6	
					8			4
3	7		6					1

Layer 2

5				1				4
7			8					
	9			3		1		
		2		6				
			4					2
9	6				1	4	3	
				8			4	
	7	3	6				1	
	4		7			6		

Layer 3

		5	1				4	8
		7			8			
9			3					1
	2		6					
					4		2	
		9		1		3		4
			8			4		
7	3				6	1		
4					7			6

Layer 4

	7			8				
		9			3		1	
	5				1	4	8	
				4		2		
	9	6	1				4	3
2					6			
3	7		6					1
		4		7			6	
					8			4

Layer 5

	9			3		1		
5				1		8		4
7			8					
9	6				1		3	
		2		6				
			4					2
	4		7			6		
				8			4	
	7	3	6				1	

Layer 6

9			3					1
		5	1				4	8
		7			8			
6		9		1		3		4
	2		6					
					4		2	
4					7			6
			8			4		
	3			6	1			

Layer 7

	5				1	4	8	
	7			8				
		9			3		1	
2					6			
				4		2		
	9	6	1				4	3
					8			4
3	7		6					1
		4					6	

Layer 8

7			8					
	9			3		1		
5				1		8		4
			4					2
9	6				1	4	3	
		2		6				
	7	3	6				1	
	4		7					
				8			4	

Layer 9

There's No Place Like Home, (an account on the happenings in the Science Club)

- Sarthak Parikh

Everybody knew from the beginning it was going to be something. That it would commence on a Thursday and be called every next Thursday was decided, tentatively.

Little knowing that seven out of the next nine available Tuesdays were doomed to be the meeting time of the Science Club; its members set out to plan other finer details.

More recently, following some mathematics, I found that the tenth Tuesday too will be a witness to the exciting meeting the members always enjoy having, which makes each one of them memorable.

Historically, starting from one Darshan Joshi's teaser on the history of Astronomy, the stars in the sky instilling awe for the cosmos, we had the same Mr. Joshi giving an equally brilliant and singular talk three meetings later on the Indian Calendar Systems, and the science behind them (the talk went on for two hours, and I can swear it would have gone further still had it not been for the temptation to go out and look at the stars that helped design calendars and wonder, meanwhile catching the bus too). That day, each and every listener had something interesting to say; even now you can come to me and ask what they all said.

PVRT (no that's not the ideal gas equation) gave a cryptic talk on the basics of Cryptography and different ciphers used (at the end we were able to decipher the acronym PVRT correctly as P. Venkata Raghu Tej). On the timeline, this was the second science talk (Raghu entertained all the questions with a cool head, and we all left Raman Hall wiser that day).

Although only one science talk was set in the Innovation Park (by Darshan Joshi), that didn't mean Raman Hall had less innovative minds coming to give a talk. One of them was Mohammed Zuhair, whose immense love for calculus finally made me

think there was something the matter in totally distrusting calculus. His talk, on curves in nature, and their applications, is easily mentioned like this than actually done. Solving age-old problems, and explaining why bridges collapse, he was able to span his time out at ease, when people like me would have freaked out at the idea of sharing such heavy weight problems.

Kunal Sinha (KVPY Fellow 2006) exhibited some brilliant pictures on the way ants live (the first time someone used an LCD projector) and gave us a beautiful insight into the social behaviour of ants. (The pictures are worth seeing; you'll find them in the hard drive of the computer in Raman Hall- but don't get antsy.)

Home, the club became our home; like a home within a home. Although we thought of naming it, we got too involved in its functioning to step back and think of a worthy name.

Adimoolam Santosh Arvind, so is said in golden letters in the annals of this Science Club, mesmerized the audience with his deep understanding of Thermodynamics.

The seventh talk was presented by a hungry Piyush Agrawal. His personal wisdom on Oscillating reactions proved a cut above the usual kind. As the rate of the reaction oscillated, our minds were sent on a roller coaster ride.

In pretty much the same way and continuing on with the same fashion, which now comes tagged with the science club, I plan to confuse the listener on the subject of Lagrangian mechanics this Tuesday.

Everybody knew from the beginning it was going to be something,

All are invited.

POBE @ JNCASR, Bangalore

- Sisir C. Anand

Every year JNCASR, Bangalore selects ten students from First Year B.Sc. (or equivalent) for an Orientation Programme in Biology which extends over three summers (six months) and culminates in the completion of a project in biology. They have two departments: Evolutionary and Organism Biology Unit & Molecular Biology and Genetics Unit. The first year, there is a lecture series by in-house professors, PhD students and visiting professors (from IISc, CCMB, University of Mysore). And then there are lab visits for familiarization with fundamental protocols (like DNA extraction) and instrumentation. More details can be obtained on the host website: www.jncasr.ac.in

My experience at Bangalore was interesting. The ten selected candidates included eight girls and two boys. The other one failed to turn up, and the rest of my vacation was spent being mobbed by eight spirited girls from premier institutions of India (DU; St. Xavier's Calcutta; Osmania University; FC, Pune). Lectures on Evolution by Prof. Amitabh Joshi were profound and stunning. And lectures on Genetics by Prof Anuranjan Anand were deep, insightful and sometimes confusing (...the fault being of the subject). Joshi sir and Anand sir are the coordinators of POBE. PhD students Sutirth, Kavitha, Kaustubh and others gave lectures in ecology, developmental biology and chronobiology respectively (Some of their guides were too successful and hence busy with international conferences). The lab components were a welcome change to morning lectures and quite fun (especially

when they were ditched before completion due to lack of resolve and determination from the girls' side). If one experiment was killing bugs with mouse clicks to observe the evolution of efficient prey-predator systems, the other was waking up at unearthly hours to transfer emerging (eclosion) flies to their new beds (vials). We chilled a lot watching the extraction of plasmids and corresponding protein in the cold rooms (we didn't do the main work because the result (purity) was of great importance to the PhD student Bharath and he didn't trust us, much. We too.). Mohan, a project assistant and a nice friend, was at the receiving end of most of our antics (Sorry!) We had failed experiments too. We put up (severed) gulmohar leaves in sucrose solution to look at diurnal variation in uptake (chronobiology) and the leaves punished us by not responding at all. However large ants in Petri dishes were well behaved data points. We sexed flies, separated males and females based on anatomical differences under the microscope. We also went on a visit to IISc on my birthday. And the girls were disappointed that they couldn't fleece me by dropping in at the closest MacD. Instead they were treated to refreshing and healthy milkshakes at the IISc Juice Stall. We went around labs in IISc and studied the XRD at the MBU and observed MALDI, and column chromatography, HPLC... and those who know IISc, know better. The tour never ends.

Putting two months of relaxing fun into writing is hard. You have to be there (and around) to enjoy it. Hope you get as cheerful a company as I did, if you make it there.

-
- ❖ The best humans can do is pick a star that helps them get through the day. Some do it by contemplating the motion of the stars, others by being finicky about the celebrities, and others become the stars in the circle of life.
 - ❖ Michael Schumacher's Formula One Ferrari is faster off the mark than a supersonic Eurofighter jet. The Grand Prix champion beat the jet by half-a-car length at a race over 600 metres.

The Pretty Face of Microbiology : Our Experience at 48th Ami Conference

- Madhuresh, Nitin & Hemant

As part of our curriculum at IISER, we enjoy spending time in labs asking some questions pertaining to Basic Sciences. We call it an intra-semester 'project work'. Hemant was very much fascinated when he found some oil-degrading micro-organisms from a soil sample collected from a garage. He continued observing the dynamics under various conditions. Similar was the case with Nitin. He constrained *Aspergillus* to different pH, salt concentration, glucose, etc. He found out that glucose concentration and pH govern both fitness and morphology of the fungus while salt concentration governs only the fitness related parameters and is indifferent against morphology related parameters. Madhuresh was interested in knowing whether the chemical composition of fresh water has any effect on the types of micro-organisms found in it. Interestingly, he found that different water sources (like rivers, lakes, and springs) have very distinct chemical composition and have definite relationship with the bacterial diversity in that ecosystem. We must say, it was the kind of mentoring and guidance that we got from our Biology faculty, Neelesh Sir that all the above works resulted into abstracts that got accepted for Poster presentation at the AMI Conference. And we went to Chennai to represent our work in the conference.

AMI was founded in 1938 to promote the discipline of Microbiology. During the silver jubilee session of the Indian Science Congress in the forties, the idea of forming an independent Association of Microbiologists was mooted and in January 1947, with Dr. J. C. Ray as its secretary, the Association was registered at Lucknow under Society Registration Act on 29th June 1959.

Association of Microbiologists of India (AMI) organised its 48th annual conference at the Indian Institute of Technology Madras, Chennai, between 18-21st December 2007. Theme of this conference was "**Microbes : Biofactories of future**". Around 800 delegates from around the world had participated in this conference. There were in total 14 technical sessions on different areas of Microbiology. These sessions included guest lectures and main attraction of the event i.e. Poster presentation. Each technical session had 3-4 invited

lectures from prominent personalities in that area. Lectures were more based on their research work which was quite interesting. Around 400 posters on different sections were presented. The posters brought out immense amount of work going on in Microbiology throughout the country. Interaction with the presenter provides ample amount of knowledge on that topic. In addition to academics there were cultural events and motivational lectures. Students and researchers from different parts of the country had come there to represent their work. We found them interested in knowing about IISER. We felt glad to tell them how we enjoy doing Science at IISER. We got a nice exposure to researches going in various domains of microbiology. The lecture sessions were very interesting and we would like to share some of the experiences. All in all this conference had enabled everyone to interact academically, socially and culturally. It was a very rich and great experience for us to be there with hundreds of great scientists and also provided us a platform to present our work.

The key note address by Prof. P Balaram (Director, IISc) was very inspiring. He told that Chemistry plays a major role in understanding microbiology. He emphasized that Mass Spectrometry and Liquid Chromatography are going to be the central weapons dealing with biological questions. We felt proud of ourselves because this multidisciplinary approach towards Science is always inculcated in us at IISER.

In the lecture session, Prof. G Shreedharan (CMC Vellore) talked about opportunistic viral infections. He told about herpes virus (an enveloped DNA virus) which sets up latent infection following primary infection. Studies on such immunosuppressed patients reveals that it is more frequent and severe if the patient is receiving cytotoxic therapy or organ grafts recipients. Prof. Mary Jesudason (AIMS, Thrissur) talked about beta lactamases, extended spectrum beta lactamases and related drug resistance. He told us to be aware of new resistance mechanisms. He said, "Seek and you will find!".

On the other hand, Dr. P. P. Kanekar from ARI Pune explained about biodegradable polymers of

microbial origin. Alkaliphilic and haloalkaliphilic bacteria were screened for PHA production. Alkaliphilic strain of *Bacillus* produced ~ 40 % PHA on dry cell weight basis from glucose as sole C source. The polymer identified as a copolymer of PHB-co-PHV. Prof. Bharat Patel from Griffith University described about the *Halothermothrix orenii* in hot, salty, anaerobic conditions. It is important because of its genomics and proteomics perspective.

We also had lectures on Microarray, Genomics and microbial nanotechnology etc. All of them were fascinating and inspiring.

Our Posters selected for AMI :

- *Isolation and characterization of an oil degrading oligotolerant actinomycete*

Hemant Kumar Verma, Anuja Damle, and Neelesh Dahanukar

Indian Institute of Science Education and Research, Pune.

- *Factors that govern the diversity of bacteria in freshwater ecosystems*

Madhuresh Sumit, Anuja Damle, and Neelesh Dahanukar

Indian Institute of Science Education and Research, Pune.

- *Changes in the morphology and fitness of Aspergillus grown under stress conditions*

Nitin Singh Chouhan and Neelesh Dahanukar

Indian Institute of Science Education and Research, Pune

- *Multivariate analysis of viral genomes*

Shraddha Karve¹, and Neelesh Dahanukar²

¹ Department of Microbiology, Abasaheb Garware College, Pune.

² Indian Institute of Science Education and Research, Pune

It is worth mentioning that the last one received the best poster award.

REUNION

O! Fire...

*Thou hold me in raptures with Thy fervour...
Thy force... Thy desire...*

*Towards Thy noble task
Of demolishing the mask*

*That bodily mask which shrouds me
Oh! How I wish to flee*

*As you approach me near
I would run forward and embrace you with
all cheer*

*How the mortals never accept it fair
To reclaim me - Thy share*

*Whoever did say... Death is pain?!
Nay! From the worldly ties I refrain*

*And into the oneness I join
To be a part of Thou... To be Thou... To be
myself... The Reunion*

- Lakshmi Priya M.E.



My Experience at the NIUS Chemistry Programme.... - Harita Rao

Vacations.....great!!! Time to have fun.

How about doing a project ? No, no.....don't turn the page. Seriously guys it's not such a bad idea. At least for me the experience has been remarkably inspirational and pleasurable. I did my project during the winter break at HBCSE- TIFR (Homi Bhabha Center For Science Education)- Bombay. It was for the first time I what actually 'research' means. From the chemist point of view it is about patience when you don't get the results trying over and over again. My project was on *Selective Reduction of Aromatic di-nitro Compounds*. The aim was to subsequently reduce the two nitro groups without affecting the adjacent reactive groups.

Scope for further work in the project:

- 1) To design a method that provides advantages over other laboratory methods which have a poor purification technique.
- 2) To provide an elaborate mechanism, since till now there is no definite detailed mechanism by which the catalytic hydrogenation takes place.
- 3) To determine definite trends of selectivity.
- 4) To improve the yields, selectivity, and rate of reaction.
- 5) To design a more eco-friendly method that helps reducing the environmental stress.

As a prerequisite of the project, I got to learn the basic techniques required to carry out the reaction & to interpret their results. These involve identification of solvent system for the reaction, refluxing, distillation, monitoring & analysing the reaction using TLC (thin layer chromatography), crystallization techniques, characterization of compounds using spectroscopic techniques and many other things. Working in the lab was a fun with me, myself & I being the boss. I could do things the way I wanted to without any restrictions. New ideas were always greeted with pleasure. But it was not just about working all the time. There were students from other

institutions as well. This was a chance to learn from and interact with them. We used to have a lot of fun together. I still miss the tea/coffee break sessions where we kept pulling each others' legs. In short, I would say the experience was GREAT!!!

Summer Projects (external) at IISER

Studies on Synchronization in Coupled prey-predator system
MOSES J. KARTHA
with Dr. G. Ambika

Synthesis & Structural studies of Pro-Gly Dipeptide
ASHWANI KUMAR N, SRFP (JNCASR) 2007
under Prof K. N. Ganesh

Basic techniques in molecular biology
ABIRAMI LAKSHMINARAYANAN
under Prof. K. N. Ganesh

Dr HARESH KEHARIA
IAS Summer Research Fellow
under Prof K. N. Ganesh

National Science Festival 2008, St. Stephen's College, New Delhi

Nine students from IISER were chosen to showcase their talents at National Science Festival hosted by St. Stephen's, Delhi. They were Sushant More, Anup Mahesh Savale, Madhur Mangalam, C. B. Ajit, Sartakh Parikh, S. Ajay Subramaniam, Surojit Sural, Sisir C. Anand and Bedartha Goswami. The pair of Ajit and Ajay emerged victorious in an aptitude test, while Madhur went down giving a valiant fight in an obstacle race. Surojit put forward a Bindaas Absurd Theory, while the programming and circuit making contests beat the contestants recursively. Sisir inched minutely through four consecutive rounds of JAM, only to stumble at the final, where street smartness went to test. Bedartha presented a paper on Rescue Effect, but the forum needed much rescuing, and the science quiz turned out to be a tough crack.

When Time Stood Still

- Bedartha Goswami

The young man (more of a boy) lay stretched out on his bed on that lazy afternoon his body on one of the diagonals, his bare chest facing upwards, his feet hanging over the side of the bed, while his arms were below his head, which was tilted at a slight angle to his body, so that he could look out of the small window of his room. He lay there, his entire body relaxed and peaceful and his eyes simply stared out the window at the small patch of the brilliant blue sky it presented. His breaths were easy and slow and though it was the height of Spring it was not that hot and the ceiling fan had not yet come out of its winter hiatus.

Everything about him was soothing a pleasant sight of leisure, easy, being.

Only, perhaps, his mind was active, yet not such that his eyes might betray. His bright, dark eyes just stared at the sky-patch while his mind flitted comfortably through numerous thoughts and images, never pausing at any single one for more than an instant, not selecting any particular theme or pattern, so that he did not have to reflect on any, and all, that was manifest in his mind.

He just lay there, thinking of nothing, and everything.

He was surrounded by an envelope of serenity. Not a single wisp of dust moved or made a sound. All was silent a silence unlike the dreadful quiet of the night that can shroud you with a feeling of weight as none other can this silence was '*light*', in every sense, as opposed to weight, as opposed to darkness. He seemed to be living in a photograph, a still image from an album.

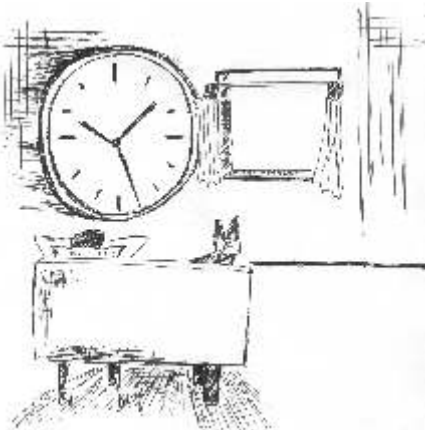
A quiet picture suspended in a comfortable calm.

Time lost all meaning - Time, which is manifest only through change, however minute or gigantic, slow or rapid it might be. A universe without change is like a universe without Time. The definition of change is born out of time (and, in principle, space) but it is also true that time cannot exist without change. Clocks, sundials, hours, days, seasons, eras, aeons - no depiction of Time is complete without evoking an image of change. What is Time, if not but a degree of change? An indicator? And in the small microcosm of the youth where the only vision was of a clear blue sky, the only

sound was of a *shunya*, only touch was of an imperceptible air: *nothing was changing*.

There was no Time.

He was still living in the same moment as he was when he fell on his bed and started to look at the window and stopped moving. He 'is' still in that moment that moment is not going on, it *is* still, it is not moving, it is here, right now.



He felt an immense power in that instant, on being able to stop Time. He felt he could forever remain like this if he did not move. Time was his slave. Time, the universal presence, that which cannot be tamed, stopped, reversed a slave to his beckons. Time, on a lazy afternoon, in his eyes, in his mind, shackled and bound and brought under reins.

And suddenly the doorbell rang.

That piercing sound changed everything. Time was unleashed from its captivity and it lurched forward with a vengeance, dragging the youth in a single lashing whip from the moment it stopped to the moment the doorbell rang. All that was there (or could have been) in between was lost. Those moments in between did not exist for all that matters.

Irritated at having lost his grip over Time, his source of immense power, and for having to pay as a fine those lost non-existent moments from his life, the youth jerked his head up at the sound of the doorbell and got up in a swift single move. He went to the door, picking up his shirt on the way; his thoughts still dwelling on Time. His body moved reluctantly, yet with a sweet relish, as if released from a prison of inactivity and happy to be back in the world. His entire being seemed to enjoy this comeback but his mind was still hung over his Time-stopping experience. He did not realize that in those non-existent moments, Time, bound and captive, was not the only prisoner his body too, had been held hostage by the situation.

He opened the door, nevertheless, and saw *her* standing in front of him, looking at him, his eyes.

And then Time stood still.

The Speed of Light

- H. Guhan Venkat

Here we discuss on how to measure the speed of light using a method very similar to the Foucault method.

The Foucault Method

Foucault's method uses a rotating mirror. A light source was shone onto a rotating mirror where it was reflected onto a distant concave fixed mirror. The light was then bounced off the fixed mirror, back to the rotating mirror, and returned to the light source. If the rotating mirror was spinning at high speeds, the returning light hit it at a slightly different place causing the returning beam to be shifted from its original path. The **speed of light** could then be measured by taking into account the speed of mirror rotation, amount of shift, and distance between the rotating and fixed mirror.

The instruments required for the experiment are: A plane mirror, a rotating glass slab (a glass slab fixed to a rotating motor), a strobe laser, screen, cameras with high FPS.

Set-up



Method and Discussion

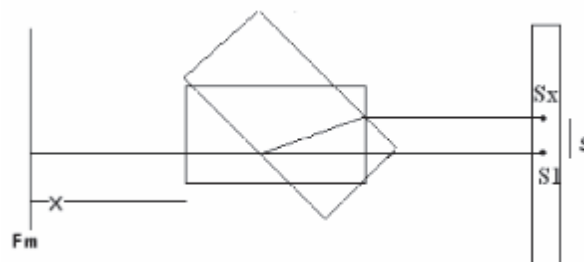
With all the equipment properly aligned with the rotating slab stationary, the optical path is as follows: The beam of light from the strobe laser is refracted through the rotating slab R_s (at normal incidence initially) and is focused at the fixed plane mirror F_m . F_m reflects the image back through R_s along the same path, again after being refracted through the glass slab and is caught at the screen at S_1 .

However, when R_s is rotated continuously at high speeds, the refracted image is no longer formed at ' S_1 ' but is laterally displaced. This is because the light

reflected from F_m no longer strikes the boundary of R_s at normal incidence and hence suffers refraction. The final emergent sets of rays are parallel to the incident rays and can be caught on a screen. If the laser is continuous, there will be continuous refraction through different angles and the image at the screen won't be a single point. Hence we use a strobe laser that sends out only one ray.

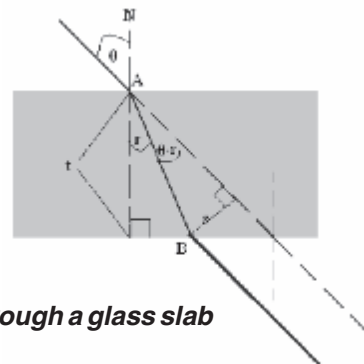
The lateral displacement of the image from ' S ' can be calculated with the help of a camera with high FPS. This camera is installed in such a way that it takes shots of the screen where the refracted light ray is captured.

Plan View



Another similar camera is installed from the top which takes shots continuously of the rotating slab so that the angle, the slab makes with normal, can be retrieved.

Now we have two sources of (data sets) information, one from each camera. One gives the lateral displacement on the screen while the other gives the angle through which the slab has rotated for that corresponding displacement.



Refraction through a glass slab

We consider this phenomenon to derive an important result which will be used later.

$$s = AB \sin(\theta - r)$$

$$\Rightarrow s = t(\sec(r) \sin(\theta - r))$$

$$s = t(\sec(r) \sin(\theta - r))$$

$$\frac{\sin \theta}{\sin r} = \mu$$

$$\Rightarrow r = \sin^{-1} \left[\frac{\sin(\theta)}{\mu} \right]$$

But

$$\theta = \omega t$$

And

$$t = \frac{2x}{c}$$

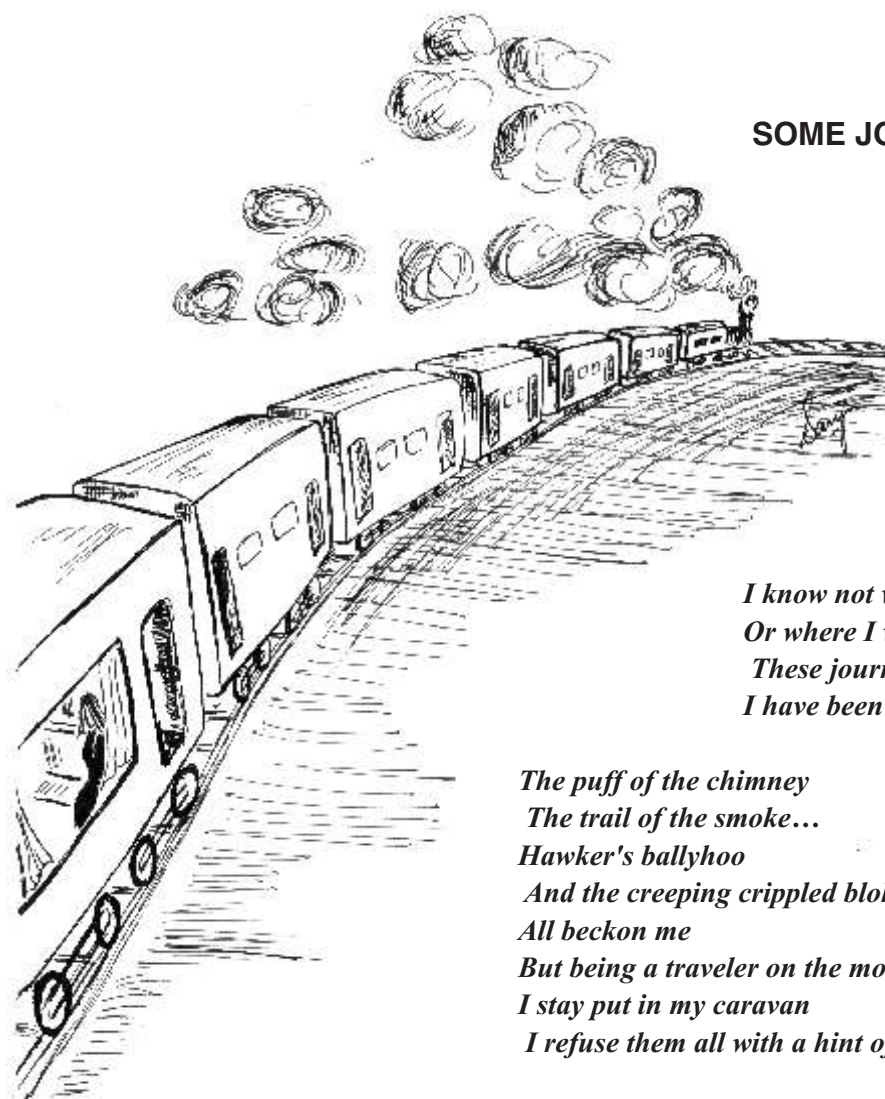
2006-07. I would like to express my gratitude to The Physics Department, PSBBSS School for helping me with the project.

Suggested Reading

[1] H.C. Verma. *Concepts of Physics, Part 1*, Bharati Bhawan P&D, 1993.

COMEDY by Woody Allen (Atheist, Chauvinist, Stand up Comic)

1. Life is like a concentration camp... you can't leave without dying.
2. Why are our days numbered and not, say, lettered?
3. I think crime pays. The hours are good, you meet a lot of interesting people, and you travel a lot.
4. After all, there are worse things in life than death. If you've ever spent an evening with an insurance salesman, you know what I'm talking about.
5. The key is, to not think of death as an end, but as more of a very effective way to cut down on your expenses.
6. Interestingly, according to modern astronomers, space is finite. This is a very comforting thought particularly for people who can never remember where they have left things.
7. When I was kidnapped, my parents snapped into action. They rented out my room.
8. I was thrown out of college for cheating on the metaphysics exam; I looked into the soul of the boy sitting next to me.



SOME JOURNEYS NEVER END...

- Shambhavi Vashishtha

*I know not where I started
Or where I will end up now
These journeys never seem to end
I have been travelling for years at row...*

*The puff of the chimney
The trail of the smoke...
Hawker's ballyhoo
And the creeping crippled bloke...
All beckon me
But being a traveler on the move
I stay put in my caravan
I refuse them all with a hint of nod...*

*Some faces I would never see again
I would miss the soft caress of parting hands
Voices that soothed my ebbing senses
Long after, would be heard no more...*

*The fellow traveller with whom I had struck a chord
Gets ready to leave with a sobbing heart 'n' a heavy baggage
He keeps waving his hand
His silhouette gets lost in the crowd...
A man but travels all by himself
He keeps travelling until he fades out
His traces and his road map do however stay
No zephyr or tornado can wipe these things away...*

..... At NCBS

- *Sushant More*

It was about March end last year. I was bit nervous because I had applied for summer fellowship programme at JNCASR, IAS but had been selected for none. Then, suddenly one day I received a mail from Dr. Mukund Thattai from National Centre for Biological Sciences, Bangalore inviting me for The Living Networks workshop at NCBS.

At the first glance, I was unable to comprehend the mail. On subsequent readings I concluded that I had been invited for some kind of workshop related to genetic engineering. I was invited for this program based on my JNCASR application. I had specified biophysics as my area of interest and he required students with physical science background who were willing to work in biology. I consulted IISER faculty and decided to accept the invitation. The workshop was going to be held from June 1 to July 15, 2007 at NCBS, Bangalore.

I reached NCBS on 31st May. It was my second visit to Bangalore within a month's time. About twenty days before, I had been at IISc, Bangalore for KVPY camp. Even when I reached NCBS, I was quite unsure as to what I was up to. I entered Mukund's lab in a confused state of mind. I met Sugat Dabholkar, a PhD student under Mukund. I also met other students they were quite friendly. I met Shashanka Kundu from St. Stephens, Delhi, he had also come for workshop just like me. Shortly afterwards Mukund arrived, he was an enthusiastic young person in his thirties. I wished him Good morning. 'Don't call me Sir' was his first response. I was taken aback. I soon realized that none of the students addressed their guide as 'Sir' or 'Madam'; they directly called them by their first name. I found it rather odd in beginning, but later adjusted myself to it.

By next day, all of the participants arrived. There was Krishna from IIT Bombay, Shashanka from St. Stephens, Varun from St. Xaviers, Mumbai, Senthil Kumar from PSG, Coimbatore, Vini from Delhi University & myself. I realized that we had gathered for iGEM competition. iGEM is International Genetically Engineered Machines competition held at MIT, Boston. It is being held for last few years by now, on the lines of Robotics competition of MIT. We

were told that the networks emerging from our workshop would be presented at iGEM.

Mukund and Sugat had already conceived the experiment. Mukund had a plan ready at the back of his mind. Varun and Krishna had reached some days earlier and had already begun with the experiments. For first ten days I was completely at sea and had no clue of what was going on. Apart from actual team members we had with us some supervisors and advisors. These were PhD students at NCBS. I pestered them with questions, but even they were not fully able to satisfy me. About two weeks down the line, I started getting a vague idea about the project. The gist of the project is as follows:

The project consisted of investigating 'Multistability and Hysteresis' in synthetic genetic circuits. The stability properties of feedback blocked system can be deduced mathematically from how the system behaves when feedback is blocked. The system is guaranteed to be bistable for some range of feedback strengths provided the feedback blocked system is monotone and shows sigmoidal characteristic.

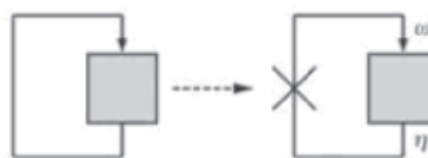


Fig. 1: Schematic view of a feedback system before (Left) and after (Right) breaking the feedback loop. ' ω ' is the input of the open-loop system and ' ω' ' is the output.

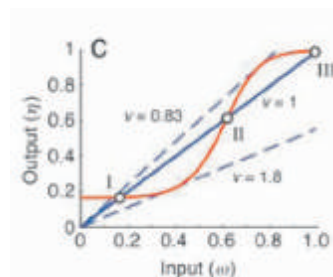


Fig. 2: Steady state I/O static characteristic curve for the open loop of the mutually inhibitory feedback system (red). The solid blue line represents ω as a function of ω for unitary feedback.

One can experimentally manipulate the amount of input(ω) and monitor the output(ω) as a function of ? The fixed point of the corresponding closed loop system are then obtained by intersecting $\omega=f(\omega)$ with the straight line, $\omega=(1/\omega) \omega$, where ' ω ' is the feedback strength. At these points of intersection, the open loop system exactly mimics the closed loop system.

Using the above approach, we conducted experiments to explore the multistability of synthetic genetic circuits. The two combinatorial circuits which were

pLac luxI cfp pR luxR yfp and
pLac luxR yfp pR luxI cfp

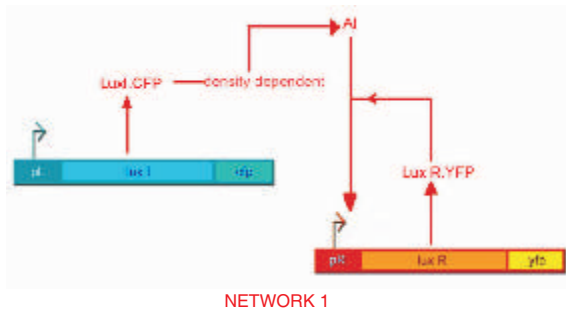


Fig.3 Network 1 by combinatorial construction

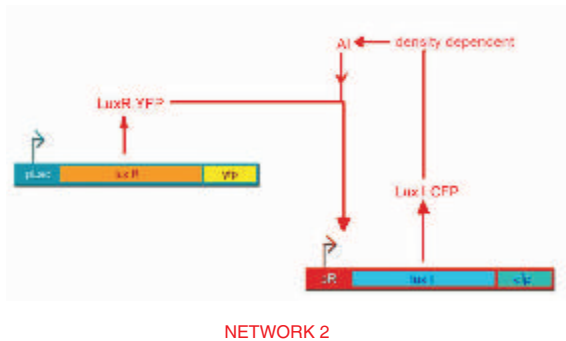


Fig.4 Network 2 by combinatorial construction

The feedback blocked, open loop system for both the systems can be represented using the following two constructs:

pTet luxI cfp and pLac luxR yfp pR cfp

So, here, output is fluorescence of CFP. Input is luxR YFP and parameter is aTc for network 1. (aTc activates pT promoter). For Network 2, output is again CFP and input & parameter are luxI CFP and IPTG, the activator of pL promoter. So what we required were the following graphs.

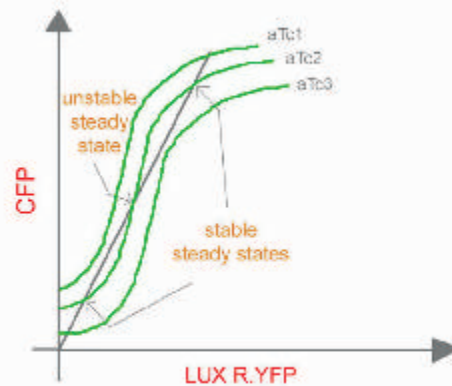


Fig.5 CFP vs. LuxR.YFP plot (Network 1)

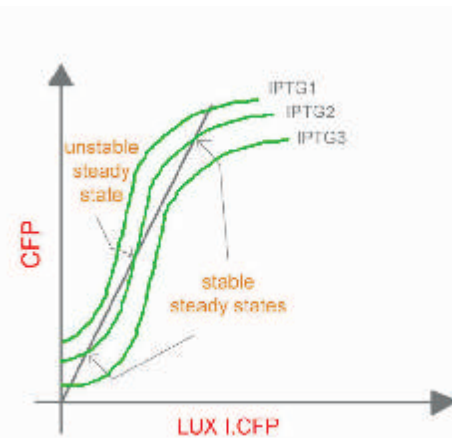


Fig.6 Plot of CFP against LuxI.CFP (Network 2)

I believe that this much information is enough for a general reader and refrain myself from going into much technical details. We divided ourselves into groups. Each group was assigned particular aspect of the work. Shashanka and I were given the task of data analysis. We had to feed in the experimental data in computer, using MATLAB plot the graphs of required quantities and interpret the results obtained. According to the results, the further course of the experiments was decided. Every team had been allocated some space on MIT website. It was called team wiki page. The teams had to post information about the experiments on the wiki. The major chunk of this work was done by Vini with inputs from all others. Varun and Krishna did the actual experimental work. The whole team contributed to mathematical modeling. This included setting up equations for the behavior of the system, feeding

them into computer and checking the sensitivity of the system to the various parameters.

Mukund was a sharp person. He spent very little time with us and let us do the work on our own for first few days. But the small amount of time which he spent with us was enlightening enough.

During my NCBS stay, I got the real taste of research. I realized that even to accomplish simple things, innumerable hurdles had to be overcome. For example, initially we did our fluorescence measurements on FACS machine. But due to technical problems we had to abandon flow Cytometry and go back to microscopy. It considerably reduced the speed of our experiments.

After about every ten days, we used to have discussions with people from National Institute of Advanced Institute, (NIAS), Bangalore. Team consisting of Prabhakar Vaidya and his students used to visit NCBS. We used to discuss with them the plan and perspective experiments.

Most of the students, I interacted with in NCBS, were senior to me. The contacts I developed, the information and advice I received from them has proved immensely helpful to me. I spent long evenings playing Badminton and nights playing Table Tennis.

NCBS stay was my first long stay in a state other than my home state, Maharashtra. I tried to learn Kannada, Tamil and Bengali just for intellectual fun. Comparing similarities between different languages became my favourite pastime. I even tried to learn Kannada script by comparing the nameplates on the shops. It helped me to some extent to read the boards on Bangalore buses. I also roamed a lot in Bangalore on Saturdays and Sundays.

Now something about the NCBS institute itself. The students at NCBS were quite helpful. They quickly made us feel as if we had been lifelong members of the lab. The atmosphere of the lab was vibrant. One of the lab members, Neelesh's, birthday was celebrated at twelve o'clock at night in the lab itself. Every alternate Thursday, there used to be a party in NCBS. The party was called 'mixer'. The purpose of the party was that people working in different labs should mix. One thing I hated about NCBS was dinner! The taste of food declined linearly from

breakfast to dinner. So, whenever time permitted we made it a point to go out for dinner in Bangalore hotels.

We were destined to complete our project within six weeks, before July 15. Therefore, as the deadline approached our last phase preparation began. We speeded up the experiments. The *E. coli* culture had to be incubated for 8 to 10 hrs before observation could be made. As we were running short of time we tried to utilize every possible minute available. Incubations were done at as unconventional time as two in night. We could not afford to spend day time for incubation period. The NCBS hostel in which we were accommodated was six kilometers away from NCBS labs. NCBS buses plied between labs and hostel round the clock. We started using the night trips. Mukund also started spending more time with us. Few days before the completion of project, Mukund took every one of us out for dinner. Our approach had worked quite well and the results obtained were satisfactory.

On July 14, we had to present the project before entire NCBS. People in NCBS, either working in synthetic biology or interested in the topic attended the presentation. NCRA Director, Rajaram Nityananda was also present. Mukund talked about the actual concept and plan. I talked for about ten minutes on experimental measurements and analysis of data. Krishna elaborated the experiments carried out and explained their results. And thus with the end of presentation, our workshop concluded formally.

It was time to return. Few days ago, I was longing to go home. But now suddenly I started feeling the pangs of separation. With a heavy heart I bade good bye to everyone and headed for my return journey.

In November 1st week, Krishna and Varun presented our project at MIT. Our team won the best model / simulation prize! It was a moment of great joy for everyone who had contributed to the project. All our efforts had ultimately borne fruit. With this the iGEM 2007 episode came to an end. The memories of NCBS days shall always remain afresh in my mind.

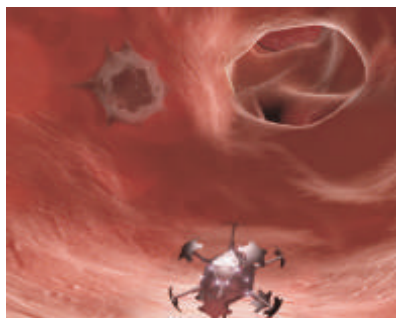
Nanorobots Enabled Diagnosis & Molecular Machines

- Compiled by Neelesh Soni

The age of advanced nanomedicine is not much away from us. In future, the general picture of a diagnosis center will be...

'A young man arrives at his physician's office with a mild fever, discomfort, nasal congestion and a cough. The physician pulls a light weight device, resembling a pocket calculator from his pocket. He unsnaps a cordless, self-sterilizing, pencil sized probe from it and inserts it into patient's mouth as if it were a tongue depressor. On the tip of the probe there are billions of molecular receptors. Each receptor is sensitive to a specific kind of bacterium or a virus. After few seconds a three dimensional, colour-coded map of his throat appears on the display panel of the device. Below the map there scroll columns of data, showing the unique molecular signature of a known and unwanted bacterial pathogen.

After the diagnosis, the infectious microorganism can be completely killed. No need for cough drops and a week-long course of antibiotics. The physician using a computer in his office, programs billions of nanorobots to locate, recognize and destroy the particular microbial strain. The nanomachines are suspended in a carrier fluid that the patient inhales into his lungs, after which the mobile devices march down the patient's throat, propelled on tiny legs. Following a search pattern, the nanorobots ingest and destroy the harmful bacteria they encounter using mechanical and chemical phagocytosis. After several minutes, the physician activates an acoustic homing beacon to guide the nanorobots back into patient's mouth, where he retrieves them through a collection of part on the tip of the homing device. A further survey with the original diagnostic probe reveals no evidence of the pathogen.'



An imaginative picture of nanorobot in the alveoli of lungs

This is a wonderful vision of the nanomedicine in future. But we will get there from here only by mimicking nature. Nature has provided us many biological living systems that can be used to make bionanorobots or artificial molecular machines. Molecular biological systems themselves are nanomachines, constituting an existing proof for molecular nanotechnology.

http://www.mtmi.vu.lt/pfk/funkc_dariniai/nanostructures/bacteria.htm

WHIPLIKE TAILS, found on many bacteria, are propelled by nanomotors. The tiny biochemical motor turns a rotary shaft that spins the tails, or flagella, and allows the bacteria, such as *E. coli*, to move through liquid.

A comparison of biochemical to macroscopic components will show the possibilities of the former by analogy to the latter : (Table on next page no.)



'ATPase enzyme' a membrane protein, can be used as molecular pump.

The existence of this range of components in nature indicates that power driven mechanical systems can be constructed on a molecular scale.

The main advantage of using molecular devices is that objects created using molecular nanotechnology will be precise to within the size of a molecule. Machined components will no longer abrade one another because they will fit together with molecular precision. Moreover, they will have been with virtually no waste or pollution. They will have been made one atom at a time with readily

S.No	Technology	Function	Molecular Example
1	Struts, Beams, Casings	Transmit force, hold positions	Microtubules, Cellulose Mineral Structures
2	Cables	Transmit tension	Collagen
3	Fastener, Glue	Connect parts	Intermolecular forces
4	Solenoids, Actuators	Move things	Conformation-changing Proteins, Actins/Myosin
5	Motors	Turn shafts	Flagella motor
6	Drive shafts	Transmit torque	Bacterial flagella
7	Bearings	Support moving parts	Sigma bonds
8	Containers	Hold fluids	Vesicles
9	Pipes	Carry fluids	Various tubular structures
10	Pumps	Move fluids	Flagella, Membrane proteins
11	Conveyor belts	Move components	RNA moved by fixed ribosome
12	Clamps	Hold work pieces	Enzymatic binding sites
13	Tools	Modify workspace	Metallic complexes, Functional groups
14	Productions lines	Construct devices	Enzymes systems ribosome
15	Numerical control systems	Store and Read programs	Genetic system

available components like Carbon, Oxygen and Nitrogen as their building blocks.

The field of nanomedicine will certainly take decades to develop. Perhaps before we let our imaginations run in different directions, dreaming of the promises that nanomedicine can deliver, our first task is to decide whether the capabilities are indeed possible. The seeming difficulty of treating disorders is always changing. Once polio was frequent and incurable, today it is easily prevented. Syphilis once caused steady physical decline leading to insanity and death, now it is cured with a shot.

In the longer term, though the story of nanotechnology in medicine will be the story of extending surgical control to the molecular level.

References:

- 1) *Nanoscope The Encyclopedia Vol 1 & Vol 6*
By Dr.Parag Diwan and Ashish Bharadwaj
- 2) http://www.mtmi.vu.lt/pfk/funkc_dariniai/nanostructures/nano_robots.htm
- 3) http://www.rtstpauls.com/archives/cat_articles.html

- ❖ Sleeping on the job is tolerated in Japanese work culture, as long as you remain upright and obey certain other rules. It's called inemuri.
- ❖ Forty percent or more of household packaging can't be recycled. See Anne Leonard talk about material economy on www.storyofstuff.com

Carzania

- *Rishabh Verma*

Pune is one heck of a place. It has got all the right ingredients to be an ideal cultural and technical hub of the country. The city has got great lounges to hang around at and splendid malls to go crazy shopaholic. The IT sector is going great guns, thanks to the influx of more and more IT firms in the city. Pune, also known as the “Oxford of the East”, has always attracted students from the length and the breadth of the country. The city has a great crowd of young and vibrant students and IT professionals who have the never-say-die attitude. The city seems to be alive at any hour of the day. The city is also a home to a splendid variety of cars which vary in size class and their huge prices.

I think its time I talked a bit about myself. I am from a small town in Eastern India which is filled with cynics and snobs (I guess you might now have an explanation regarding my attitude towards 'other' people). The place is crammed with small hatchbacks going about doing their own business. On the road these hatchbacks have quite a domineering position, but if you are unbelievably lucky you might just be faintly surprised (remember the snobbery?) by one automobile that you would even kill to own, but those surprises are quite rare and has that once in a lifetime charm to them.

So when I came to Pune about one and a half years ago, I wasn't as taken aback as my other friends, when we saw a RANGE ROVER in the parking lot of E-Square. My friends were appalled by my having general no-knowledge (Yup, I made that word up.) about the high-end cars that were designed only for the stinking rich. That was then, today is different. It took me one and a half years to become a full-fledged automobile fanatic that I am today. Well, at least all those people present at University Circle (and a friend of mine) would vouch for that, when I freaked out and started shouting when I saw a Bentley Continental GT go cruising by(God! That was embarrassing...), Anyway that is a different story altogether and would be placed on the hold for now.



Bentley Continental GT

A few days back I went to meet an old school friend near Piramyd situated at Senapati Bapat road. I was having tea at a roadside shop when my friend nudged me and drew my attention to an orange Lamborghini Gallardo gliding off. The car is worth nearly two crores and is the most desirable sports-car in the entire world. If you ask me, orange as a color for any car can look so lame; the color really killed the charm. As for me and the other people who were standing there and watching that one hell of a car going passing by, I felt as if someone had knocked the living daylights out of me. No matter how pathetic that orange Lamborghini looked, it had that “out of your league” allure written all over it.

On a personal note I feel that the Mercedes are a pure waste of time, money and metal. Their designs are so cliché, and furthermore you see a humongous numbers of Mercedes around here that you kind of feel sick. About a few days back I saw a Mercedes that was one hell of a looker, a welcome surprise from the repulsive looking Mercs.

On to some real super cars that can be spotted in Pune. One day after finishing our practicals, a friend and I were waiting for an auto-rickshaw outside the gate of NCL Innovation Park when I saw a Ferrari 599GTB swishing past me. It seemed as if an astonishingly beautiful lady wrapped in red drapes went gallivanting off to glory upon her noble and exotic steed (Must get out of Fairytale land. Ok... I am back.). A dream had almost come true for me (I saw a Ferrari at last), and as I looked almost wet-eyed to

my friend, so as to share the excitement and joy of what we had just witnessed, what I got in return was a blank stare. I was disappointed by the no-response (I also made that up.) he gave me, but I could understand, he had a tough day. On that day, the guy would not even give two shits about the fact that a bespectacled chimpanzee had gone ahead and solved the Schrödinger equation. (God, those chimps are always one step ahead of me in the game.)

Now I think its high time I revealed some truths. While halfway through this article you might have guessed that this guy(me) knows nothing about cars or anything remotely close to them. To tell you the truth, I find all the specifications about the torque, the payload and engine capacity quite unbelievably boring. I think to us laymen, the only things that really interest us about these mean machines are: price, maximum speed, and (specifically to us Indians) mileage. There is also one more thing; Some of you must have started wondering about the title of my article. I know what you would be thinking, but then there has to be at least something interesting in this article.

Anyways it's high time I related that incident regarding Bentley Continental GT. On second thought, why would you guys be remotely interested in that story? So let us talk about something that is a bit interesting and related to this article. (Gosh! At least, for once) I think I am infatuated with the Bentley Continental GT. The car has a neat engine which produces a torque of 650Nm. It reaches a maximum speed of 310kph. It is surprisingly agile for something this big and heavy.

I have seen some of most unique cars in this city. To top it up some people in our hostel spotted the ever so elegant Rolls Royce Phantom passing through our humble hostel gate. How do you top that!



Rolls Royce Phantom

If I had an option of buying a car of my dreams... Let me see... If everything goes according to plan, give or take a few major glitches, that are bound to happen even if you are the king of Fairytale land, I would love to own a Por.....Snap out off it!! (Man I really have to stop doing that.) Sorry guys, I blacked out.

Well I think I have to round up over here. My friend Sisir gave me a very minute space in our magazine. If you find this article unimaginably boring then you know who is to be blamed for it. No, not me, it is Sisir who is to be blamed, because I had a great article but he edited everything out.

Photos taken from [weblogs](#).

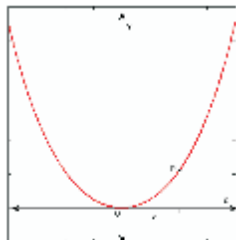
-
- ❖ There is mobile phone reception from the summit of Mount Everest.
 - ❖ Ships emit twice as much CO₂ as planes.
 - ❖ Spiraling obesity rates are forcing councils to upgrade their crematoria, to take wider coffins.

The Catenary

- Mohammed Zuhair M. M.

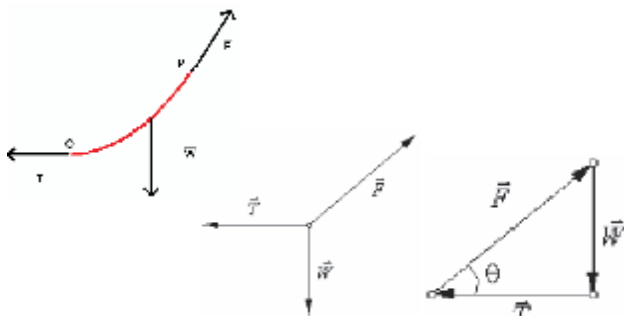
Take a flexible chain of uniform linear mass density. Suspend it from the two ends. What is the curve formed by the chain? Galileo Galilei said that it was a parabola, and perhaps you made the same guess. This time Galileo was not correct. The 17 year old Huygens (1646) disproved him, though at the time he was unable to determine the correct curve. The curve is now called the catenary.

The problem of the catenary was finally solved independently by Johann Bernoulli, Huygens, and Leibniz in the year 1691 in response to a challenge from Jakob Bernoulli in 1690.



Let us analytically derive the equation of the catenary. Let us take the minima of the curve to be the origin and let P be any arbitrary point on the curve. Consider only that part of the cable in the interval between O and P. It is motionless. That means the net force acting on it is zero.

There are three forces acting on the cable interval OP. One force is the tension from the cable to the left. Call this force T. It acts in a horizontal direction to the left and is constant for any OP. There is also a force from the cable on the right, exerted at point P. This force will be called F. Its is directed along the tangent at P. The third force is the weight on the cable, W. It is directed vertically downward.



Thus from the vector diagram

$$\tan \omega = W/T = (dy/dx) = y'$$

Let the mass density of the chain be μ .

Now $y' = W/T = \mu g s / T$ where,

g is the acceleration due to gravity and

s is the length of chain from 0 to x (shown in red above)

$$\diamond y' = sk \quad (k = \mu g / T)$$

$$\text{But} \quad s = \int_0^x [1 + (dy/dx)^2]^{1/2} dx$$

$$\diamond y' = k \int_0^x [1 + (dy/dx)^2]^{1/2} dx \quad \dots\dots(1)$$

Differentiating (1) we get

$$y'' = k [1 + (dy/dx)^2]^{1/2} \quad \dots\dots(2)$$

Now let $y' = P$

$$(2) \diamond P' = k [1 + P^2]^{1/2}$$

$$\diamond dp/[1 + P^2]^{1/2} = k dx \quad \dots\dots(3)$$

Integrating (3) on both the sides

$$\diamond \ln (P + [1 + P^2]^{1/2}) = kx + c$$

$$P + [1 + P^2]^{1/2} = e^{(kx+c)} \quad \dots\dots(4)$$

But at $x=0$, $P=0$ $\diamond c=0$

Now squaring (4) and rearranging gives

$$P = (dy/dx) = (e^{kx} - e^{-kx})/2$$

$$\diamond y = (e^{kx} + e^{-kx})/2k + C$$

Now at $x=0$, $y=0$ $\diamond C = -(1/k)$

$$\diamond y = (e^{kx} + e^{-kx})/2k - (1/k) \quad \dots\dots(5)$$

So we see that the catenary is a curve of the form $y = (1/k) \cdot \cosh(kx) - (1/k)$ where $\cosh$ is the hyperbolic cosine function.

It may be a little surprising to know that the shape of 'hanging chain' - a common sight involves the exponential function. This once again emphasizes the role of exponential function e^x the function that equals its own derivative - in nature.

Signaling just the “second” way to communicate

- *Prakhar Arora*

A child crying, magazines lying at a book store, an Initial Public Offer (IPO), a peacock dancing frantically....!!! Can you relate them up all in a thread!? Guessing! Answer is yes surely we can. All these concepts are related to a term “signaling”.

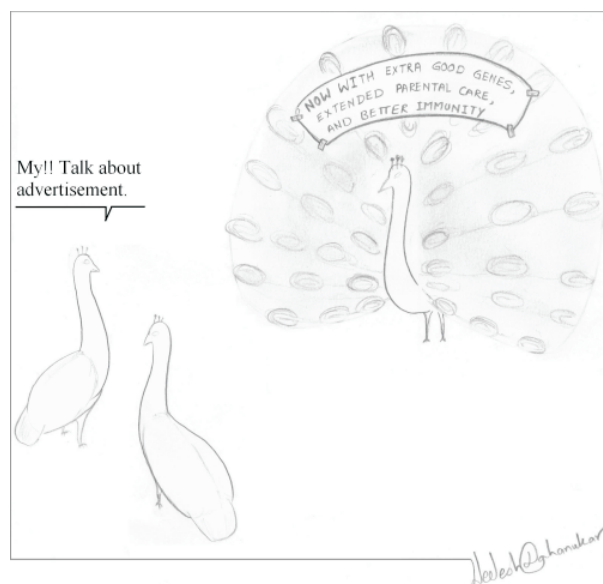
Signaling is just some way of interacting with others and with a condition that only a specific class is able to grasp the message. When a child cries, whether out of thirst or hunger or some other reason, he signals to all but only a specific class (which includes mother and few close individuals to the baby) is able to understand the “unspoken” words of baby.

Next time when you visit to a book store, have a close look at the magazines (specially business magazines) in terms of the price-band, number of pages, virtual thickness, quality of paper and then the frequency of full-page models posing in different style(i.e the advertisements).

In general, we can divide the bread & butter of all these magazines in two categories: first those who buy just for the time pass and secondly those who buy for gaining some knowledge. A guy who just want to buy the magazine for keeping boredom away wants it to be thick, with even the first page as double (this is just a new and extensive way of advertising) and must be soft to the pocket. On the other hand the knowledge seeking customer will never look at the top most right hand side corner of the front page. He will be concentrating on the cover story of that magazine and a synchronized motion picture playing on his mind. This guy will be surely interested in the information and news held in the magazine. And if he (reader) is so sincere then how an ad-expert can sit at the powerful position of editor of magazine and marketing various products.

I doubt with Sensex zooming to 22k levels and then falling steeply to 15k levels and that is too in just 4-5 sessions and constantly able to make to the top headlines of newspaper you can't leave this zone.

Full front page advertisements, large hoardings on roadside advertising on television and the most innovative way of advertising i.e on the caller tunes of mobile (and this advertising cost was not even a penny as company offers telecom services too). I am pretty sure these signals must have reached you in one or other form as all this cluster of advertisements were signals for people of India as company was coming for an IPO. And all these signals created novel landmarks in the history of Indian Stock Market in terms of oversubscription and the number of individuals invested in this issue. Although this signaling is nowhere can stand in front of multifarious signaling phenomenon of human immune system which is responsible for shielding billions of cells from another billion. And what do you think advertising is limited to humans only, on the surprise it exist in animal kingdom too. Most of us some time or other must have appreciated the nature's beauty like a navy color sky with few white clouds, a light aesthetically pleasing breeze accompanying with soft drizzle and a dancing male peacock with gorgeous feathers spread-out in green lush jungle. Hey! Wait for a second. Think for a while a colorful



train must be attracting the predators too, then why a peacock should have a long bulkier colorful tail which endangers their lives? Can it be related to some kind of “signaling”....!!! This can be well explained by *Handicap Principle* given by biologist **Amotz Zahavi** which quotes that “Male peacock is trying to tell a female that although it has long tail but due to some “good genes” presence, he is able to survive with this handicap ness”. So the colorful

feathers are the costly signals just like some advertisements which a company applies for some brand-name building processes or launching a new product.

I tried to create out few analogies between signaling techniques used by a company coming for an IPO and animal world. And what I came to know were some astonishing facts such as in Mir cats few individuals take responsibility of guarding the fleet by keeping an eye on predators instead of gathering food for their own, this means that they are taking some sort of social responsibility to have attention of females so that females will believe that "the guarding" individual is self-sufficient of his own and will then prefer those males. Such phenomenon can be seen in IPO also in which few good companies follow a strategy of giving discount to the general public (i.e retail investors) on the allotment price of the shares which in result attracts few big investors and Foreign Institutional Investor's (FIIs) to pour huge funds in their company.

And bolt from the blue thing is that those people in the business intelligence segment of a company never came to know about that this act is even adapted by animals (and with an illusion in mind that human is the most intelligent animal).

This part is a bit of babyish in nature as I thought of it recently during the lectures of Shashidhara sir and Aurnob sir. Till now I have discussed few scenarios in which signaling was playing a major role just as that of *Alladin* was in *Arabians Nights*, now let me put focus on a process where it is absent. Cancer disease is caused due to some lack in the event of signaling in which cancerous cell is isolated and is not able to communicate with its niche. This results in malfunctioning of cell and a continuous division which results in the most highlighted disease of today.

Moving ahead with my crazy thoughts when I thought about evolution then also it was again the signaling which circumscribed the history of today's life. What you think which process made possible to unite various entities like nucleus, golgi apparatus etc. to result in *life* i.e first ever unicellular organism? Also why and how few unicellular were able to evolve a more complex organism? These events had been possible only when the smaller entities were able to communicate with each other to give larger organisms which we see as today's life.

So now it's high time that we could even add **sanketa** as fourth utmost entities after the three basic necessities of **jeevan** i.e **ann vaayu jal** as

HOLD ON...

*I trudged through the deep sand
In that unknown land
That land so dark and deserted
Cold and unconcerned*

*The wind gushing up against me
Charged with the contempt of the past travelers
Attempting to shove me off the path
That path which no one knoweth*

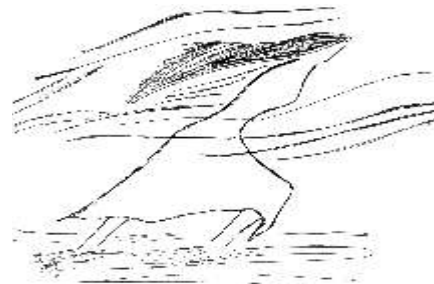
*The quest for the divine lake beyond the brink
For the holy dip, to wrench off the sting...
The unpleasant past stung into my soul
Embroided deep in it all*

*Engulfed in the overflowing emptiness
Seeping in through every vein and every pore in my
soul*

*Oh! This body and soul dissolving into this
emptiness
The whole world sinking around me*

*The dark and the cold pressing into me further and
further
I only wished it were all soon o'er
Then came Thy voice "Hold on...Hold on..."
My Talisman...*

- Lakshmi Priya M. E.



“Tortoise in standing”

- Dr. G. Ambika

Benjamin Crooksware, Ben for short, is my name. Crooksware is an attachment that one of my great grand fathers acquired under mysterious circumstances and later got carried over down the family line. I am an Amazonian tortoise and was in all aspects akin to my community till about 29 months ago, when a series of events have flushed me out into my present state of shameful and pathetic existence. Now standing erect on all my 'stretched out' fours, I constantly gulp down unshed tears and ponder on my 'man made' destiny.

It all started with the visit of a few highbred humans, invading our territory one day. My Mom later summed it up as some weird but planned out experiment. There were hours of discussion on how to save us from the stigma of infinite slowness attached to the species. I felt a bit spaghetti-like on being caressed and rolled over many times by each human. Since all my friends, especially that female Bliss who has started to take an interest in me, were around, the collective petting and poking was great fun at that time. But on the second time, the number reduced and on subsequent visits reduced to me alone. Before I could feel elated at being singularly selected for whatever, I began to feel a little uneasy about the strange things happening to me. On one or two occasions, I was taken in a cool cabin and woke up later with giddiness and nausea. What disturbed me most was the way Mom got upset about the whole procedure. She talked in heated outbursts how we could have got along well with out getting the “set ups”, as the humans called it. At times, she woke up in the night and whispered in my ear in low tones, “Ben, darling, are you all right?”

A few months later, I ended up standing high on stretched out legs that carried me forward in quick trots against my will, instead of the graceful slow scroll on bent legs I was proud of. The perspective of my vision got restricted to the backs of my brethren erasing all chances of chance encounters or face to face small talks. Worst of all, the 'man-given' boon of speed, got me into trouble with Bliss also, who began to avoid me like hell. Mom got quite philosophical about this and pointed out that the disparity of time scales lurks at the back of the incompatibilities between couples. Secretly, I even wished that next

time the humans would try the same 'set up' with a female so that I may get a chance to start afresh.

I hated most the way other creatures passed under me during their carefree strides. That Spinny sparrow once or twice jubilantly started trotting under me, unnecessarily giggling all the time, just to annoy me. Only once I got really scared while Kingley cobra started crawling below me and I had to stand still till he passed. Surprisingly, many times Mom sensed the tension in my legs and crawled under me so that I could relax on her top and loosen my legs a bit.

I was sincerely trying to get used to my newly acquired fastness and jerkiness, until that day when I trotted along a long way carelessly and before long lost sight of all my familiar surroundings. Severely shaken, I was leaning against a tree trunk to breath out my confusion, when suddenly a passing team of bipeds got amused in my look of a different poses, put me in a bag and marched off. Before I could make out what happened, I was set free on a grassy surface full of thorns and stones. Very soon I came to grip with the fact that I was in a cage with barbed wires and a small cottage with a pool. Every day many humans passed by in front of me, which often drove me into fits of uncontrollable emotions and I began to hate my jerky high speed motion and confined myself to stationarity. Looking back on the sequence of events that changed the course of my life entirely, I often wondered how Jonathan Livingston or Gregor Samsa would have analysed the situation.

One day, a sign-board conscious ten-year old scribbled on the plate hanging on the fence “Tortoise in standing”. Maybe he meant tortoise is standing, I never bothered to figure out.



The Ultimate Soapbox

- S Ajay Subramanian

Blogs, or “weblogs”, is the new buzzword in communication. And blogging is an amazingly large phenomenon. Don't believe me? Sample this: I did a Google search for the term “Microsoft”, and I got around 980,000,000 results. A search for the term “blog” returned over 2,200,000,000 results. And according to a recent survey, there are over 400,000 registered bloggers in India alone. That's how big it is.

Now that I've got your attention, here's a little history. Blogs have been around for some time now. The very first one (called links.net) was started by Justin Hall in 1994. But the blogging boom really took off only after Pyra Labs launched Blogger.com in 1999. Blogger.com (now owned by Google) is a blog hosting space. When it was launched it let people who knew very little about HTML coding create blogs for the first time. And as it turned out, everybody's got a lot to say.

Different flavours

Broadly, blogs fall in three major categories. The first and most common is the personal blog. These blogs are about the author's personal/professional lives, their hobbies and the like. The more popular authors write wittily and usually have a dedicated fan following.

The second category is the social commentary blog. The authors write about social/political events in their region and their analysis of what happened. These blogs can be very influential. In fact it is said that some of them had a major influence on the voters during the 2004 US Presidential election.

The third category is the review blog. The authors review gadgets, software, books, movies, restaurants, tourist spots... you name it. Often, these blogs include local information that you won't find even in the manufacturer's official website. Although some of these blogs can be biased, the better ones give you a neutral, authoritative overview of what's being reviewed.

Emerging categories include the PR blog, which complements an organization's official website. Also you've got photo blogs, video blogs (or vlogs), news blogs... it's a full house out there. Blogs are a great source of information and entertainment if you choose wisely.

The way I see it

I'm rather passionate about blogging, since I think it's a great way to say whatever it is that you want to say. The ultimate soap-box for everybody's opinion. And recently, I've started a blog of my own. It's a personal blog. I don't think I'm mature enough for social commentary, and not knowledgeable enough about anything to do a review ❖ I find blogging to be very satisfying for many reasons. First, it's the anonymity that the internet gives you. That means I can write about things that are close to my heart and not have people tell me, “You've talked about it (whatever it is) for the umpteenth time. Will you please just shut up?” Secondly, it's a great feeling when someone you don't know writes a positive comment on your blog. It means someone cares about what you think enough to tell you how they feel about it too. And thirdly it's a challenge for me to top my previous post every time I write a new one. I'd like to think that my writing has improved since the time I started blogging regularly.

There are some clarifications I must add here. One, the 'net is not truly anonymous. A fellow blogger told me about the time someone put an IP trace on him, and had information about all the sites that my friend had visited. Stalkers, either online or in the real world, are a threat for the more popular bloggers. Also, blogging can be fairly addictive. The whole process of writing all those little details and following up on comments can very easily wreck your routine if you don't have the self control for it.

Now, if you think you have something to say that the world should know about, and if I haven't scared you off blogging yet, you should start a blog of your own. I'd recommend using an established blog hosting space like Blogger.com or WordPress.com. Both have very clear, step-by-step instructions on how to create a blog. They also have comprehensive FAQ sections, which should help clear most doubts that you may have about blogging.

And finally, here are handy webpages on the facts of life blogging style !

<http://simonworld.mu.nu/archives/037779.php>

<http://www.writerswrite.com/journal/jul02/gak16.htm>

Welcome to the blogosphere! It's a wonderful place. I hope I'll see you around !

Fermat's Last Theorem down the ages

- Compiled by : P. Venkata Raghu Tej

$X^n + Y^n = Z^n$ has no positive integral solutions for $n > 2$

This innocent looking equation is the one which troubled number mathematicians for about 350 years. This theorem was given by *Pierre de Fermat*. This theorem is famously known as Fermat's Last Theorem.

Who was Fermat?

Pierre de Fermat was a French civil servant with a passion for numbers. He was inspired by a book "*Arthematica*" by *Diophantus*, an Egyptian mathematician. While studying *Diophantus*'s problems, Fermat used to be inspired to think and tackle other related and subtle questions. He had a habit of scribbling down whatever was necessary to convince himself that he could see the solution.

What is his last theorem?

"Cubem autem in duos cubos, aut quadratoquadratum in duos quadratoquadratus, et generalititer nullam in infinitum ultra quadratum potestatem in duos eiusdem nominis fas est divider"

This is the statement which tormented mathematicians for centuries together.

It means:

"It is impossible for a cube to be written as a sum of cubes or a fourth power to be sum of two fourth powers, or in general for any number which is a power greater than the second to be written as sum of two like powers"

That is, in simple mathematical language we are fond of is

$X^n + Y^n = Z^n$ has no positive integral solutions for $n > 2$

The above statement was a marginal note written by Fermat in "*Arthematica*". After the first marginal note outlining his theory, the mischievous genius jotted down an additional comment that would haunt generations of mathematicians

"Cuis demonstrationem mirabilem sune detexi hanc margins exiguitasa capret"

"I have a truly marvelous demonstration of this proposition which the margin is too narrow to contain"

The theorem was finally proved by Dr. Andrew Wiles in 1993. The proof of this was not one man's work but came out after many mathematicians exhausted their intellect. In the following text, I will briefly tell about mathematicians who contributed towards proving this theorem.

Leonard Euler: Fermat already gave a hint for proving his theorem for $n=4$. Fermat assumed $x=X_1$, $y=Y_1$ and $z=Z_1$. By observing the properties of X_1 , Y_1 and Z_1 , he could show that there exists even smaller solution (X_2, Y_2, Z_2) and even smaller (X_3, Y_3, Z_3) .

.But the solutions being positive integers, should have a least solution (X_n, Y_n, Z_n) and this is not happening and the solutions are infinitely descending. Therefore no solution can exist. Euler used a similar method to prove Fermat's theorem for $n=3$. He gave the proof in a letter to Prussian mathematician Goldbach, in 1953.

Before any progress could be made on the theorem, it was observed that it is enough to prove it for prime numbers as any integer n can be expressed as product of primes.

Sophie Germain: Sophie Germain was a German mathematician. She gave insights for proving Fermat's theorem for specific type of primes known as Germain primes. A prime number 'p' is a Germain prime if '2p+1' is also a prime.

In 1825, her method claimed its first complete success when Gustave Lejeune-Dirchlit and Adrian Marie Legendre proved Fermat's theorem for $n=5$. Fourteen years later, Gabriel Lame proved it for $n=7$.

Augustin Cauchy, Gabriel Lame and Ernest Kummer:

Cauchy and Lame, two of the greatest mathematicians of the 19th century shocked the audience at French Academy of Sciences, on March 1, 1847 by independently announcing that they were close to solving Fermat's problem.

Both published tantalizing but vague details of their proofs. On May 24, 1847, Joseph Liouville shocked the academy by reading out German mathematician Ernest Kummer's letter. In his letter Kummer said that both Cauchy and Lame came to same logical dead end by assuming unique factorization for complex numbers, which is not true.

Later Kummer gave some techniques for proving Fermat's theorem for primes other than what he called irregular primes (irregular primes less than 100 are 37, 59 and 67).

Paul Wofskhel: Paul Wofskhel was a German industrialist with patronage for mathematics. He found a gap in Kummer's argument in contradicting Cauchy and Lamé. Kummer assumed something and did not justify it. Wofskhel filled up the gap, solidifying Kummer's argument. Satisfied that he could find a gap in the great Kummer's argument, he announced a prize for any one who solves the problem. The prize is one million German marks.

Taniyama and Shimura: Taniyama and Shimura were Japanese mathematicians. Though they were not directly related to Fermat's problem, one of their results became a major breakthrough in solving Fermat's problem.

Taniyama-Shimura conjecture: Any elliptic equation can be expressed as a modular form in hyperbolic space

An elliptic equation is an equation of form

$$Y^2 = X^3 + aX^2 + bX + c \quad \text{where } a, b, c \text{ are whole numbers}$$

Modular form is a hypothetical mathematical object with inordinate level of symmetry.

Gerhard Frey: Gerhard Frey was a German mathematician who linked Taniyama Shimura conjecture and Fermat's last theorem. He assumed the solutions for $X^n + Y^n = Z^n$ to be (A, B, C)

He rearranged the equation $A^n + B^n = C^n$ into an elliptic equation

$$Y^2 = X^3 + (A^n - B^n)X^2 - A^n B^n$$

According to him the above equation exists only if Fermat's theorem is false. But the equation was too weird to be expressed in modular form. According to *Taniyama-Shimura conjecture* the equation should not exist. So if we can prove *Taniyama-Shimura conjecture*, we can prove Fermat's last theorem.

Ken Ribet: Ken Ribet, an American mathematician proved that Frey's elliptic curve does not exist.

Andrew Wiles: Finally Dr Wiles, an English mathematician proved *Taniyama-Shimura conjecture* true and hence Fermat's last theorem holds true. In 1994, he updated his proof along with his student Roland Taylor.

References: '*Fermat's enigma*' by Simon Singh (Penguin)

SEARCH

*Streams of water down her cheek,
Oceans of sorrow deep within.
Set out on a lonely walk,
Sure of winning the war they thought was lost.*

*She's seen the mirrors but had seen a face,
Which was lost in the mad rat race.
"Where am I?" she started thinking,
And knew her soul was sinking.*

*She wasn't the one who'd give in.
She rose! Oh, what a rising!
Made that journey on barren sands,
And she now has all bliss of fertile lands.*

- Ayesha Fatima

GMB

- Madhuresh Sumit

Ishaan was happy. Neither because he had won in the school drawing competition nor because his father would be happy to see him with a medal. He was happy because he had found a teacher who was more than a friend for him. A man who made him believe that he could do himself proud; a drawing teacher who taught him how much colourful this life is. Lying on the bed, propping his chest over the pillow and pillaring his dimpled cheeks with his hands, he closed his eyes.

He was recalling what his genius drawing teacher had told in the classroom. Albert Einstein used to get low grades in his school. And yet the whole world knows his famous energy mass equation, $E=mc^2$. Even Vinci, the most multifaceted and dynamic personality of the Renaissance era was not good with his handwriting and memory. "Every child is special..." Nikumb sir continued, "...and in fact, I must say, every human being is special. There is something special in everyone." Suddenly the bell rang. Students rushed to the school bus.

It was the month of July and monsoon was at its zenith in India. Mumbai had recently witnessed a huge precipitation and consequent water logging. Peeping out of the window of the bus, Ishaan found a battalion of grey and black clouds approaching to the middle of the sky from a corner. He opened his school bag, took out a big notebook and detached one of the pages at the end. He folded the paper several times and within no time a tiny paper-boat was ready. Such a boat really resembles childhood, unaware of worldly waters, a boat full of whimsicalities and adventures. Inside the bus an innocent child was planning to fully enjoy the rain with that paper-boat and outside over the sky, the grey and black demons were planning to destroy the peace and happiness of the humans. Suddenly it started raining. And it grew heavier and heavier.

Subsequently, water started logging on the road. People got stuck in the traffic. Now the water had entered into the bus also and its level was rising gradually. The conductor and driver started taking the children outside to a higher and safer place. One by one they rescued all the kids to a safer place. "...but where is Ishaan!?", "Ishaan, Ishaan, where

are you?" they shouted. No reply. Ishaan had already slipped through the window to sail his paper-boat. He was unaware of the rising water level. And suddenly there was a power cut in the city. In the sky, only black demons were roaring. In the twilight nothing was clearly visible and all of a sudden a huge storm pulled Ishaan into her lap and pushed him very far from his friends. The water was up to his neck now. Ishaan was about to cry. "...mmm...mummy....mmm..." But suddenly he saw somebody getting hold of him. He was somebody with a very unusual look; a human being with very large ears and a huge head. His clothes were also very uncommon. Both of them reached to a safe place but there was nobody around except these two.

"Thank you, my dear! You saved me...but....why do you look so strange, I mean..." said Ishaan. "You're right" the other fellow interrupted. "I am not a human being. In fact, I do not belong to this Earth. I was only visiting this world when I saw you stuck in the storm".

"Alien! Alien! Jadoo! right?...I've seen that movie...mmm....yeah....*Koi Mil Gaya*." Ishaan jumped with happiness. "Tell me Jadoo, tell me more about you, where do you live?" Ishaan insisted.

"Well, we live on Dearth. It is a planet similar to Earth but two light years away from here. Like Earth only, life started from coacervates and then cyanobacteria and underwent evolution. But all this happened a few million years earlier than what happened on the earth. There is very less amount of oxygen on our planet and so we have named it like that. We read in our history books that our ancestors used to be *human beings* and they looked somewhat very similar to people on earth. So, I've come with my team to explore the possibility of getting some oxygen and to understand evolution by interacting with people on Earth."

"You are not a human being. Then what do you call yourselves?"

"We call ourselves GMBs."

"GMBs?"

"Yes, Genetically Modified Beings. We evolved artificially from the human race in order to combat with the problem of lack of oxygen. Our ancestors engineered their progeny genetically to increase brain to body ratio. You see green patches all over my body. These are nothing but chlorophyll containing tissues. So we need very less oxygen."

"Then how did you come to know about us, about Earth?"

"We knew about Earth since the times of humans. In fact, they tried to communicate with this planet. But, unfortunately we got no signal. Also, it was very difficult to make a spaceship that travels with speed nearing that of light. And, we were facing the problem of oxygen also. So, we focussed more on our survival."

"So, what do you find on Earth?"

"Well, it seems I've not travelled in space. Rather I've travelled in time. Earth seems quite similar to what is described about our planet during the human era in the history book, but..."

"But what?"

"But I am afraid my dear friend, Earth will also soon undergo tremendous changes due to pollution and population and people will have to suffer a lot..."

"Yes you are right. We should think about this problem."

"Wait a minute. I've something for you. Here it is! A chocolate made on Dearth"

"Wow! I like chocolates. But....my mummy had warned me..."

"Oh! Don't worry. Take one for your mummy also."

Ishaan peeled off the wrapper and started relishing the chocolate.

"mmmm...yummy...'tis very different. I've never got such a tasty chocolate. Thank you Jadoo."

And suddenly he heard the voice of his Mom. "Ishaan, utho beta, brush kar lo, school nahi jaana kya?"

The dream was over. But Ishaan had got a dream for his life. A dream - to become a great scientist. Scientist so that he can do something for his planet Earth. He got up and started preparing for school.

THE WAR

- Swati Venkat

*"Mother, do not delay me,
I must not be late,
For the war that shall change our destiny,
The battle that will decide our fate."*

*The heart-broken mother in a state of shock,
Suppressed her sadness and fear,
Hopelessness filled her burning heart,
She knew her son's end was near.*

*The courageous son set off with a strong will,
To achieve his nation's goal.
But what about his poor mother,
As despair filled her soul?*

*The outcome of war is always clear,
Her brave son did not survive,
The mother broke into uncontrollable sobs.
She no longer felt 'alive'.*

*Her husband, her symbol of strength,
Calmly consoled his wife,
"Our son was a brave soldier,
It is for the nation he sacrificed his life."*

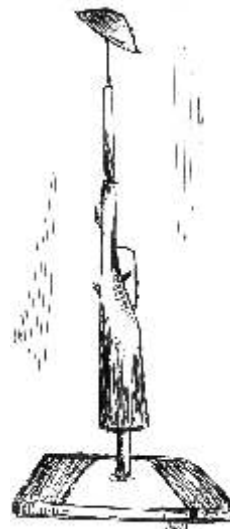
*"We parents are not GODS,
Who can control our son's destiny,
Our son led his life with a purpose,
A dream to fight for the country."*

*The mother marveled at the strength of her husband,
He was always her support and encouragement,
She felt relieved; at least her pain had reduced,
But still, a hollow feeling of
emptiness was present.*

*Then, as if she was in a dream,
a trance,
She turned to her husband and
said,
"But isn't the boy for whom we
sacrificed everything,
Nearly everything, now dead?"*

*As the realization dawned upon
the husband,
To the amazement of his wife,
The brave father broke down
into heart-rending sobs,
For the son he had lost for life.*

*(Inspired by the short story
'The War' by Leo Tolstoy.)*



BOOKS

- C. B. Ajit

There are books and then there are BOOKS. It is alright to feel sad about the number of trees that are cut down every year to add to the already growing pile of useless stuff out there; but then there are some books that I guess if the trees could read (hypothetical), they would be glad to sacrifice themselves for the sake of those works of art.

I am no expert on anything, least of all scientific but I guess that being a layman (which is how most books on science refer us) provides me with the advantage of being able to write about anything. One of the problems with being an expert is that when you venture out of your field of expertise, people no longer take you seriously.... I don't intend to be taken seriously in the first place and so it suits me just fine.

The books that I am going to be talking about, some are well known, while others are not so popular, some have no equations at all and some can't be read without a pen and paper in hand....but all of these books have a common thread.... The authors are extremely clear in what it is they want to say and at the end of the day after reading the book, you get the feeling of having learned something, of being infinitesimally wiser. This is by no means an all inclusive list, being limited by the fact that I can comment only on the books that I have read but I hope that this will not drive away the very few readers who might chance upon this article in the first place.

Let me start with the most popular book of them all, "A Brief History of Time" by Stephen Hawking. Most people believe this book started the popular science revolution and it is easy to see why.... As Hawking admits in the preface, every equation in the book would cut the proposed readership by half and so he includes just one equation ($E=mc^2$). Having said that, this is by no means a bedtime book.... Although there are no equations the ideas are fairly involved and to truly digest this book, one needs to spend some time with it.

Another book on the early universe which I found fascinating personally is "The First Three Minutes" by Steven Weinberg. Most people say that cosmology is difficult to grasp but Weinberg makes it both interesting and enjoyable. The best thing about this book is that it is self contained in the sense that it

does not assume you know a lot and sort of builds from the ground up.

George Gamow is in my view the best science writer of them all, primarily because he has this fascinating sense of humor which keeps you hooked throughout. Part of the reason why novels are easy to read whereas science books are not is the sense of anticipation which the novelist builds up which keeps us flipping pages. I think that Gamow's books provide the same excitement.... I have no particular favorite but I guess Mr. Tompkins is probably the best place to start. CP Snow's "The Physicists" is another brilliant book on the architects of quantum theory. It is full of rich anecdotes most of which are rarely found in any other book on the subject.

Freeman Dyson's book "Disturbing the Universe" is a personal favorite because of the splendid prose that the author employs.... Sometimes you really wonder if his primary occupation is that of a physicist. "Feynman's Lectures on Physics" are classics about which I guess everyone knows but there is another book by him called "QED-The Jewel of Physics" which in my view is rather special because he starts out with absolutely nothing and constructs a beautiful theory from first principles.... Again I think the book is non-technical but requires some effort to appreciate all its qualities but I can guarantee that the effort will be worthwhile.

Then there are books by the masters... Dirac's "Principles of Quantum Mechanics" which I believe is worth buying for reading the first chapter alone... nowhere else has anyone explained the need for a quantum theory more elegantly.... Landau's "Course on Theoretical Physics" especially the volume on Mechanics which again is beyond praise. Another inspirational book is Mauro Dardo's "Nobel Laureates & Twentieth-Century Physics". I could go on and on about the many more books that I find fascinating but I guess that the purpose of this article was not to give a list of great books but more to try and identify what makes a great book great. I have tried to identify the books that I love and I guess this choice is heavily subjective and individualistic but then I believe that the whole process of learning is one of self discovery and so to each, his own.

ELUSIVE HAPPINESS

*To find that elusive happiness,
I looked at all the places.
But all that I could find,
Were blood stained dirty faces.*

*I searched in the busy streets,
And found people of different creeds.
But no one wore a smile,
Or cared for a little while.*

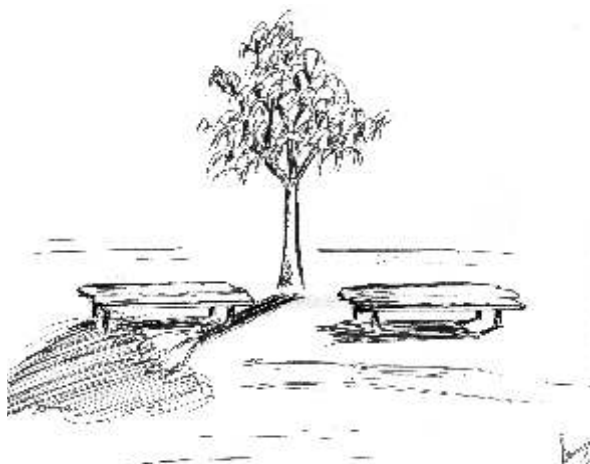
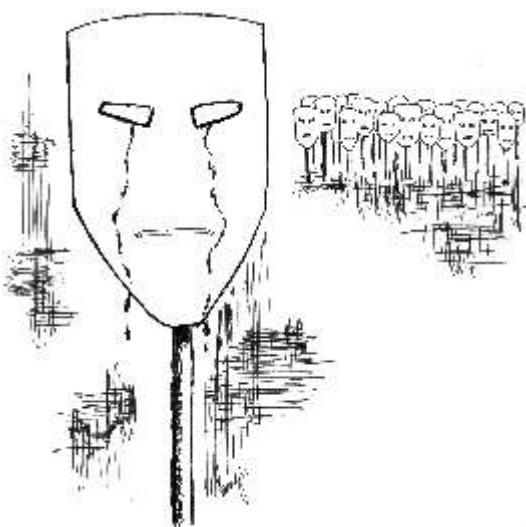
*I searched in swanky rooms,
Where a strange melancholy looms,
And found people who have no time,
For things not sophisticated or fine.*

*I searched in the eyes of a child,
Who for his dead mother cried,
And found a sense of fear,
For he had just lost his dear.*

*I searched in the face of a young man,
While he prepared for his race to be ran
And found an urgency to lead
To survive and to succeed.*

*I searched for many days,
And found only chaos and melees.
And searched at many places
But found only blood stained faces.*

- Ayesha Fatima



EMPTY BENCHES...

*Once in a while I come here
To feel the wind across my face
Sitting on these soiled, empty benches
I find many people reminisce...
What they try to remember, I really don't know
Eyes of some, ask questions and some bear
answers...
Some have wet eyes, and some wear a strange
smile
Some seem they are worn out by long weary miles
Some eyes even look at these benches with hate,
some love them
Yes really...
These benches have never cared if they have been
drenched by tears
Nor they have ever worried when we have danced
on them
They have bore the weight of my heavy heart
And have let me smear them with mud beneath
my feet
They let the mosses grow on them
I think they have done this to conceal their tears
Or may be restrain their outbursts, when we win
O God! If I were to have my way
I would have loved to hear these benches say
"Come; let me wipe your tears
And let me dance with you
So that when you look back and think
You deem me to be the only friend you knew"*

- Parivesh Priye

The Three Friends and a Sneeze

- Sarthak Parikh

Today, I am going to tell you a story. It's not any taradiddle, it's an almost true story.

There were three friends, and they were inseparable. [They were not scientists, nor were they doctors, engineers, or IAS. They were simply like you and me: people who would think they knew nothing, but would always want to learn which means they were *natural* scientists.]

Now why would I say that? You forget. Its not *me* cooking tales, it's a true story- almost.

Now if you couldn't guess they liked to experiment a lot, maybe you are one of them, you need to learn a lot. This brings me back to their story, for at that moment, one of them articulated, "We need to learn a lot."

This was hardly surprising, but given the circumstances, it was going to be a stepping stone in their lives.

The three would always get ill, at least one of them. These weren't big maladies, but that's where the beauty lay - they noticed small things. Common cold and sore throat (anyone would agree these bring the most testing times- needless to say the most annoying ones too) would get them or one of them at least. Cover your mouth while sneezing, this much they knew, because the infection was contagious. Obviously, they never would do that. The ill coughed and sneezed freely, it was a free country. Droplets would be bombarded on the face of the person standing next to them, and they would all laugh over that. Eventually, each one of them *would* get flu. This puzzled them.

Even if they had fun times together in sickness, they decided it was too much. They didn't want to get that flu again. Because the infection is contagious, let's cover our mouths while sneezing or coughing, they thought. So once in blue moon, the ill would cover his mouth while coughing and life would go on. They realised even now, once one of them got ill, eventually all of them *would* get ill, even if not together. They resolved they needed to be stricter, and the infected should cover his mouth all the times he is going to cough or sneeze.

It wasn't difficult, for as soon as one got the sensation of coughing, one would immediately bring forward his hand and cover his mouth. It was foolproof, they thought. Still all of them got influenza.

Helpless, they looked for more information on such infections, and they found out the virus was one tough character: he would inhabit all the places it would get a chance to visit- taps, door knobs, chairs, books; and wait there till someone came by to give the virus hospitality in their bodies- which was not preventable; they couldn't just stop touching things. The brightest of the three realised that although they *were* covering their mouths, they were using their hands, which they would also use, without further ado, for other work. Their hands were big community centres for the virus.

The brightest continued thinking, and came up with a solution, "Handkerchiefs!"

Using a hanky to help others not get the virus was labouring, and annoying. As soon as one would get to know one wanted to sneeze, one would get a grace period of hardly a second, in which one had to take out his hanky from his pocket, and bring it all the way to the mouth. They would fail to do that in time. By agreement they decided that the ill person should carry the hanky so that he could produce it in time. By experience they found that carrying it in one hand gave the best results.

The experiments were getting difficult to perform. Now they had to make sure they never coughed or sneezed without covering their mouths with a *handkerchief*. In addition to that, they had to all the time resist the temptation to use their hands to cover, but it was a highway for the virus to all material things, big and small, and they wanted to avoid that. Even if they were able to learn to do that, not perfectly but quite satisfyingly, they still couldn't stop the onslaught of the virus (although there was a noticeable change in the ease with which the virus would thrive).

Feeling helpless for a second time (which is quite common among scientists too, while they are trying to solve a problem) the second of the three made a careful observation. Like quite a lot of scientific

technologies, the hanky too had its uses and misuses. While sneezing, if one never *fully* covered the mouth, (he knew from high school fluid mechanics that area times velocity was constant) one would eject a high speed jet of concentrated droplets, which if the neighbour got on his face, would be disastrous. This would hold either when the mouth was not fully covered, or when the hanky wasn't cupped over the mouth properly and the virus had some outlet out of the hanky.

Feeling happy, they persevered. But they still couldn't succeed. They would all get ill even now, when one of them was ill.

Finally, the third came to the rescue. He realised however hard they would try, one could never get perfect with all this. What was needed was to wash the hands whenever it got involved in either of the receiving ends of sneezing. It was important for the ill to not contaminate the surroundings, and as much important for others to watch their step.

What happened next can be easily guessed. The story ends with the three being able to get the virus to their mercy.

Ah..these sweet moments of victory. I wish they keep on coming, and teach others how to live.

Forlorn..... Forward

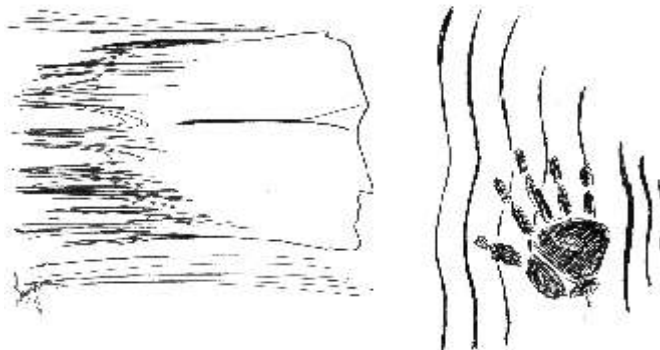
*Frozen in time as a fossil I stayed,
 Stuck by the harshness and hardness of life;
 Gone are the days when I used to struggle
 To pitch up my talents with ways of my life.*

*Vibrant in waves of visions and hopes,
 Fathomless powers to conquer my fate:
 Fighting all alone for justice and chance
 In this gigantic playground of founts.*

*But with a crash, I landed on harsh land,
 And lay there forlorn in ruinous mood,
 Until my whole being drained into void:
 Rhythms all merged into pathos of fluid.*

*Nectar of peace slowly trickl'd on me
 Covering all cuts and corners alike;
 Raising me up with firmly set steps
 Ticking of time cutting slices of bliss.*

- Dr. G. Ambika



Three Stages of Life - School, College, Business

- *Prakhar Arora*

I remember my school days: whenever there was no teacher in the class we used to play many games like carom with sharpener, pen fight, dumb charades and the rock-paper-scissors, my favorite one.

Although I was not that good at it, from the beginning I was fascinated by its rules which ensured no champions, and was daunted by various strategies used by my friends to beat me. But with time, it got washed away from my memory and the day-to-day life during the voyage to higher classes and college, trivialized it as merely a game.

Suddenly one day (in college) our biology faculty asked us to do a project for the semester. They gave us various options related to our course which included Ecology, Evolution and Game Theory. I first thought of doing some field work but when I came to know about the hard work and patience involved in that, I shifted my wits to some kind of theoretical project. Then searching through all the options I luckily found a project related to Rock-Paper-Scissor (RPS) Game. It was just like meeting some school-days' friends here in college. First I thought this project will be just simply to dig out the sand from my brain underneath which *this game* was buried, but soon realized it was not that easy as I had imagined. Now let me explain the R-P-S Game.

Just about everybody knows how to play Rock-Paper-Scissors, but in case you don't, it's a simple playground game, usually used to decide who goes first in some other game. The players hold closed fists up at about ear level and incant, "one, two, three, shoot!" At "shoot," the fists are lowered to about mid-chest level, and the players reveal one of three gestures.



Rock: The hand is kept as a fist.

Paper: The hand is flattened, palm down.

Scissors: The index and middle fingers are extended from the fist

gesture is superior to one other gesture, and inferior to another. Rock crushes scissors (a win for rock), but paper covers rock (a loss for rock). Paper covers rock (a win for paper), but scissors cuts paper (a loss for paper). Scissors cuts paper (a win for scissors), but rock crushes scissors (a loss for scissors). In order to win, you have to outguess your opponent, and play the gesture that will beat the gesture your opponent makes.

There's not a lot of strategy, but the game is strangely addictive, and since it's not just a matter of chance, it's actually useful for deciding between even sides in a dispute.

And don't think I am doing some crazy work if you ever get time search for R-P-S game you will find there is an official world scale society for this game (WORLD RPS SOCIETY) and prize money for competitions held are around twenty thousand dollars (this is even more than what a player in an ODI cricket match get when he is selected as *Man of the Match*). Now I will introduce a fanatical concept which is still in nascent stages and to develop more I need some authentic data to move ahead with my analysis.

RPS Game Application In Notebook Business Trends

ROCK	PAPER	SCISSORS
COST	BRAND NAME	AFTER SALE SERVICE (ASS)
		
256 MB RAM	ASS (SCISSORS)	BRAND (PAPER)
512 MB RAM	COST (ROCK)	ASS (SCISSORS)
1 GB RAM	ASS (SCISSORS)	COST (ROCK)

256 MB RAM SERIES: At times when laptop was a sign of luxury, whosoever was investing in laptops was emphasizing that after sale service should be best as the laptop was complicated and if there is some problem it can be readily corrected. And at this time SONY was taking care to amplify their Brand Name. So majority went for HP as it was having service centres at all first class cities.

512 MB RAM SERIES : This was the time when most of the IT companies went for bulk deals of laptop for their employees and such deals keep price tag at high priority. Here HP played a better move of 'cutting cost' strategy whereas SONY now realized their mistake of previous game and this time they were aggressively opening Sony service centers after understanding the psychology of Indian consumer.

1GB RAM SERIES : Middle class and their incomes were rising and now a laptop was no longer to be consider as luxurious item. In this set of game Sony played a move of 'reducing prices' so that they can be bought by paying just few extra bucks than HP. And it is human psychology that we want everything superior (in terms of Brand Equity) and costlier than our neighbors. Due to this only we see that why

sometimes in many companies' budgets for marketing and advertising exceeds the budget spend on R&D.

In this series HP was looking at bigger picture of the story and was now moving to two and three tier cities of India to explore that untapped potential. So they have to invest a lot in infrastructure so was not able to cut the cost as like Sony and lost in this series.

Ending this article on a lower note, I have designed a *desi* version of RPS game, the idea of which came from a Japanese animated series AVATAAR, thanks to Subhajit who gave me that series. The three strategies I choose from great Sanskrit Puraanas are *Jal Prithvi Agni*. The essential nature of the game is same as that of RPS GAME that each gesture is superior to one other gesture, and inferior to another. In my JPA GAME, Prithvi can tame Jal as in case of dams and rivers (a gain for Prithvi), but Agni can burn up Prithvi (a loss for Prithvi). Agni can be controlled (extinguished) by Jal (a loss for Agni), but Agni can burn up Prithivi (a win for Agni). Jal is tamed by Prithivi (a loss for Jal), calm Jal destroying violent Agni (a gain for Jal). So are you ready to play the JPA game to keep off your boredom?

TO MY FELLOW TRAVELLER

*In a never ending journey
If you happen to travel alone
Your spirits will nose-dive
And your senses will be numbed.*

*But with me lies an elixir
A fellow traveler, my college peer
All the way we have talked and laughed
Have munched eatables all day,
our bellies are stuffed...*

*He looks at me with gimlet eyes
As I happen to feel drowsy
He won't let me show I am drained
Whatever happens, he is there to spruce me up,
my friend!!*

*In college, he seldom touches his books
Walks and struts in the aisle,
hooded like spooks
He never sets himself on the willow
Most of the time, he embraces his pillow*

*He is fun and he is joy
With him besides, laughter draws nigh
He is life and he is hope
With him besides, sadness seldom draws close*

*You be my comrade in all my travels
You lend me thy voice all day
When on my way, I feel lost and bored
You be my light, to god I pray...*

- Parivesh Priye

Debates on Science, Scientists And Scientific Research

- Dr. T. S. Mahesh

If you ever wonder about public opinion on science, it is time to realize that science and scientists themselves have always been comedy figures for society. Ask “what is science?”, and you are likely to get a variety of answers except the standard definitions. For example, “science is an art of systematic oversimplification; is what people create to come up with most convincing answers about most obvious facts; is perpetual discovery of our ignorance; is what happily accepts the left-over budget”, etc. Some may find it is easier to compare than define science, mostly with religion since both claim to explain everything. The main difference, they all acknowledge, is that science has proofs with uncertainty while the religion has certainty without proofs. Einstein however, trying to bridge the gap, declared “science without religion is lame, religion without science is blind”. In addition to religion, philosophy is the second immediate candidate to compare with science, though most scientists are comfortable with neither. Again the gap was bridged, without compromising the ego of both scientists and philosophers, by declaring that where science ends, philosophy begins. How about science and art, say poetry? “In science one tries to tell people”, Paul Dirac explains, “in such a way as to be understood by everyone, something that no one ever knew before; but in poetry, it's the exact opposite”. Ironically Dirac's quantum physics doesn't fit into the above definition. “If anybody says he can think about quantum physics without getting giddy”, Max Planck revealed the secret to public, “that only shows he has not understood the first thing about them”.

It is not that surprising that even scientists' opinions differ on various issues. When Enrico Fermi was asked what characteristics Physics Nobel prize winners had in common, he answered, “I cannot think of a single one, not even intelligence”. Inter disciplinary critics are common in science too. “All science is”, boasted Ernest Rutherford, “either Physics or stamp collection”. Others, especially biologists, are very critical of Rutherford. So are mathematicians, who are always disturbed by the way physics handles Mathematics. “Physics is a way of approximating”, a mathematician comments,

“a divergent series with the average of first 3 terms”. Mathematics may have abstract vigor, but Nature may not. “As far as the laws of Mathematics refer to reality they are not certain”, Einstein points out “and as far as they are certain, they do not refer to reality”. For example, “the laws of probability is so true in general, but so fallacious in particular”. What about chemistry? “All theoretical chemistry”, observed Feynman “is really physics and all theoretical chemists know it”. Chemists claim a similar situation with biology. “Organic chemistry is the study of carbon compounds”, noted a chemist, “biology is the study of carbon compounds that crawl”.

While scientists acknowledge the uncertainty in science, public is naturally skeptical about scientific research. Basic research is compared to shooting an arrow into the air and, where it lands, painting a target. Einstein supported it too by asking “if we knew exactly what it was we were doing, would it be called research?”. That still does not appeal to funding agencies who demand a book size report on the research proposal even though they are convinced that outcome, if any, of the project will be entirely different. It is a general expectation that the outcome should necessarily result in a series of research publications in prestigious journals. In the absence of any other measure to estimate a scientist's capability, the past publications often become a figure of merit for future research funds. It is said however that research publications should be reputative not repetitive. Obtaining such a publication though may not be all that easy. It can often result in a virtual fight between the author and an anonymous but Omni-potent referee. That is also time for referees to come out with their artistic talents. “This paper contains much that is new and much that is true”, a jovial referee once wrote, “unfortunately, that which is true is not new and that which is new is not true”. Niels Bohr has a piece of advice: “do not express anything in the paper more clearly than you think”. “The fact that the author thinks slowly is not serious”, warns Wolfgang Pauli “but the fact that he publishes faster than he thinks is inexcusable”.

- Links by Google are acknowledged.

भारतातील औषध निर्मिती उद्योग - काल, आज आणि उद्या...

- प्रा. अरविंद नातू

औषधांच्या बाबतीत संकल्पना ते बाजारातील त्यांची उपलब्धता हा एक खूप खर्चिक आणि मोठा प्रवास आहे. याला सरासरी १० ते १५ वर्षे आणि साधारणतः २५०० कोटी रुपये लागतात. (यात भारतातल्या छोट्या राज्यांचे अंदाजपत्रक बसेल किंवा एखादे छोटे धरणही बांधता येईल) एक औषध बाजारात येते. त्याच्या १५ वर्षेअगोदर ३,००,००० रेणू तयार करावे लागतात. त्यानंतर त्यांना अत्यंत कडक अशा जीवशास्त्रीय चाचण्यांतून जावे लागते. शरीरातील त्यांची उपलब्धता, शोषण, तुकडण, पाखरण आणि उत्सर्जन याचा अभ्यास केला जातो. उंदिरासारख्या प्राण्यांवरचे हे प्रयोग यशस्वी झाले की येतो महत्वाचा टप्पा. तो म्हणजे मानवी प्रयोग. यात प्रथम निरोगी व शक्यतो वेगवेगळ्या भौगोलिक खंडातील, वयोगटातील स्त्री-पुरुषांवर प्रयोग केले जातात (काही गटांत तर गर्भवती स्त्रियांवर हे प्रयोग होतात. विशेषतः त्याचा गर्भाव्र होणारा परिणाम तपासला जातो) आणि या सर्व चाचण्यांतून तावून-सुलाखून बाहेर पडलेल्या औषधासमोर सगळ्यात मोठा अडथळा उभा असतो तो अमेरिकन औषध नियंत्रकांचा. (आपण कितीही म्हटलं तरी अजूनही अमेरिकन नियंत्रकांच्या होकाराशिवाय त्याला जगन्मान्यता मिळत नाही. क्वचित प्रसंगी युरोप / जपानचा अपवाद). दोन टक्के भरून कागदपत्रे (होय, या मेल / फॅक्स / आयपॉड / मोबाईलच्या / संगणकाच्या युगातही) त्या साहेबासमोर न्यावी लागतात. ते त्यातील त्रुटी दाखवितात, त्या पुन्या कराव्या लागतात. परत परत तीच कृती. (सर्व चुका एकाच वेळी न दाखवण्याचा त्यांना नियम असावा. किंबहुना तुम्ही चुका करा, त्या आम्ही सुधार - हेच ध्येयवाक्य असावे)

या सर्व प्रयोगात सध्या भर पडलीय आणखी दोन-तीन गोष्टींची. शुद्धकापेक्षा अशुद्धके महत्वाची ! औषध ९९.५% शुद्ध चालेल, पण उरलेल्या ०.५% चे काय ? त्यात घातक पदार्थ तर नाहीत हे पाहावे लागेल. त्यातल्या प्रत्येक पदार्थाचे पृथक्करण करून तो प्रयोगशाळेत तयार करावा लागतो आणि त्यालाही वर दिलेल्या सर्व चाचण्यांतून जावे लागते. दुसरी नवीन गोष्ट म्हणजे आरसपानी औषधे किंवा कायरल औषधे. सर्व बाबतीत सारखी (रचना, घटना, गुणधर्म) पण प्रतिबिंब मात्र वेगळे. आता औषधात एक जरी कार्बन अणू कायरल असेल तर त्याची कायरल शुद्धताही १००% च हवी असा अमेरिकन साहेबांचा आग्रह

असतो आणि तसं नसलं तर तो त्या औषधाला मान्यता देत नाही. या क्षेत्रात सध्या धुमाकूळ घालत असलेला आणखी एक प्रकार म्हणजे औषधाचे स्फटिकीकरण. पूर्वी औषधे, चूर्ण, स्फटिक कोणत्याही प्रकारात चालत असत. आता मात्र स्फटिकाचा निश्चित प्रकार कोणता ? तो पूर्वी कोणी शोधला आहे का ? आदी प्रश्नांची उत्तरे द्यावी लागतात. त्यातल्या छोट्या छोट्या फरकांवर बौद्धिक संपदेचा हक्क प्रस्थापित केला जातो. प्रसंगी प्रयोगशाळेतून न्यायालयातही या लढाया लढल्या जातात. किंबहुना विनोदाने असेही म्हटले जाते की, नविन औषधातील प्रमुख लढाई / निर्णय न्यायालयातच घेतले जातात आणि अर्थातच वकील मंडळीचे खिसे फुगवतात.

गेल्या १०-१५ वर्षांत हा कालखंड कमी कसा करावा याबद्दल प्रयत्नही जोरात आहेत. मानवी चाचण्या आणि इतर प्राण्यांवरच्या प्रयोगात / कालावधीत काटछाट शक्यच नाही. राहता राहिली रेणूनिर्मिती आणि जीवशास्त्रीय परीक्षणे. या दोन्ही क्षेत्रात मात्र बरीच प्रगती आहे. एकच वेळी अनेक रेणूंची निर्मिती करणे ही आता नित्यनेमाची गोष्ट आहे. तसेच एकाच वेळी ५०००-१०००० जीवशास्त्रीय परीक्षणे करणेही आता अवघड नाही. सूक्ष्मीकरण आणि रोबोटीकरणामुळे ही पद्धत आता वेगवान होऊ लागली आहे आणि त्याचे परिणामही आता दिसून येऊ लागले आहेत. रोजच्या नवनवीन औषधांचे आगमन हे त्याचेच निर्देशक आहे. मात्र एक गोष्ट लक्षात ठेवायला हवी, औषध निर्मितीचे जे प्रमुख तीन स्रोत, संगणक दिग्दर्शन, आम्ही सुद्धा मार्ग आणि अंतर्मन संवेदना यापेक्षा योगायोगानेच संशोधिलेल्या औषधांची संख्या जास्त आहे.

या सगळ्यात भारत कुठे आहे ? जगातील सर्वात जास्त कारखाने (छोटे-मोठे २५,०००) औषधे आणि औषध निर्मितीची मोठी व्याप्ती (२३,००० रसायने), स्वस्त रसायनांची उपलब्धता, दोन क्रमांकाची शास्त्रीय संशोधन मानव संपत्ती, सर्वात जास्त अमेरिकामान्य कारखाने (१००), सर्व रोगांचे माहेरघर असल्यामुळे मानवी चाचण्यांना लागणारे भरपूर मानवी भांडवल, वनौषधींची सुवर्ण खाण इतक्या अनुकूल गोष्टी असूनही भारतात एकाही नवीन औषधाची निर्मिती झाली नाही. असं का ? हे पाहायचे असेल तर आपल्याला थोडंसं मागे गेलं पाहिजे.

काल...

१९९५ च्या गॅट कराराच्या आधी भारतातील औषध उद्योग (खरं म्हणजे सर्व उद्योगच) एका संरक्षित कवच्याखाली वावरत होता. परदेशी आयातीवरच्या प्रचंड करामुळे (काही वेळा तर २००% टक्केसुद्धा) ती परवडणे शक्यच नव्हतं. त्यामुळे आम्ही करू ते उत्पादन आणि ठरवू ती किंमत असा काहीसा प्रकार झाला. त्यातच भर पडली ती १९७० च्या पेटंट कायद्याची, ज्यात फक्त प्रक्रिया पेटंटची सोय होती, उत्पादन पेटंटची नव्हती. त्यामुळे सर्वजण फक्त प्रक्रिया सुधारण्याच्या मागे लागले. कारण तो यशाकडे (खरे म्हणजे पैशाकडे) नेणारा सुलभ मार्ग झाला. त्यामुळे उलाढाल/फायदा हाच एक मंत्र झाला. त्यामुळे (नफादायी प्रक्रिया) काही बहुराष्ट्रीय कंपन्यांचे धाबे दणाणले हा भाग वेगळा. मूळ संशोधनाकडे संपूर्ण दुर्लक्ष झाले. नवीन रेणूंची निर्मिती, जीवशास्त्रीय परिक्षणे, जिथून औषध निर्मितीची प्रक्रिया सुरू होते, तीच थांबली. रसायन संशोधन शाळा फक्त नवीन - जुजबी प्रक्रियेपर्यंतच घोटाळू लागल्या. जीव-रसायन संशोधन तर कायदेशीर तरतुदीपर्यंतच ठप्प झाले. नवीन सृजनता जवळ जवळ लोप पावू लागली, संशोधन शाळा बंद पडू लागल्या आणि राहिल्या त्या नाममात्र दैनिक अडचणी सोडविण्यापुरत्याच. स्वाभाविकच वैज्ञानिकांची निर्यात (कधीही परत न येण्यासाठी) मोठ्या प्रमाणावर वाढू लागली. एका वेळी तर जगातल्या प्रमुख दहा औषध संशोधन शाळेतल्या प्रमुखांपैकी पाच भारतीय होते. मात्र भारताला त्याचा काही उपयोग नव्हता हेच दारुण सत्य होतं. एका डोळ्यात हासू तर दुसऱ्यात आसू अशी काहीशी मलूल अवस्थेत भारतातील औषध निर्मिती होती. पण ही स्थिती लवकरच बदलणार होती.

आजवर...

१९९५ च्या गॅट करारानंतर (१० वर्षांच्या तात्पुरत्या कवचासह) मात्र ही परिस्थिती झपाट्याने बदलू लागली. आयात कर कमी झाले, त्यामुळे परदेशी औषधे स्वस्त होण्याचा धोका निर्माण झाला. औषध उद्योगाच्या अस्तित्वाचाच प्रश्न असल्यामुळे तो खडबडून जागा झाला. पेटंट कायदा जरी २००४ पर्यंत बदलला नसला तरी १० वर्षांच्या कवच अवधीतही परदेशी कंपन्यांना उत्पादन पेटंट दाखल करण्याच्या सवलतीमुळे तर औषध उद्योगाचे धाबेच दणाणले. कारण अनेक अमेरिकन आणि युरोपीय कंपन्या भारतात येण्याची इच्छा दर्शवू लागल्या. संरक्षित वातावरणाची चटक असलेल्या उद्योगाला प्रथमच जागतिक स्पर्धेचे चटके बसू लागले. काहीही केले तरी चालतं हा दृष्टिकोन

बदलणे आवश्यक झाले, त्यातच भर पडली ती संदिग्ध बौद्धिक स्वामित्वाच्या कायद्याची. काही दिवस ही गोंधळाची परिस्थिती राहिली. पण हळूहळू या आपत्तीचे संधीत रुपांतर करायचे उद्योगाने ठरवले. वैज्ञानिक, तंत्रज्ञ तर होतेच, पण गरज होती ती विचार दृष्टीची, निश्चित धोरणांची आणि प्रबळ इच्छाशक्तीची. या सगळ्याचा परिणाम म्हणजे अनेकांनी नवीन आंतरराष्ट्रीय दर्जाच्या (धोरण, वैज्ञानिक आणि पायाभूत सोयी/व्यवस्था) संशोधन शाळा सुरू केल्या. मुलभूत संशोधनात रसायन आणि जीवशास्त्रज्ञ एकीने काम करू लागले. (पूर्वी ते शक्यतो एकमेकांची तोंडेही पहात नसत). आंतरशास्त्रीय संशोधनाचे महत्त्व पटले. रसायन, जीवशास्त्र, संगणक, औषधशास्त्र एकत्र नांदू लागले. पडेल ते आणि वेळ येईल तेव्हा ही नित्य विचारसरणी सुटून त्याची जागा निश्चित स्वरूपाच्या समयबद्ध प्रकल्पांनी घेतली. नवनवीन रोगांवर केंद्रीभूत करण्याचे धोरण ठरले. कर्करोग, एड्स, मधुमेह, लठ्ठपणा, नैराश्य, निद्रानाश (कदाचित नवीनच उदयाला आलेल्या माहिती तंत्रज्ञान उद्योगाची ती देणगी असावी), मानसिक आजार यासारख्या विशिष्ट रोगांवर प्रयोगशाळांनी लक्ष केंद्रीत केले. अर्थातच ध्येय होते स्वतःच्या हिंमतीवर. नवीन औषध बाजारात आणायचे किंवा बहुराष्ट्रीय कंपन्यांचे कमीत कमी सहकार्य घेऊन ध्येयसिद्धी करायची. भारतीय कंपन्या खऱ्या अर्थाने आता बहुराष्ट्रीय कंपन्या झाल्या. विलीनीकरण, ताबा, संयुक्त प्रकल्प, अनेक मार्गांनी त्या जागतिक पटलावर उभ्या राहू लागल्या. सी.एस.आय.आर. प्रयोगशाळांनीही बौद्धिक संपदा आणि पायाभूत सोयी यात वाटा उचलला. पेटंट साक्षरतेमुळे छोट्या छोट्या कंपन्यांनीही आपल्या संशोधन शाळा काढल्या. त्यांनी बहुविध औषध उत्पादन, जीवशास्त्रीय परीक्षणे, वेगवेगळी औषध लक्ष्ये, प्रथिनशास्त्र, सूक्ष्मीकरण, रोबोटीकरण यावर भर द्यायला सुरुवात केली. अनेक प्रयोगशाळा सुरू झाल्या आणि यातूनच जन्म झाला आणखी एका क्षेत्राचा - कंत्राटी संशोधन शाळांचा. औषध निर्मिती ही किचकट, वेळकाढू आणि अनेक शास्त्रशाखांशी संबंधित असल्यामुळे अनेक बहुराष्ट्रीय कंपन्यांनी यात काम दिले. आज या शाळा सर्वत्र पसरत चालल्या असून हजारो वैज्ञानिक आणि तंत्रज्ञ यात काम करताहेत. औषध पृथःकरण शास्त्रातही भारताने भरारी मारली. सर्व प्रकारच्या संशोधनाची सुरुवात असे एक आशादायी चित्र निर्माण झाले. थोडक्यात काय, उद्योगाने आपला आळस झटकून नवीन वैश्विक आव्हानांचा मुकाबला करण्यासाठी आपली मानसिक, आर्थिक आणि तांत्रिक शस्त्रे पाजळायला

सुरुवात तर केली. उद्योगाने कात टाकलीच म्हणा ना.

आणि उद्या...

सुरुवातीच्या गोंधळाचे आता शिस्तबद्धतेत रुपांतर होतंय. पुढील काळात हीच प्रक्रिया अधिक वेगाने परिपूर्णत्वाकडे वाटचाल करील. भारतीय कंपन्यांच्या बदललेल्या दृष्टीकोनाची प्रचिती येऊन नवनवीन संशोधन क्षेत्रात प्रगती वाखाणण्याजोगी असेल. (उदा. अँटीसेन्स, अँटीजीन उपचार पद्धती, नॅनो अणूशास्त्र, बहुस्फटिकीकरण शास्त्र) आणि त्या आपल्या वैश्विक स्पर्धकाला यशस्वीरित्या तोंड देतील. जीवशास्त्राच्या बाबतीत तर ही प्रगती लक्षणीयच असेल. मानवी आणि प्राणी चाचण्या, प्रोटिओमिक्स, नवीन लक्ष्य निर्मिती, परिक्षण निर्मिती आणि विधिकरण, संगणक दिग्दर्शित औषध रचना, नाविन्यपूर्ण औषध (शरीरातील) प्रवेश आदि क्षेत्रात नवीन संशोधन शाळा / कंत्राटी शाळा सुरु होतील. सेंद्रीय रसायन तज्ञ, जीवशास्त्र तज्ञ, अभियांत्रिकी आणि संगणक तंत्रज्ञांच्या एकत्रित प्रयोगांमुळे नवीन औषध निर्मिती सुलभपणे होईल. जीवशास्त्र निर्मितीवर आधारित औषधे प्रामुख्याने दिसतील. (व्हॅक्सिनस, प्रतिजैविके, हार्मोन्स वगैरे) विशेषतः अवयव बदल शस्त्रक्रियेत लागणारी प्रतिसंरक्षक औषधे यात आघाडी घेतील. हरित रसायनात अभिप्रेत असलेली मायक्रोवेव्ह, प्रकाश, ध्वनी रसायन पद्धती, आयॉनिक द्रव माध्यम, पाण्यातल्या औषध प्रक्रिया या पद्धतीवर जोर राहील. एकंदरीत प्रदूषण मुक्त रसायन निर्मितीला प्राधान्य असेल. सुवर्ण खाण असलेल्या भारतीय वनसंपदेचा उपयोग आधुनिक औषध निर्मितीत करून घेता येईल का ? याकरिता वेगळ्या यंत्रणेमार्फत प्राचीन आणि अर्वाचीन औषध निर्मितीची सांगड घालण्याच्या

दृष्टीने प्रयत्न सुरु होईल आणि ते देखील शक्यतो मूलतत्वांना धक्का न लावता.

संघटित पातळीवर अनेक छोट्या कंपन्या एकत्र येऊन विशेष लक्ष्य गट बनवतील. छोटे हे नेहमीच सुंदर असणार नाही. आंतरशाखीय / शास्त्रीय संशोधन आणि शिक्षण संस्था (विद्यापीठे) यांना एकत्र यावेच लागेल. त्याकरिता लागणाऱ्या पायाभूत सुविधा निर्मितीही एकत्रित करणे फायद्याचे ठरेल. चांगल्या प्रयोगशाळा / उत्पादन पद्धती संशोधन हा मंत्र ठरेल. कडक पर्यावरण नियम, शुद्धतेचे नियम हे खऱ्या (?) अर्थाने बंधनकारक ठरतील. वैज्ञानिक निर्यातीऐवजी आयात सुरु होईल. आजही परतणाऱ्यांची संख्या मोठी आहे. त्यांना टिकवून धरावे लागेल. त्यासाठी योग्य ती वातावरण निर्मिती करणे हे उद्योगांना बंधनकारक ठरेल. अर्थात वैश्विक स्पर्धेत उतरणाऱ्या कंपन्या नाविन्य, कौशल्य, आत्मीयता आणि निश्चय यावर आधारित वैज्ञानिक गट / समाज निर्माण करून खऱ्या अर्थाने भारतीय असा शिक्षा असणाऱ्या नवीन औषधांची निर्मिती करतील यात शंकाच नाही. प्रश्न आहेत दोन, एक आहे भारतीय निकडीला प्राधान्य देण्याची गरज. (उदा. क्षयरोग, मलेरिया, हगवण) आणि दुसरी म्हणजे भारतीय जनतेला परवडणाऱ्या किंमतीत औषध देण्याची आवश्यकता. भारतीय औषध उद्योग या सामाजिक जाणीवेचे भान ठेवून आपल्या कौशल्याने या वैश्विक क्षेत्रातही आपली विजय मालिका चालू ठेवून भारताच्या आरोग्य प्रगतीत (२०२० - सर्वांसाठी आरोग्य) आपला वाटा उचलील अशा आशा बाळगू या.

ही विज्ञापना.

अहिंसा

- अर्पित यती

“मार डालो इन्हें, इन्होंने हमारी पवित्रता भंग करी है।” मौत नंगा नाच कर रही थी और मनुष्य जानवर बना बैठा था।

एक लँगडा अपनी जान बचाने के लिये भाग रहा था। अचानक किसी ने कहा, “भाई कहाँ भागे जा रहे हो, और यह शोर कैसा?” आवाज पास के तिराहे पर लगी एक मूर्ति से आई थी। लँगडे ने कहा, “अरे तुम्हें नहीं पता, शहर में दंगे भडके हुए हैं। मनुष्य की बर्बरता का तॉडव चल रहा है।”

मूर्ति से आवाज आई, “हे ईश्वर! ये क्या हो रहा है, अरे भाई! मुझे

भी अपने साथ ले चलो। मैं यह सब नहीं देख सकता।”

लँगडे ने कहा, “अरे! तुझे दिखता नहीं मैं लँगडा हूँ।”

मूर्ति ने कहा, “तो ठीक है, तुम अपने डंडे से मुझे तोड़ दो। इन पापियों के हाथों से मरने से अच्छा है, मैं किसी भले मनुष्य के हाथों से मरूँ।”

लँगडे ने कहा, “हिंसा? कभी नहीं। मैं अहिंसक हूँ। मैं भला तुम्हारी हत्या कैसे करूँ?”

लँगडा आगे बढ़ गया। उसे अंतिम स्वर सुनाई दिया, “हे राम!”

समझ

- कपिल कुमार गुप्ता

आज पता नहीं क्यों ये भरी हुई सड़क मुझे एक सुनसान गली लग रही है और मेरे दोस्तों की आवाज क्यों मेरे कानों में नहीं पड़ रही है। मेरा आज मुझे मेरे अतीत के बारे में सोचने पर क्यों मजबूर कर रहा है।

आज पता नहीं मुझे क्यों याद आ रहा वो दोस्तों की भीड़ में अपने आपको अकेला समझना। कारण कोई विशेष नहीं था, कुछ था तो हमेशा अपने आपको दूसरों से छोटा समझने की एक बुरी आदत। पता नहीं हर वक्त पापा से यही पूछा करता था कि पापा क्यों आप मुझे एक ऐसी जगह पर पहुँचाना चाहते हैं, जिसका सामना करने का ना तो मुझमें साहस है और ना ही आपके पास स्रोत हैं और शायद मेरे अन्दर इतनी हिम्मत भी नहीं कि मैं उनका मुकाबला कर सकूँ। आप क्यों नहीं समझ सकते कि मैं आपके सपनों को पूरा करने में असमर्थ हूँ। क्योंकि वो सपने शायद हमारे सामर्थ्य से बाहर हैं। तब मेरे पापा ने जवाब में बस यही कहा कि एक दिन तुम खुद समझ जाओगे कि मैंने तुम्हारे लिये क्या किया जिस से कल तुम अपने सामर्थ्य से बाहर के काम को पूरा कर सकोगे। कल पता नहीं क्यों लेक्चर से हुई बोरीयत दूर करने के लिये फिल्म देखने बैठ गया। यह एक हॉलीवूड फिल्म थी। यह एक प्रसिद्ध शेयर ब्रोकर (क्रिस गार्डनर) की सच्ची जीवनगाथा (द परस्यूट ऑफ हैपीनेस) थी। जब मैंने अपने पापा को उस कथानायक की जगह तथा खुद को उसके बेटे की जगह रखकर सोचा तब मुझे लगा शायद मैं अपना किरदार सही से निभा रहा हूँ। पर क्यों मेरे पापा अपने सपनों का भार मेरे कंधे पर डाल रहे हैं? वो अपना किरदार क्यों नहीं निभा पा रहे हैं?

पर पता नहीं आज मेरा दिल मेरी उस सोच को सही नहीं मान रहा था। शायद इसीलिये मुझे ये भीड़ अपने साथ ना चलाकर मुझे अलग किये जा रही थी। मैंने फिर से अपने जीवन के हर पहलू को परखने का फैसला किया। तभी पता नहीं कैसे मुझे अपनी समझ की कमी का अहसास हुआ। मैंने पाया कि मेरे पापा का सपना एक बड़ा शेयर ब्रोकर बनना तो कभी था ही नहीं, परन्तु उनका सपना तो अपने बेटे को एक ऐसी मंजिल पर पहुँचाना था, जहाँपर खड़ा हो कर वो अपने आप को किसी से छोटा ना समझे। भले ही उनके पास इतने स्रोत नहीं थे कि वो मुझे मंजिल तक पहुँचा सके, पर उनके पास इतनी ताकत थी कि वो मुझे इतना योग्य बना सके कि मैं अपनी मंजिल खुद पा सकूँ। और शायद यह मेरे लिये मेरी मंजिल से ज्यादा महत्वपूर्ण है।

मैं अब तक तो यहीं समझता था कि मेरे पापा मुझे कभी नहीं समझ पाये हैं। पर आज मुझे यह अहसास हो गया है कि मैं कभी इतना योग्य नहीं हो सकता कि मैं उनको समझ पाऊँगा। आज भी हमें अपने माता-पिता से यहीं शिकायत रहती है कि वो हमको नहीं समझ पा रहे हैं, पर हम लोग ये भूल जाते हैं कि क्या कभी हम उनको समझ पाये हैं। तो शायद मेरे बाद आप खुद भी सोच सकते हैं कि आखिर गलती किसकी है।

आराधना

- मधुरेश सुमित

कण कण की रासायन में,
 हे गणेश बस तुम ही तुम हो।
 इस अनन्त भौतिक विश्व में,
 हे महेश बस तुम ही तुम हो।
 कोलाहल हो या प्रशान्ति हो,
 माँ अम्बे बस तुम ही तुम हो।
 जीवन के सार में हे शशिधर,
 ओ निलेश बस तुम ही तुम हो।

दो आशीष प्रखर विवेक का,
 अर्पित सुमन हम करते हैं।
 बने शीतल, सुशील, सुशान्त हम,
 विनय यहीं अब करते हैं।
 शिशिर हेमन्त की मन्द समीर में,
 नवीन ज्ञान का सौरभ फैले।
 कर्म मधुर, प्रियकर, रुचिकर हो,
 आशु तुष्ट हम रहते हैं।

मुख में मन्त्र हो गायत्री का,
 उर में अनुराग और आनन्द हो।
 चहु ओर अमृत नेहा बरसे,
 पग प्रशस्त हो विजय पथ को।
 गाए सर्वदा गौरव गाथा,
 और जीवन अपना सार्थक हो।

येथे कर माझे जुळती

- प्रज्ञा गोखले, ग्रंथपाल, भारतीय विज्ञान शिक्षण आणि अनुसंधान संस्था, पुण

मागील काही दिवसांत जग थोडे गरीब झाले आहे. कालौघात एक तेजस्वी रत्न आपल्याकडून हिरावले गेले आहे. कोण्या एका विकारामुळे शरीराचा एक एक अवयव गमवत समाजाच्या दृष्टीने कुरूप बनत जाणाऱ्या, उपेक्षेचे जीवन जगणाऱ्या लाखो जणांना जीवनदान देणाऱ्या एका प्रेषिताचे निधन.

मुरलीधर देविदास आमटे (२६ डिसेंबर १९१४) हिंगणघाट, जि. वर्धा येथील एका श्रीमंत ब्राह्मण जमीनदाराचा सर्वात मोठा मुलगा. सर्व सुख पायाशी लोळण घेत होती. हातात वकिलीची पदवी होती. उत्तम जीवन जगण्यासाठी लागणारी अनुकूलता होती. पण नियतीच्या मनात काहीतरी वेगळेच होते. या वल्लीच्या हातून लाखो जीवांना नवीन जीवनदृष्टी लाभणार होती. नवे आयुष्य मिळणार होते.

कॉलेजच्या दिवसात बाबा भारत फिरले. लोकांची दुःखे जवळून पाहिली. तिथून त्यांच्यावर समाजजीवनाचे संस्कार घडत होते. बाबा अत्यंत संवेदनशील कवी होते. त्याचवेळी त्यांना आयुष्यभर खऱ्या अर्थाने साथ देणारी, सावलीप्रमाणे सतत त्यांच्याबरोबर असणारी सहधर्मचारिणी मिळाली. इंदु घुले... साधनाताई आमटे. साधनाताईंशी विवाहबद्ध झाल्यावर बाबांच्या आयुष्याला खऱ्या अर्थाने सूर गवसला.

बाबांचे समाजकार्य अहोरात्र चालू होते. पण बाबा कुष्ठरोग्यांचे झाले ते अपघातानेच. असाच एक दिवस होता. नेहमीसारखाच. पण त्या दिवशी काहीतरी वेगळे घडणार होते. वरोऱ्यातून परतत असताना बाबांनी रस्त्याच्या कडेला एक मानवी देह पाहिला. मनुष्यत्वाच्या सर्व खुणा लुप्त झालेला तो मानवी चेहऱ्याचा विरघळलेला भेसूर साचा अन् त्यात वळवळणाऱ्या अळ्या पाहून बाबा शहारले. नकळत एक पाऊल मागे आले. तिथून पळून जाण्याची अनावर उर्मी त्यांच्या मनात आली. पण क्षणभरात ते सावरले व एक तरट त्या देहाच्या अंगावर टाकून ते घराकडे मार्गक्रमण करू लागले. त्यांचा घरात प्रवेश होताच त्यांच्या चेहऱ्यावरून काहीतरी बिनसले आहे हे साधनाताईंच्या लक्षात आले. रात्री झाकपाक झाल्यावर बाबांनी ताईंना सर्व हकीकत सांगितली. म्हणाले, काय नालायक माणूस आहे मी. जे करायला पाहिजे ते करत नाही. करू का महारोग्यांची सेवा ? हिंस्र श्वापदे, नामांकित मल्लांसमोर शडू ठोकून आव्हाने स्वीकारणारे आपले मन एका लिबलिबीत ऑगळ मांसाच्या गोळ्याला पाहून कचरले याचे त्यांना मनोमन वैषम्य वाटले. त्याच रात्री बाबांनी कुष्ठकार्याला जीवन वाहण्याचा संकल्प सोडला.

त्यानंतर बाबांनी अवघे आयुष्य कुष्ठरोग्यांच्या सेवेसाठी वाहून घेतले. कुष्ठरोगामुळे माणसाच्या जगण्याचा हक्क हिरावून घेणाऱ्या, त्याला वाळीत टाकणाऱ्या विचारसरणीला बाबांनी छेद दिला. कुष्ठरोग हा पूर्णपणे बरा होतो. तो संसर्गजन्य नाही. हे सिद्ध करण्यासाठी बाबा हरत-हेचे प्रयत्न करत. कुष्ठरोग्यांनाही सामान्य माणसाप्रमाणे जगण्याचा हक्क आहे आणि तो बाबांनी खऱ्या अर्थाने मिळवून दिला. त्यांना स्वावलंबी बनविले. त्यांच्यावर उपचार केले आणि हे सगळे अत्यंत निःस्पृहपणे बाबा व ताई करत होते. A person can live without fingers but not without self-respect असे बाबा नेहमी म्हणत.

सर्वप्रथम १९५१ मध्ये आनंदवनाची स्थापना झाली आणि तेव्हा तिथे विनोबा भावे अचानक आले. त्यांच्या हस्ते बाबांच्या आनंदवनाचे उद्घाटन झाले. सहा कुष्ठरोगी दाखल झाले. तेव्हा या ठिकाणी सेवेचे रामायण घडेल असा आशीर्वाद विनोबा भावेंनी दिला. हळूहळू आनंदवनातील रुग्णांची संख्या वाढू लागली. त्यांना स्वावलंबनाने जगता यावे म्हणून बाबांनी आनंदवनात शेती, भाजीपाला, फळे करायला सुरुवात केली व बाजारात नेऊन विकण्यास प्रारंभ केला. परंतु सुरुवातीला कुष्ठरोग्यांनी पिकवलेली भाजी म्हणून कोणी विकत घ्यायला धजेना. शेवटी बाबा स्वतः जाऊन भाजी विकू लागले. हळूहळू लोकांची भिती कमी होऊ लागली. आनंदवनाबरोबर बाबांनी अशोकवन, सोमनाथ, नागेपल्ली हे प्रकल्प देखील उभारले.

बाबा आमटेंच्या या कार्याची समाजाने, सरकारने देखील योग्य दखल घेतली. भारत सरकारने त्यांना १९७१ मध्ये पद्मश्री तर १९८६ मध्ये पद्मविभूषण देऊन गौरविले. १९८५ मध्ये त्यांना मानाचा मॅगसेसे पुरस्कार देखील बहाल करण्यात आला.

आज आनंदवन डॉ. विकास आमटे व भारती आमटे, तर हेमलकसा डॉ. प्रकाश आमटे व डॉ. मंदा आमटे चालवितात. बाबांची दुसरीच नव्हे तर तिसरी पिढीदेखील आज त्याच ठिकाणी मूळ धरत आहे, त्यांचा वसा चालवित आहे, वाढवत आहे. बाबांचा परमेश्वरावर विश्वास होता, पण मूर्तिपूजेत ते रमणारे नव्हते. ते नेहमी म्हणायचे -

I sought my Soul, my Soul I could not see

I sought my God, my God eluded me

I sought my Friend, I found all the three.

व त्यावर ताईचे प्रत्युत्तर -

I sought my Lover, my Lover I could not see
I sought my Friend, my Friend eluded me
I sought my Husband, I found all the three

बाबांना तब्येतीची उत्तम साथ कधीच नव्हती. पण खंबीर मन, कामात झोकून देण्याची वृत्ती यामुळे बाबांनी अनेक दुखणी अंगावर काढली. शेवटी आपल्या कार्याची धुरा पुढच्या पिढीकडे सोपवून बाबा व ताईनी वानप्रस्थाश्रम स्वीकारला. १९८० साली बाबा व ताई नर्मदेकाठी विसावले.

९ फेब्रुवारी २००८ या दिवशी या सूर्याचा अस्त झाला. उपेक्षितांचा कैवारी, महान कर्मयोगी काळाच्या पडद्याआड गेला.

बाबा जरी आज आपल्यात नसले तरी ते तेजस्वी जीवनाचा, चिरंतन विचारांचा आणि विधायक कार्याचा ठेवा ठेवून गेले आहेत.

म्हणतात ना -

देणाऱ्याने देत जावे, घेणाऱ्याने घेत जावे
घेता घेता एक दिवस, देणाऱ्याचे हात घ्यावे

बाबा आमटेंच्या जीवनामधून काय घ्यायचे असल्यास त्यांचे हात घ्यावेत. त्यांच्या विधायक कार्याला थोडासा हातभार लावणे - हीच त्यांना खरी श्रद्धांजली ठरेल.

माझे आजी-आजोबा

- सुशांत मोरे

एखाद्या सायन्स इन्स्टिट्यूटमध्ये शिकणाऱ्या मुलाने आपल्या आजी-आजोबांबद्दल लिहिणे काहीजणांना बालिशपणाचे वाटेल कदाचित. असो. कवि केशवसुतांनी देखील म्हटले आहे - प्रौढत्वे निजशैशवास जपणे !

घर असावे घरासारखे, नकोत नुसत्या भिंती.... हे गाणे हल्लीच ऐकण्यात आले. कवितेतील प्रेम, जिव्हाळा, नाती या शब्दांभोवती मन पिंगा घालायला लागले. का कोणास ठाऊक, डोळ्यांसमोर आजी-आजोबा आले. मनातील भावनांना वाट करून द्यावीशी वाटली आणि हा लेख लिहिण्यास घेतला.

माझे आजी-आजोबा सातारा जिल्ह्यातील आमच्या लहानशा खेड्यात राहतात. आजोबांना पंच्याहत्तर वर्षेपूर्ण झाली आहेत, तर आजीला सत्तर. आजोबा निवृत्त मुख्याध्यापक आहेत. तसेच ते स्वातंत्र्य सैनिकही आहेत. स्वातंत्र्य संग्रामात त्यांचाही खारीचा वाटा होता. साताऱ्याचे प्रतिसरकार त्यांनी जवळून पाहिले आहे. त्याविषयी ते सुरम्य वर्णन करतात. शिवाय ते आपल्या गावी शेतीवाडीही करतात. आषाढ आणि कार्तिक एकादशीला दरवर्षी नित्यनेमाने त्यांची पाऊले पंढरपूरच्या दिशेला वळतात.

आजी पूर्वीच्या काळी शिकूनही समोर आलेली शिक्षिकेची नोकरी नाकारून गृहिणी होण्यातच समाधान मानलेली. आजोबांना सर्व कामात साथ दिली ती आजीनेच.

घरातील सर्व मुले-मुली शिकून आपआपल्या नोकरीसाठी/संसारासाठी परगावी-शहरात गेली. पण आजी-आजोबांना आपले गाव, गावचे घरच अधिक प्रिय ! आमच्या घरी - ठाण्याला ते बऱ्याच वेळा येतात. पण त्यांचे मन शहरात रमत

नाही. आम्ही सुट्टीसाठी गावी गेल्यावर त्यांना व आम्हाला खूप आनंद होतो.

आजी-आजोबा जरी दूर रहात असले तरी आम्हा नातवंडांवर त्यांची दाट माया आहे. बुद्धिनिष्ठ व भावनाशील आजी-आजोबा प्रत्येक नातवंडाला त्यांच्या वाढदिवशी आशीर्वादपर पत्र लिहायला विसरत नाहीत. शिवाय अभ्यास, शिस्त यांवरही एखादी ओळ असतेच. कारण माझ्या आजोबांमध्ये त्याकाळचा शिस्तप्रिय शिक्षक लपलेला आहे.

गेल्यावर्षीच माझे आजोबा एका जीवघेण्या आजाराला झुंज देऊन पूर्ण बरे झाले. माझी आजी अन्नपूर्णा आहे. गावात आजोबांप्रमाणे तिलाही मान आहे. साऱ्या गावातील स्त्रिया आजीकडे मदतीसाठी येतात.

मे महिना जवळ आला की, आम्हांला ओढ लागते आजी-आजोबांना भेटण्याची. तेही चातक पक्षाप्रमाणे आमच्या आगमनाची वाट बघत असतात. खेड्यामधले घर कौलार पुन्हा एकदा नातवंडांच्या किलबिलाटाने नवे रूप धारण करते. शाळा-कॉलेज सुरू झाले की, नाईलाजाने आम्हांस परतावे लागते. फिरून फिरून आजी-आजोबांचा निरोप घेताना त्यांचे डोळे पाणावलेले असतात आणि आमच्या मनमयूराचा पिसारा आकुंचित झालेला असतो.

असे माझे आजी-आजोबा आता सायंछायेत वावरत आहेत. पण संध्याछाया-भिवविती हृदया असे न म्हणता दुर्दम्य इच्छाशक्तीच्या जोरावर आपल्या वार्धक्यामध्ये सुद्धा मनाने तरुण आहेत. ईश्वर त्यांना उदंड आयुष्य व मनोबल देवो हीच प्रार्थना.

भारतीय कालमापन पद्धत आणि खगोलशास्त्र

- दर्शन जोशी

पंचांग हे नाव घेतले की लोकं त्याचा संदर्भ फलज्योतिषाशी जोडतात. पण पंचांग व त्यातील संख्यामोड ही संपूर्णपणे खगोलशास्त्रावर आधारित आहे. तारकांच्या पार्श्वभूमीवर सूर्य, चंद्र व ग्रह फिरत असतात. त्यांच्या भ्रमणावरून कालमापन केले जाते. आकाशात सूर्य ज्या मार्गाने फिरतो, त्याचे १२ समान भाग केल्यास आपल्या राशी मिळतात. या राशींच्या आधारे ग्रहांची स्थिती व स्थान सांगणे सोयीचे होते.

पंचांग म्हणजे पाच अंगांचा समूह - तिथी, वार, नक्षत्र, योग व करण. या सर्व अंगांचे जे गणित मांडले जाते, ते वर सांगितल्याप्रमाणे ग्रहांच्या भ्रमणावरून. ते कसे हे आपण एक एक करून पाहू.

आपण रोज निरीक्षण करतो की, सूर्य व चंद्र एकाच गतीने भ्रमण करत नाहीत. उलट चंद्र हा आकाश मंडलात सूर्यपेक्षा खूप अधिक वेगाने फिरतो.

जेव्हा सूर्य व चंद्र यातील सापेक्ष अंतर 12° होते, तेव्हा एक तिथी पूर्ण होते. समजा अमावस्या आहे. अर्थात सूर्य व चंद्र एका ठिकाणी आहेत. आता चंद्र वेगवान असल्याकारणाने जलद गतीने पश्चिमेला जाऊ लागतो. या दरम्यान जेव्हा सूर्य व चंद्र यांतील अंतर 12° होते, तेव्हा पहिली तिथी म्हणजे प्रतिपदा संपते. पुढे जेव्हा हे अंतर 24° होते, तेव्हा द्वितीया आणि मग इ. रित्या १५ तिथी पूर्ण होऊन जेव्हा अंतर 180° होते, तेव्हा चंद्र सूर्याच्या अगदी उलट दिशेला असतो व ह्यालाच आपण पौर्णिमा म्हणतो.

मग पुन्हा प्रतिपदा इ. तिथी होतात व अंतर 360° म्हणजे सूर्य-चंद्र एकत्र आल्यावर (अर्थात एक वर्तुळ पूर्ण झाल्यावर) अमावस्या होते. आता यात गंमत अशी आहे की, सूर्यही फिरत असल्याने सूर्य व चंद्र दर अमावस्येला एकाच जागी न भेटता थोडे पुढे भेटतात. हे समजण्याकरिता आपण घड्याळाचे उदाहरण घेऊ या. या घड्याळात सेकंद काटा नाही. मिनिट काटा म्हणजे चंद्र व तास काटा म्हणजे सूर्य असे समजा. आता अशी कल्पना करा की, दोन्ही काटे बारावर आहेत व घड्याळ सुरु झाले तर काय होईल ? मिनिट काटा वेगाने पुढे जाईल. पण तो जेव्हा बारावर येईल तेव्हा तास काटा आपल्या मंदगतीने पुढे हलला असेल. आता हे दोन्ही काटे १२ ऐवजी १ च्या जवळ मिळतील व पुन्हा तेच चक्र सुरु होईल. अशाप्रकारे वर सांगितल्याप्रमाणे ३० तिथी मिळून चांद्रमास पूर्ण होतो. आपण जे शालिवाहन शक मानतो ते

चांद्रमासावर आधारित आहे.



आपण बऱ्याच वेळा पाहतो की, काही वेळा तिथी अनुक्रमे न येता मध्येच एखादी तिथी वगळली जाते. यामागे अगदी सोपे शास्त्र आहे. ते आपण पाहू. नियमाप्रमाणे सकाळी सूर्योदयावेळी जी तिथी चालू असेल, तीच तिथी त्या दिवसाची तिथी होते. परंतु आपल्या लक्षात आले असेल की प्रत्येक तिथी पूर्ण होणाचा काळ समान नसतो. त्यामुळे एखादी तिथी एखाद्या दुसऱ्या तिथीपेक्षा लवकर किंवा उशीरा संपू शकते. आता उदाहरण घ्या की काल दुपारी एकादशी सुरु झाली व ती आज दुपारी सूर्योदयानंतर एका तासाने संपली. अर्थात नियमाप्रमाणे आज एकादशी आहे. आता सूर्योदयानंतर एका तासाने द्वादशी सुरु झाली व समजा ती उद्या सूर्योदयापूर्वी दोन तास असताना संपली आणि त्रयोदशी सुरु झाली. आता उद्याच्या सूर्योदयाला त्रयोदशी असणार म्हणून उद्याची तिथी त्रयोदशी. आता गंमत अशी आहे की, आज एकादशी आणि उद्या त्रयोदशी, म्हणजे द्वादशी लुप्त झाली. अशा परिस्थितीत द्वादशी तिथी ही क्षय तिथी कोणत्याही सूर्योदयाला नसते. यावर्षी भारताच्या बऱ्याचश्या पश्चिम भागात गुढीपाडवा (म्हणजे चैत्र शुद्ध प्रतिपदा) ही क्षय तिथी म्हणून आली आहे.

आता आपण पंचांगाचे दुसरे अंग म्हणजे वार यावर चर्चा करू. सूर्य एकदा पूर्वक्षितिजावर उगवल्यानंतर दैनंदिन गतीने पश्चिमेला जाऊन पुन्हा पूर्वक्षितिजावर उगवेपर्यंत जो वेळ लागतो, त्याला वार म्हणतात. माझ्यासारखाच तुम्हालाही कधी ना कधी तरी प्रश्न पडला असेल की ७च वार का आहेत ? रविवार नंतर सोमवारच का येतो, बुधवार का नाही ? इ.तर आपण या प्रश्नांची उत्तरे शोधण्याचा प्रयत्न करू. पूर्वीच्या काळी फक्त बुध, शुक्र, मंगळ, गुरु, शनि, रवि व चंद्र हेच ग्रह माहित होते. सूर्य व चंद्र हे ग्रह नसून अनुक्रमे तारा व उपग्रह आहेत. परंतु या चर्चेत सोयीसाठी आपण त्यांना ग्रह म्हणू. आता या सर्व ग्रहांची गती समान नाही. म्हणून एक बिंदू ठरवून व तो मध्य मानून सात वेगवेगळ्या आकाराचे (गणित वापरून) वर्तुळ आखले गेले. आता या मांडणीची कल्पना अशी की सर्व ग्रह एका ठराविक वेळेत समान कोनीय अंतर पूर्ण करतील. यासाठी अर्थातच मंदगतीच्या ग्रहाला आतल्या कक्षेत तर सर्वात जलद ग्रहाला बाहेरच्या कक्षेत ठेवावे लागेल. असे

केल्यास वाढत्या गतीप्रमाणे ग्रहांचा हा अनुक्रम मिळतो.

- १) शनि
- २) गुरु
- ३) मंगळ
- ४) रवि
- ५) शुक्र
- ६) बुध
- ७) चंद्र



शनि हा सर्वात मंद, तर चंद्र हा सर्वात वेगवान ग्रह आहे.

आता दिवसाचे २४ समान भाग करण्यात आले व प्रत्येक भागाला होरा हे नाव देण्यात आले. म्हणजे साधारणपणे एका तासाचा एक होरा. या २४ समान भागांमधील प्रत्येक भागाला ७ ग्रहांची नावे वरील अनुक्रमे दिली जातात. ७ नावे पूर्ण झाल्यावर हीच यादी ह्याच क्रमाने पुढे लिहिली जाते. अशाप्रकारे २४ कोष्टक भरले जातात. मग पुन्हा दुसऱ्या दिवसासाठी तेच. दिलेल्या दिवशी ज्या ग्रहाचा पहिला होरा असेल, ते त्या दिवसाचे नाव. उदा. जर दिवसाचा पहिला होरा शनिचा असेल तर तो वार शनिवार. पहिला होरा रविचा असेल तर रविवार इ. पण मग शनिवार नंतर रविवारचा का ? आता ह्याचे उत्तर बरेच सोपे आहे. समजा आज शनिवार आहे. याचा अर्थ आजचा पहिला होरा शनिचा. पुढे मोजत गेल्यावर लक्षात की, १५ वा आणि २२ वा होरा पण शनिचाच आहे. म्हणजे याचा अर्थ पुढचा वार सुरु झाला की त्याचा पहिला होरा रविचा येणार. म्हणून तो वार रविवार. हेच तंत्र बाकीच्या वारांच्या क्रमामागेही आहे. पण वार यावर चर्चा करताना आपल्या लक्षात येईल की, कुठेही राहू वा केतूचा उल्लेख

नाही. याचा अर्थ आपल्या पूर्वजांना पूर्णपणे माहित होते की राहू व केतू हे ग्रह नाहीत.

सर्व आकाशभर हजारो लखलखते तारे आहेत. पण ही सर्वच तारकासमूह नक्षत्रे होत नाहीत. चंद्र, सूर्य इ. ग्रहांचा जो भ्रमणमार्ग प्रदेश दिसतो, त्या मार्गाजवळ विशेष मनोवेधक असे जे तारकासमूह अतिप्राचीन काळी नक्षत्रे म्हणून निश्चित करण्यात आले आहेत, त्यांनाच नक्षत्रे असे म्हणतात. नक्षत्रे एकूण २४ असून प्रत्येक नक्षत्रांची तारकासंख्या वेगवेगळी आहे. प्रत्येक नक्षत्राची काहीतरी आकृती असते. काही नक्षत्रांची नावे त्यांच्या आकृतीवरून पडली आहेत. उदा. कृत्तिका नक्षत्राच्या ६ तारका असून त्याचा आकार धारदार वस्तूच्यासारखा आहे. नक्षत्रे ही राशीपेक्षा लहान असल्याने ते एखाद्या ग्रहाचे किंवा सूर्य-चंद्राचे राशीत नेमके स्थान सांगण्यास उपयुक्त ठरतात.

योग व करण खगोल अभ्यासात एवढे महत्त्वाचे नसल्याने त्यावर आपण इथे चर्चा नाही करणार आहोत. दैनंदिन कामकाजात तिथी, वार हे सर्व आपल्याला किती क्षुल्लक वाटतात. चतुर्थी, एकादशी सोडली तर एखाद्या दिवशी कोणती तिथी आहे हे आपल्याला माहित आहे असे क्वचितच घडते. साप्ताहिक वार चालू असतात, पण आपल्याला असे कधीच वाटत नाही की त्यांच्या नावामागे, क्रमामागे काही शास्त्र असेल. बऱ्याच जणांना तर तिथी व नक्षत्र काय असतात हे देखील माहित नसते.

म्हणूनच पंचांग व एकंदरीत भारतीय कालमापन या विषयामध्ये वाचकांची रुची वाढविण्याचा हा छोटासा प्रयत्न. आशा आहे आपणास तिथी, वार इ. ची थोडी तरी कल्पना आली असेल व पंचांगाच्या सहाय्याने आपण वार व क्षयतिथीसारख्या गोष्टीचे निरीक्षण करण्याचा प्रयत्न कराल.

पायरसी - एक प्रवृत्ती

- गिरीश र. काळे

ह्या लेखात आपण पायरसीबद्दल चर्चा करणार आहोत. तिचा उगम कशामुळे होतो, फैलाव कसा होतो, तिला आळा घालता येऊ शकतो का, त्यासाठी काय करावे लागेल, ह्याबाबत थोडा विचार या लेखात प्रकट करण्याचा मी प्रयत्न करीत आहे.

उगम -

पायरसीचा उगम हा मुख्यत्वेकरून सामान्य माणसाच्या आर्थिक परिस्थितीमुळे झाला असे म्हणायला हरकत नाही. जर एखाद्या महाग वस्तूला पर्यायी स्वस्त वस्तू उपलब्ध असेल तर ते कोणाला नको आहे. प्रत्येकजण आपल्या श्रमाचा पैसा वाचवायला

बघणारच ना ! आणि तसे बघावे तर त्यात गैर काहीच नाही. पैसे वाचवणे हा सर्वांचाच हक्क आहे. पण नेहमीप्रमाणे त्यामागचे कर्तव्य आपण विसरतो. आणि इथेच पायरसीला खतपाणी मिळायला सुरुवात होते. सामान्य माणसाच्या याच प्रवृत्तीचा फायदा घेतला जातो आणि सुरु होते एका प्रवृत्तीची वाढ, अशी प्रवृत्ती जी अखळी अर्थव्यवस्था बुडवू शकते.

पायरसीची सुरुवात कधी झाली हे सांगणे अवघड आहे. तसा लिखित पुरावा मिळणेही अवघडच. कारण ही कामे काही फार गौरवास्पद मानली जात नाहीत, पण हिचा प्रसार जगभर झाला

आहे यात तिळमात्र शंका नाही. पुराव्यादाखल म्हणून हे उदाहरण. गेल्यावर्षी हॅरी पॉटर मालिकेतील पाचवा चित्रपट - हॅरी पॉटर अँड द ऑर्डर ऑफ फिनिक्स प्रदर्शित झाला. भारतात १३ जुलैला पहिला प्रयोग होता. जगभरात वेगवेगळ्या ठिकाणी हाच ११ व १२ जुलैलाच प्रदर्शित होणार होता आणि परिस्थिती अशी होती की, हाच चित्रपट १२ च्या दुपारपर्यंत इंटरनेटवर डाऊनलोड करण्यासाठी उपलब्ध झाला होता. ह्यावरून लक्षात येते की, ह्या चाच्यांचे हात किती पसरले आहेत आणि ह्यांची मुळे किती खोलवर पोहोचली आहेत. माझ्यासारखे कित्येक हॅरी-भक्त चित्रपटगृहांमध्ये जाऊनच हा चित्रपट बघतील ह्याबद्दल शंकाच नाही, पण म्हणून आपण ह्या चाचेगिरीकडे दुर्लक्ष करू शकत नाही.

फैलाव -

ह्या चाचेगिरीचा सगळ्यात मोठा फटका बसतो तो मनोरंजन क्षेत्राला. आजकालच्या धकाधकीच्या जीवनातले मनोरंजनाचे महत्त्व पटवून द्यायची गरज नाही. प्रत्येकजण आपापल्या परीने मनोरंजन करून घेत असतो. याच वेळी एक स्वस्तात मस्त पर्याय म्हणून सामान्य माणूस पायरेटेड वस्तू विकत घेतो. या प्रवृत्तीला खतपाणी मिळायला लागते. हा धंदा सुरू करण्यासाठी फार भांडवलाची गरज नसते. २०० ते ५००% नफा देणाऱ्या ह्या धंद्यात भांडवल वसूल व्हायला फार वेळही लागत नाही. मग आपल्या व्यवसाय बंधूशी संबंध वाढवायचे आणि खोऱ्याने पैसा ओढायचा. मार्गात गैर, बेकायदेशीर वगैरे शब्द येतात, पण ते दूर करायला फार वेळ लागत नाही. कारण दाम करी काम ! त्यामुळे चाचेगिरी बरोबरच भ्रष्टाचारही वाढायला लागतो.

प्रतिबंध -

चाचेगिरीला आळा घालणे अत्यंत कठीण आहे. याचे एक महत्त्वाचे कारण म्हणजे सामान्य माणसाकडून नकळत मिळणारा पाठिंबा. पायरेटेड वस्तू विकत घेणाऱ्याला माहित असतेच की, त्याने विकत घेतलेली वस्तू पायरेटेड आहे व हे बेकायदेशीर आहे. पण ह्या बेकायदेशीर व्यवहारांबद्दल तक्रार करायची कोणी तसदी घेत नाही. खरे तर तशी इच्छाच कधी मनात नसते. सामान्य ग्राहक व चाचे यांच्यातील हा अलिखित करार चाचेगिरीला आळा घालण्यातला एक मोठा अडथळा आहे, पण ग्राहकालाच पूर्ण दोष देण्यात अर्थ नाही. पायरसीच्या विरोधात समाज प्रबोधन महत्त्वाचे आहे. आपल्या ह्या छोट्याशा तडजोडीचे परिणाम किती वाईट आहे हे जोपर्यंत लोकांना उमजत नाही तोपर्यंत

चाचेगिरीला आळा घालणे केवळ अशक्य आहे. आपण हे विसरता कामा नये की आजच्या चाच्या कधी काळी सामान्य माणूसच होता आणि म्हणूनच आजचा सामान्य माणूस उद्याचा चाच्या बनू शकतो.

पण सामान्य ग्राहकांनी तरी फक्त पायरसीच्या विरोधात म्हणून दसपट किंमत का मोजावी ? (उदा. १० ते १२ गाणी असलेली एक गाण्यांची सीडी ९९ रुपयांना विकत मिळते. म्हणजे गाण्यामागे १० रुपये, तर एक पायरेटेड सीडी २०-३० रुपयांना मिळते. तीत ५०-६० गाणी असतात. म्हणजे गाण्यामागे ५० पैसे) आणि अशा प्रश्न विचारण्यात ग्राहकाचा जराही दोष नाही. महत्त्वाचा प्रश्न असा की ह्या किंमती एवढ्या जास्त का असतात ? अनेक कारणे - सीडी बनविणाऱ्या कंपनीचे नाव व प्रसिद्धी (ब्रँड नेम), कलाकारांचे मानधन (रॉयल्टी), पॅकिंग व आकर्षक बनविणे वगैरे वगैरे. ह्यातले पहिले दोन घटक सगळ्यात जास्त महत्त्वाचे. ह्यांच्यामुळे ५-७ रुपयांत तयार होणारी सीडी ६०-७० रुपयांपर्यंत विक्रेत्याकडे येते. माझ्या मते निर्मात्यांनी व संबंधित कलाकारांनी ह्याकडे लक्ष देणे गरजेचे आहे. एक साधे उदाहरण घेऊ. समजा एका खऱ्या सीडी मागे ५ पायरेटेड सीडी विकल्या जातात. (खरा आकडा ह्याहीपेक्षा भयंकर असू शकतो. पण १:५ गुणोत्तर मानण्यात काहीच हरकत नाही) जर खऱ्या सीडीची किंमत पाचपट कमी केली, तर तिचा खप पाचपट वाढेल एवढे नक्की. आता निर्मात्यांना व संबंधित कलाकारांना प्रत्येक सीडीमागे कमी पैसे मिळतील, पण जास्त सीडी खपल्यामुळे एकूण नफा जवळपास तेवढाच राहील. आणि सगळ्यात महत्त्वाचे म्हणजे ग्राहकाचा खऱ्या सीडी घ्यायचा कल वाढून चाचेगिरीला आळा बसेल.

इथे एक साहजिकच प्रश्न असा उद्भवेल की, दोन्ही किंमती सारख्या असूनही ग्राहक पायरेटेड का घेणार नाही ? कारण गॅरंटी. कंपनी खऱ्या मालाची गॅरंटी देते. पण पायरेटेड मालाची कोणी गॅरंटी देत नाही आणि कुणी देऊ शकतही नाही. पायरेटेड सीडीतील कलाकार कित्येक वेळा नकली असतात. खऱ्या सीडीबद्दल हा प्रश्नच उद्भवत नाही. म्हणूनच सामान्य ग्राहक दुप्पट किंमत देऊन देखील खरा माल विकत घेईल, पण दुप्पट किंमत देऊन, दसपट नव्हे.

आणि मग नेहमीच्याच रडगाण्यांसारखे - सरकारने कडक कायदे करावेत, सरकारने हे करावे, सरकारने ते करावे वगैरे, वगैरे.

**Our Sincere Thanks
To
CPWD Team for their assistance in developing IISER facilities at SAI Trinity Campus**



(LEFT) Members of the Civil Construction team
(From left) Mr. M. P. Jaeel, Mr. P. K. Dixit, Mr. Y. S. Rajput, Mr. A. K. Dey



(RIGHT) Members of Electrical Construction Team.
(Standing) Mr. Shiv Kumar, Mr. G. R. Tripathi



Mr. Y. S. Rajput, Mr. A. Pandey, Mr. Harish Kumar Bangar, Mr. Ranjeev Sao, Mr. B. B. Patil

IISER FAMILY 2007 - 2008



ENLIGHTENED MINDS



WORKING MINDS



PENSIVE MINDS