



Exciting Science Group

Annual report

April 2009 – May 2010

Summary

In September 2008, a few scientists at the National Chemical Laboratory, Pune (a constituent laboratory of CSIR, India) initiated a lecture series to communicate their excitement for science and technology with school students. This activity has gained momentum with time, and over 20 scientists from NCL; faculty from IISER and IIT-B; staff from the Venture Center, and enthusiastic volunteers are associated with this group, now called the “Exciting Science Group”. The activities of this group, apart from the continuing popular science talks, now include outreach lectures at schools for underprivileged students, mentoring for students planning to send in entries to national science fairs and weekly science/technology video screenings. Our most recent talk (by Dr. Magesh Nandagopal, on 2 May 2010) had to be held in the Venture Center cafeteria to accommodate the 110-strong crowd of students who attended.

This report discusses the activities undertaken by the Exciting Science Group from April 2009 to May 2010, and recognizes the people and institutions that have made this work possible. Specifically, we would like to acknowledge the generous support for this activity from NCL, the Venture Center, Battelle India, Forbes Marshall and Praj.

We gratefully acknowledge that the activities of the Exciting Science group are supported by:



1. Popular Talks for (8th to 10th grade) School Students:

The Popular Talks series of once-a-month talks aims to connect school students to *practising* scientists. Thus, school students get to hear a first hand account of what it means to do research, and to get a feel for the thrill of discovery. The speakers do not attempt to teach science to the students – rather, the idea is to create a sense of “wow” and to kindle the students’ curiosity. The talks are not meant to be pedantic lectures, but combine live demonstrations, experiments and problem solving exercises to involve the students and engage their attention. We have chosen to target 8th to 10th standard students for this effort, since in most boards, students need to choose whether to stay in the science stream at this juncture.

The Popular Talks are held once a month at 10 am on Sunday mornings at the NCL Innovation Park, Pashan Road. The talks are free and open to students and science teachers. Registration is on a first-come-first-served basis, and is done by sending email to register@excitingscience.org or through our new web site: <http://www.excitingscience.org>. In the last two months, we have actively visited close to 50 schools to make them aware of this lecture series and have put up posters in these schools, apart from advertising the talks in newspapers. As a consequence, we have received an overwhelming response to our talks from schools from all over Pune. Our talks have also received coverage in the local press, and these press reports have increased the visibility of our lectures and have resulted in increased participation.

Talks since April 2009:

Date	Topic	Speaker
26 Apr 2009	How Giant Molecules Wiggle	Ashish Lele
31 May 2009	Bubbles and Drops: Stories from Disney Land, ice cream, laptops and petrol	Amol Kulkarni
28 Jun 2009	Chemical and Biological Analysis: Lets go fishing “molecules”	Venkat Panchagnula
26 Jul 2009	Can we get unlimited energy from sun or wind?	K.Vijayamohan
25 Oct 2009	Tiny Magnets	Ajith Kumar
15 Nov 2009 (rescheduled due to swine flu outbreak in Aug/Sep)	Chemistry and Magic	Anil Kumar (IITB)
29 Nov 2009	How cancer begins?	Chitra Manikandan (Dow)
13 Dec 2009 (rescheduled due to swine flu outbreak in Aug/Sep)	Getting to know solids: How are they built?	Nandini Devi
20 Dec 2009	Ligands: Tools for a nanogoldsmith	BLV Prasad
17 Jan 2010	Excitement in chemistry	Dr Sourav Pal
28 Feb 2010	Why Everyone is talking about Climate Change	Dr. K. Guruswamy
28 Mar 2010	Inhaled drug delivery: Science and Technology	Dr Pankaj Doshi
2 May 2010	Chemistry that you can eat. The science behind food and cooking	Dr Magesh Nandagopal

SCIENTISTS DEMYSTIFY SCIENCE FOR STUDENTS

NCL's outreach programme



NCL scientists popularising science among students
This outreach programme is run by a few scientists from NCL in which three main activities are involved. Popular talks by scientists on contemporary topics (including experiments, demos, etc), a mentoring programme for students planning projects for the National Science and Technology Fair and Outreach lectures at few schools.

Lectures for child scientists
The National Chemical Laboratory (NCL) has invited students of classes VIII and XI to participate in its outreach programme. Sessions will be held on the NCL Innovation Park.

COMING SOON
Anil Kumar of IIT Mumbai

Lecture on 'How giant molecules wiggle' for students
APRIL 22
DR ASHISH Lele, Bhatnagar Awardee from the National Chemical Laboratory

National Chemical Lab's mentor programme for children till August

Several other institutions have since at the IRIS this year," said ananswasmy. "We interacted with many students from Ashilbagam labakia dur-

NCL to organise science lectures for students
To popularise science and engineering among young-er, talks by researchers and practitioners will be or-ed for students between class VIII and XI. The first such talk will be held at the NCL Innovation Park on ay. Chetan Gadgil, a scientist with NCL, will speak on physics, chemistry and mathematics can be used to un-and biology". The other lectures will include topics such e most famous math textbook in history, science and ions and chemistry in everyday life, DN

Students get to know world of science
FUTURE TALKS
Dr. Chetan Gadgil of NCL will speak on 'New Cancer Drugs' at 10 AM, Sat, November 29
Dr. Anil Kumar will speak on 'Upstairs Tools for a Nanopositioner' at 11 AM, Sun, December 13
Asking questions, if nobody has the answers, it could be the opportunity for years-ears and go forward in life". The students attending the sessions were thrilled with the experience. Media Desk

रविवारी 'एनसीएल' मध्ये व्याख्यान
पुणे, ता. २८: राष्ट्रीय रासायनिक प्रयोगशाळेच्या (एनसीएल) रविवारी (ता. ३१) 'बबल्स अँड डॉसिस' स्टोरीज प्रॉम डिन्ने लँड, आइस्क्रीम, लॅपटॉप अँड पेट्रोल' या विषयांवरील व्याख्यानाला

NCL to connect with schoolkids
The outreach programme was launched with an idea to

Collage of selected press reports in ToI, Indian Express, DNA, Sakal, and Dainik Jagran.



EXCITING SCIENCE TALKS and PROJECTS

POPULAR SCIENCE TALKS AT NCL

WHAT DO REAL SCIENTISTS DO?

Speaker and Topic	Date (Sundays)
Dr. Pankaj Doshi (NCL) Inhaled drug delivery: Science and Technology	28 March 10
Dr. Magesh Nandagopal (NCL) Chemistry that you can Eat: The Science Behind Food and Cooking	25 April 10
Prof Arindam Chowdhury (IIT-B) Seeing single molecules	30 May 10
Dr. Anu Raghunathan (NCL) Evolution of Mickey Mouse: How you become you	27 June 10

Talks, experiments, demonstrations
8th-10th std students
Once a month, on Sunday mornings, at the NCL Innovation Park, Pashan Road. Come! Discover the excitement of the latest science and technology

MENTORING FOR SCIENCE PROJECTS

HAVE YOU THOUGHT OF YOUR SCIENCE PROJECT YET?

The last date for entries to the National Science fair is

31 August 2010

Mentoring sessions by NCL scientists to help you come up with project ideas, and develop them into award winning projects

Mentoring sessions immediately after the popular science talks at NCL

National Science and Technology Fair winners represent India at the prestigious Intel Science Fair, USA

Science Talks for School Students

(for 12-15 year old school students)


Date	Topic	Speaker
17-01-10	Excitement in Chemistry	Dr Sourav Pal
28-02-10	Symmetry everywhere	Dr. Anirban Hazra
28-03-10	Inhaled drug delivery: Science and Technology	Dr Pankaj Doshi

Heer practicing scientists describe the excitement of cutting-edge science. Talks, exercises and demos. Attendance by registration. Free registration. Register by emailing outreach@ncl.res.in

NEW IN 2010: Mentor sessions for students planning projects for the National Science and Technology fair. Find out more and sign up at the Outreach talks.

www.nclacademy.org/Outreach/
Join our mailing list today!

Supported by:
NCL | Venture Center | Battelle India | Forbes Marshall



होरक जयन्ती वर्ष 2009-10
National Chemical Laboratory, Pune

Poster (put up in around 50 schools) and the advertisement that appeared in ToI, IE and Sakal, in January 2010.



Dr. Pankaj Doshi's talk (March 2010, "Inhaled drug delivery: Science and Technology")



Dr. Magesh Nandagopal's talk (May 2010, "Chemistry that you can eat")

2. Mentoring school students to do research based projects:

Doing science is the best way to discover the excitement of science and research. Research based science projects are an excellent way to instil scientific temper in school students. National science and technology fairs for school students, such as the IRIS (Initiative for Research and Innovation in Science), sponsored by the CII, DST and Intel, encourage such projects. The IRIS is held every year, in a different city in India and selects about 100 project entries for the National Finals. Student projects that win awards at the National Finals are selected to represent India at the Intel International Science Fair in the USA. In recent years, there have been very few entries from Pune, and none that have been selected to the National Finals of IRIS. Often, high quality projects that are selected at the IRIS have students being mentored by scientists or teachers with research experience.

This year, we have attempted to raise the awareness of opportunities such as IRIS to spur students from schools in Pune to do research based projects, and NCL scientists, Dr. Chetan Gadgil and Dr. BLV Prasad, have offered to mentor student projects. Chetan and Prasad have already conducted three “mentoring” sessions, following the regular Popular Talks, to help students put together exciting projects. The idea of our mentoring sessions is to give students with project ideas a forum to discuss their ideas with scientists, and to get further ideas on how to develop their projects. Students who don't yet have project ideas can learn how to select a topic and how to initiate and plan work on that topic at the mentoring sessions.

Recently, we invited Anuja Bagul, a mechanical engineering student from MIT college, and a former finalist at the IRIS, to speak about her experience at the IRIS. Anuja had worked with scientists at NCL to develop her ideas and urged the students to approach parents, teachers or NCL scientists who can help them develop their project ideas.



Anuja Bagul talks to students and science teachers in May 2010.

3. Saturday Video Screenings:

The Exciting Science group is now organizing “Saturday Video Screenings” – every Saturday, at 4pm at the Venture Center, we organize screenings of videos that describe inspiring science or technology. These screenings are open to all, and are advertised on our web site and via our mailing list. At this time, we plan to run these screening events for the next two months (viz. through the school summer vacations). Our first screening on 8th of May attracted not only our “regular” 8th to 10th standard school students, but also parents, engineering students and much younger students (in the 3rd standard).

Communicating with Students, Teachers, Parents:

In order to effectively utilize technology to communicate the activities of the Exciting Science group with students, teachers, parents and others who come to our seminars, video screenings, etc., the team at the Venture Center has come up with a redesigned web page. Registration for our talks can now also be done through a convenient web-based form (or by sending email, as before). Slides from the talks, resources and photographs are uploaded on our site and can be easily shared through our site. To connect with the students, we also have a presence on Facebook, Orkut and Twitter.



4. Taking Science Outreach to Schools for Underprivileged Students:

We have developed a new programme with the same philosophy as the the NCL Outreach lectures, but that is aimed at students at underprivileged schools. The challenges in exciting children in such schools, given the lower average level of student awareness of science, are somewhat different as compared to our popular talks. In our new programme, we will continue use experiments, demos, etc. to excite children about science – however, we will choose topics for our talks from those that they are taught and will develop modules with appropriate experiments and historical background that will help them make connections with the science.

We have currently identified 5 speakers from NCL who have committed to participating in this exercise. Each speaker will deliver a module to a school (viz. modules will be once a month) starting in the new school year (June 2010). We are also considering handing out chemistry kits to the students (for example: growing crystals) so that they can get hands-on experience with *doing* experiments and popular books like “The History of Chemistry”, at the end of our lectures. The NCL scientist speakers for this series will include some of senior colleagues such as:

- Dr. Sourav Pal (PhD, IACS, Kolkata; Bhatnagar Awardee; FNA; FNSc, FASc)
- Dr. Ashish Lele (PhD, U. Delaware; Bhatnagar Awardee; FNAE; FASc)
- Dr. Sayam Sengupta (PhD, Carnegie Mellon)
- Dr. Nandini Devi (PhD, IIT Madras)
- Dr. K. Guruswamy (PhD, Caltech)
- Dr. Kumar Vanka (PhD, U. Calgary)

We have identified three schools to implement these lectures:

- Jawahar Navodaya, Shikrapur, Pune District (<http://www.navodaya.nic.in/>)

Jawahar Navodayas are located residential schools in rural areas, as part of a central government scheme to provide quality education to talented children in rural areas. Education in Navodaya Vidyalayas is free of cost. A total of 75% of seats are reserved for rural children and a minimum of 33% of seats are reserved for girls. The JNV coordinator for Maharashtra, Goa and Gujarat, Mr. Bhatt is based out of Pune and has been very supportive of our initiative and very enthusiastic about the prospects for this programme.

We visited the JNV-Pune in Shirur on 16th April 2010 and spoke with the teachers there, with the principal and with students in class 8th and 9th. We received a very warm welcome at this school, and we are looking forward to initiating our lectures in July at this school (the school term resumes only in early July – hence, our talks will need to start in mid July here). We have identified a suitable area (the mess) for our lectures.

- Hutatma Balveer ShirishKumar Vidyalaya, Pune

This is a PMC Vidya Niketan (a “magnet” school, for the brightest students in the PMC school system) at Police Lines, Pune. Here too, we have been warmly welcomed by the

principal and science teachers (when we visited them on 13th April) and are planning to initiate our lectures in June 2010 for the 8th standard “semi” English medium section. While both the Jawahar Navodaya, and the PMC Vidya Niketan has highly motivated teachers, the Vidya Niketan has significantly lesser infrastructure for the students.

- Valley View School, Kondhwa

Dr. Sayam Sen Gupta (NCL coordinator for this programme) visited this school on 17th March, after discussions with the Teach for India fellow, Daniel Lobo who is based at this school. The Teach for India team, that had recommended this school to us, and the school principal are very enthusiastic about our initiative, and would also like to encourage their students to submit project entries for the IRIS. The Valley View school is a private school for the low income community in the area around the school. This school has been adopted by Teach for India – however, the Tfi fellows are focused on primary schooling. This is an English medium school, but, the students are not very proficient in the language. The Teach for India fellow (Mr. Daniel Lobo) has agreed to be a local resource for the students when we initiate our programme. A few selected students from this school will also visit NCL in early June since they have very limited exposure to experimental facilities and would like to see cutting-edge laboratories.



Hutatma Balveer ShirishKumar Vidyalaya, Shivaginagar Pune

The People behind the Exciting Science group:

NCL Team:

Popular Talks: Dr. K. Guruswamy; Dr. V. Premnath



Outreach at underprivileged schools: Dr. Sayam Sengupta



Mentoring: Dr. Chetan Gadgil; Dr. B. L. V. Prasad



Venture Center Team:



Web-site and IT: Namrata Salwe; Shiv Tripathi



Event Organization: Pravin Chavan; Kiran Talele

Volunteer:



Yogeshree Phadke

Outreach Assistant:



Ms. Bhakti A. Dhamdhare: joined the Exciting Science group at the Venture Center in March 2010. Ms. Dhamdhare has an M.Sc. in organic chemistry, and was previously associated with the Science Express Train (an initiative of the Vikram Sarabhai Community Science Center, Max Planck Society and DST).

Future Plans:

The activities of the Exciting Science group have rapidly expanded in scope, in the first couple of years, in response to the enthusiasm generated by our initial forays. We are constantly looking for ways by which we can continue to engage society, and to excite people about the possibilities offered by science and technology. We have ambitious plans that build on our modest beginning and would like to facilitate visits to laboratories, increase scientist-student and scientist-society interactions. Our current activities are made possible by the support of organizations such as NCL, the Venture Center, Battelle India, Praj and Forbes Marshall, that provide us with space and resources to conduct our programmes. We are now seeking to build a corpus that will allow us to sustain our current activities and build on future themes. We are hoping for continued support in the form of donations, from our local industry partners and other philanthropic organizations that share our commitment to science outreach.

To find how you can help support these activities, please contact us at:

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