Summary

Report Period: April 2014- March 2015

About Exciting Science Group:
The Exciting Science Group comprises of scientists from two of Pune's best research institutions, NCL and IISER-Pune. This initiative is aimed at conveying the excitement of science and technology to school students. The motivation behind our programme is to attract the brightest talent from the next generation towards careers in science and technology, since it will be these students who will drive tomorrow's science and innovation based economy.

Popular Talks: Held once a month (on the last Sunday) these talks give students a chance to meet scientists and understand the relevance of their work to society. Typically, these talks are filled with live demonstrations and experiments conducted by scientists – so as to kindle a sense of wonderment in the students.

Talks at PMC magnet schools: Scientists (from NCL and IISER-P) visit the following schools once a month, and deliver a talk (typically on topics from school textbooks), conduct experiments, and interact with the kids:

- K.C.Thackeray Vidyaniketan, Near Daruwala Pul
- Hutatma Balvir Shirishkumar Vidyalaya, opposite Police lines.
- Dr Vasantdada Patil Vidyaniketan,Shaniwar Peth

At the end of the talks, students are given small gift (such as a book, or a science kit that we specially put together) that typically relates to the topic discussed. The students are also provided a snack at the end of the talk.

Science Clubs: From last two years, we have also extended our activities by initiating a weekly "Science Club" program at two underprivileged schools (K.C.Thackeray Vidyaniketan and Hutatma Balvir Shirishkumar Vidyalaya). The basic objective of this club is to develop the students' abilities to think analytically and creatively and encourage the participation of students in research based projects, like Intel/Google science fair.

Workshops: A 5-day workshop on Molecular modeling was conducted in June. This hands-on workshop intended to introduce school students to the power of computers in solving problems in physics/chemistry/biology from a molecular perspective.

We would like to acknowledge the generous support for this activity from CSIR-NCL, IISER-Pune, the Venture Center, Forbes Marshall Foundation, DSM India Pvt Ltd and the Praj Foundation.

Popular Talks

What:

This series of once-a-month talks aims to connect school students to practicing scientists. Thus, school students get to hear a firsthand 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.

When & Where:

The Popular Talks are held once a month at 10 am on Sunday mornings at the NCL Innovation Park, Pashan. 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 web site: http://www.excitingscience.org.

Date	Speaker	What was the talk about?
27 April 14	Chetan Gadgil	Using Physics, Chemistry and Mathematics to Understand Biology
18 May 14	Suman Chakrabarthy	Virtual Chemistry: Building labs inside computers
29 June 14	Anjan Banerjee	An Information Super-Highway in Plants: A tale of tour and detour
27 July 14	Goutam Chattopadhyay	Space Exploration Driven by "Curiosity"
24 Aug 14	Girish Ratnaparkhi	The Circle of Life: An Introduction to the wonderful world of Animal Development
21 Sept 14	Nagaraj Balasubramanian	To stick or not to stick that is the question: How and why do cells stick?
19 Oct 14	Ramrup Sarkar	Fighting Diseases with Math
30 Nov 14	Chaitanya Athale	Looking at life beyond the limit of the eye- at the atomic unit of life
28 Dec 14	Sanat Kumar	What makes Gold so special and precious ? My experiences as an engineer and a scientist
18 Jan 15	Neelesh Dahanukar	Game Theory and Behavior
1 Mar 15	Magesh Nanadagopal	Chemistry of Food
22 Mar 15	Rahul Chopra	Origin and Evolution of the Earth

Photographs from the talks:

Talk on Space Exploration driven by "Curiosity" by Dr Goutam, NASA Jet Prop Laboratory, USA

Talk on "Virtual Chemistry" by Dr Suman, NCL-Pune

Talk on "Information Super Highway in Plants" by Prof Anjan, IISER-Pune

Talk on "Using Physics, Chemistry and Mathematics to understand Biology" by Dr Gadgil

Talk on "Animal Development" by Asst Prof Girish, IISER-Pune

Talk on "Cell Adhesion" by Prof Nagaraj, IISER-Pune

Talk on "Looking at life beyond the limit of eye"

By Asst Prof Chaitanya Athale

Talk on"What makes gold so precious"

By Prof Sanat Kumar

Talk on "Game Theory" by Prof Neelesh Dahanukar

Talk on "Chemistry of Food" by Dr Magesh

Talk at PMC Magnet Schools

What:

Scientists (from NCL and IISER-P) visited three PMC magnet schools once a month, and delivered a talk (typically on topics from school textbooks), conducted experiments, and interacted with the kids. At the end of the talks, students are given small gift (such as a book, or a science kit that we specially put together) that typically relates to the topic discussed. The students are also provided a snack at the end of the talk.

Schools covered:

- ***K C Thackeray Vidyaniketan, Near Daruwala Pul, Shaniwarvada***
- ***Hutatma Balvir Shirishkumar Vidyalaya, Opp Police lines, Shivaji Nagar***
- ***Dr Vasantdada Patil Vidyaniketan, Shaniwar Peth***

When, How Often:

These talks are typically planned once a month

Date	Speaker	What was the talk about?	Gift (Book/kit) given to the students at the end of the talk
19,25 & 26 July 2014	Anjan Banerjee	Plant Tissue Culture	Genes and Means
19, 20 & 27 Sept 2014	Amitava Das	Colors in Life	Cloning
6 Sept 14, 7 & 11 Nov 2014	Steven Spallone	Jugglology	Juggling Balls
28,29 Nov 14 & 6 Dec 14	Chaitanya Athale	Looking at life beyond the limit of the eye- at the atomic unit of life	Shot in the Arm
7 Feb 15 & 14 Feb 15	Debashree Ghosh	How Computers Work	Harmone Harmony

Photographs from the talks:

Talk on "Plant Tissue Culture" at KCT
By Anjan Banerjee, IISER-Pune

Talk on "Jugglology" at HB
By Steven Spallone, IISER-Pune

Talk on "Colors in Life" at VD
By Dr Amitava Das, NCL-Pune

Talk on "Looking at Atomic Unit of Life" at VD
By Asst Prof Chaitanya Athale, IISER-Pune

Talk on "How Computers Work" at HB
By Dr Debashree Ghosh, NCL-Pune

Talk on "How Computers Work" at VD
By Dr Debashree Ghosh, NCL-

What did the teachers who attended these talks say?

"The lecture was very nice. Students were happy and excited about the complete session. They got good new information and knowledge about Tissues, their types and their functions. Students were giving very good response. Students were surprised to see different colours of different types of stones. Only the change in structural formula can change the colour of material. That was the completely new thing for them. Overall students as well as teacher were satisfied about session and looking forward for more interactions with scientist. "

- *Mrs Neeta Gulawani, Science Teacher, Hutatma Balvir Vidyaniketan*

"The talk was interactive and informative. Children were benefitted by the talk. They were also surprised how a small impurity can cause changes in the original structure. I found the talk very useful."

- *Mrs Punita Acharya, Science Teacher, K C Thackeray Vidyaniketan*

"The presentation inspired the students to make impossible think possible."

- *Mrs Deshmukh, Science Teacher, Dr Vasantdada Patil Vidyaniketan*

"Activity based teaching. Good interaction with students. Content was very informative. The exposure to microscope and computer technology was exciting. Needs to be more loud and expressive."

- *Mrs Punita Acharya, Science Teacher, K C Thackeray*

Science Clubs

What:

The students are mentored by research students from CSIR-NCL and IISER during the weekly sessions. The basic objective of this club is to develop the students' abilities to think analytically and creatively and encourage the participation of students in research based projects, like Intel/Google science fair. The members are either engaged in science activities, or they plan/discuss/work on a science project or have a special scientific visitor. This program gives tremendous opportunity for the students to engage in more hands-on activity, which enhances their approach towards science in their classes.

When and for how long:

Once a week. Typically 1- 1.5 hours.

Where, Who attends, Volunteers:

The science clubs are run in the following schools:

K.C.Thackeray Vidyaniketan,
Near Daruwala Pul
(KCT)

Number of students attending per week: 30
Grade: 7,8 and 9

Hutatma Balvir Shirishkumar Vidyalaya,
opposite Police lines.
(HB)

Number of students attending per week: 40
Grade: 8-9

Amogh Kulkarni is pursuing PhD at IISER-Pune. He has been an ESG volunteer for over 3 months

Sanika Hakim is pursuing B Sc in Microbiology at Fergusson College, Pune. She has been an ESG volunteer for over 3 months

Aseem Rajan is a 2nd year BS-MS student at IISER-Pune. He has been an ESG volunteer for over 3 months

Volunteers at
K C Thackeray
Vidyaniketan

Suvidyakumar is a 2nd year undergrad student at IISER-Pune. He has been a ESG volunteer for over 3 months

Kumar Priyadarshi is a 2nd year undergrad student at IISER-Pune. He has been a ESG volunteer for over 3 months

Harshvardhan Jog is a 2nd year undergrad student at IISER-Pune.He has been a ESG volunteer for over a year

Volunteers at

Hutatma Balvir Vidyaniketan

Photographs from the Science Clubs:

Volunteers demonstrate the Borax-Glue experiment to the students

Volunteers conducting a session on "Tower of Hanoi"

Volunteer conducting session on Microscope

At the end of school year in March 2014, students from these science clubs developed innovative novel project ideas that they presented to CSIR-NCL/IISER scientists. Innovative research idea entries were also invited from ten other schools in and around Pune. Selected projects received further mentoring through the summer to develop them for the National Science Fair. This year, three science club teams from these Vidya Niketans including one team from a local school (Abhinava Vidyalaya) sent in projects for the National Science Fair.

Science Projects that resulted out of the mentoring:

Sl no	Title of the Science Projects	Student Names, Details	Volunteers who mentored
1	Strength of Jackfruit sap adhesiveness underwater	Shubhangi Deshmukh & Kalpana Chavan *School: Hutatma Balvir Vidyaniketan*	Ruchi Wasnik - 3rd year UG student at IISER-Pune
2	Weedkillers from weeds	Bharti Rajput & Shweta Sharma *School: Hutatma Balvir Vidyaniketan*	Sutirth Dey – Professor at IISER-Pune
3	Low frequency radio waves are safer for small animals	Jay Ratnaparkhi & Sanket Shinde *School:K C Thackeray Vidyaniketan*	Danveer Singh – 2nd year Research Scholar at IISER-Pune
4	Quest to save the Himalayas by using UV degradable plastics to combat plastic litter	Shreya Parchure & Kimaya Bedarkar *School*: *Abhinava Vidyalaya*	Sameer Huprikar – 2nd year PhD student at NCL-Pune

Highlights:

Two of these teams (Project no. 3 & 4) qualified for the National Finals of the Intel-CII-DST Science Fair(IRIS). IRIS Fair was held in Ahmedabad this year, between 4-7 December 2014. These were the only two teams from Pune to make it to the IRIS finals.

This is the second consecutive year that a team from the KC Thackeray Vidya Niketan has received mentoring from the Exciting Science Group, and has been selected to the IRIS National Finals.

INNOVATIVE IDEAS 2015:

Innovative Ideas 2015 is the third edition of the ESG Research Idea Competition. The Innovative Ideas competition is an important way for us to get school students introduced to research and to the scientific method.

For the first time, we opened out the Innovative Ideas competition to school students from all over the country. 6-10th standard school students from all over the country sent in online entries that described their innovative ideas: new technologies or research questions and methods to address those questions. This year, the Exciting Science Group received nearly 160 entries from schools as far away as Chennai, Mumbai and Nagpur. Of these, 20 were selected for the final round. Of the 20 teams selected, about a third were from the Pune Municipal Corporation magnet schools (Vidya Niketans).

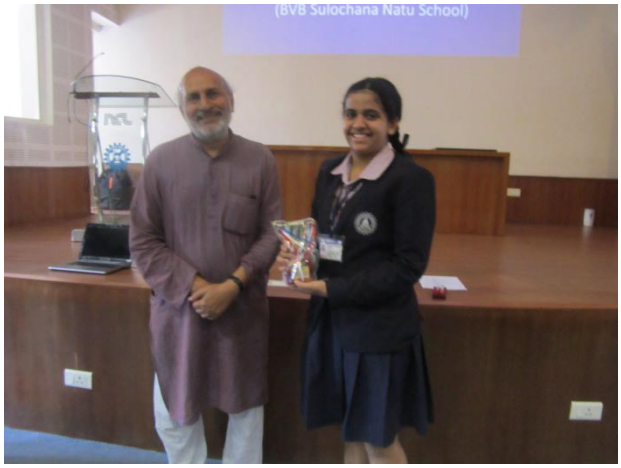
In February this year, these teams presented their ideas to researchers from CSIR-NCL and IISER, in the final round of the **"Innovative Ideas Competition 2015"** on 22nd Feb, 2015 Sunday. The **"Innovative Ideas Competition"** is a unique competition that focuses only on research/technology *ideas*.

These twenty teams presented their ideas to researchers from CSIR-NCL and IISER-Pune, who judged these ideas and selected the following winning ideas:

Position	Title of the Science Projects	Student Names	School
1st Prize	Study of interaction amongst micro-organisms with reference to observations of growth patterns in a designed environment.	Vibha Bapat Srushti Rahigude	Jnana Prabodhini
2nd Prize	Reducing carbon Footprints by recycling thermocol under household conditions	Deveesha Tudekar	BVB Sulochana Natu Vidya Mandir
3rd Prize	Mini Portable Signal Tower	Yashwardhan Dixit Tanmay Agarwal	City Pride

Photographs of Innovative Ideas 2015:

Innovative Ideas presented by student teams to judges from NCL and IISER-P



Distribution of Prizes to the participants by Chief Guest Mr Arvind Gupta

Highlights:

In the last couple of years, winners of the Innovative Ideas Competition were the only projects from Pune to get selected to the National finals of the Science and Technology Fair organized by DST/Intel/CII.

For the first time, we opened out the Innovative Ideas competition to school students from all over the country and received nearly 160 entries from schools as far away as Chennai, Mumbai and Nagpur.

Workshop on Molecular Modeling

About Workshop: Computer simulation/Molecular modeling is emerging as a powerful tool in scientific research. This hands-on workshop introduced school students to the power of computers in solving problems in physics/chemistry/biology. At the end of the workshop, students had some familiarity with molecular modeling and elementary simulations that can be done at home.

Details:

Date	Speaker	Title	Duration	No. of Participants
7 Jun 14 - 12 Jun 14	Dr Suman Chakrabarthy, Ramanujan Fellow CSIR-NCL Pune	Moleculoscope: Make them dance, make them fold	2.5 hrs/ day for 5 days	25

Photographs from the Workshops:

Faculty explains the modeling concepts

Participants explore the modeling kit

Workshop Participants

What did the participants who attended these talks say?

After the workshop, kids were asked to fill up an evaluation form in which we had asked the kids to rate us between 1 and 5 (1-Poor; 2-Okay; 3-Good; 4-Very Good; 5-Excellent) on each of the activity (content, explanation by faculty, quality of content). Overall, the workshop got a rating of either 4 or 5. We also took a feedback on the part of the workshop they enjoyed the most. Most kids equally enjoyed the explanation by faculty and working with the software tools.

Also, the students were asked for their feedback and suggestions, the following are what they had to say:

"I enjoy coming here and feel like coming every year. I could learn new things by attending this workshop. I could view and do programs that were new to me."

- Shweta Sharma,
Hutatma Balvir Vidyaniketan

"I liked the way the faculty helped us try many more programs and he explained each and every step in detail. I found the workshop really very helpful. I also liked the softwares. Thank you!!"

- Neha Chaudhari,
Dr Kalamadi High School

Press

Innovative Ideas 2014:

SUNDAY, MARCH 16, 2014

Sakal Times

CITY

Unique projects dominate 'Innovative Ideas 2014'

ST CORRESPONDENT
reporters@sakaaltimes.com

Pune: Projects like the automated fish feeder, automated drip irrigation system, eco-friendly ways to tackle river pollution etc, marked the 'Innovative Ideas 2014 Competition', on Saturday.

The competition was organised by the Exciting Science Group, an initiative of the National Chemical Laboratory (NCL) and Indian Institutes of Science Education and Research (IISER), Pune.

Students of seven schools from the city and its adjoining areas participated in the competition.

"It is organised with an aim to encourage students to present their ideas in any field. The best teams will then be selected for mentoring from the Exciting Science Group to develop their ideas into full-fledged research projects," stated Sutirth Dey, scientist from IISER.

Dey added the students participating in the competition are in the age group of 13 to 16.

"We had conducted this competition last year but at that time it was restricted to PMC schools. This time we have opened it for all schools in the city," added Dey.

Last year, the two teams mentored by the Exciting Science Group were selected for the national finals of the Intel Science Fair.

A team of eight scientists from NCL and IISER judged the performance of each team and selected the best four teams.

Vaibhav Thombare

EXPLAINING AN IDEA: Students explaining their research ideas to visitors at the 'Innovative Ideas 2014 Competition' organised at IISER, Pashan Road, on Saturday.

LIST OF WINNERS

- Bharati Rajput and Aishwarya Khiste from Hutatma Balbir School
- Shubhangi Deshmukh and Kalpana Chavan from Hutatma Balbir School
- Shreya Parchure and Kimaya Bedarkar from Abhinava Vidyalaya
- Jay Ratnaparkhi and Sanket Shinde from KC Thackeray School

QUOTE–UNQUOTE

I made an automated fish food feeder. One of our neighbours used to leave her fish tank with us when she went out of station. I used to be confused as to when to feed the fish. Hence, I developed this model which feeds food to fish in a controlled manner at regular intervals. I found that this helps in keeping the fish healthy.

– **MANASI TAMGOLE,** *Dr Kalmadi Shamarao High School*

We had done a survey on Senapati Bapat Road on the effect of high rise buildings on the surrounding environment. We found that the heat in the area has increased considerably and the level of ground water also depleted a lot in the past few years.

– **YASH JOSHI AND YASH PARGAONKAR,** *Abhinava Vidyalaya*

We have always been interested in astronomy. We were curious to know how sunsets look like in different planets. For this, we collected the data on atmospheric conditions of different planets and their distance from the sun.

– **RUCHA WANI AND CHINMAY KULKARNI,** *Vidyanchal School*

Popular Science Talk on Space Exploration Driven by "Curiosity"

NASA scientist inspires children to take up science

ANJALI MARAR
reporters@sakaaltimes.com

Pashan: It is not an everyday thing to meet and interact with a scientist of the National Aeronautics and Space Administration (NASA). But for Riya and Yash Mehta, students of Vidya Valley School, it was an opportunity that they did not want to miss.

Dr Goutam Chattopadhyay, Scientist, NASA Jet Propulsion Laboratory (JPL) was speaking to school students at a science outreach programme, organised by the National Chemical Laboratory (NCL) at Innovation Park on Sunday.

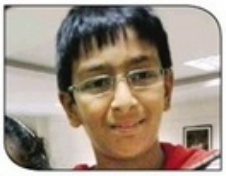
Advising the young school students assembled for the talk, Chattopadhyay said, "Anybody who is good at math, science, art, history and has computer skills along with passion to answer the fundamental questions of science, can qualify to become a space scientist. Never hesitate to stop the teacher and raise questions when in doubt, that alone can help your progress."

"I did not know how the rover 'Curiosity' had landed on Mars. But the video and the information given today has helped me understand about the same," said an excited Yash, a student of Std VI. Proud of his children, Manish Mehta said, "My children do not throw tantrums in waking up early and coming for the talk every month. They are getting to learn a lot about science outside the classroom because of this initiative by the NCL." Chattopadhyay, who has been a part of the team that built 'Curiosity', the first rover that was sent to Mars in 2011, has been associated with JPL and NASA since 1999. "The biggest challenge for scientists is to develop a working system that will function in the existing conditions of the outer space. Hence, a lot of research and experimentation happens before any major space programme is undertaken," he said.

WHAT'S NEW AT NASA?

■ Scientists at NASA have developed a stand-off explosive detector system called the Terahertz (Thz) Radar System, that could help in detecting arms, explosives or similar hazardous objects carried by the people. This could be a great breakthrough in curbing cases of suicide bombings and other bomb explosions that are generally reported at airports and railways stations.

Speaking to Sakal Times, Chattopadhyay said, "This radar can catch signal of any overt object, like a gun or a bomb from a distance of 25 metres. With the implementation of this detector, the security officers will be able to instantly act and avert major attacks."



I did not know how the rover 'Curiosity' had landed on Mars. But the video and the information given today has helped me understand about the same

– Yash, Std VI student

'ENCOURAGE STUDENTS TO TAKE UP RESEARCH'

NASA Scientist **Dr Goutam Chattopadhyay** is the Principal Engineer/Scientist at NASA-Jet Propulsion Laboratory (JPL) and a visiting professor at the California Institute of Technology (Caltech). He talks to **Anjali Marar** about Space Science and India's contribution in this field.

QUICK TAKES

What do you have to say about India's maiden Mars rover 'Mangalyan'?

I am very excited and it is going to be a big breakthrough for India. Being the first attempt, India will have to face its own challenges, which will help them identify their shortcomings before getting on to the next mission.

What is your message to the teachers who are the craftsmen of the young India?

It is very important for the teachers to encourage students to take up research so that they are made to think differently. Learning should be done more.

What is the biggest challenge for space scientists?

It is very important that the instruments that are designed do not encounter any technical glitches when already in space. Additionally, before initiating any mission, the one thing that needs to be kept in mind is whether the purpose of answering the basic scientific question is fulfilled. If both these are tackled, then the journey for a scientist is full of excitement.

PuneMirror

Thu, Jul 31, 2014 MUMBAI MIRROR | BANGALORE MIRROR | AHEMDABAD MIRROR

'Students need to innovate'

Pune Mirror | Jul 28, 2014, 02.30 AM IST

Over 50 school students attended the interactive session at NCL on Sunday

By: **Sandip Dighe**

In an interaction with school students, sr NASA scientist Goutam Chattopadhyay spoke of looking beyond marks.

In a unique interactive session, 50 school students spent part of their Sunday with NASA senior scientist Goutam Chattopadhyay, at the National Chemical Laboratory's (NCL) Innovation Park in Pashan.

The talk, organised by NCL under their Science Outreach Programme, saw students from Vidya Valley School, Vidyapratishthan, Baramati and other city-based schools in
eager attendance.

Chattopadhyay, who was also part of the team that built Curiosity, the first rover that was sent to Mars in 2011, has been associated with Jet Propulsion Laboratory (JPL), NASA since 1999.

The most common question asked was the fundamentals of becoming a rocket scientist. "Mathematics, Science, Art, History and Computer Skills are important, but you also need passion, along with curiosity and an unerring nose for questioning," Chattopadhyay said.

Students were inspired by the talk. Amey Shirke who studies in Class IX at Vidyapratishthan School, Baramati, said, "I learnt so much from today's talk, and would like to explore being a scientist. Also, I didn't have a very clear idea of how Curiosity landed on Mars, but there was a video shown as part of the programme, which helped."

Ninad Gadhe, a teacher who accompanied students to the session, lauded the interaction, saying such events help students develop an interest in science and research. "Our students attend similar programmes every month. Many of them have changed their approach towards science and are thinking seriously about doing research in the future," he said.

Speaking to Mirror, Chattopadhyay outlined the difference between academic systems in the US and India. "In the USA, undergraduate students get to do research, whereas Indian tend to focus on marks. As a result, their minds are not open to innovative ideas which can be used in research. India should encourage science at the school level," he said "We have very good institutes such as the IITs, and highly intelligent students, but the lack of leadership in academics is a problem," he added.

Chattopadhyay also expressed his curiosity about Mangalyaan — India's first spacecraft to Mars. "I am excited about Mangalyaan. Even if the mission isn't 100 per cent successful, it is still a big achievement," he said.

ESG mentored students make it to National Science Fair 2014:

City students shortlisted for IRIS national science fair

Shreya Parchure (L) and Kimaya Berdarkar

ST CORRESPONDENT
reporters@sakaaltimes.com

Pashan: Four students from the city have been shortlisted to compete in Initiative for Research and Innovation in Science (IRIS), a national science fair organised by the Department of Science and Technology (DST), INTEL and Confederation of Indian Industry (CII). The fair is to be held in December this year.

Jay Ratnaparkhi and Sanket Shinde from KC Thackrey PMC Vidyaniketan along with Shreya Parchure and Kimaya Bedarkar from Abhinava Vidyalaya have been selected to participate in the final round of the national fair.

The two teams were being mentored by Exciting Science Group (ESG) after being selected at Innovative Ideas Competition earlier this year. Later, they were working on their respective projects guided by scientists of CSIR-National Chemical Laboratory (NCL) and Indian Institute of Science, Education and Research (IISER), Pune.

Ratnaparkhi and Shinde, being mentored by Danveer Singh, are studying the effects of cell phone radiation on fruit-flies while Parchure and Bedarkar under the guidance of Sameer Huprikar are developing plastic nanoparticles degradable by Ultra Violet radiation at high altitude, in order to prevent littering on high mountains.

The winning team of the national science fair would get a chance to visit Pittsburgh, USA and represent India at the INTEL Science and Engineering International Fair.

Sanket Shinde

Jay Ratnaparkhi

EXCITING IDEAS

- The Exciting Science Group has invited applications for Innovative Ideas 2015 to be held at IISER-Pune in March next year.
- Students who wish to participate should register through their schools with the Exciting Science Group.
- At the Innovative Ideas Competition, teams will be able to present their research ideas to scientists from CSIR-NCL and IISER-Pune.
- A few teams will be selected for the next stage where they will receive mentoring from the Exciting Science Group to develop their ideas into full-fledged research projects.
- Please visit www.excitingscience.org for further details.

THE TIMES OF INDIA

City kids' works in science contest finals

Swati Shinde Gole,TNN | Nov 15, 2014, 06.43 AM IST

PUNE: Two innovative science projects developed by city-based students on degradation of plastic litter at high altitudes, especially in the Himalayas, and the effect of radiation on common flies have been selected for the national finals of the Initiative for Research Innovation in Science to be held in December.

Shreya Parchure and Kimaya Bedarkar of the Abhinav Vidyalaya and Jai Ratnaparkhi and Sanket Shinde of the K C Thackeray Pune Municipal Corporation Vidyaniketan School were mentored by the Exciting Science Group formed by scientists from the National Chemical Laboratory. The students were also guided by the Indian Institute of Science Education and Research, Pune. The winner of the contest will represent the country at the Intel Science and Engineering Fair to be held in the US.

At high altitudes, the temperature is consistently below -10 degrees with low humidity and microbes are nearly absent. As a result, plastic degrades at a very slow rate. Hence, we brainstormed on an idea which can help degrade plastic at a faster rate," said Parchure and Bedarkar.

The duo developed plastic composites containing titania nanoparticles that absorb UV radiation and monitored the degradation of these composites. "UV radiation is 30% more intense at 2,000m above sea-level. We experimented with a chemical composition of polymer-titanium dioxide (TiO_2) and added it to the plastic material while manufacturing polythene bags on a smaller scale. The chemical helped the plastic bag absorb the UV radiation and accelerate its degradation process," the students said.

In the second project, Ratnaparkhi and Shinde tried to experiment with the effect of cellphones and Wi-Fi frequencies on small organisms. "Electromagnetic radiations are used for communication everywhere including cellphones and Wi-fi. Typically, the frequency of waves used in cellphones is 900-1,800MHz, which are safe for human beings. However, they are harmful for small organisms like bats, birds and insects. Through this project, we wanted to know if the radiations of lower frequency can harm such organisms," Ratnaparkhi said.

Shinde said the duo conducted an experiment on the effect of low frequency waves (434MHz with 25mW) on the common fruit fly (Drosophila melanogaster). "The eggs of the fly were exposed to radio waves for 14 days. We went ahead with further processes and the results gained suggested that low frequency electromagnetic radiations are not harmful for the flies. This also suggested that low frequency waves can also be used in cellphones, however, more research is required in this field," he said.

Popular Science talk on "What makes Gold so precious?"

'Gold nanoparticles future of cancer cure'

Reporters Name | ST Correspondent | Monday, 29 December 2014 AT 11:26 AM IST

Gold nanoparticles, Pune, Department of Chemical Engineering, Sanat Kumar, Columbia University, effective cancer treatment, Sanat Kumar

Pune: Gold nanoparticles have a critical role to play for effective cancer treatment in the near future by ensuring targeted delivery of the drugs into the cancer tumour, a senior scientist from Columbia University said here on Sunday.

"Currently, the cancer treatment is unguided. The cancer drugs can damage the healthy body cells, cause side-effects like hair fall, while the actual tumour remains untouched by the medicine. But, usage of gold nanoparticles can help in locating the exact presence of the tumour," Chairman and Professor, Department of Chemical Engineering, Sanat Kumar told Sakal Times.

Kumar, who was in the city to deliver a talk on 'What makes gold so special and precious?' at the National Chemical Laboratory (NCL) Innovation Park on Sunday said that such application of gold would help in delivering the correct amount of dosage on the exact tumour.

"All the drugs you put inside the body would then go and hit the tumour. So, we have targeted delivery of drugs. There are drugs based on this concept and are close to entering the commercial market.

However, they have to pass the extensive rounds of clinical trials and get through the stringent US Food and Drug Administration clearance," he said.

According to the senior scientist, gold will remain the most sought-after metal in years to come because it is easily mouldable and not reactive hence it doesn't corrode.

"Somebody calculated that a total of 1,70,000 tonnes of gold is available in the world currently. India imported 250 tonnes of gold last year to meet its huge gold demand. Platinum is perhaps the closest competitor but it requires 300 degrees Celsius to melt. Which means the need for huge ovens and high expenditure. So, gold will continue to remain the most sought after metal," Kumar said.

Innovative Ideas 2015

Jnana Prabodhini students excel in competition

Pune: Students from Jnana Prabodhini won the Innovative Ideas Competition 2015. Arvind Gupta, well-known toy inventor, felicitated the students on the occasion at National Chemical Laboratory (NCL) on Sunday.

Jnana Prabodhini team comprising Vibha Bapat and Shruti Rahigude won the award for their project, 'Study of interaction amongst micro-organisms with reference to observations of growth patterns in a designed environment.'

Innovative Ideas Competition was organised by the Exciting Science Group for students across India.

In his speech, Gupta stressed on the importance in participation rather than winning prizes. He also said parents play the main role in motivating students and providing the environment to do research.

A total of 160 entries were received and 20 were selected for the final round.

These 20 teams presented their ideas to researchers from NCL and Indian Institute of Science, Education and Research (IISER), who judged these ideas and selected the top three projects. On Sunday, all 20 teams displayed their innovative ideas at the venue at NCL. Parents and teachers from all 20 schools were present on the occasion. It was also a chance for participants to see each others' projects. Teachers and parents were also engrossed in watching the presentations.

Activities of the Exciting Science Group are funded by the Forbes Marshall Foundation, the Praj Foundation and DSM, India.

INNOVATIVE IDEAS COMPETITION

Vaibhav Thombare

Students showing their innovative ideas to Arvind Gupta, chief guest of Innovative Ideas Competition at NCL on Sunday.

THE RUNNERS-UP

- **2nd prize: Deveesha** Tudekar, a student of BVB Sulochana Natu, for her idea of reducing carbon footprint by recycling thermocol under household conditions.
- **3rd prize: Tanmay** Agarwal and Yashwardhan Dixit from City Pride School for mini-portable signal tower.

We got good suggestions from the judges, which will help us in improvising our project.

—SOHA THEKEDAR

I presented natural AC concept for a vehicle. This will help me and Rishikesh Shitole, my teammate, in future.

—ANAND SHINDE

I showed chip adsorption converter for vehicular pollution control. This will improve my confidence.

—ADITYA BIYANI

Popular Science Talk on “Chemistry of Food”

Expert demystifies the chemistry of food

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Pune: The Outreach Popular Talk on 'Chemistry of Food' organised by Exciting Science Group received a huge response from students of various schools on Sunday morning.

Schools from the city and outside attended the talk.

Exciting Science Group is the initiative of National Chemical Laboratory (NCL) scientists and Indian Institute of Science Education and Research (IISER) faculty.

Magesh Nandgopal from NCL delivered the talk on chemistry that one can eat. He pointed out to the students the similarity between the laboratory and the kitchen. He said, "Kitchen itself is a laboratory where we have flasks, glasswares etc like we have in the laboratory. Also we deal with the aromatics, texture like we do in the laboratory."

Nandgopal also explained how carbohydrates and fats that work for the body and how they are differentiated due to their working. While discussing the difference between the energies generated by them, he talked about the chemical bonding which helps fats store more energy than carbohydrates. He described how important water is and the crucial role it plays in food as well as in the human body. He explained the various scientific phenomenon related to day-to-day life. The talk ended with making of ice-cream with liquid nitrogen which students enjoyed a lot.

This talk was supported by CSIR-NCL, IISER, Pune, Venture Center, Forbes Marshall Foundation, Praj Foundation and DSM India Pvt Ltd.

Mukkund Bhute

CURIOUS: Students eagerly listening to Magesh Nandgopal's talk organised by the Exciting Science Group at NCL Innovation Park, on Sunday

STUDENTSSPEAK

I liked the experiments where they showed how foam is created and the different types of foam. I also learned to understand what is healthy food and non-healthy food.

—ARNAV BANKAR

I liked the experiment of how the red cabbage helps to identify acidic food and other things which are basic in nature. This helped me to understand how our lives revolve around science.

—SIDDHI KHOPADE

Popular Science Talk on “Origin and Evolution of the Earth”

Talk on origin of Earth a hit with students

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#ExcitingScienceGroup-PopularTalksSeries

Pune: Lecture on 'Origin and Evolution of the Earth' got a huge response from students of various city schools on Sunday.

Rahul Chopra, Associate Professor, Earth Sciences and Environmental Studies, Foundation for Liberal and Management Education (FLAME), Pune, delivered a lecture on the subject at NCL Innovation Park as part of the Exciting Science Group's Popular Talks series.

The Popular Talks are a monthly series of talks that allow school students to learn more about research in various fields of science and technology. These talks are supported by the Forbes Marshall Foundation, the Praj Foundation and DSM India.

Chopra showed them how analysis of rocks reveal the history of the Deccan plateau. Starting from when the Earth was formed, over 4.5 billion years ago, Chopra showed how modern scientists use geological records to understand changes in Earth, atmosphere formation and how dinosaurs became extinct. He explained how different types of stones help to understand the process of evolution of the Earth. He said fossils are used to get more information and also explained the types of fossils.

Chopra used actual rock/ mineral samples from his collection to show the changes. He explained the types and sub-types of rocks to students and the difference between structures of rocks and crystals, how the Earth has grown and stages of evolution of Earth.

Sakal Times

DEMYSTIFYING: Rahul Chopra, Associate Professor, Earth Sciences & Environmental Studies, FLAME showing different types of stones to explain the evolution of the Earth at the NCL Innovation Park, on Sunday.