Winning with Innovation

Celebrating 10 years of Intel's science fair initiatives in India

Initiative for Research & Innovation in Science

IRIS

Win the World with Science

राविप्रौसंप NCSTC

CII

Confederation of Indian Industry

intel Education

Foreword

Intel is directly involved in education today, through the Intel® Education Initiative, to inspire and enable tomorrow's innovation. Intel believes that students everywhere deserve to have the skills necessary to become the next generation of innovators. We are actively involved in education programs, advocacy, and technology access to enable tomorrow's innovators.

Back in 1998, Intel launched our first program under the Intel Education Initiative in India: the Intel Science Talent Discovery Fair (Intel STDF). Since then, Intel STDF has grown into India's largest science promotion and fair initiative for students. Now called Initiative for Research & Innovation in Science (IRIS), it is conducted in partnership with the Department of Science & Technology, Government of India, and the Confederation of Indian Industry.

Over the last 10 years, Intel STDF and IRIS have succeeded in unearthing brilliant young minds from schools across the country at the National Fairs held every year. The National Winners have gone on to represent India and showcase their ideas to the world at the Intel International Science and Engineering Fair (Intel ISEF), held in the United States of America.

In this book, we celebrate some of the past winners, as they tell us about the impact that this scientific initiative has had upon their lives and choices. We salute their innovative ideas, which reveal the abundance of science talent that India has. We have also profiled the resource persons and scientists who have made consistent efforts across the years to make IRIS what it is today, and take this opportunity to thank them all.

Best wishes

Praveen Vishakantaiah
President, Intel Technology India Pvt Ltd

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The Story So Far...

Joyeeta Das
Corporate Affairs Group, Intel India

Since the Intel® Education Initiative was launched in India, Intel has been challenging young minds to bend the rules of science to find new answers and innovative applications. To start with this was done annually through the Intel Science Talent Discovery Fair (Intel STDF).

Launched in 1998, this nationwide initiative helped infuse a spirit of discovery in school children, increase their interest in science and technology, and build a robust scientific temper among the youth. Intel STDF gave students a platform to display their scientific aptitude, discover unique scientific solutions to everyday problems, and win public recognition and awards at the national and international level. It also encouraged students to use research as a tool for creating new knowledge about themselves and the world around them.

In February 2006, Intel STDF was merged with *Steer the Big Idea*, a joint initiative of the Department of Science & Technology, Government of India, and the Confederation of Indian Industry, to form Initiative for Research & Innovation in Science (IRIS). This is a comprehensive initiative for popularising innovation and science among students.

IRIS is now the single largest science initiative in India. IRIS conducts science fairs annually in India for middle and high school students. They compete in 10 subject categories: Bio-Chemistry, Botany, Chemistry, Computer Science, Earth and Space Science, Engineering, Environmental Science, Mathematics, Physics and Zoology.

Every year, the National Winners at IRIS (and, earlier, Intel STDF) have gone on to represent India and showcase their work to the international scientific community at the Intel International Science and Engineering (Intel ISEF), held in the United States of America. Intel ISEF is the world's largest pre-college science competition that brings together millions of young scientists to share ideas, showcase cutting-edge science, and compete for scholarships.

In India, nearly 1.5 million students have been touched by Intel's science initiatives till now. In the last 10 years, a total of 47 students Indian students have won 54 awards and accolades at Intel ISEF, including seven awards won by the eight-member Indian team at Intel ISEF 2008.

Detailed information on IRIS is available on *www.educationinindia.net* and *www.intel.com/education/in*.

"ISEF no doubt broadened my spectrum and gave me the much needed perspective and confidence... it offered me focus... and therefore, a thorough edge over other starry-eyed 16 year olds".

Madhurima Benakareddy
Intel ISEF 1999

"We had won the US Navy and Coast Guard Award! Life seemed like a dream, my heart tap-danced, and I was grinning from ear to ear".

Bharat Suresh Mhatre
Intel ISEF 2001

10 Years of Scientific Excellence:

"Personally, the thing I value the most about the ISEF experience is the level of confidence and motivation it gave me. As for my career, ISEF gave me the confidence that I can do whatever I put my mind into to the best of my ability".

Amruth B R
Intel ISEF 2004

"The other projects at ISEF were absolutely amazing. They were very ingenious and well thought out. It was evident that everyone had put in a great deal of effort to get to ISEF, and each one clearly deserved to be there."

Hamsa Padmanabhan
Intel ISEF 2006

"We had the privilege of sharing our table with Norman Ramsey, Nobel Prize winner for Physics. In the same function, we had a session with Jeanne Cavelos, an astrophysicist, and Dr David Stork, CEO of Seagate, Inc. All these are my precious memories of Intel ISEF".

Yash Vasant Joshi
Intel ISEF 2001

The Milestones

"The biggest impact that ISEF had in my life was that it changed my perspective on life; now I believe that anything is possible."

Rishin Behl
Intel ISEF 2007

"Participating in ISEF was a great chance for us to know new things related to science."

Pooja Dholakiya & Riddhi Dasani
Intel ISEF 2008

1999

St Augustine's School, Anantapur

Madhurima Benakareddy

Bio-Chemistry

Insecticides and Anti-feedants from Custard Apple Seeds

Winner at Intel ISEF 1999

Grand Awards: Third Prize of USD 1,000, Individual Category, for Bio-Chemistry

A Passion for Research

As a student at St Augustine's School in Anantapur, Andhra Pradesh, Madhurima Benakareddy was an enthusiastic participant at the Intel International Science and Engineering Fair (Intel ISEF) in 1999.

Madhurima's project, *Insecticides and Anti-feedants from Custard Apple Seeds*, at ISEF explored how biological pesticides were effective in controlling pests that were resistant to chemical pesticides. It won her a Grand Award in the Bio-Chemistry category, making her the first ever Indian winner at the prestigious forum.

Intel ISEF put her on the shining path of success, and, a year later, she was invited to participate at World Wide Young Researchers for Environment, a forum for young environmental researchers, in Hanover, Germany.

Encouraged by the exposure and recognition, Madhurima was ready for greater challenges in science, and completed her B Sc from Osmania University.

Today, Madhurima continues to indulge her passion for research and science. She is currently associated with the Tata Institute of Fundamental Research (TIFR), Mumbai, as a Research Scholar, and is pursuing her Ph D in *Animal Models of Depression*.

According to Madhurima, her exposure at Intel ISEF helped her in many ways. Among the advantages: "Experience and soft skills. It taught me the art of effective communication and making tough, yet good, choices."

With her feet firmly planted on the ground and eyes turned towards the skies, Madhurima Benkareddy is sure to achieve even greater heights in the future.

"Intel ISEF has broadened my spectrum and given me the much needed perspective and confidence... it offered me focus... and, therefore, a thorough edge over other starry-eyed 16 year olds".

2004

Sadvidya Composite Pre University College, Mysore

Physics

Wave Modulation and its Applications

Winner at Intel ISEF 2004

Grand Awards: Fourth Prize of USD 500, Individual Category, for Physics

Honorable Mention Award Certificates for International Students

Amruth B R

All I Need are Wings

When the tsunami devastated Indian shores in December 2004, Amruth B R must have felt a strange sense of *déjà vu*. It was only seven months earlier that this young boy from Mysore had wowed the judges at Intel ISEF 2004 in Oregon, USA, with his solution for reducing the impact of giant tsunami waves on a major construction project along the Japanese coastline. He showed how an effective shock absorbing system can decrease the impact of waves by modulating amplitudes.

Right from an early age, Amruth was intrigued by science, especially physics. His parents, both of whom are science graduates, have played a very vital role in nurturing his inquisitive interest in unveiling the mysteries of science. His project, *Wave Modulation and its Applications*, which won him a Grand Award at Intel ISEF, had its genesis in a documentary he saw on Discovery Channel. It showed how an ambitious Japanese construction project had been affected by a tsunami.

Today, at 21, Amruth holds a Masters degree in Physics from the prestigious Birla Institute of Technology and Science in Pilani, and is co-founder and Chief Executive Officer of a Web solutions company—Vita Beans—that helps in the recruitment and management of employees by storing neurobehavioural profiles of the candidates. His company works on algorithms to duplicate the decision making pathways in the human brain.

Amruth feels that Intel ISEF has contributed in more ways than one to his success. Apart from the confidence and penchant for success he gained from his participation at Intel ISEF, the prize money he won helped in a big way in the initial funding when he set up Vita Beans.

Talking to Amruth, it is tough to not to be affected by his highly contagious energy and optimism, and his interest in fuzzy logic and neuroscience. Every time he talks about his company and his plans for the future, you can see the sparkle in his eyes."One little dream is all it takes," he says, "to make a believer out of you..."

"Personally, the thing I value the most about the ISEF experience is the level of confidence and motivation it gave me. As for my career, ISEF gave me the confidence that I can do whatever I put my mind into to the best of my ability".

2004

Shree Baldevdas Kikani Vidyamandir Matriculation Higher Secondary School, Coimbatore

Computer Science

PESDOC – A Farmer Friendly Software for Pest Diagnosis of Crops

Winner at Intel ISEF 2004

Intel Achievement Awards: Prize of USD 5,000

Award of USD 500 US Savings Bond by AVASC Foundation

Kanishka Raajkumar

Pest Control Gets the Digital Edge

Before Kanishka Raajkumar participated at the Intel STDF in 2003, he had very little exposure to computers. But as he worked on his project, Kanishka developed quite an in-depth knowledge of computers and software programming. His new found expertise propelled him to success at Intel STDF: his project was adjudged the best in the Bio-Chemistry category. The software that Kanishka developed can analyse symptoms, identify pests, and suggest remedial measures for farmers in remote areas growing cotton, sugarcane and rice.

"Be yourself. Work hard and most importantly have fun doing that. There is no point in doing a project if you are not having fun doing it."

For young Kanishka, who was all of 14 at the time, and taking part in his first science fair, that was nothing short of a spectacular achievement. But even greater recognition was to follow: at Intel ISEF in May the following year, his project, *PESDOC – A Farmer Friendly Software for Pest Diagnosis of Crops*, won him the Intel Achievement Award, with a cash award of USD 5,000, and another award of a US Savings Bond worth USD 500 from the AVASC Foundation.

It was an article that said pests caused the maximum damage to crops that had got him thinking: "I thought these problems could be addressed with artificial intelligence and expert guidance systems." After he conceptualised the idea, Kanishka found that it was rather a tough project to handle. Apart from correcting his ignorance of computers, he had to scout for books on pest management, and transcribe them in to a simple format. But nothing could stop this boy, once he had set his mind to the task.

Kanishka recalls that his experience at Intel ISEF at Oregon was "exhilarating and entertaining". He remembers how he found the high standard of the projects quite mind-boggling. He feels he was successful in the face of stiff competition because he was able "to present my project in a clear, concise, funny and unique way to the judges." This way, he says, he could keep them entertained, "rather than them dozing off from a boring presentation!"

After his success at Intel ISEF, only the sky is the limit for Kanishka, who is currently pursuing his undergraduate degree in Computer Engineering from the University of Waterloo in Canada.

2006

Jawahar Navodaya Vidyalaya,
Meerut

Mathematics

A Novel Technique to Find Cube Root

National Winner

Amar Deep

The Problem of the Root

Life has never been the same for Amar Deep after he returned from the United States of America, where he and his teammate, Vakeel Ahmed, had gone as part of the team that represented India at Intel ISEF 2006. This village boy now has new dreams, immense motivation, and great hopes, all born out of his interaction with Nobel laureates and fellow participants from different countries.

"Before participating in the IRIS, my aim was to become an engineer but now I want to pursue a career in research related to computers."

Amar Deep is a shining example of how the nationwide network of Jawahar Navodaya Vidyalayas, the residential schools set up by the Navodaya Vidyalaya Samiti (NVS), an autonomous organisation under the Ministry of Human Resource Development, Government of India, has helped to tap into the pool of rural talent in India.

What took Amar Deep to Intel ISEF 2006 was his fascination for numbers. "Math is in my blood," says this 18 year old, whose father, a Mathematics teacher, has had a huge role to play in developing his interest in the subject.

For his project, Amar Deep and his teammate Vakeel Ahmed presented a unique way to easily calculate the *n*th root (3rd root, 4th root, and so on) of any number. Normally, this would involve a log table and differential calculus, a cumbersome and difficult process. On the other hand, the technique that he and his teammate developed is very simple and accurate, and enriches conceptual understanding as well.

Though Amar is still in college, completing his undergraduate course in advanced computer hardware and networking from the Indira Gandhi National Open University (IGNOU) , he has already moved on to a new research project related to space, which he calls "Space Elevator". Though lack of money and high speed internet connectivity are hindering his research, he is confident of completing his project in the next two years. "My dream is to become an anti-hacker," says this boy from a rural village in UP with a sparkle in his eyes.

2006

Kendriya Vidyalaya, Ganeshkhind, Pune

Physics

Physics of a Simple Prototype for Static Magnetic Levitation

Winner at Intel ISEF 2006

Second Prize of USD 1,500 by Lawrence Livermore Laboratory

Third Prize of USD 300 & UTC Stock worth approximately USD 2,000 by American Association of Physics Teachers and the American Physics Society

"The other projects at ISEF were absolutely amazing. They were very ingenious and well thought out. It was evident that everyone had put in a great deal of effort to get to ISEF, and each one clearly deserved to be there."

Hamsa Padmanabhan

A Bright New Star

Success is not new to Hamsa Padmanabhan, be it her merit list performance in Class 10 and Class 12, or her 15-page page research paper, titled *Physics of a Simple Prototype for Static Magnetic Levitation*, that won her three prestigious awards at the 2006 edition of Intel ISEF.

Hamsa's project provides an understanding of magnetic levitation of static extended bodies, and shows that a prototype can be built with inexpensive, everyday, materials. She was inspired by a magnetic pen set gifted to her by her parents. She began investigating magnets and magnetic fields, and researched the variable strengths and distances of magnets that would keep a magnetic pen suspended in mid-air.

Physics runs in Hamsa's family: she is the daughter of Vasanthi, who holds a Ph D in physics, and Thanu Padmanabhan, noted physicist and dean at the Inter-University Centre for Astronomy and Astrophysics (IUCAA) in Pune, who is also a senior visiting fellow at the Institute of Astronomy, Cambridge, and at Princeton University. Small wonder that Hamsa herself aspires to be a physicist!

For her project, Hamsa began the theoretical analysis under the guidance of her father, a specialist in quantum theory, gravitation and structure formation in the universe at IUCAA. "This is a very complex process, and my daughter analysed the forces involved in the process, as well as factors contributing towards the stability of the levitating pen," says her mentor-father.

Intel ISEF 2006 was Hamsa's second major co-curricular win. In 2004, she had won the gold medal at the prestigious all India test for Class 9 students conducted by Educational Initiatives—an organisation started by IIM-Ahmedabad alumni to bring about qualitative improvement in school education.

Hamsa Padmanbhan is currently a second year B Sc (Physics) student at Fergusson College, Pune.

2006 & 2008

Christ Nagar Senior Secondary School, Thiruvananthapuram (2006)

Bhavan's BP Vidyamandir, Nagpur (2008)

Environmental Science

Fungal Bio-Pesticide for Eco-Friendly Management of Insect Pests

Winner at Intel ISEF 2006

Grand Awards: Third Prize of USD 1,000, Individual Category, for Environmental Science

Fusarium Pallidoroseum II: Can it Control Water Hyacinth?

Winner at Intel ISEF 2008

Grand Awards: Third Prize of USD 1,000, Individual Category, for Environmental Science

Fourth Prize of USD 500, by American Phytopathological Society

"Don't waste a minute not being happy. If one window closes, run to the next window—or break down a door! When you feel down and out, just remember that the darkest hour is just before sunrise."

Swathi Soman

India's Pride: Twice Over!

It wouldn't be surprising if Swathi Soman builds a shrine to *Fusarium pallidoroseum*. After all, it is this fungus that has given her the unique experience of representing India twice at Intel ISEF. Even better, she was a winner both times!

Back in 2006, little did Swathi Soman know that her curiosity about black spots in vegetables would take her to Indianapolis as the youngest budding scientist ever selected to represent India at Intel ISEF. Swathi, who saw that her mother would always have to throw away fungi infected peas, wanted to find a solution—that, too, without using chemicals. She discovered that *Fusarium pallidoroseum* can be used to control the fungal infection in the cowpea plant. For her project, she won a Grand Award in the Environmental Science category at Intel ISEF 2006.

This passionate environmentalist from Kerala was determined to represent her country again at the international fair. She participated at the IRIS 2007, this time with a project on how to control water hyacinth, the pernicious aquatic weed—this time, it was the sight of the ghastly weed choking the water bodies around her house in Kerala that egged her on to find a solution. Swathi found an efficient method to integrate *Fusarium pallidoroseum* with cashew nut shell liquid, a byproduct of the cashew industry, and turn it into an effective bio-control agent against the weed. After her last win in 2006, Swathi knew exactly how to present an award winning project, and, at Intel ISEF 2008 in Atlanta, she won not only another Grand Award, but also an award from the American Phytopathological Society.

Swathi attributes her success to her parents and her sister, who have been a constant source of support and inspiration.

While Swathi's interactions with the Nobel Laureates at the international fairs had inspired her to try to become one some day, life seems to be taking her down another path. Currently studying in Class 12 in her Nagpur school, Swathi intends to become a Chartered Accountant.

2007

Kendriya Vidyalaya, Mankhurd, Mumbai

Engineering

A Novel Design for Magnetic Levitating Seismograph

Winner at Intel ISEF 2007

Second Prize of USD 1,500 by Shell Oil

Full Tuition Scholarship Award by University of New Mexico

First Prize of USD 1,000 US Savings Bond by AVASC Foundation

Prize of USD 500 by Society of Exploration Geophysicists

Trip to China to attend 22nd China Adolescents Science and Technology Innovation Contest (CASTIC) by China Association for Science and Technology

"The biggest impact that ISEF had in my life was that it changed my perspective on life; now I believe that anything is possible. I always liked structures and systems, though, to tell the truth, before ISEF I was confused like every other teenager. But now I believe one should do what he likes without being pressured by society."

Rishin Behl

An Ignited Mind

A keychain laser, an aircraft—and the spark of genius. That's what went into making Rishin Behl the biggest Indian winner at Intel ISEF to date.

Rishin was toying with the keychain laser, which was reflecting off the window when an aircraft passed overhead, causing the window to vibrate. Rishin noticed that this made the laser spot oscillate—it was his Eureka moment! He put his discovery to practical use in his project, *A Novel Design for Magnetic Levitating Seismograph*, which is a product of his spirit of enquiry that questioned the inability of seismographers to detect the tsunami that struck India in 2004.

From a playful experiment to a prize-winning project, it was a lot of hard work, reading, experimenting and thinking for Rishin. But not an ounce of his efforts went futile: he went on to win as many as five awards at Intel ISEF 2007. If cash prizes worth USD 3,000, a trip to the Society of Exploration Geophysicists International Exposition, and another to Kunming in China for a week to attend the 22nd China Adolescents Science and Technology Innovation Contest were not enough, he also won a full tuition scholarship award of USD 60,000 over 4 years from the University of New Mexico.

Both Rishin's parents have an engineering background, which has contributed a lot to his exceptional talent in this field. Rishin is currently studying to be a structural engineer—"because I always liked structures and systems"—at the University of New Mexico on the scholarship he won at Intel ISEF.

With a minor planet already named after him by the Lincoln Laboratory at the Massachusetts Institute of Technology (MIT), Rishin, who modestly believes that "being good at what I do is my reward", is well on his way to finding his place in the universe.

2007

Jai Hind College, Mumbai

Engineering

Design, Fabrication and Testing of an Omni-Directional Vehicle using Spherical Wheels

National Winner

Sarvesh Nevatia & Rehan Netarwala

A Smooth Ride to Success

After one of their friends met with an accident and was confined to a wheelchair, Sarvesh Nevatia and Rehan Netarwal wanted to devise a mechanism that would help him move around more easily. Taking their cue from the ball in a computer mouse, they proposed that using spherical wheels, instead of conventional circular wheels, would improve the ease of movement. It will reduce turn radius, allow free movement in any direction, increase mileage and safety, and provide better stability and grip.

The two boys come from non-technical families, but they have had a very strong instinct for science and technology from a very tender age. Says Rehan: "I have always tinkered with machines, gadgets and gizmos, repairing or improving on them." Sarvesh "loves being creative and trying to invent new things to help mankind in daily life and to make the world a better place."

IRIS 2006 was Sarvesh's and Rehan's first attempt at any national level competition, and with tremendous support from their family members, they made it a winning start. The recognition and experience they gained opened new vistas for them. They represented India at Intel ISEF 2007 in Albuquerque, New Mexico, and the 17 year old duo from Mumbai returned to India as confident and triumphant lads ready to take on the world. "We got to meet like-minded people, young scientists and engineers. We learnt a lot about other projects, and had a chance to showcase our skills as well. It was not merely a science fair; other activities like students mixer and pin exchange were really enjoyable".

Their winning project,*Design, Fabrication and Testing of an Omni-Directional Vehicle using Spherical Wheels*, was also showcased on the The Next Big Thing, a show on NDTV 24x7, India's leading English news channel.

Rehan is now a first year Mechanical Engineering student at the K J Somaiya College of Engineering in Mumbai. He aims to do an MBA and pursue a career in a technical field. Sarvesh is currently pursuing his degree in Mechanical Engineering from the Nanyang Technological University in Singapore. He aims to pursue a career related to robotics and microsystems.

"The recognition that comes with this award has significantly boosted our confidence, and will go a long way in helping us in our studies and career. It's said that the best way to predict the future is to create it. We believe we are getting by—with a little help from Intel."

2007

Modern English School, Mumbai

Vaishnavi Viswanathan

Environmental Science

Desmostachya Bipinnata/Kusha Root as an Eco-friendly Termicide

Winner at Intel ISEF 2007

Second Prize of USD 500 US Savings Bond by AVASC Foundation

Termites Meet Their Nemesis

15 year old Vaishnavi Viswanathan, the lone girl member of the Indian contingent at Intel ISEF 2007 comes from a family of accountants, but has always found science really interesting. She pondered for hours together about any phenomenon that intrigues her. "Once you find out how and why it occurred after a lot of logical reasoning, you understand how beautifully and logically the entire universe has been created."

At Intel ISEF, Vaishnavi was awarded the second prize of USD 500 in US Savings Bonds by the AVASC Foundation in the Individual Category for Environmental Science. Her project, titled *Desmostachya Bipinnata/Kusha Root as an Eco-friendly Termicide*, showed that the presence of Kusha root extract leads termites to exhibit a "lingering behaviour", while the *Desmostachya Bipinnata* extracts had potent anti-termitic properties. Using this knowledge, she developed a natural alternative to current environmentally detrimental termicides.

Vaishnavi was inspired to participate in IRIS after two students from her school—Srividya Swaminathan and Shriram Jayaraman—found success at the 2004 edition of Intel ISEF. She says that she owes most of her success to her guide. "My guide, Sitalakhsmi Parmeshwaran, was really supportive and guided me in all possible ways. After I conceived the idea, I felt lost when I did not know how to proceed. That's when she carved out a proper methodology and gave me advice on all the subjects involved. Right from going to various scientific institutions for more information to assisting me with the experiments, she was there for me. My school was also very supportive. Without my school I couldn't have achieved as much."

Surprisingly, this talented scientist does not want to pursue a career in a science related field. Genes do matter—she wants to carry on in the footsteps of her father. Currently studying in Class 11 in the Commerce stream at the Modern English School, Mumbai, she aims to pursue a career as a corporate lawyer or a Chartered Accountant.

"Respect for science was a common thread among all individuals attending the ISEF. The total experience was extremely rewarding as it gave me an opportunity to interact with students from all over the world. I felt very proud to note that the number of Indian students representing various other countries at the ISEF was very high. This event has not just given me excellent exposure but also helped me make new friends from across the globe."

2008

Sunbeam School Bhagwanpur, Varanasi

Computer Science

A Low Cost Water Based Evaporative Cooling Device for Computers

Winner at Intel ISEF 2008

Grand Awards: Fourth Prize of USD 500, Individual Category, for Computer Science

Scholarship of USD 50,000 by Florida Institute of Technology

"Representing my country at an international event gave me great personal satisfaction. Also, I feel it was a major opportunity to interact with Nobel laureates, eminent scientists, and heads of leading companies of the world."

Ambud Sharma

A Cool Solution

The absence of an airconditioner in his Varanasi home was a boon in disguise for Ambud Sharma. His old PC was forever hanging, due to overheating. He tried different ways to fix the problem, but got no respite—till he realised that the chips could be cooled by water, and that water could be cooled by evaporation.

That's the project that took Ambud to IRIS, and then to success at Intel ISEF 2008 at Atlanta. He did not have a guide for his project, and his parents did not know how to operate a computer. So it was to his cousin, who works in USA in the field of robotics, that he turned for inspiration. Ambud's groundbreaking Evaporative Cooling Device, which he named "Heat Busters", has the potential to considerably reduce the need for environmentally hazardous airconditioners that are a threat not only to individual health but also to the ozone layer.

At Intel ISEF 2008, Ambud had the good fortune of participating in a Question-Answer session over lunch with eminent Nobel laureates and the Chairman of Intel, Dr Craig Barrett. But his most cherished memories of Atlanta are the moments he shared with Mrs Elizabeth Merrinchola, the President, Society for Science & Public, Washington, USA, and Robert F Curl, who got the Nobel Prize in Chemistry in 1996. It was also gratifying when several of the eminent judges told Ambud that they look forward to his presence in the industry.

After garnering a Grand Prize and being awarded a USD 50,000 scholarship by the Florida Institute of Technology at Atlanta, Ambud is very keen on developing his project and marketing it, but a lack of corporate sponsors has hindered his endeavours thus far.

This Class 12 student at Sunbeam School dreams of being a chip designer so that he can work for Intel.

2008

Late Shree S G Dholakiya Memorial High School, Rajkot

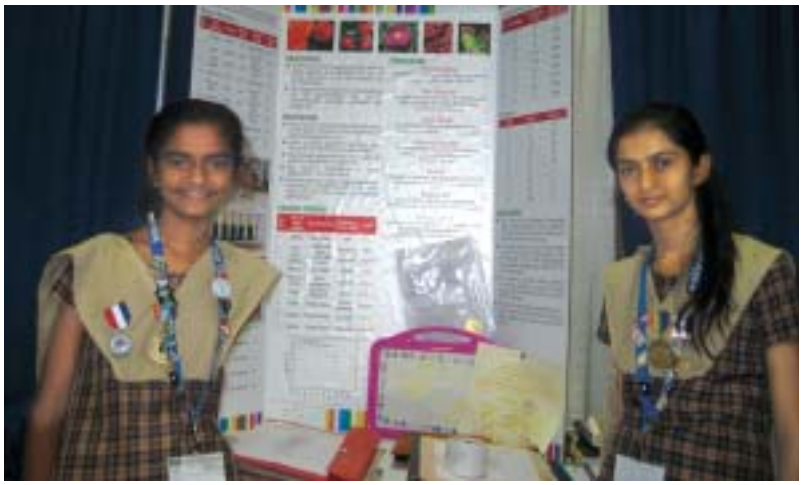
Plant Sciences

Eco-Friendly Ink for Colour Pens

Winner at Intel ISEF 2008

Third Prize of USD 1,000 by Science News

Riddhi Dasani & Pooja Dholakiya



An Edible Palette

Winning at IRIS is not the prerogative of students from big schools in the metros. Six of the eight students who represented India at Intel ISEF 2008 in Atlanta are from small towns and lesser known schools from different parts of India. Among them were Riddhi Dasani and Pooja Dholakiya, from the Late Shree S G Dholakiya Memorial High School in Rajkot.

"We have got an opportunity to bring out our talents in the field of science. We are very happy to participate in such a big scientific event."

Their trip to Atlanta was their first anywhere outside their home town, but the pride they felt at representing their country at the international level overcame any apprehensions they felt. And they did India proud, too: Riddhi and Pooja came back richer by USD 1,000, and became the first students from Gujarat to win at Intel ISEF.

The idea for their winning project, *Eco-Friendly Ink for Colour Pens*, came after Pooja saw some young children in her school licking ink from sketch pens. She discussed this with her friend and teammate, Ridhhi, and they decided to do something about it. Six long months of experiments later, they acheived their objective: a special ink that is non-toxic. Their raw material: fruits, flowers and vegetables, with their appetising colours! They successfully constructed their edible palette: yellow from turmeric, red from chili peppers, pink from roses Green-Greek, Light-Green Vetch, Pistachios-Gourd, Pink-Rose and White-Brown.

The girls consider the former President of India, Dr AP J Abdul Kalam, their idol, and his words have been their constant inspiration. Their story and their path to success have, in turn, been a great inspiration to not just the students in their school, but to others in the community. They have proved that "If you desire anything intensely, and you act upon it, then everything becomes within your reach."

After being felicitated by the Union Minister of Science and Technology, Mr Kapil Sibal, in New Delhi along with other winners at Intel ISEF 2008, they were also honoured at a special event by the Chief Minister of Gujarat, Mr Narendra Modi.

Their school has sent the inks to various laboratories in Gujarat, and the analysis has shown encouraging results.

2008

MES Kishore Kendra, Bangalore

Vishakh Hedge

Life Sciences

A Novel Low Cost Design of Tic-Tac-Toe Board Game for the Visually Challenged

National Winner

Beacon of Hope

"The visually challenged require not only our sympathy but also opportunity. It is necessary to extend a helping hand, provide opportunities and thus build confidence in them. We must realise, and also make them realise, that they are not a burden to society, but a part of it." When these words fell on 15 year old Vishakh Hegde's ears, he was inspired to make a difference in the lives of the visually impaired.

So Vishakh invented a low cost design of the tic-tac-toe board game for the visually challenged which is much more than a means of recreation. His design helps in observing changes in the behaviour and mental ability of the visually impaired as well. Instead of traditional X's and O's, there are two types of pawns which they can touch, feel and identify. The game box consists of a simple circuit on the base board. There are gaps in the circuit that are bridged when the pawns are appropriately inserted. The circuit works purely electromechanically, and there are no complex logic circuits or ICs that are used, and, hence, the game can be made at very low cost.

Tested on visually impaired students, Vishakh's tic-tac-toe proved to increase their confidence levels, ability to interact with others, and levels of enthusiasm and excitement. Based on feedback from two schools for the blind, he has constantly improved his invention. Currently, he is working on the sixth version: the circuit is now made on a Printed Circuit Board, an improvement from the earlier versions, which used thin copper sheets as conductors. It now also includes four buzzers—two to indicate wins for either player, one to indicate a drawn game, and one that indicates when a player inserts a pawn.

IIT aspirant Vishakh's role model is Albert Einstein, who has inspired him in many ways. Especially encouraging to him were Einstein's words while accepting the Nobel Prize in 1921: "Imagination is more important than Knowledge". And it was Vishakh's imagination and desire to have a perfect world, where the visually challenged will have equal opportunities, that led to his invention. He hopes to get generous funding from philanthropists and charitable organisations, so that a series of games using similar technology can be developed and distributed to schools for the visually challenged.

"As a human being, the most important conclusion I draw from this whole experience is that the visually challenged are no different from the rest of us; instead, they have much sharper senses, and a deeper understanding of the things that surround us that most of us gifted ones don't understand."

2006

DAV Public School, Bhubaneshwar

Apurv Mishra

Engineering

Glabenator – An Advanced Alternative and Augmentative Communication Device

Winner at Intel ISEF 2006

Grand Awards: Third Prize of USD 1,000, Individual Category, for Engineering.

To help his grandfather, who had suffered a paralytic attack, to communicate, Apurv Mishra conceptualised a machine that would allow paralytic, spastic, and disabled persons communicate using the muscles of the forehead. His engineering project, *Glabenator – An Advanced Alternative and Augmentative Communication Device*, won a Grand Award of USD1,000 at Intel ISEF 2006. Additionally, Apurv received a cheque of Rs100,000 from the Chief Minister of Orissa for his achievement. He also reveived the National Technology Award for Welfare of the Disabled from the former President of India, Dr A P J Abdul Kalam.

2006

Sanatan Dharam Public School, Pitampura, New Delhi

Kanishka Tiwary & Varun Mittal

Zoology

Effect of Chinaberry Fruit Extract on Feeding, Growth and Fecundity of DBM Plutella Xylostella

Winner at Intel ISEF 2006

Grand Awards: Fourth Prize of USD 500, Team Category, for Zoology

Kanishka Tiwary and Varun Mittal discovered an environment friendly way to combat a deadly moth that infests vegetables. They studied the diamond black moth that is found in cruciferous plants, such as cabbage and cauliflower, and destroys these crops. This moth also enters into the human brain and causes a severe disease called cysterosis. Kanishka, who is from a family with agricultural links, wanted to find a method to control this moth. Working with Varun, she found the solution: chinaberry fruit extract oil. They stumbled upon chinaberry oil while checking out neem leaves as a solution. An example of innovation by accident!

2007

Sishya School, Chennai

Ram Raghunathan

Computer Science

FDIS: A Fast Frequency Distribution Based Interpolation Search Algorithm for Ordered Lists

Winner at Intel ISEF 2007

Grand Awards: Second Prize of USD 1,500, Individual Category, for Computer Science

In his project, *FDIS: A Fast Frequency Distribution Based Interpolation Search Algorithm for Ordered Lists*, Ram Raghunathan has developed a novel way to guide searches based on the frequency distribution of an ordered list in the database. It, hence, conducts the search in a more intelligent fashion than the usual methods. The algorithm results in 82 to 94 per cent reduction in average time for searches, compared to other methods that achieve only 15 to 88 percent reduction.

2007

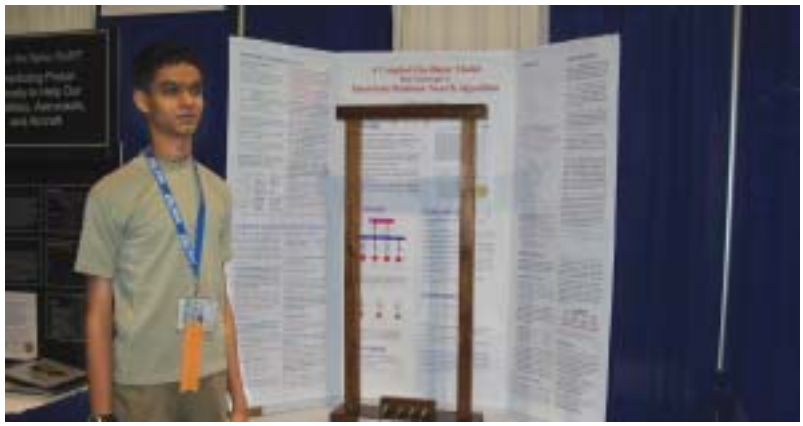
National Public School, Bangalore

Aavishkar Apoorva Patel

Physics

A Coupled Oscillator Model for Grover's Quantum Database Search Algorithm

National Winner



Aavishkar Patel's project, *A Coupled Oscillator Model for Grover's Quantum Database Search Algorithm*, demonstrates Grover's quantum database search algorithm in a simple and stable mechanical setting. It shows how the energy of a coupled oscillator may be focused into a single oscillator. This mechanism could be useful in the construction of nanotechnology devices.

2007

Dhirubhai Ambani International School, Mumbai

Physics

A Novel Advanced Brake Light Warning System to Prevent Vehicular Tailgating Accidents

Winner at Intel ISEF 2007

Grand Awards: Fourth Prize of USD 500, Team Category, for Physical Sciences

Tanay DeLima & Nikhil Khosla

Tanay Delima and Nikhil Khosla in their project 'A Novel Advanced Brake Light Warning System to Prevent Vehicular Tailgating Accidents' explored whether it was possible to reduce incidence of tailgating accidents by giving the driver in the rear vehicle additional reaction time to apply his brakes. The brake lights of a car usually come on when the breaks are applied. In their experiment the brake lights come on when the accelerator is released prior to the brakes being applied. Hence it was useful for the driver at the rear to be able to detect when the front vehicle driver's foot was taken off the accelerator.

2008

Jawahar Navodaya Vidyalaya, Mandya

Plant Sciences

Winner at Intel ISEF 2008

Second Prize of USD 500 by American Society for Horticultural Science

Lavanya H Giriraj

Lavanya Giriraj (fifth from right)

Lavanya Giriraj wanted to replace toxic chemicals that are commonly used in household products with more environmentally friendly substances. She investigated alternatives to synthetic dyes that are used in fabrics, paints, and foods. She extracted dye from the petals of *Ixora coccinea*, a fuschia-flowered plant of the coffee family. She was able to successfully dye icecream, cotton, and silk, and prepared water colours and oil paints from the pigment.

2008

Modern English School, Mumbai

Life Sciences

Winner at Intel ISEF 2008

Third Prize of USD 1,000 by Science News

Second Prize of USD 500 US Savings Bond by AVASC Foundation

Divya Venkataraman & Neha Kulkarni

Divya Venkataraman and Neha Kulkarni were distressed by the increasing cases of malaria and dengue fever around them. They were determined to find a way to prevent the spread of these diseases.

Divya and Neha developed an extract from the leaves of the papaya, and tested it at different stages of mosquito breeding. They studied the efficacy of the extract for several months, and found that the mortality rate of mosquitoes was 86 per cent. Their product is completely bio-natural, easily available, and cost effective. It doesn't cause any harm to the soil, plants, or human beings.

India at Intel ISEF

Students who have represented India at the Intel International Science & Engineering Fair (Intel ISEF)

Year	Participants	Subject Category	Awards Won at Intel ISEF
2008	**Ambud Sharma** Sunbeam School Bhagwanpur, Varanasi Uttar Pradesh	**Computer Science** A Low Cost Water Based Evaporative Cooling Device for Computers	▪ Grand Awards: Fourth Prize of USD 500, International Category, in Computer Science ▪ Scholarship of USD 50,000 by Florida Institute of Technology
	Swathi Soman Bhavan's B P Vidyamandir, Nagpur Maharashtra	**Environmental Science** *Fusarium Pallidoroseum* II: Can It Control Water Hyacinth?	▪ Grand Awards: Third Prize of USD 1,000, Individual Category, in Environmental Science ▪ Fourth Prize of USD 500 by American Phytopathological Society
	Vishakh Hegde M E S Kishore Kendra, Bangalore Karnataka	**Life Sciences** A Novel Low Cost Design of Tic-Tac-Toe Board Game for the Visually Challenged	
	Divya Venkataraman & Neha Kulkarni Modern English School, Mumbai Maharashtra	**Life Sciences** Larvicidal and Insecticidal Properties of *Carica Papaya* Leaf Extract Against Mosquitoes	▪ Third Prize of USD 1,000 by Science News ▪ Second Prize of USD 500 US Savings Bond by AVASC Foundation
	Lavanya H Giriraj Jawahar Navodaya, Mandya Karnataka	**Plant Sciences** Natural Colour from *Ixora* Flowers	▪ Second Prize of USD 500 by American Society for Horticultural Science
	Riddhi Dasani & Pooja Dholakiya Late Shree S G Dholakiya Memorial High School, Rajkot Gujarat	**Plant Sciences** Eco-Friendly Ink for Colour Pens	▪ Third Prize of USD 1,000 by Science News
2007	**Vaishnavi Vishwanathan** Modern English School, Mumbai Maharashtra	**Botany** Desmostachya Bipinnata/Kusha Root as an Eco-friendly Termicide	▪ Second Prize of USD 500 US Savings Bond by AVASC Foundation
	Ram Raghunath Sishya, Chennai Tamil Nadu	**Computer Science** FDIS: A Fast Frequency Distribution Based Interpolation Search Algorithm for Ordered Lists	▪ Grand Awards: Second Prize of USD 1,500, Individual Category, for Mathematics ▪ Second Prize of USD 500 by Association for Computing Machinery
	Rishin Behl Kendriya Vidyalaya, Mankhurd, Mumbai Maharashtra	**Engineering** A Novel Design for Magnetic Levitating Seismograph	▪ Second Prize of USD 1,500 by Shell Oil ▪ Full Tuition Scholarship Award by University of New Mexico ▪ First Prize of USD 1,000 US Savings Bond by AVASC Foundation ▪ Prize of USD 500 by Society of Exploration Geophysicists ▪ Trip to China to attend the CASTIC by China Association for Science and Technology
	Sarvesh Nevatia & Rehan Netarwala Jai Hind College, Mumbai Maharashtra	**Engineering** Design, Fabrication and Testing of an Omni-Directional Vehicle using Spherical Wheels	
	Aavishkar Apoorva Patel National Public School, Bangalore Karnataka	**Physics** A Coupled Oscillator Model for Grover's Quantum Database Search Algorithm	
	Tanay David DeLima & Nikhil Khosla Dhirubhai Ambani International School, Mumbai Maharashtra	**Physics** A Novel Advanced Brake Light Warning System to Prevent Vehicular Tailgating Accidents	▪ Fourth Prize of USD 500 by Science News

Year	Participants	Subject Category	Awards Won at Intel ISEF
2006	Apurv Mishra D A V Public School, Bhubaneshwar Orissa	Engineering Glabenator – An Advanced Alternative and Augmentative Communication Device	▪ Grand Awards: Third Prize of USD 1,000, Individual Category, for Engineering ▪ Second Prize of USD 500 US Savings Bond by AVASC Foundation
	Swathi Soman Christ Nagar Senior Secondary School, Thiruvananthapuram Kerala	Environmental Science Fungal Bio-Pesticide for Eco-Friendly Management of Insect Pests	▪ Grand Awards: Third Prize of USD 1,000, Individual Category, for Environmental Science
	Mukund Tiwari St Aloysius High School, Kanpur Uttar Pradesh	Life Sciences Multifunctional Therapeutic-cum-Mobility System for Cerebral Palsy (Spastic) Children	
	Vakeel Ahmed & Amar Deep Jawahar Navodaya Vidyalaya, Meerut Uttar Pradesh	Mathematics A Novel Technique to Find Cube Root	
	Hamsa Padmanabhan Kendriya Vidyalaya, Ganeshkhind, Pune Maharashtra	Physics Physics of a Simple Prototype for Static Magnetic Levitation	▪ Second Prize of USD 1,500 by Lawrence Livermore Laboratory ▪ Third Prize of USD 300 & UTC Stock worth approximately USD 2,000 by American Association of Physics Teachers and the American Physics Society
	Kanishka Tiwary & Varun Mittal Sanatan Dharam Public School, New Delhi Delhi	Zoology Effect of Chinaberry Fruit Extract on Feeding, Growth and Fecundity of DBM *Plutella Xylostella*	▪ Fourth Prize of USD 500 by Science News
2005	Mrunmaye V Math Indian Education Society, Mumbai Maharashtra	Bio-Chemistry Antimalarial Activity of Leaves of *Calycopteris Floribunda*	
	Anitha P R Jawahar Navodaya Vidyalaya, Mandya Karnataka	Botany Parthenium as a Friendly Plant	
	Prathik George Kendriya Vidyalaya No 1, Bangalore Karnataka	Computer Science An Algorithm for Hidden and Occluded Surface Removal from One or More Viewpoints	
	Malavika Tiwari St Mary's Convent High School, Kanpur Uttar Pradesh	Engineering A Foot-Controlled Device and Wheel Attachment for Persons with Upper Limb Disability	▪ Grand Awards: Third Prize of USD 1,000, Individual Category, for Engineering
	Mridul C A K Fertilizer Model Senior Secondary School, Nangal Punjab	Engineering Automatic Electronic Sun Tracker	
	Riddhiman Yadava & Mihir Tandon Modern School, New Delhi Delhi	Engineering Saviour Helping People Walk again	▪ Scholarship Award of USD 1,000 by National Collegiate Inventors and Innovators Alliance and The Lemelson Foundation
	Siddharth G Menon & Rohit Mohan National Public School, Bangalore Karnataka	Engineering Emulating Insert Flight for The Development of Tomorrow's Aircrafts	
	E Vindhya Revathi Vyjayanthi Takshasila Public School, Hyderabad Andhra Pradesh	Mathematics Correlation of Radii of Incircle and Circumcircle with Lengths of the Sides of Triangle: Two Specific Cases	
	Raghavendra G S B O A Schools and Junior College, Chennai Tamil Nadu	Physics Global Range Electronics Appliance Controller	
	Prahlad G Menon & Shanda Prasad P N National Public School, Bangalore Karnataka	Physics Improvement of Efficiency of Solar Cells Using Total Internal Reflection	
	Mallika Desai & Suvrata Desai Jawahar Navodaya Vidyalaya, South Goa Goa	Plant Sciences Traditional Spices, Modern Pesticides	▪ Second Prize of USD 500 US Savings Bond by AVASC Foundation
	Shaarika S Kendriya Vidyalaya, Thiruvananthapuram Kerala	Zoology *Shatavari* – A Potential Enhancer of Breast Milk Production	

Year	Participants	Subject Category	Awards Won at Intel ISEF
2004	Zeeshan Ali Sayed & Rishi Mahavir Patil Shreerang Vidyalaya, Mumbai Maharashtra	Bio-Chemistry To Study the Effect of Bio Seed Dressing on the Growth, Yield and Quality of Crop	▪ Grand Awards: Second Prize of USD 1,500, Team Category, for Bio-Chemistry
	Kanishka Raajkumar Shree Baldevdas Kikani Vidyamandir Matriculation Higher Secondary School, Coimbatore Tamil Nadu	Computer Science PESDOC – A Farmer Friendly Software for Pest Diagnosis of Crops	▪ Intel Achievement Awards: Prize of USD 5,000 ▪ Award of USD 500 US Savings Bond by AVASC Foundation
	Shriram Jayaraman & Srividya Swaminathan Modern English School, Mumbai Maharashtra	Environmental Science Paperwood – Paper from Wood? No, Wood from Paper	▪ Third Prize of USD 1,000 by Science News ▪ Scholarship Award of USD 1,500 by National Collegiate Inventors and Innovators Alliance and The Lemelson Foundation
	Sameer Yeleswarapu St Francis de Sales High School, Hyderabad Andhra Pradesh	Mathematics An Interesting Property of Right Angle Triangle	▪ Honorable Mention Award Certificate by National Aeronautics and Space Administration
	Amruth B R Sadvidya Composite Pre University College, Mysore Karnataka	Physics Wave Modulation and its Applications	▪ Grand Awards: Fourth Prize of USD 500, Individual Category, for Physics ▪ Honorable Mention Award Certificate for International Students
	Harshini Ramachandran Shri B S Mootha Girls Senior Secondary School, Chennai Tamil Nadu	Plant Sciences Eco-Friendly Products: Application of Date Palm as Bio -Manure, Cosmetics and Health Drinks	
2003	P Senthalir & S Sharanya Avila Convent Matriculation Higher Secondary School, Coimbatore Tamil Nadu	Botany Suppression of Branches in Eucalyptus Trees	▪ Fourth Prize of USD 500 by Science News ▪ Award of USD 500 US Savings Bond by AVASC Foundation
	Bhushan Prakash Mahadik Fr Agnel Junior College, Mumbai Maharashtra	Chemistry Carbon Nanotubes (CNT): A New Frontier in Nanotechnology	▪ Grand Awards: Fourth Prize of USD 500, Individual Category, for Chemistry ▪ Prize of USD 1,000 and Honorable Mention Award Certificate by National Aeronautics and Space Administration and DuPont's Center for Collaborative Research
	Sangameswaran Tejeshwar Tandon S B O A Schools and Junior College, Chennai Tamil Nadu	Computer Science Text Explorer	▪ Second Prize of USD 500 by IEEE Computer Society
	Aadhar Mittal Montfort School, New Delhi Delhi	Engineering Artificial Creation of Music Using Music Theory	▪ Award of USD 500 US Savings Bond by AVASC Foundation
	Karan Sharma Apeejay School, New Delhi Delhi	Engineering Speed Booster System for Gliders	▪ Second Prize of USD 150 by Patent and Trademark Office, US Department of Commerce and Patent and Trademark Office Society
	Maithili P Dalvi Smt Sulochanadevi Singhania School, Mumbai Maharashtra	Environmental Science The Effectiveness of Coconut Flower Extract in Stopping Abnormal and Excessive Uterine Haemorrhage	▪ Award of USD 500 US Savings Bond by AVASC Foundation
	Samhita Anand Rao & Nikhil Mukund Thatte LES BVN Sule Guruji English Medium Secondary School, Mumbai Maharashtra	Life Sciences Evaluation of In Vitro Effect of Selected Food Items on Platelet Aggregation	––-
	Varun Kumar Nagaraja Sri Vani Public School, Bangalore Karnataka	Life Sciences Diagnosis of Pregnancy in Cattle (Punyakoti Pregnancy Test)	▪ First Prize of USD 1,000 and a Certificate by American Intellectual Property Law Association

Year	Participants	Subject Category	Awards Won at Intel ISEF
2002	Anupama Bhadoria & Chetna Dudeja St Anthony's Senior Secondary School, New Delhi Delhi	Botany Fibre Bags	
	Shraddha Mangesh Telli & Shrushti Mukesh Shah J B Vachha High School, Mumbai Maharashtra	Chemistry Application of Natural Dyes on Natural Fibres	▪ Fourth Prize of USD 500 by Science News ▪ Award of USD 500 US Savings Bond by AVASC Foundation
	Akshat Singhal St Anselm's Pink City School, Jaipur Rajasthan	Computer Science The Intelligent Document Management System	▪ Summer Internship at Agilent Technologies
	Rahul Shah Cathedral & John Connon School, Mumbai Maharashtra	Computer Science Storage of Information as a Colour Code	
	Vaibhav Gupta Delhi Public School, Rourkela Orissa	Environmental Science Cow Dung: The Legacy of Ancient Pesticide Discovered	
	Madhav Pathak Joy Higher Secondary School, Jabalpur Madhya Pradesh	Life Sciences Modification in Braille Slate to Make Writing Easy for Blind	
2001	Ruchira Bajpai St Joseph's School, Shakti Nagar Uttar Pradesh	Bio-Chemistry Lowering Hyperglycaemia using Custard Apple Leaves	▪ Grand Awards: Third Prize of USD 1,000, Individual Category, for Bio-Chemistry ▪ Second Prize of USD 500 by Endocrine Society
	Yash Vasant Joshi St Xavier's High School, Mumbai Maharashtra	Engineering Bicycle Pump Modified for Household Recycling of Plastic Scrap	▪ Grand Awards: Fourth Prize of USD 500, Individual Category, for Engineering ▪ Intel Achievement Awards: Prize of USD 5,000
	Bharat Suresh Mhatre & Amit Kiran Sowani Ramnivas Ruia Junior College, Mumbai Maharashtra	Environmental Science Pollution Controller and Fuel Collector	▪ Grand Awards: Fourth Prize of USD 500, Individual Category, for Environmental Science ▪ Award of USD 5,000 by US Coast Guard Research and Development
2000	Samip Agarwal & Sarvesh Rathore Christ Church Boys Senior Secondary School, Bhopal Madhya Pradesh	Biology Shellac Industry Waste as a Chelating Agent for Uptake of Micronutrients by Plants	▪ Grand Awards: Second Prize of USD 1,500, Team Category, for Biology
1999	Madhurima Benakareddy St Augustine's School, Anantapur Andhra Pradesh	Bio-Chemistry Insecticides and Ant-Feedants from Custard Apple Seeds	▪ Grand Awards: Third Prize of USD 1,000, Individual Category for Bio-Chemistry

The National Winners

By Subject Category

Subject Category	Year	Participants
Bio-Chemistry	2005	Mrunmaye V Math Indian Education Society, Mumbai Maharashtra
	2004	Zeeshan Ali Sayed & Rishi Mahavir Patil* Shreerang Vidyalaya, Mumbai Maharashtra
	2001	Ruchira Bajpai* St Joseph's School, Shakti Nagar Uttar Pradesh
	1999	Madhurima Benakareddy* St Augustine's School, Anantapur Andhra Pradesh
Biology	2000	Samip Agarwal & Sarvesh Rathore* Christ Church Boys Senior Secondary School, Bhopal Madhya Pradesh
	2007	Vaishnavi Vishwanathan* Modern English School, Mumbai Maharashtra
	2005	Anitha P R Jawahar Navodaya Vidyalaya, Mandya Karnataka
	2003	P Senthalir & S Sharanya* Avila Convent Matriculation Higher Secondary School, Coimbatore Tamil Nadu
	2002	Anupama Bhadoria & Chetna Dudeja St Anthony's Senior Secondary School, New Delhi Delhi
Chemistry	2003	Bhushan Prakash Mahadik* Fr Agnel Junior College, Mumbai Maharashtra
	2002	Shraddha Mangesh Telli & Shrushti Mukesh Shah* J B Vachha High School, Mumbai Maharashtra
Computer Science	2008	Ambud Sharma* Sunbeam School Bhagwanpur, Varanasi Uttar Pradesh
	2007	Ram Raghunath* Sishya, Chennai Tamil Nadu
	2005	Prathik George Kendriya Vidyalaya No 1, Bangalore Karnataka
	2004	Kanishka Raajkumar* Shree Baldevdas Kikani Vidyamandir Matriculation Higher Secondary School, Coimbatore Tamil Nadu
	2003	Sangameswaran Tejeshwar Tandon* S B O A Schools and Junior College, Chennai Tamil Nadu
	2002	Akshat Singhal* St Anselm's Pink City School, Jaipur Rajasthan
	2002	Rahul Shah Cathedral & John Connon School, Mumbai Maharashtra

*Winner at ISEF

Subject Category	Year	Participants
Engineering	2007	**Rishin Behl*** Kendriya Vidyalaya, Mankhurd, Mumbai Maharashtra
	2007	**Sarvesh Nevatia & Rehan Netarwala** Jai Hind College, Mumbai Maharashtra
	2006	**Apurv Mishra*** D A V Public School, Bhubaneshwar Orissa
	2005	**Malavika Tiwari*** St Mary's Convent High School, Kanpur Uttar Pradesh
	2005	**Mridul** C A K Fertilizer Model Senior Secondary School, Nangal Punjab
	2005	**Riddhiman Yadava & Mihir Tandon*** Modern School, New Delhi Delhi
	2005	**Siddharth G Menon & Rohit Mohan** National Public School, Bangalore Karnataka
	2003	**Aadhar Mittal*** Montfort School, New Delhi Delhi
	2003	**Karan Sharma*** Apeejay School, New Delhi Delhi
	2001	**Yash Vasant Joshi*** St Xavier's High School, Mumbai Maharashtra
Environmental Science	2008	**Swathi Soman*** Bhavan's B P Vidyamandir, Nagpur Maharashtra
	2006	**Swathi Soman*** Christ Nagar Senior Secondary School, Thiruvananthapuram Kerala
	2004	**Shriram Jayraman & Srividya Swaminathan*** Modern English School, Mumbai Maharashtra
	2003	**Maithili P Dalvi*** Smt Sulochanadevi Singhania School, Mumbai Maharashtra
	2002	**Vaibhav Gupta** Delhi Public School, Rourkela Orissa
	2001	**Bharat Suresh Mhatre & Amit Kiran Sowani*** Ramnivas Ruia Junior College, Mumbai Maharashtra
Life Sciences	2008	**Vishakh Hegde** M E S Kishore Kendra, Bangalore Karnataka
	2008	**Divya Venkataraman & Neha Kulkarni*** Modern English School, Mumbai Maharashtra
	2006	**Mukund Tiwari** St Aloysius High School, Kanpur Uttar Pradesh
	2003	**Samhita Anand Rao & Nikhil Mukund Thatte** LES BVN Sule Guruji English Medium Secondary School, Mumbai Maharashtra
	2003	**Varun Kumar Nagaraja*** Sri Vani Public School, Bangalore Karnataka
	2002	**Madhav Pathak** Joy Higher Secondary School, Jabalpur Madhya Pradesh

Subject Category	Year	Participant
Mathematics	2006	Vakeel Ahmed & Amar Deep Jawahar Navodaya Vidyalaya, Meerut Uttar Pradesh
	2005	E Vindhya Revathi Vyjayanthi Takshasila Public School, Hyderabad Andhra Pradesh
	2004	Sameer Yeleswarapu* St Francis de Sales High School, Hyderabad Andhra Pradesh
Physics	2007	Aavishkar Apoorva Patel National Public School, Bangalore Karnataka
	2007	Tanay David DeLima & Nikhil Khosla* Dhirubhai Ambani International School, Mumbai Maharashtra
	2006	Hamsa Padmanabhan* Kendriya Vidyalaya, Ganeshkhind, Pune Maharashtra
	2005	Raghavendra G S B O A Schools and Junior College, Chennai Tamil Nadu
	2005	Prahlad G Menon & Shanda Prasad P N National Public School, Bangalore Karnataka
	2004	Amruth B R* Sadvidya Composite Pre University College, Mysore Karnataka
Plant Sciences	2008	Lavanya H Giriraj* Jawahar Navodaya, Mandya Karnataka
	2008	Riddhi Dasani & Pooja Dholakiya* Late Shree S G Dholakiya Memorial High School, Rajkot Gujarat
	2005	Mallika Desai & Suvrata Desai* Jawahar Navodaya Vidyalaya, South Goa Goa
	2004	Harshini Ramachandran Shri B S Mootha Girls Senior Secondary School, Chennai Tamil Nadu
Zoology	2006	Kanishka Tiwary & Varun Mittal* Sanatan Dharam Public School, New Delhi Delhi
	2005	Shaarika S Kendriya Vidyalaya, Thiruvananthapuram Kerala

The National Winners

By State

State	Participants	Year	Subject Category
Andhra Pradesh	E Vindhya Revathi Vyjayanthi Takshasila Public School, Hyderabad	2005	Mathematics
	Sameer Yeleswarapu* St Francis de Sales High School, Hyderabad	2004	Mathematics
	Madhurima Benakareddy* St Augustine's School, Anantapur	1999	Bio-Chemistry
Delhi	Kanishka Tiwary & Varun Mittal* Sanatan Dharam Public School, New Delhi	2006	Zoology
	Riddhiman Yadava & Mihir Tandon* Modern School, New Delhi	2005	Engineering
	Aadhar Mittal* Montfort School, New Delhi	2003	Engineering
	Karan Sharma* Apeejay School, New Delhi	2003	Engineering
	Anupama Bhadoria & Chetna Dudeja St Anthony's Senior Secondary School, New Delhi	2002	Botany
Goa	Mallika Desai & Suvrata Desai* Jawahar Navodaya Vidyalaya, South Goa	2005	Plant Sciences
Gujarat	Riddhi Dasani & Pooja Dholakiya* Late Shree S G Dholakiya Memorial High School, Rajkot	2008	Plant Sciences
Karnataka	Vishakh Hegde M E S Kishore Kendra, Bangalore	2008	Life Sciences
	Lavanya H Giriraj* Jawahar Navodaya, Mandya	2008	Plant Sciences
	Aavishkar Apoorva Patel National Public School, Bangalore	2007	Physics
	Anitha P R Jawahar Navodaya Vidyalaya, Mandya	2005	Botany
	Prathik George Kendriya Vidyalaya No 1, Bangalore	2005	Computer Science
	Siddharth G Menon & Rohit Mohan National Public School, Bangalore	2005	Engineering
	Prahlad G Menon & Shanda Prasad P N National Public School, Bangalore	2005	Physics
	Amruth B R* Sadvidya Composite Pre University College, Mysore	2004	Physics
	Varun Kumar Nagaraja* Sri Vani Public School, Bangalore	2003	Life Sciences
Kerala	Swathi Soman* Christ Nagar Senior Secondary School, Thiruvananthapuram	2006	Environmental Science
	Shaarika S Kendriya Vidyalaya, Thiruvananthapuram	2005	Zoology
Madhya Pradesh	Madhav Pathak Joy Higher Secondary School, Jabalpur	2002	Life Sciences
	Samip Agarwal & Sarvesh Rathore* Christ Church Boys Senior Secondary School, Bhopal	2000	Biology

*Winner at ISEF

State	Participants	Year	Subject Category
Maharashtra	Swathi Soman* Bhavan's B P Vidyamandir, Nagpur	2008	Environmental Science
	Divya Venkataraman & Neha Kulkarni* Modern English School, Mumbai	2008	Life Sciences
	Vaishnavi Vishwanathan* Modern English School, Mumbai	2007	Botany
	Rishin Behl* Kendriya Vidyalaya, Mankhurd, Mumbai	2007	Engineering
	Sarvesh Nevatia & Rehan Netarwala Jai Hind College, Mumbai	2007	Engineering
	Tanay David DeLima & Nikhil Khosla* Dhirubhai Ambani International School, Mumbai	2007	Physics
	Hamsa Padmanabhan* Kendriya Vidyalaya, Ganeshkhind, Pune	2006	Physics
	Mrunmaye V Math Indian Education Society, Mumbai	2005	Bio-Chemistry
	Zeeshan Ali Sayed & Rishi Mahavir Patil* Shreerang Vidyalaya, Mumbai	2004	Bio-Chemistry
	Shriram Jayraman & Srividya Swaminathan* Modern English School, Mumbai	2004	Environmental Science
	Bhushan Prakash Mahadik* Fr Agnel Junior College, Mumbai	2003	Chemistry
	Maithili P Dalvi* Smt Sulochanadevi Singhania School, Mumbai	2003	Environmental Science
	Samhita Anand Rao & Nikhil Mukund Thatte LES BVN Sule Guruji English Medium Secondary School, Mumbai	2003	Life Sciences
	Shraddha Mangesh Telli & Shrushti Mukesh Shah* J B Vachha High School, Mumbai	2002	Chemistry
	Rahul Shah Cathedral & John Connon School, Mumbai	2002	Computer Science
	Yash Vasant Joshi* St Xavier's High School, Mumbai	2001	Engineering
	Bharat Suresh Mhatre & Amit Kiran Sowani* Ramnivas Ruia Junior College, Mumbai	2001	Environmental Science
Orissa	Apurv Mishra* D A V Public School, Bhubaneshwar	2006	Engineering
	Vaibhav Gupta Delhi Public School, Rourkela	2002	Environmental Science
Punjab	Mridul C A K Fertilizer Model Senior Secondary School, Nangal	2005	Engineering
Rajasthan	Akshat Singhal* St Anselm's Pink City School, Jaipur	2002	Computer Science
Tamil Nadu	Ram Raghunath* Sishya, Chennai	2007	Computer Science
	Raghavendra G S B O A Schools and Junior College, Chennai	2005	Physics
	Kanishka Raajkumar* Shree Baldevdas Kikani Vidyamandir Matriculation Higher Secondary School, Coimbatore	2004	Computer Science
	Harshini Ramachandran Shri B S Mootha Girls Senior Secondary School, Chennai	2004	Plant Sciences
	P Senthalir & S Sharanya* Avila Convent Matriculation Higher Secondary School, Coimbatore	2003	Botany
	Sangameswaran Tejeshwar Tandon* S B O A Schools and Junior College, Chennai	2003	Computer Science

State	Participants	Year	Subject Category
Uttar Pradesh	Ambud Sharma* Sunbeam School Bhagwanpur, Varanasi	2008	Computer Science
	Mukund Tiwari St Aloysius High School, Kanpur	2006	Life Sciences
	Vakeel Ahmed & Amar Deep Jawahar Navodaya Vidyalaya, Meerut	2006	Mathematics
	Malavika Tiwari* St Mary's Convent High School, Kanpur	2005	Engineering
	Ruchira Bajpai* St Joseph's School, Shakti Nagar	2001	Bio-Chemistry

Participating in IRIS

Who is eligible?

If you have an idea that is original and innovative, and yo belong to any of the categories below, you are eligible to participate in IRIS, either as an individual or in a team of two:

- Category I Classes 5 to 8
- Category II Classes 9 to 12

Research-based projects alone qualify to participate at IRIS. Hence, your project must be original in content and should be substantiated with data collected from experimentation, if appropriate.

In case of a team project, if you have worked as a larger group, two persons should be nominated to represent your project. If selected for IRIS, the other members of your group need to give a No Objection Certificate to the nominees.

Projects selected from Affiliated Fairs, together with shortlisted Direct Entry projects, participate at the IRIS National Fair.

Subject Categories

Currently, there are 10 subject categories for which entries are accepted for IRIS:

1. Botany/Plant Sciences
2. Biochemistry
3. Computer Science
4. Chemistry
5. Environmental Science
6. Earth Science/Space Science
7. Engineering
8. Mathematics
9. Physics
10. Zoology/Animal Sciences

Affiliated Fairs

Various Science Fairs in the country are affiliated with IRIS:

- Navodaya Vidyalaya Samiti (NVS)
- Central Board of Secondary Education
- Union Territory and State-level Science Fairs organised by:Andhra Pradesh, Chandigarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra,Uttar Pradesh, Rajasthan.
- National Children's Science Congress (NCSC)

Projects are selected from these Science Fairs based on the judging criteria applicable to that particular year. These projects must be research based projects, and simple models of existing scientific mechanisms or principles are not allowed.

Direct Entries

In the case of direct entries, students apply for the IRIS Handbook and Registration Kit.

The Handbook can be obtained through your school, at *www.iris.educationinindia.net/iris.htm*, or through IRIS 2008 workshops. Students respond with the Participation Form, Project Details, and Project Synopses by a specified date, usually 31st August.

Scientific Review Committee

A Scientific Review Committee (SRC) screens and shortlists projects, from direct entries as well as those from Affiliated Fair. The SRC is comprised of senior scientists from distinguished institutions like the Tata Institute of Fundamental Research (TIFR), Bhabha Atomic Research Centre (BARC), Indian Institutes of Technology (IITs), Indian Institute of Science (IISc), The Energy and Resource Institute (TERI), and Science City-Kolkata, as well as highly qualified technologists from industry. In 2008, almost 60 professionals from academia and industry have volunteered their time to scan, interview and award India's most promising young scientists.

The members of the SRC take great pride in their voluntary work. The judges analyse each project with much deliberation, and give valuable feedback to the participants, thus greatly contributing to the overall educational experience of the competition.

National Fair

Projects shortlisted by the SRC are presented at the IRIS National Fairs, usually held in December. Project improvement kits are sent to all the students selected by the judges. Online chat sessions with scientists affiliated to IRIS also help shortlisted students for the National Fairs resolve project related queries and further improve their projects.

The winners of the National Fairs undergo two coaching sessions with the scientists to gear up for their participation at the international level. Winners from the National Fairs may be invited to participate at Intel ISEF, held in USA in May each year.

For more information on IRIS, and how to participate, please contact:

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