Dr. K. V. RAO SCIENTIFIC SOCIETY

KVRSS

TAMASOMA JYOTHIRGAMAYA

FRIENDSHIP WITH SCIENCE

Annual Report 2022-23

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President's Note

We are extremely pleased to report a successful, activity-filled year during which we pursued our mission with full vigour. The pandemic had induced us to develop a strong on-line presence and this year, through a very beneficial combination of our electronic out-reach and our hands-on programmes we believe we have made major strides towards achieving our objectives.

The mission of KVRSS is to popularise science among the youth, with special emphasis on school children. Through programs like the SPARK Innovation Awards, SMART Awards, School Talent Awards, Science Quiz contests etc we have been able to connect with and kindle interest in science in a large number of school children.

We were also able to fully operationalise two of our cherished plans - the Science Innovation Centre and the Mobile Science lab. Both these initiatives provide opportunities to children – specially the underprivileged – to receive expert guidance and work with their own hands - conduct physical experiments, build working models, test their own ideas. This, we believe is the basic requirement for developing a scientific temper among children and eventually launching them onto a career in science.

We are grateful to M/s Electronic Arts, Hyderabad and the Lalitha Varanasi Fund through Orange County Community Foundation for continuing their support for these projects.

The Research Awards for budding scientists got nation-wide participation and we are grateful for the subject matter specialist judges who performed the onerous task of evaluating the research papers and selecting the winners.

Our success is built upon the participation and invaluable contribution of the large number of eminent scientists, the managements of schools and institutions, the teachers and parents who guided and supported the children, the dedicated staff of KVRSS who toiled round the clock to organise our events and of course the participants themselves. The enthusiasm and the high quality of participation in our events gives us the confidence that the future of Science in India is in safe hands.

We look forward to another year of activities with the continued support and participation of all stake holders.

Mr. Anil Kumar Kutty

Vice President's Note

It was a glorious moment when Chandrayaan 3 soft landed on the moon on 23rd August 2023 on the southpole of the Moon.

India is gradually making its mark in significant scientific and technology innovations in areas of space exploration, non-conventional energy sources, 5G networks, AI, biosciences and many other fields and we are able to see the significant impact of these technologies in the country's progress in recent times.

The recent innovations in these areas in India are marked with achievement of advanced designs and solutions at a significantly lesser cost giving India a distinct competitive edge.

Needless to say these scientific and technological innovations need a strong foundation in fundamental sciences and environment which promote innovation. Our programs and efforts to encourage science education, scientific innovation in schools, universities and leading research labs is a small effort to a larger cause.

All our programs and initiatives have targeted towards encouraging and kindling interest in science in the formative years while in schools and encouraging the research scholars in Universities and research Institutes. There is a significant student community at the college level in graduate and postgraduate levels where we need to bring in more awareness of the significant opportunities which exist in scientific research. The idea is to promote innovation and encourage the bright talent amongst this section of students to pursue research and innovation. We propose to conduct Science Hackathons for undergraduate and graduate college students on specific topics of current interest. We appeal to the scientific community and institutions to help in this endeavour.

The Science Innovation Centre and Mobile Science lab have been used by many students. Most of our programs were offline and this gave an opportunity to launch new initiatives.

We actively seek involvement of the scientists and engineers from leading labs and enterprises to help encourage and promote innovation in schools and colleges and I am sure this will help students move towards innovation and improve.

We thank you all for your support and look forward to an exciting year ahead.

Mr. K. Ramamurthy

Secretary's Note

Greetings from KVRSS!!!

It has been great to be back offline after three years of online interactions. We at KVRSS were ready to get back to regular interactions with the students and the faculty for all our activities.

The year 2022-23 started with both the Science Innovation Centre and Mobile Science Lab becoming fully functional and reaching out to students from various schools. Learning concepts through hands-on has been appreciated by teachers and schools and students have found it to be enriching while being fun. Around 6000 students were impacted by the two facilities in the last academic year.

All the schools are continuing to utilise the services in the current academic year. KVRSS has tied up with more schools for the current academic year. Many institutions have contacted us and evinced interest in developing Mobile Science lab facilities. It would be a privilege to develop many more such facilities and extend the reach to needy students.

There were slight delays in the conduct of various events as the schools and other scientific institutions were adjusting schedules after Covid. However, all the annual events in the 23rd year of KVRSS were conducted successfully. These include the Research Awards, SPARK Innovation Awards, SMART Awards and School Talent Awards. All events witnessed very good participation.

Apart from the annual events KVRSS got the opportunity to conduct many more events. A major event has been the collaboration with Sri Satya Sai Institute of Higher Learning (SSSIHL), Puttaparthi, Andhra Pradesh, for the conduct of various events in science to celebrate National Science Day at their Institute. KVRSS is proud to inform that all the competitions, which included Science Posters, Science Essays, Concept Models were formulated and conducted by the KVRSS team. After online preliminary rounds, finals were held at the Puttaparthi campus. KVRSS enlisted the support of senior scientists who travelled from Hyderabad to SSSIHL campus to make the event a success.

Pi Day is an annual celebration of the mathematical constant π and is observed on March 14. KVRSS celebrated the day with a Math Quiz for schools in Hyderabad and a talk by an eminent educationist, Mr. Y. K. Gurwara, Director, Sherwood Public School, Hyderabad.

Concept and hands-on learning were given a fun twist with games and interesting experiments during summer by conducting a five-day Science Camp “Science Safari”. The students got to learn, explore, express, and have fun, all at once. The sessions were spiced up with quizzes, puzzles, story sessions and jokes. All in all, the camp was a huge success and KVRSS plans to conduct such camps regularly.

The gleam in the eyes of the students when they come to KVRSS is the reason to do much more for them. It always gives a great sense of joy to interact with students who have participated in various events of KVRSS and we wish them all the best in their future endeavours.

Sustaining an organisation requires not only manpower but also financial support. After self-sustaining for about eighteen years, when KVRSS diversified to development of labs, different organisations and individuals extended their support. We wish to place on record the support from Electronics Arts Company, Hyderabad, for the Science Innovation Centre, Lalitha Varanasi Fund for Mobile Science Lab, Mr. Karedla Phanindra for sponsoring the School Talent awards, Mr. Parekh for sponsoring the SMART awards. We are thankful to Lalitha Varanasi Fund for continuing the support for operational costs of Mobile Science Lab for the current academic year also. We received tech support from Amazon to scale up our audio-visual and content development equipment. Our gratitude to individuals and Institutions who appreciated our work and contributed generously to the cause.

The immense contribution by KVRSS committee members, technical committee members, judges' panels, volunteers, and KVRSS staff, makes the efforts of KVRSS a success.

It was a proud moment when the Chandrayan-3 mission team successfully landed the Vikram Lander on the south pole of moon. It was the triumph of scientific excellence of the scientists of our country. It has made science a buzz word and we hope many students now look at a career in science equally exciting. We are proud to mention that two of our earlier Orators have been from ISRO, Prof. B. N. Mathur in 2019 and Dr. K. Kasturirangan in 2021.

KVRSS has completed 23 years of functioning and we are now working towards our Silver Jubilee year. The Society has a vision to reach out to many more students and participate in research for societal benefit. It has been a satisfying journey so far and we look forward to inspiring many more people to make Friendship with Science.

Dr. K. Ratna

Programmes conducted in 2022-23
Annual Events

School Talent Awards

The School Talent Awards event was conducted for the students from Andhra Pradesh on 18th January 2023 in coordination with APCOST (Andhra Pradesh Council for Science and Technology). 17 teams from different districts of Andhra Pradesh presented their work based on the theme "Understanding Eco-System for Health and Well-Being" given by National Children's Science Congress NCSC under Department of Science & Technology.

The presentations were held Online, and it was noted that the quality of the projects was very good and the presentation skills of the students had increased significantly. To help these youngsters advance to the final presentations at the National Children Science Congress, a panel of professionals and scientists reviewed their work and gave the students recommendations on the key aspects in project, content, and presentation. In the process, four students were selected for awards and scholarships.

We are very happy to announce that Mr. K. Phanindra has come forward to support these awards annually. We greatly appreciate his support and to acknowledge his support the awards would henceforth be called as **Karedla-KVRSS School Talent Awards**.

The following are the four candidates selected for the awards

S Sireesha & Pydala Venkat Bhavya

Class: X

School : Z P P High School, Chennur, Nellore District, Andhra Pradesh

Project Title : Ecosystem Restoration by the Resource use of Eichhornia in Chennur Village Tank

Guide Teacher : Mr. G Vamsicharan

The Work : Liquid extracted from water hyacinth, an aquatic plant, is a good fertiliser. It is also shown to improve crop yield for vegetable crops, even better than chemical fertilisers.

Shaik Asifa & Shaik Hafsa Asra

Class: IX

School : International Delhi Public School, Proddatur

Project Title : Sanctity to Clarity

Guide Teacher : Mr. N Prashanth

The Work : Utilized used garland flowers to make eco-friendly natural dye for clothes and created awareness among the people about the benefits of eco-friendly dye clothing for health, finance, water, non-toxic, allergies, and multi-use.

G Dhasrita

Class: VI

School : St John's E High School, Vijayawada, Andhra Pradesh

Project Title : The Old Genius Kadamba

Guide Teacher : Ms Y Surekha

The Work : The work showed that Vitamin-C deficiency can be overcome by adding "Kadamba", a fruit which finds mention in ancient literature, to our daily meal plan. It helps us protect from stress-related diseases like cardiovascular disease and cancer as this fruit is highly rich in nutrients like vitamin C, calcium, and iron and has medicinal properties.

S Lasya & K Yashmin

Class: X

School : Camford EM School, Chitoor, Andhra Pradesh

Project Title : Eco-Friendly Preservatives

Guide Teacher : Mr. D Shobanbabu

The Work : Prepared eco-friendly preservative sachets using natural raw materials for storing food, to overcome the harmful effects on the human body, which occur due to the use of chemical preservatives.

"The greatest discoveries often lie not in finding new things, but in seeing familiar things in new ways."

- Alexander Fleming

"Science is a never-ending quest for truth, a journey of exploration that transcends boundaries and unlocks the secrets of the universe."

- Subrahmanyan Chandrasekhar

"The greatest triumphs of science are born out of the struggles and failures of countless experiments."

- Marie Curie

SMART Awards – (Science Meets ART)

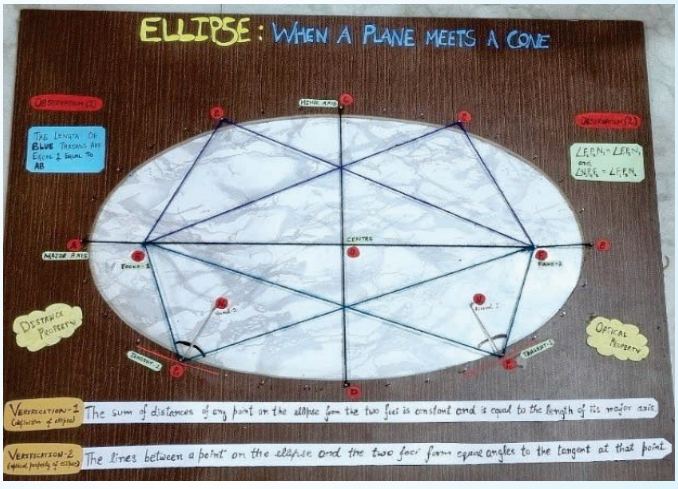
National Science Day is observed on February 28 every year to mark the discovery of the Raman effect by Indian Physicist Sir C V Raman. KVRSS celebrates the day with a competition SMART – Science Meets ART. Started in 2021 the aim of the competition is to visualize science concepts and make the students think out-of-the-box and enhance their creativity. The competition is conducted for school students from 7th to 12th grades across India.

This year our focus was on 2D and 3D math models. The students had to develop models to explain any of the concepts in Math.

The event received 113 entries for initial scrutiny from which 39 were screened for final selection. The entries were judged by a panel of experts in the field, who evaluated the models based on their originality, accuracy, creativity and usefulness. Top three models were selected for awards and consolation prizes were given to two more models.

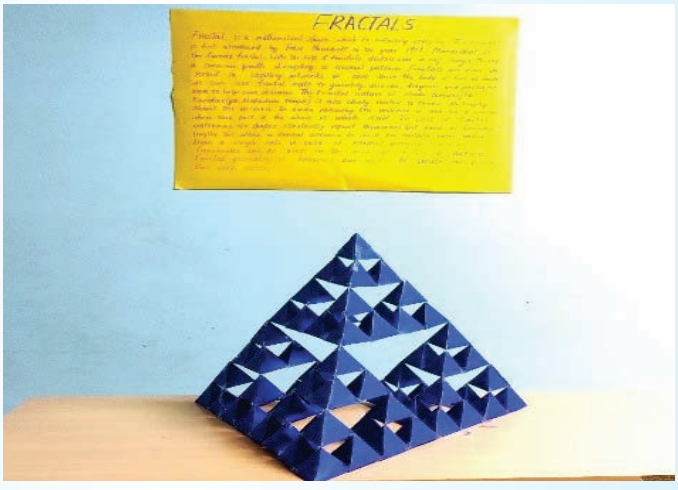
Winner

Sadrashya Singh - IX
Delhi Public School,
Buland Shahr, UP
Topic: Ellipse: When a Plane meets a Cone



Runner up I

G Lasya Sri - IX
Alphores High School,
Karimnagar, Telangana
Topic: Fractals



Runner up II

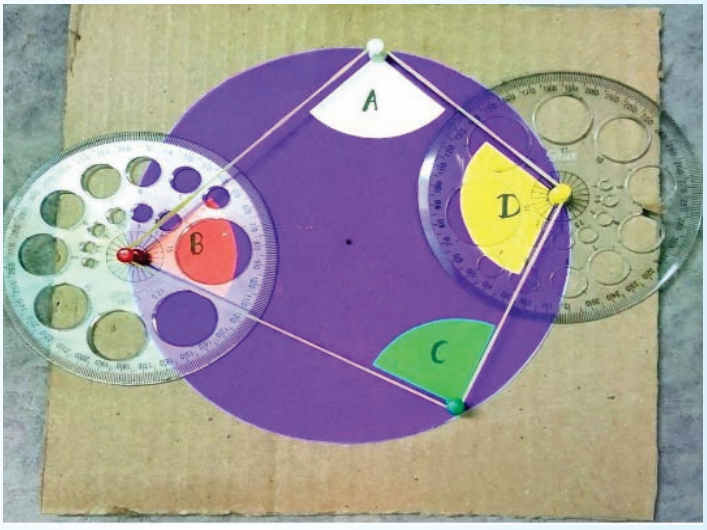
Krishna Aggarwal - VIII
DAV International School,
Amritsar, Punjab
Topic: Relationship between Volume of Cone and Volume of Cylinder

Consolation Prize

Nikunj Kumar - VIII
Mahavir Model School,
G T Road, Delhi
Topic: Clinometer

Consolation Prize

Sneha Goel - IX
DAV Public School,
Shrestha Vihar, Delhi
Topic: Cyclic Quadrilateral



Mr. Shashikant Parekh from USA has been supporting KVRSS for some years now and has pledged his continued support for the SMART awards. To acknowledge his contribution, these awards will be called **Parekh - KVRSS SMART Awards** from this year.

SPARK Innovation Awards

The Annual SPARK Innovation Awards competition provides awards to students who develop the most innovative presentations or concepts in various scientific areas of study, viz., Bhoutikam, Jeevanam, Rasayanam & Ganitam. The objective of these awards is to boost creativity and imagination among schoolchildren. The competition is open to children in classes from 7 to 12 across schools in India.

This year, there was an incredible response, with 147 projects submitted by (298 students) from 80 different schools for preliminary review. 40 of the projects, totaling 75 children, were chosen for their final presentations. The Spark Innovation Awards was held offline at the Siddhartha Nagar Welfare Association on April 8, 2023.

The projects were evaluated by a panel of judges consisting of eminent researchers and academic teachers, and projects selected for the awards were based on the quality of their work and the way they used methods of concept representation in their presentations. It turned out to be a wonderful opportunity for the participants to get feedback from prominent researchers which they could apply to scale up their projects.

The event was graced by the guest speaker, Dr. N. Madhusudhan Rao, CEO, Atal Incubation Centre – CCMB, Hyderabad. He interacted with the students and evinced a keen interest in the projects. Later he presented a talk on “Healthify India". The talk delved on the challenges faced by India in the health sector, the possible solutions for it and execution of them. He also spoke about the role of young workforce in India in tackling this issue and the supporting the programs of the government.

The Scientific team of KVRSS presented many models depicting various science concepts. Not only the students but the parents and teachers accompanying the students had a very fun-filled and informative session.

The following projects were selected for awards

Ganitam – Maths

Winner

Krishna Thapar - XI & **Khyaati Joshi** - XI

School : B C M Arya Model Senior Secondary School, Ludhiana Punjab

Guide Teacher : Mrs. Ashmita

Project Title : Mini Mobile Maths Lab (Making Maths Fun to Learn)

The Work : Designed and developed a “Mini Maths Lab” for multipurpose teaching which is Portable and of Low budget. It provides opportunity for hands on practice of mathematics activities in the class for more than 150 concepts.

Runner up

Siddhartha Hrishikesh Voleti – XI, **Utkarsh Mishra** - XI & **Kushagra Goyal** - XI

School : Tagore International School, Vasant Vihar, New Delhi

Guide Teacher : Ms. Archana Vashishtha

Project Title : Optimisation of E-Waste Management using Linear vProgramming

The Work : Developed a linear programming model which uses constraints to represent a situation. The aim is to maximize or minimize an objective function involved in collecting E-waste from dumping areas and generate profit by selling it to technical giants.

Consolation

Sahishana Amaravadi – VIII & **Kundana Vanmai Kotte** - VIII

School : Bharatiya Vidya Bhavan's Atmakuri, Hyderabad, Telangana

Guide Teacher : Ms. M. Lakshmi

Project Title : Quadratic Factor Game

The Work : Designed a 'Toy-Based Pedagogy' using old jewellry cover and pista-shells. Where using this we can find the factor of a Quadratic polynomial when one factor is given to us.

Bhoutikam – Physics

Winner

Bennet Roysten A – XI & **Vishal Deep N D** - XII

School : G D Matriculation Higher Secondary School, Coimbatore, Tamil Nadu

Guide Teacher : Ms. Juno Kamala Soundra S

Project Title : Portable Ventilator

The Work : Designed and developed a ventilator which uses a very simple concept of 'cam mechanism' to compress the ambu bag and produce the ventilated oxygen from the oxygen cylinder to the patient.

Runner up I

Milesh K – X & **Ashika K** - X

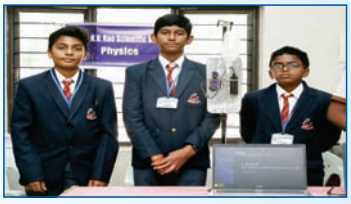
School : D A V Public School, Chennai, Tamil Nadu

Guide Teacher : Ms. Saraswathy Alias Abirami

Project Title : Vehicular Emission Monitor

The Work : Developed a sensor Vehicular Emission Monitor with GSM 900 A Module, MQ9 Pollution Sensor which measures the harmful gas levels emitted from the vehicle and displays it on the screen, and sends an SMS automatically to the Vehicle Owner If the pollution level exceeds the allowed limit.

Consolation



J Vinu – VII, **Shashank** H S - VII & **Vismay D** - VII

School : B G S National Public School, Bangalore, Karnataka

Guide Teacher : Ms. Anupama S

Project Title : I Flow

The Work : Developed a "IV drip monitoring system" using concept of light - critical angle and total internal reflection of light by which the surface of the liquid in the drip chamber acts as a mirror and reflects the light which is received by the IV Sensor. This keeps the buzzer off and the green light on showing that fluid is flowing in the drip chamber

Rasayanam – Chemistry

Winner

Reshmi A S – IX & **Niya Sara Vineeth** - IX

School : Bhavans Adarsha Vidyalaya, Kakkanad, Kerala
Guide Teacher : Ms. Mary Sorna Rani D
Project Title : Gravel Eco-Brick
The Work : Developed bricks made up of plastic and gravel with a chemical combination of fixed proportion of thermosetting plastic types like polypropylene(PP), high density polyethylene(HDPE), polyethylene terephthalate(PET)

Runner Up I

S Siddhartha Srivasthav - VII & **M Chandradhar Singh** - VIII

School : Bhavan's Vidya Bhavan's Atmakuri, Hyderabad, Telangana
Guide Teacher : Dr. Prasanna Lakshmi
Project Title : Treatments of Textile Effluents with Low Cost of Ecomaterial
The Work : Made an textile effluent treatment process using low cost and eco-friendly material and prepared immobilized beads of activated carbon using wood charcoal to successfully treat the textile effluent through biosorption

Consolation

Devarshan V - VII, **Yajat Rajpurohit M** - VII & **Sivakaveen** S - VII

School : Mahatma Montessori Matriculation Secondary School, Alagar Koil, Madurai, Tamil Nadu
Guide Teacher : Ms. Tamilselvi J
Project Title : Sustainable Water Supply for Agriculture Field 2.0
The Work : Developed an eco-friendly, low cost method which conserves water in agriculture, by creating a capsule with the use of alginate which is able to control its water release rate in order to minimize evaporation.

Jeevanam – Biology

Winner

Subhashree Sahu – IX

School : Paramita Heritage School, Karimnagar, Telangana
Guide Teacher : Mr. Lalit Mohan Sahu
Project Title : Multifunctional Ecofriendly Agro Machine
The Work : Designed especially for farmers a low-cost and affordable "Multi Functional Eco Friendly Agro Machine" which functions efficiently with four separate operations of threshing and grain separating, straw cutting, winnowing and bag stitching in a single process. This machine also operates mechanically and can also be operated through solar power

Runner up I

Prajwal N H - X

School : B G S National Public School, Bangalore, Karnataka

Guide Teacher : Ms. Rajasree Nair

Project Title : Netra AI

The Work : Designed an eye wear (NetraAI) which provides unobtrusive and intuitive design excelling in all kinds of text recognition, even handwriting in over 80 languages with Advanced Azure AI Services, Privacy and security, Language understanding and Translator, Call an Any Helpline, Envision for Enterprise.

Consolation

Sanvi Mahopatra - IX

School : Amity International School, Haryana, India

Guide Teacher : Ms. Devyani Sharma

Project Title : HAS Health

The Work : Designed a virtual assistant HAS-health watch which monitors elderly behaviours, activities, room temperature, and altitude which are available in real-time as a web server as well as on the app.

The HAS-health watch also monitors the BPM, SpO2, along with environmental critical parameters such as Room Temperature, altitude from sea level and Pressure and also Sets a medicine reminder for the elderly people.

Annual Research Awards

The Research Awards are presented to young researchers under the age of thirty who are actively engaged in fundamental scientific research, covering physics, chemistry, biology, and mathematics. The awards are given in recognition of the outstanding work done by students as part of their doctoral study.

More than 70 scholars from various institutes in India applied for awards this year in the four science disciplines. The preliminary screening was conducted online, and candidates were then shortlisted for the final presentation by a panel of distinguished scientists and professors in each discipline. As final presentations were offline, the candidates got an opportunity to engage in fruitful discussions with the judges, which aided them in gaining added insight into their potential research topics.

After carefully examining the presentations and research papers of the candidates in each category, the students for awards were chosen based on the recommendations of the panel of judges.

The following students have been selected for awards this year:

Ganitam - Maths

Winner

Abhay Jindal

Institute : Indian Institute of Science, Bengaluru, Karnataka

Project Title : Complete Nevanlinna-Pick Kernels and the Characteristic Function

Supervisor : Prof. Tirthankar Bhattacharyya

Runner Up - I

Shanola Smitha Sequira

Institute : Indian Institute of Technology, Hyderabad, Telangana

Project Title : Absolutely norm Attaining and Absolutely Minimum Attaining Toeplitz Operators

Supervisor : Prof. G Ramesh

Bhoutikam - Physics

Winner

Ranjith Kumar R

Institute : Manipal Academy of Higher Education, Manipal, Karnataka

Project Title : Multicritical Phenomenon in Topological States of Matter

Supervisor : Dr. Sujit Sarkar

Runner Up I

Riyanka Karmakar

Institute : Indian Institute of Science Education and Research, Bhopal, Madhya Pradesh

Project Title : Extreme Low-Threshold Multiple Carrier Generation in Atomically Thin MoS2 with a Giant Quantum Efficiency of 200%

Supervisor : Prof. Adarsh K. V.

Runner Up II

Choudhury Abhinash Bhuyan

Institute : Indira Gandhi Centre for Atomic Research, Kalpakkam, Tamil Nadu

Project Title : Ultra-Clean Transferred Monolayer MoS2: Implication for Field-Effect Transistors

Supervisor : Dr. Sandip Kumar Dhara

Jeevanam - Biology

Winner

Shagufta Haque

Institute : CSIR-Indian Institute of Chemical Technology, Hyderabad, Telangana

Project Title : Regulatory Pathways and Role of Smartly Engineered Casein Manganese Oxide Nanoparticles for Therapeutic Angiogenesis.

Supervisor : Dr. Chitta Ranjan Patra

Runner Up I

Sneha Gupta

Institute : Indian Institute of Technology, Kanpur, Uttar Pradesh

Project Title : Antibiotic and Exosome Functionalized Bone Cement in Synergy with Herbal Membrane to Treat Bone Infection and Execute Complete Bone Healing

Supervisor : Prof. Ashok Kumar

Runner Up II

Subholakshmi Choudhury

Institute : CSIR-Indian Institute of Chemical Technology, Hyderabad, Telangana

Project Title : Bioengineered MSCCxcr2-Keratinocyte-like Cells Derived 3D Organoid Grafting Potentiates Skin Regeneration in Chronic Diabetic Wound

Supervisor : Dr. Amitava Das

Rasayanam - Chemistry

Winner

Avulu Vinod Kumar

Institute : University of Hyderabad, Hyderabad, Telangana

Project Title : A Broadband, Multiplexed-Visible-Light-Transport in Composite Flexible-Organic-Crystal Waveguide

Supervisor : Prof. R. Chandrasekar

Debanjana Das

Institute : Tata Institute of Fundamental Research, Mumbai, Maharashtra

Project Title : Metal-Binding and Circular Permutation-Dependent Thermodynamic and Kinetic Stability of Azurin

Supervisor : Prof. Sri Rama Koti Ainavarapu

Runner Up II

Madhuparna Chakraborty

Institute : Birla Institute of Technology & Science, Pilani, Hyderabad, Telangana

Project Title : Concentration-Controlled Rapid and Selective Recognition of Putrescine using Reusable Solid-State Emitter: A Solution to Food Safety and Wastage

Supervisor : Prof. Manab Chakravarty

Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world."

- Louis Pasteur

Scientists have become the bearers of the torch of discovery in our quest for knowledge."

- Stephen Hawking

The more I learn, the more I realize how much I don't know."

- Isaac Newton

Other events conducted in 2022-23

KVRSS Foundation Day

KVRSS was formed on 9th January 2001. It celebrated its 23rd foundation day on 9th Jan 2023 at the Science Innovation center. The Science teaching staff of Srinidhi school was invited to participate in the event.

The Society flag was hoisted by our guest, Dr. Hanumantha Rao, Scientist at Advance Center of Research in High Energy Materials (ACRHEM), Hyderabad University. He was the recipient of KVRSS Research award in the year 2009.

Dr. Hanumantha Rao presented a talk on the occasion “Role and Importance of Chemistry in Modern Science and Advanced Technologies for Better Mankind”. He spoke about the various elements which can be used in fuels such as hydrogen, aluminum, boron. He also enumerated different properties and uses of Boron such as for pyrotechnics, bulletproof jackets, whitening of teeth, etc.

The Vice-President, Mr. Ramamurthy, Secretary, Dr. Ratna and the staff of KVRSS were also present at the event.

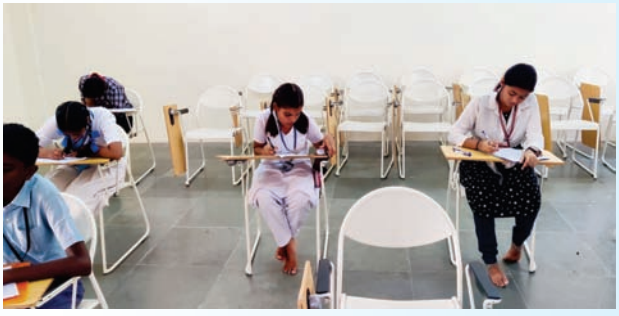
National Science Day

It was a proud moment for KVRSS when Sri Satya Sai Institute of Higher Learning, SSSIHL, Puttaparthi, invited KVRSS to organize various National Level competitions to celebrate National Science Day – 2023 at their Institute. To celebrate the event, three competitions were conducted, Essay, Painting, Science models. Students from all over India from 7th to 10th grades participated in the competitions.

The event received an overwhelming response for each of the competitions. Students selected from preliminary rounds were invited to Puttaparthi for finals on 28th February 2023.

A panel of experts in the relevant field travelled from Hyderabad to Puttaparthi along with KVRSS team, to evaluate the finals of the competitions.

The top three candidates in each competition received a cash award, a certificate, and a trophy each.





Essay Competition:

The event had received 249 entries from which 130 students were selected for first screening and 10 candidates were screened for the finals. The topics for preliminary and finals rounds

Winner

Rakesh Hrangkhawl, Class: IX**, School :** Kendriya Vidyalaya, Ambassa, Tripura

Topic : Indian Science Transcending Boundaries

Runner Up I

Prarthana Sajith, Class: IX, **School :** Bharatiya Vidya Bhavan, Valanchery, Kerala,

Topic : Indian Science Transcending Boundaries

Runner Up II

Siri Pattabhi, Class : IX, **School :** Sri Sathya Sai Vidya Vihar, Palasa, Andhra Pradesh

Topic : Indian Science Transcending Boundaries

Painting Competition:

The event had received 242 entries from which 165 students were selected for first screening and 10 candidates were screened for the finals.

Winnner

Harsha Vardhan Davuluri, Class : VIII, **School :** Sri Sathya Sai Gurukulum English Medium School, Rajamundry, Andhra Pradesh

Topic : Evolution of Science and Technology in India

Runner Up I

Arma Sadiya Rachakatla, Class: IX, **School:** MJP AP BCW Residential School, Anantpuramu, Andhra Pradesh

Topic: Evolution of Science and Technology in India

Runner Up II

Yashaswini N Raikar, Class: IX, **School:** Eshwaramma English Medium High School, Davagere, Karnataka

Topic: Evolution of Science and Technology in India

Science Models:

54 teams (137 participants) presented various models depicting the concepts in science from which the winners were selected.

Winner

Jagadeep & Anirudh, Class: VII, **School:** Sri Satya Sai Higher Secondary Boys School,
Topic: Electrolysis of Water

Runner Up I

Sumithra, Saileela & Sushmitha, Class: IX, **School:** Bheedupalli ZPH School

Topic: Hydroponic Farming

Runner Up II

Manaswini M, Duity & Srujana, Class: VIII & VI, **School:** Sri Satya Sai Higher Secondary Girls School

Topic: Hydraulic Bridge

Pi-Day celebrations

International Pie Day is celebrated on 14th March each year. This year KVRSS celebrated the event by conducting a Math Quiz for students from various schools in Hyderabad. About 300 children participated in the competition held on March 14th, 2023, at the Siddhartha Nagar Welfare Association, Hyderabad.

The quiz was conducted in two phases. In the preliminary phase, 149 teams, each team consisting of two students, from grades 7 through 10 competed. Based on their performance in the preliminary phase 6 teams were selected for the finals.

The finals of the quiz consisted of five rounds, including famous mathematicians, the history of arithmetic, reasoning, problem-solving, etc. The top three teams in the finals were presented with cash awards and certificates. The quiz was conducted by Quiz Master Mr. Rajdeep Dasgupta, who kept all the students glued to their seats with his interesting questions.

The event was graced by an eminent academician, Mr. Y.K.Gurwara, Director, Sherwood Public School, Hyderabad. He spoke about the importance of Pi, its evolution and history. With the help of models he showed easy methods of calculating pi and various properties of circles.

The following teams won awards at the event:

Winners
K V S V Ashrith - IX & **Achyuth** – IX
Hyderabad Public School, Hyderabad, Telangana

Runner up I
Swech -VII & **Rudhir** – VII
Jubilee Hills Public School, Hyderabad, Telangana

Runner up II
Havish Sastry – X & **G Vikhyat** – X
Sister Nivedita School, Hyderabad, Telangana

Consolation
Dhanush – VIII & **Suhas** – VIII
Jubilee Hills Public School, Hyderabad, Telangana

Consolation
Akshith – VIII & **Akshay** – VII
Sister Nivedita School, Hyderabad, Telangana


Math Quiz


Math Quiz


Quiz
TEAM 4
TEAM 6


Dr. K.V. Rao Scientific Society


TEAM 5
TEAM 6


TEAM 5


Math Quiz

Science Safari – Hands-on Science Concepts Camp

KVRSS has started another new initiative this year to generate interest in science among school students. The "SCIENCE SAFARI" – hands-on science concepts camps to be organized regularly which showcase various concepts in an interesting and fun-filled atmosphere. The first camp was taken up as a 5-day summer camp. It was organized at the KVRSS Science Innovation Centre, from 1st to 5th May, 2023.

This Science Safari summer camp gave an opportunity to school students to learn various concepts along with learning new scientific skills. It aimed at keeping the students engaged & providing them an even platform to Learn, explore and express their creativity, in the field of science.

A group of 16 students from classes 6 to 10 from various reputed schools of Hyderabad participated enthusiastically on all five-days. They not only made memories while having fun, but they were able to try new things, make new friends amidst lots of laughs & also learnt team spirit.

The concepts touched upon during the camp are as follows:

Biology:

Life under microscope: wherein a brief description of microscope and its parts was followed by an introduction to slides preparation by isolating lactobacillus from curd (simple staining technique), fungi from bread mold and stomata from leaves.

What's your blood type: After a brief Introduction to blood, its components, the antigens and antibodies, blood group identification of the students was performed by themselves.

It's in my DNA: In this topic DNA structure was explained followed by a short video about the research regarding discovery of DNA inside dinosaur fossils. On the practical side, DNA was extracted from Banana and human Saliva (by and of each of the student on their own).

Chemistry:

Magical separation: Students were introduced to Chromatographic separation methods, where students could separate the various colours in black ink and other secondary colours, various components in pigments in leaves like chlorophyll, xanthophyll etc. An interesting demo of surface tension with milk and different colors thrilled the students.

Physics:

Mastering measurements: Basics of units and SI units were discussed followed teaching the use of vernier calipers and screw gauge for measuring radius, diameter, length, and depth of various objects.

Physics around us: The session mainly focused on all the Newton's Laws of Motion, and each was explained through games. Tug-of-war was used to explain all the three laws and students had a blast playing it.

Light it ON: This session had students practically learning about: Series and parallel connections, relation between intensity and voltage, conduction of electricity through carbon rods, Laws of reflection and Magnetic effect through current.

Math:

Math Magic: A fun session of calculating areas and volume of various 3D figures, e.g, cube, cuboid, cone, sphere, etc. without calculating, by converting into 2D structures made the students fall in love with geometry.

The sessions were spiced up with quizzes, puzzles, story sessions and jokes which led to students asking for more. The camp ended on a colorful note with all the students being presented participation certificates in presence of their parents.






EA KVRSS Science Innovation Centre

The Innovation Centre was ready in 2021, however, due to Covid schools were closed. KVRSS took this up as an opportunity to plan the content for teaching of various concepts. KVRSS recruited teaching personnel and procured the material required for the demonstration and hands-on learning of various scientific concepts. By the time schools reopened in April 2022,

KVRSS was ready with about twenty concepts and started its implementation process immediately. The concepts cover topics in all the sciences, Physics, Biology, Chemistry and Math from classes 7 to 10. As the academic year progressed more topics were added.

The Centre has become a place of attraction, with not only students but also many teachers, scientists and parents visiting to understand the concept. **The total footfall has been more than 2000 students till date.**

KVRSS has been supporting students from government schools as well as small private schools which lack lab facilities. The students from various schools have availed themselves of the services of the Innovation Centre till date and include several Government Schools, small private schools on a regular basis.

During weekends students come from various schools like Gitanjali School, Jubilee Hills school, and Slate - The School for hands-on experience. The students are provided with the material/equipment to conduct the experiments either individually or in groups of two to three.

KVRSS has inducted adequate faculty to facilitate the process. Volunteers have been helping us in the conduct of the classes as well as content development. The programme has evoked a great response from schools and students. KVRSS plans to address many more schools on a regular basis while inviting many schools for demonstrations at the Innovation Centre.

The content developed is customized and unique such that the concepts are taught not only through demonstrations by our faculty and hands-on experimentation by students but also through different interesting games. More than 2500 students have visited and availed the facility till date.

Scientists from various research institutions in Hyderabad like the University of Hyderabad, IIT-Hyderabad, BITS-Hyderabad, IICT, and some colleges have visited the Centre and were highly impressed with the concept. They have extended their support for providing both content and demonstrations on a voluntary basis. Many teachers from various schools also visited the facility and requested support to develop labs in their schools.

We thank M/s Electronic Arts, Hyderabad for supporting us in developing and operating the Innovation Centre.





Dr. K.V. RAO SCIENTIFIC


KVRSS



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KVRSS Mobile Science Lab (KVRSS MSL)

The Mobile Science Lab was developed in February 2022 and started functioning from April 2022, when schools reopened after Covid. The concepts cover topics in all the sciences, Physics, Biology, Chemistry and Math from classes 7 to 10.

Since commissioning, KVRSS MSL has been going to various schools, both government as well as some private schools which lack adequate lab facilities. Apart from regular visits to some government schools, MSL has been going for demonstrations to many schools. Particularly, during school events like Science Fairs and Annual Days, schools have been inviting for demos. KVRSS has also been working with a few schools adopted by Rotary. Apart from these regular activities, many schools, and scientists from various organisations keep visiting MSL to understand our teaching methodology.

We started with teaching about 10 concepts and now we are equipped with content as well as material to teach all the concepts from class 7 to class 10. Apart from these, our team is also developing various games to make learning fun and easy by using jigsaw puzzles, crosswords, etc. This, we have found, reinforces the concepts being taught and at the same time the students enjoy while learning. Volunteers have been helping us in the conduct of the classes as well as content development. Till date more than 4000 students have availed the MSL facility.

Annual Memorial Oration

To encourage and inspire the students, an eminent Scientist is invited every year to present an Oration during the Annual Awards Function. We are honoured to have Dr. Tata Narasinga Rao, Director, International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), Hyderabad to present this year's Dr. K. V. Rao Memorial Oration. The topic of Oration is **"Nanomaterials Based Technologies for Energy, Health and Environment".**

Orator's Profile

Dr. Tata Narasinga Rao received his Ph.D. degree in Chemistry from Banaras Hindu University, India in 1994. He worked at IIT Madras as Research Associate before moving to The University of Tokyo in 1996 as a JSPS post-doctoral fellow. He subsequently became lecturer in the same University in 2001. Dr. Rao joined International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, India, in 2003 as senior scientist, and presently he is the Director of ARCI. In addition, he is also an Adjunct Professor at IIT-Hyderabad.

Dr. Rao is known for his translational nanomaterials research. He has developed novel, scalable and low-cost processes for suspension/powder production of nano-silver and nano-TiO_2 for self-cleaning/antibacterial textile applications, high performance Li-ion electrode materials, bio & organic waste-derived activated carbon for supercapacitors and nano-aluminium for high energy applications. Six of the technologies developed by his team are transferred to industry and commercialized. Other areas of his research interest include solar energy materials, Photocatalysis, Diamond Electrochemistry, biosensors/devices. During the pandemic situation, he has been involved in UVC-based systems and copper-coated masks for Covid-19 disinfection.

Dr. Rao has published more than 190 research papers and filed/granted more than 20 international and Indian patents several of which have been translated to technological developments. His publications have got total citations more than 16000 with an h-index of 51. The average Impact Factor for his publications of last 5 years is above 5. Dr. Rao has been a member of several project assessment / standardization and governing board committees at national level.

He is recipient of several awards and honors including 'Material Research Society of India (MRSI) Medal'-2009; 'Tokyo University of Science President Award'-2014; 'Academician of Asia Pacific Academy of Materials (APAM)'-2015; 'Technology Day National Award'-2016; Fellow of Telangana & AP Academy of Sciences'-2017; 'Bangalore India Nano Innovation Award'-2018 and Materials Science Annual Prize-2022 of MRSI. Recently, Dr. Rao has been admitted as Fellow of Royal Society of Chemistry through "Leaders in the Field" scheme.

Guest of Honour

Mr. P V V R SARMA, Director (Chemistry) & Officer in Charge, Chemical Division, Southern region, Geological Survey of India Hyderabad

Poluri Veda Vedantha Raya Sarma, born on 8th June 1974 in Hyderabad, completed MSc in Chemistry from Nagarjuna University in 1996. He started his career as Chemist at Dr.Reddy's Labs before joining Indian Customs & Central Excise Chemical Lab, Ministry of Finance, Visakhapatnam as Chemist in October 1997. During his tenure at Customs lab, analyzed different Import and export commodities including Ores, Minerals, Coal, Edible Oils, Textiles, Gold, Hydrocarbons, Polymers, Paper etc. He received appreciation from Ministry of Finance in the year 2001 for work done on Palm oil and Coal.

Mr. Sarma was selected as Assistant Manager in NMDC (National Mineral Development Corporation) in 2008. After working for an year at NMDC he was selected as Chemist (Group A, Gazetted) in Geological Survey of India and joined the Visakhapatnam M&CSD lab. During his tenure at Visakhapatnam he played a key role in establishing the Chemical Laboratory and further upgraded the laboratory with sophisticated analytical Instruments like, TOC, ISE, ICP-MS, AAS etc. for which he received appreciation Certificate from Director General, Geological Survey of India in the year 2017.

Mr. Sarma was selected as faculty in Geological Survey of India Training Institute, Hyderabad in September 2017 and continued there till July 2022. During his tenure at GSITI he visited more than 60 Degree and PG Colleges and 6 Universities in Andhra Pradesh and Telangana states under “Bhuvisamvad” Programme of Ministry of Mines and promoted the Basic Sciences. He tried to bridge the gap between the Educational Institutes and Industry to enlighten the students regarding Opportunities in Government Organizations. He was awarded the Certificate of Appreciation from Director General, Geological Survey of India in the year 2019 for this work. He was appointed as Director in the month of March 2023.

He has visited USA and Denmark to undergo training programme in MBES and CTD through Government of India, Ministry of Mines.

He has published 5 International/National Papers in different Journals. He is a Member of Inorganic Chemicals Sectional Committee CHD-1 of BIS for formation and amendment of various Bureau of Indian standards.

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