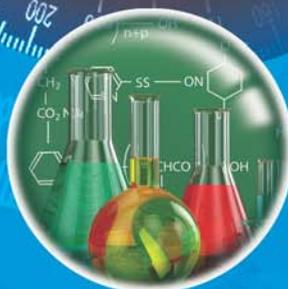
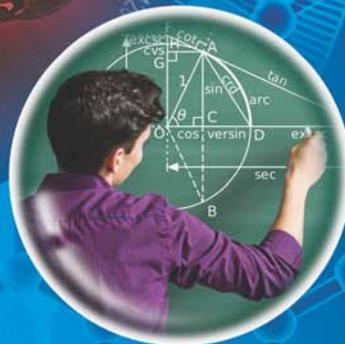


ANNUAL
REPORT
2017-18



TAMASOMA JYOTHIRGAMAYA
FRIENDSHIP WITH SCIENCE

Dr. K. V. RAO SCIENTIFIC SOCIETY

FRIENDSHIP WITH SCIENCE

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President's Note

Dr. K. V. Rao Scientific Society (KVRSS) was formed in 2001 in the memory of late Dr. K. V. Rao, who as Superintending Chemist of Geological Survey of India, was instrumental in setting up the Chemistry Laboratories of GSI, Hyderabad and made pioneering contributions to the gigantic task of cataloging the geological endowments of the country.

The Mission of the Society is to popularize science among the youth of this country – particularly school children – through a variety of programs that encourage deep understanding of the basics, tests insights of various concepts of science and requires students to work with their hands in developing innovative projects.

This year too, the various programs were conducted under the able stewardship of our dynamic Secretary Dr. Ratna in a most befitting manner. The number of participants in the competitions was not only very large, their depth of knowledge and the quality of the exhibits was of such a high order that the judges had a difficult time in selecting the winners. In all, over a couple of thousand potential budding scientists – school children from the five southern states of Telangana, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala – took part in the various events organized by the society. The Research Awards also had tremendous response with over 120 research scholars sending their papers in the fields of Chemistry, Physics, Biological Sciences and Mathematics.

Special mention must be made of the quality of participation in the '**Spark Innovation Contest**' – which is now being conducted for the seventh year by the Society. Right from the beginning, KVRSS has recognized the need to go beyond the conventional school science curriculum and examination system involving memorizing formulae and specific lessons. The 'Spark Innovation Contest' requires students to not just understand scientific concepts, but reflect and think deeply and come up with original ideas on harnessing the concepts they have learned to address issues faced in daily life. In the process of researching, thinking creatively and making projects with their own hands, through the process of experimentation, trial and error – the students not only develop a deep understanding of the basic scientific principles involved, they also develop a lasting love for science, which we in KVRSS hope, will lead them to a career in science. In the seventh year of the contest we are happy to report that there were some outstanding entries which amply demonstrated that the future of Indian science is in safe hands.

We are especially heartened that at the state and national level too, the importance of Innovation and Creativity is being recognized. A very promising initiative by the National Council for Science Museums, Government of India, is the creation of a series of Innovation Hubs in the country which aims at 'fostering problem-solving and project-based learning and engagement in the process of science, technology and innovation'. This concept fits perfectly into the activities of the society and we are trying to set up an Innovation Hub at the KRSS centre at Madura Nagar. With this very ambitious project we hope to further broaden and deepen our efforts in achieving our Mission objectives.

Anil Kumar Kutty

Secretary's Note

The year 2017-18 was a good year for the Society in terms of student participation. In all the activities conducted, there was overwhelming response and it was a challenge for the Society to work out the logistics in the conduct of various events. In Particular for the Research awards and Spark Innovation awards events, which involves participation of students from all parts of southern India. The quality of the papers / projects submitted has also been of very high standard making the job of our judges' panels a tough one. The judges enjoyed their task, commenting that the work presented by students' shows that good research work is happening in the Country and over the years the students awareness has increased and they are abreast with the various happening all over the world, thanks for the information technology and its usage. The need of the hour is to inspire these students to have belief in the importance of their work.

The main thrust of KVRSS this year has been the development of infrastructure for school children towards touch and feel of science. Towards this, the office premises of KVRSS is being converted to an Innovation Centre, with already a number of table top models, either procured or fabricated, for easy understanding of various scientific concepts. KVRSS is gearing up to provide place, equipment and mentorship to students interested in developing science projects at this centre.

A meet of research awardees of yesteryears, those who are now in various scientific positions in and around Hyderabad, was organized to take suggestions and support in designing the content of the Innovation Centre. Some of them extended support to provide models to explain concepts, for example, a dialysis unit to understand the function of kidneys, spectroscope to study Raman scattering, a de-fluoridation unit to understand the process of fluoride removal from water, etc. The suggestions given by them have been extremely useful and with their help we are working towards making this place a unique science centre.

We feel proud to inform that two of our earlier Orators, Prof. P. Rama Rao and Prof. Mustansir Barma visited our centre and appreciated the process of development of the science centre and provided valuable suggestions to make the Centre a place for enjoying science..

This is the 18th year of KVRSS and we feel proud that a number of scientists and people interested in Science have been supporting us. In our effort to make KVRSS a significant place for promotion of Science (as we call it "Friendship with Science" from its Office – Friendship Heights), we are proposing to involve senior scientists from reputed institutions, under whose guidance we hope to develop models and thoughts where learning of science becomes a joy and appreciation of good work is encouraged and motivated.

We thank all, who have been supporting us with their valuable thoughts and through their generous donations including scientific instruments.

Dr. K. Ratna

Programmes 2017-18

1. Science Quiz Awards

The Science Quiz, in its 12th year, was successfully conducted in five major cities of Telangana and Andhra Pradesh, viz., Hyderabad, Warangal, Vijayawada, Visakhapatnam and Tirupati. The finals were conducted at Hyderabad. It is heartening to see more girls participating in quiz and also making it to the finals.

Each of the zonal rounds has a preliminary round from which six teams are selected for the final zonal round and two teams each are selected for the Finals.

The Winners and Runners-up at the zonal competitions were



Winners | Visakhapatnam

Aryan Saple & Yash Chaturani

Timpany School (ICSE), CBM Compound, Visakhapatnam



Runners up | Visakhapatnam

S.Y.K. Harsha Vardhan & P. Arnab Raju

Timpany School (ISC), CBM Compound, Visakhapatnam



Winners | Vijayawada

M.V. Nikesh Kumar & N. Sankeerti

N.S.M. Public School, Vijayawada



Runners up | Vijayawada

Y. Durga Babu & T. Prasanna Kumar

Ravindra Bharathi Public School, Vijayawada



Winners | Warangal

Prachuit Priyadarshini Sahoo & V. Anshul

Delhi Public School, Warangal



Runners up | Warangal

K. Anjani Vaishnavi & P. Sharvari Moukthika

St. Peter's Central Public (Senior Sec+2) School, Warangal



Winners | Tirupati

P. Sai Jayanth & P.V. Kaushik Reddy
BVB's S.V.V. Bhavan's Campus, Tirupati



Runners up | Tirupati

Kiiran Jadhav & S. Venkata Sathvik
Sister Stanislas Memorial English School, Kurnool



Winners | Hyderabad

Shaik Shoiab & Yash Rekhari
Army Public School, Secunderabad



Runners up | Hyderabad

Shubham Haran & K. Sai Prajwal
Page Junior College, Hyderabad

Finals at Hyderabad

Every event by KVRSS is designed such that the students not only compete but also are imparted scientific inputs in some unique manner. Thus there is a book round, wherein a book based on scientific concepts (Disappearing Spoon by Sam Kean) is presented to the students selected for finals at least a week before the event. Questions are framed from the book for one of the rounds, yet the teams have a tough time answering the questions. Apart from this, the quiz also had a round based on a scientific presentation and various standard rounds, including buzzer rounds which keeps the students on their wits. This year Shubham Haran & K. Sai Prajwal from Page Junior College and Shaik Shoiab & Yash Rekhari from Army Public School, both from Hyderabad, grabbed the winners and runners-up positions respectively.



Scientific Talk by Prof. P.K. Thiruvikraman at Science Quiz Finals

Prof. P.K. Thiruvikraman, Head, Department of Physics, Birla Institute of Technology & Science, Pilani, Hyderabad Campus presented a talk on **“How we know what we know about stars and planets?”** He described how stars were formed, how to study the distance of the stars from earth and methods to calculate mass of sun and radius of earth from the various phenomena that can be observed from the earth. One of the quiz rounds was based on the above presentation.



2. School Talent Awards

The 15th School Talent Awards event was conducted in two locations, at Vijayawada for students from Andhra Pradesh and at Hyderabad for students from Telangana simultaneously on 25th December, 2017. The students presented their work based on the theme **“Science and Technology for Sustainable Development”** and its sub-themes which are given by **Department of Science & Technology (DST), New Delhi**. A panel of eminent educationists and scientists not only evaluate their work but also guide them on the important points in both subject and presentation as these students proceed to the final presentations at National Children Science Congress. A total of six candidates from the two states were selected for scholarships.

The awardees for the year are

Telangana State Council of Science & Technology



K. Koushik | Vishwa Bharathi High School, Vinayak Nagar, Nizamabad.

Class : X

Project title : “An Aid for the Blind ”

Guide Teacher : Marian Serena Francis

The work : Involves development of low cost Blind Aid (ID Card) based on IR Invisible light. It is a small device with less maintenance. The device can detect obstacles up to 30 meters and can alert blind people with Bluetooth voice.

V. Sai Shivani | Indur High School, Achanpally, Bodhan, Nizamabad.

Class : IX

Project Title : “The Effect of Typha Latifolia Beads in the Removal of Heavy Metals from Water”

Guide Teacher : P. Ujwala

The work : The plant Typha Latifolia is known to absorb heavy metals from water, even industrial effluents. In this work extract from tissues of the plant is mixed with Alginate and agarose to make beads and cubes respectively and used for extraction of lead from water. Agarose cubes showed high efficiency and lead free water was obtained from pond water also.



Andhra Pradesh Council of Science & Technology



V. V. Rajith Elipe

Sri Prakash Vidya Niketan, PL Puram Village, Payakaraopeta, Visakhapatnam.

Class : IX

Project Title : “Practice Mixed Cropping and Get Benefitted”

Guide Teacher : G.V.S. Trinadh

The work : Involves the practice of traditional cultivation through multi cropping method. This has led to better yields and productivity as compared to mono cropping method. Also the crop showed increase in soil fertility and pest resistance.

D.N.S. Meghana | Z. P. Girls High School, Chodavaram, Visakhapatnam.

Class : IX

Project Title : "Beware Consumer"

Guide Teacher : K.V.V. Ratnamala

The work : Shows the health benefits of using moringa leaf extract as clarificant in the preparation jiggery instead of the often used sodium hydrogen sulphite and caustic soda. The use of these chemicals has detrimental effect on humans. Moringa leaves are an excellent source of many vitamins and minerals and also improve the colour, quality and storage capacity of jaggery.



M. Gowhati | Z.P. High School, Chitvel, YSR Kadapa District.

Class : IX

Project Title : "Open Defecation – Dry latrine"

Guide Teacher : B. Ravishankar Reddy

The work : The project describes the importance of dry latrines as a solution to curb open defecation particularly in areas with scarcity of water

J. Rajanikanth | Z.P.H. School, Bachehalli, Settur Mandal.

Class : VII

Project Title : "Treatment Through Biometric Health Profile"

Guide Teacher : M. Suresh Kumar

The work : Highlights the benefits of maintaining Biometric Health profiles of patients. This would decrease the cost of repeating investigations and help the doctor to understand the case history very easily. This would also increase the accountability of the doctors and lead to better treatment of the patient.



3. SPARK Innovation- Awards

This event is now becoming popular and also competitive. Last two years have seen the quality of projects submitted improving vastly. The competition is open for school students from the States of Telangana, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.

In its 7th year SPARK event saw about 140 projects from various schools for initial scrutiny from which 33 projects were selected for the competition held on 20th January 2018. A panel of eminent scientists and science teachers judged the projects and a total of ten projects were shortlisted for awards. The final six winners will be announced during the annual function. The selections were made in two categories and the shortlisted projects are as follows:

Category 1 – Classes 7th to 9th



L. Sai Sruthi, B. Sruthi Sahithi & S. Shreya Sree

Paramita IIT and Medical League, Karimnagar, Telangana.

Class : VIII

Project Title : “Mathematical Path Finder.”

Guide Teacher : Lalit Mohan Sahu

The work : The main objective behind the construction of the exhibit was to find the shortest possible path between different points through different medium using laws of reflection and refraction and triangles and parallel lines.

Srikari Ammanamanchi & Shriya Vadavalli

Manthan School, Tellapur Branch, Medak District, Telangana.

Class : IX

Project Title : “Rhomocompost and Rhomolavatories.”

Guide Teacher : Agomani Roy Chowdhury

The work : Rhomo worms, commonly called the “Red wriggler worms” can reproduce fast and are surface level composters. They can withstand extreme pH and high moisture conditions. Thus Rhomo composting and rhomo lavatories can be an easy and effective solution to unhygienic and unsanitary methods of defecation, particularly in the rural areas.



K. Sumana Sri, V. Sai Poojitha & P. Priyoosha

St. John's E.M High School (Campus-1) Gunadala, Vijayawada.

Class : IX

Project Title : “Amazing Scales and Feathers.”

Guide teacher : Hemanth Kumar

The work : These are generally considered a waste and discarded. The team studied the various components of fish scales and bird feathers and converted these into useful materials like ink, fertilizer, soaps, nail polishes, scrubs, etc.

V. Harini, R. Mohamed Halith & K. Vajika Shafreen

Mahatma Montessori Matric Higher Secondary School, Madurai.

Class : IX

Project Title : "Impact of Maida Consumption (Alloxan) on Health of Madurai City."

Guide Teacher : R. Christella

The work : Maida, the refined flour of wheat has neither any nutrient nor bran. The chemical alloxan that is used to clean maida has detrimental effect on beta cells of pancreas and production of insulin. It can thus lead a person who consumes maida daily to become a diabetic patient. This project creates awareness among the people of Madurai about the adverse effect of usage of maida in their diet regularly.



R. Sathvika, B. Vaishnavi & P. Sri Harsha

Paramita IIT and Medical League, Karimnagar, Telangana.

Class : IX

Project Title : "Storing Veggies."

Guide Teacher : Bopender Kour

The work : Aims at providing innovative storage facility for vegetables to the farmers by which they can preserve fruits and vegetables for weeks. The unique storage device is low cost, damage free, easy to handle and has a high capacity to store veggies. The box also helps in reducing the waste and get more profit for the farmer.

R. Selva Sridhar & S. Allwish Romero

VedicVidyashram Senior Secondary School, Tirunelveli, Tamil Nadu.

Class : VIII

Project Title : "DTMF Based Industrial Automation and Appliances Control System for Rural and Agriculture Applications."

Guide Teacher : Arivanantham

The work : Involves automation of processes and appliances control system based on DTMF, with particular emphasis on use to farmers for irrigation thereby reducing human effort and maintenance cost. This leads to ease of work and increase in efficiency as the processes can be controlled even through their mobiles.



Category 2 – Classes 10th to 12th



Layaal Ali, Priyanga Gandhi & B.A. Bhoomika

Treamis World School, Bangalore, Karnataka.

Class : XI

Project Title : "Blind Aid."

Guide Teacher : Dr. Thanuja

The work : The innovation works by the mechanism of echo location, it detects and informs the user of upcoming obstacles and their distances thereby acting as a pair of eyes for them. A low cost device, it can detect both stationary as well as moving objects.

Prathiksha Murugavel & R. Jyothsna

D.A.V. Public School, Velachery, Chennai, Tamil Nadu.

Class : XI

Project Title : "Preparation of Biopesticide for Mosquito Larvae from Watermelon Rind."

Guide Teacher : Rema Devi

The work : The work involves development of a cost effective and eco-friendly biopesticide using low cost biological waste materials as culture medium for production of pathogenic bacterium *Bacillus thuringiensis* (Bt). The pesticide produced is toxic to a variety of insects including mosquitoes, however, it is harmless to humans.



Namita Ramesh & Deveshi Pareek

DDMS P. Obul Reddy Public School, Jubilee Hills, Hyderabad.

Class : XI

Project Title : "Lunatrat - The Destroying Pot."

Guide Teacher : Roja Rajani Geddam

The work : An innovative and cost effective pot which destroys sanitary napkins and diapers with the help of solar energy. This pot can be used not only at home but also in public places like schools, hospitals, theatres, etc..., as well as villages.

Atmakuri Sai Sri Harsha & M. Uha Sree

RMK Residential Senior Secondary School, Thiruvallur, Tamil Nadu.

Class : XI

Project Title : "PREGO : Accident Proof Car."

Guide Teacher : K. Kiran Kumar

The work : In the project the students have built a prototype car which uses alternate sources of energy for pollution control coupled with safety systems to avert and contain road fatality rates.



Scientific Talk by Dr. Sharmistha Banerjee at SPARK-Innovation Award Event

To inspire the participating students and to give them a peek into the kind of research possibilities that science offers, a talk by Dr. Sharmistha Banerjee, Associate Professor, Department of Biochemistry, School of Life Science, University of Hyderabad was arranged. She presented a talk titled "**Stem Cell Research: what is it all about?**" She spoke about the various ways the research on stem cells affects our living and far reaching implications of treating illnesses for which at present there is no cure. Many areas where stem cell research has potential use include: development of artificial skin for burns and ulcers, development of bionic eye with artificial retina, use of patient's own stem cells to cure cancer and paralysis, growth of body parts of and organs for wounded patients, etc. The talk was very interesting not only to the students but also the audience in general as the talk stressed on the possibility that what once seems like science fiction can become a reality.



4. Research Awards

These awards are given to scientists below 30 years of age who are actively involved in research in basic sciences which include Physics, Chemistry, Biology and Mathematics. The extent of participation and the quality of the work has gone up over the years and the judges admit that it is becoming increasingly difficult to choose the awardees. The list of awardees shall be announced during the Annual Function of the Society.



Candidates Presenting their Research Work

5. Support from Pool of earlier Research Awardees

The office of the Society is being developed as an Innovation and Hobby Centre. In its quest for developing a unique centre for Science, the Society invited some of the earlier Research Awardees, who are based in Hyderabad, for a discussion. They not only gave very useful suggestions but also expressed their willingness to be part of the KVRSS team in its activities.



6. Visit Arranged by KVRSS to Heritage Valley School, Shadnagar

Talk by Prof. Klaus Appenroth,

Institute of Botany and Plant Physiology, University of Jena, Jena, Germany

Prof. Klaus Appenroth, specialist in Duckweed Research presented a talk at Sherwood Public School, Hyderabad, about **“The Charms of Duckweed”**. He spoke about the potential of various duckweeds as a protein source for humans. These tiny plants also contain valuable omega-3 fatty acids such as stearidonic acid and alpha-linolenic acid. Duckweeds multiply very rapidly, but do not require any additional cultivable land as they grow in water bodies. Other potential applications for duckweeds are absorption of trace elements from water, fish farming and water purification. Prof. Klaus interacted with students of the school who showed a lot of interest in the methodology and potential of research.



7. Recap of Annual Function 2016 -17

The 17th Annual Function of the Society was held on 27th May, 2017 at SLS Auditorium, University of Hyderabad, Hyderabad. The IT team supporting us ensured a live coverage (<http://live.kvrss.org>) of the event and enabled many to watch the students receiving the awards.

The event was graced by **Dr. D. K. Aswal**, Director, CSIR-National Physical Laboratory, New Delhi. Dr. Aswal presented the Memorial Oration on **“Noise Pollution”**. He emphasized the fact that noise pollution is the worst kind of pollution human kind is going through and the responsibility of the society as a whole in fighting against it. He informed about the ill effects of high noise pollution and dwelt on possible remedies.



The Chief Guest at the event was Prof. Appa Rao Podile, Vice-Chancellor & Professor in the School of Life Sciences, University of Hyderabad, Hyderabad. He spoke about the responsibility of institutions in encouraging students to pursue science as their career and pledged his support to our Society in our mission of popularizing science. He praised the Society for its activities and the strict and efficient selection process as evidenced by the career progress of various earlier awardees.



It was a special day for the Society as its first awardee, Dr. Ch. Venkat Reddy, who was in the city on a vacation from US took time off to attend the event. He is currently a Research Chemist at BioCryst Pharmaceuticals, Iowa city, his work involves the development of drugs for rare diseases. Speaking on the occasion he said "I felt like I was receiving a Nobel prize when I was presented the award in 2001 and it would remain the best award I have ever received". He lamented that scientists still remain the least recognized community among all the fields. He congratulated the Society's effort in working towards this direction and encouraging science and scientists.



Award Winners at Annual Function - 2016-17



Young Scientist Awards

The following are the research students who received the awards in the Year 2016-17



Biology | Winner

Mr. Tushar D. Lodha
University of Hyderabad



Biology | Runner up-I

Ms. Neethu Maria Abraham
University of Hyderabad



Biology | Runner up-I

Mr. K. Narendar
Indian Institute of Technology,
Hyderabad



Biology | Runner up-II

Ms. Malapaka Kiranmayi
Indian Institute of
Technology Madras, Chennai



Chemistry | Winner

Mr. J. Haribabu
National Institute of Technology,
Trichy, Tamil Nadu



Chemistry | Runner up-I

Mr. D.V. Krishna Rao
University of Hyderabad



Chemistry | Runner up-II

Ms. J. Poorna Bindu
Tamil Nadu Agricultural
University, Coimbatore



Chemistry | Runner up-II

Mr. P. Naresh Kumar
Indian Institute of
Technology, Hyderabad



Physics | Winner

Mr. Shubhadeep Pal
TIFR Centre for Interdisciplinary
Sciences, Hyderabad



Physics | Runner up-I

Mr. K.G. Raghavendra
IGCAR, Kalpakkam,
Tamilnadu



Physics | Runner up-II

Mr. C. Vanamali Shastry
Mangalore University,
Mangalagangothri, Karnataka



Physics | Runners up-II

Mr. N. Raju
Osmania University,
Hyderabad



Mathematics | Runner up

Mr. S. Aiyappan
Indian Institute of Science,
Bangalore

8. Annual Memorial Oration Award

To motivate the young children and all the other awardees each year the Awards function of the Society is graced by an eminent Scientist who presents the Dr. K.V. Rao Memorial Oration and presents the students with awards. This year Prof. Anurag Kumar, Director, Indian Institute of Science, Bangalore will present the 18th Annual Memorial Oration. He shall present the talk on **“The Internet of Things: Technology and Prospects.”**

Profile of the Orator



Professor Anurag Kumar obtained his B.Tech. degree from the Indian Institute of Technology at Kanpur, and the Ph.D degree from Cornell University, both in Electrical Engineering. He was then with Bell Laboratories, for over 6 years. He returned to India in 1988, and has since been with the Indian Institute of Science (IISc), Bangalore, on the faculty of the Department of Electrical Communication Engineering. Before taking over as the Director of IISc, on 1 August 2014. He was the Chair of the Electrical Sciences Division since 2007. From 1988 to 2003 he was the Coordinator at IISc of the Education and Research

Network Project (ERNET), a UNDP and Government of India collaborative national program that established India's first wide-area packet switching network.

His area of research is communication networking, specifically, modeling, analysis, control and optimisation problems arising in communication networks and distributed systems. Recently his research has focused primarily on wireless networking. In addition to many publications in top journals and conferences, he has co-authored two books: I) Communications Networking: An Analytical Approach and II) Wireless Networking, both published by Morgan Kaufman (Elsevier), and co-authored with D. Manjunath and Joy Kuri.

He was the 1977 President's Gold Medallist in IIT Kanpur. He received the IISc Alumni Award for Excellence in Engineering Research for 2008. He has been elected Fellow of the IEEE, the Indian National Science Academy (INSA), the Indian National Academy of Engineering (INAE), the Indian Academy of Science (IASc), and The World Academy of Sciences (TWAS). During the period 2005-2009, he was an area editor for the IEEE/ACM Transactions on Networking. He is a recipient of the J.C. Bose National Fellowship, awarded by the Department of Science and Technology, for the period 2011-2021.

Our Society wishes to express its sincere thanks to Prof. Anurag Kumar for accepting to deliver the 18th Annual Memorial Oration.





Dr. K. V. RAO SCIENTIFIC SOCIETY
FRIENDSHIP HEIGHTS

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